MALAYSIAN JOURNAL OF

PUBLIC HEALTH MEDICINE

e-ISSN: 2590-3829

ISSN: 1675-0306 **Volume 22 (Supplement 2) 2022**

Official Publication of the

MALAYSIAN PUBLIC HEALTH PHYSICIANS' ASSOCIATION

MJPHM

Official Journal of Malaysian
Public Health Physicians' Association

EDITORIAL BOARD

Chief Editor
Malaysian JournalofPublicHealthMedicine(MJPHM)
International Centre for Casemix and Clinical Coding
UniversitiKebangsaan MalaysiaMedicalCentre(UKMMC)
Jalan Yaacob Latif, 56000 Cheras, Kuala Lumpur
Malaysia

ISSN:1675–0306

TheMalaysian JournalofPublic HealthMedicineispublishedtwiceayear

SecretariateAddress:
The Secretariate
International Centre for Casemix and Clinical Coding
UniversitiKebangsaan MalaysiaMedicalCentre(UKMMC)
Jalan Yaacob Latif, 56000 Cheras, Kuala Lumpur
Malaysia
Tel: 03-91456986/6987/6988 Faks: 03-91456685, Email: editor@mjphm.org

Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

MJPHM
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11TH NATIONAL PUBLIC HEALTH CONFERENCE & 1ST GLOBAL PUBLIC HEALTH CONFERENCE:

Theme:
Building a Resilient Public Health System for a Better Future

Date:
25th - 27th July 2023

Venue:
Resorts World Langkawi, Kedah Darul Aman, Malaysia

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CONTENT

Priya A/P Ragunath

S.4.3: A CASE OF NOISY WORKPLACE: THE UMMC EXPERIENCE
Rama Krishna A/L Sumpramanian

SYMPOSIUM 5 HEALTH MANAGEMENT AND POLICY

S.5.1: CHALLENGES AND CHANGES IN MALAYSIAN HEALTH SYSTEM: INFLUENCE BY GLOBAL SCENARIO
Rohaizat Yon

S.5.2: TRANSLATING GLOBAL VALUE-BASED APPROACH TOWARDS A SUSTAINABLE HEALTH CARE SYSTEM
Izzuna Mudla Muhamed Ghazali

S.5.3: THE ROLE OF BIG DATA IN HEALTHCARE POLICY MAKING
Mohamad fadli Khairie

SYMPOSIUM 6 FAMILY HEALTH - GLOBAL UPDATE OF REPRODUCTIVE HEALTH

S.6.1:NATIONAL IMPLEMENTATION OF CERVICAL CANCER SCREENING: AUSTRALIAN EXPERIENCE
Marion Saville

S.6.2: MEN'S HEALTH - IT'S NOT ONLY PERFORMANCE AND SIZE
Ng. Chirk Jen

S.6.3: WHO SEXUAL REPRODUCTIVE HEALTH PROGRAM: YESTERDAY, TODAY AND TOMORROW
Pascale Allotey

SYMPOSIUM 7 PRIMARY HEALTHCARE REFORM: COUNTRIES EXPERIENCE

S.7.1: HEALTH FINANCING REFORM: SPENDING ON PRIMARY HEALTH CARE
Kara hanson

S.7.2: ENHANCING PRIMARY HEALTHCARE SYSTEM IN MALAYSIA
Safiee Ismail

S.7.3: THE ROAD TO UNIVERSAL HEALTHCARE IN INDONESIA
Shita Dewi

SYMPOSIUM 8 DIGITAL HEALTH: TRANSFORMING GLOBAL HEALTHCARE

S.8.1: ARTIFICAL INTELLIGENCE IN PUBLIC HEALTH
Mohd Helmi Zakariah

S.8.2: NATIONAL EMR INITIATIVE:TOWARDS LIFETIME HEALTH RECORD
Shaifuzah Ariffin

S.8.3: NURTURING DIGITAL HEALTH INNOVATIONS
Adina Abdullah

SYMPOSIUM 9 CHALLENGES IN NCD EPIDEMIC AND EVOLUTION OF PUBLIC HEALTH APPROACHES

S.9.1:UNDERSTANDING DIABETES AND OBESITY SCENARIOS AT COUNTRY LEVEL
Majid Ezzati

S.9.2: THE BURDEN OF PREMATURE MORTALITY DUE TO NCD IN THE SOUTH-EAST ASIA REGION: CHALLENGES AND STRATEGIES
Chalapati Rao

S.9.3: HOW CAN WE MANAGE COMMERCIAL DETERMINANTS OF HEALTH
Feisul Idzwan Mustapha

ORAL PRESENTATION - EPIDEMIOLOGY

EPIDOP01/12 **EXPLORING THE PREVALENCE AND RISK FACTORS OF OBESITY AMONG ADULTS IN AN URBAN POOR COMMUNITY**
Jo Ann Andoy Galvan, Karuthan Chinna, Neoh Beng Sheng, Saman Tayeba, Ong Shu Xin, Piravenaaeaswaary

EPIDOP02/42 **PREDICTORS OF PRESENCE OF T2DM-RELATED COMPLICATION IN PAHANG: IS INSULIN ALREADY ON BOARD?**
Aizuniza, Muhammad Siddiq, Shaiful Sharizal, Mohd Fahmi I, Sharifah Fairuz, Nor Azimi, Husnina

EPIDOP03/64 **HUMAN BRUCELLOSIS OUTBREAK LINKED TO UNPASTEURISED GOAT MILK IN PULAU PINANG, 2022**
Tan Hooi Shyuan, Rozaini Mat Shah, Lydia Ann Ganapathi, Noor Farhana Mohd Fathil, Azizah Ab Manan

EPIDOP04/32 **COPING STRATEGIES FOR DEALING WITH PSYCHOLOGICAL DISTRESS AND HINDRANCES FOR HELP-SEEKING AMONG ADOLESCENTS LIVING IN THE KLANG VALLEY PEOPLE'S HOUSING PROJECT (PPR) DURING THE COVID-19 PANDEMIC**
Siti Nur Farhana H, Noor Laile J, Norrafizah J, Zanariah Zaini, Mohd Hairmansah MS, Feisul Idzwan Mustapha, Manimaran K

EPIDOP05/63 **A COMPARISON BETWEEN ANTIBIOTIC CONSUMPTION IN PUBLIC AND PRIVATE COMMUNITY HEALTHCARE IN MALAYSIA**
Audrey Huili Lim, Norazida Ab Rahman, Siti Nur Su'aidah Nasarudin, Tineshwaran Velvanathan, Mary Chok Chiew Fong, Sheamini Sivasampu

EPIDOP06/15 **DISTRESS TOLERANCE AND MOOD DISORDERS AMONG SMOKING CESSATION CLINIC ATTENDEES**
Nazirah Gulam Mohamed, Lei Hum Wee, Caryn Mei Hsien Chan, Ching Sin Siau, Alfian Mohd Zin

EPIDOP07/55 **DEPRESSION AND IT'S ASSOCIATED FACTORS AMONG BIDAYUH WOMEN IN THE RURAL AREA OF BAU, SARAWAK**
Punita Manoharan, Noorzilawati Sahak

EPIDOP08/78 **GAMIFIED-REAL-TIME VIDEO OBSERVED THERAPY (GRVOTS) MOBILE APPLICATION IMPACT ON THE TUBERCULOSIS (TB) MEDICATION ADHERENCE AND MOTIVATION**
Siti Aishah Abas, Nurhuda Ismail, Siti Munira Yasin, Yuslina Zakaria, Khalid Ibrahim, Ismasabbah Ismail, Asmah Razali, Norliza Ahmad, Rohaya Ramli, Zamzurina Abu Bakar

EPIDOP09/46 **GENDER DIFFERENCES ASSOCIATED WITH OTHER CO-MORBIDITIES AMONG LOW-INCOME (B40) INDIVIDUAL WITH HYPERTENSION IN MALAYSIA: THE RESPOND STUDY**
Nafiza Mat-Nasir, Mohamad Rodi Isa, Mazapuspavina Md-Yasin, Farnaza Ariffin, Fadhlina Ab-Majid, Benjamin Palafox, Martin McKee

EPIDOP10/116 **EMPOWERING DIABETES CARE: ASSESSING THE EFFECTIVENESS OF MY DIABETES APPS IN ENHANCING KNOWLEDGE, COMPLIANCE, AND DISEASE CONTROL AMONG UNCONTROLLED TYPE 2 MELLITUS DIABETES PATIENTS IN KEDAH, MALAYSIA**
Mohd Nazrin Jamhari, Mohd Rohaizat Hassan, MohdAm mar Ihsan Ahmad Zamzur,i Norfazilah Ahmad, Khaironi Yatim Sharif,Muhammad Sufri Muhammad, Mohd Hafeez Osman, Shareh Azizan Shareh Ali, Suziana Redzuan, Norizan Ahmad

EPIDOP11/108 **MOTIVATION TO QUIT VAPE AMONG ADULT EXCLUSIVE VAPE USERS IN MALAYSIA**
Nizam Baharom

EPIDOP12 / 45 **LOSS TO FOLLOW-UP DURING TUBERCULOSIS (TB) TREATMENT AMONG ADULT TB PATIENTS WHO SMOKE: A PROSPECTIVE COHORT STUDY**
Zatil Zahidah Sharani, Nurhuda Ismail, Siti Munira Yasin, Muhamad Rodi Isa

EPIDOP13 / 94 **DIARRHOEA AND ITS ASSOCIATED RISK FACTORS IN A JAHAI COMMUNITY**
Swe Swe Latt, Abdul Rashid Khan

EPIDOP14 / 106 **MANAGEMENT OF PLASMODIUM FALCIFARUM MALARIA OUTBREAK IN B3 LOGGING CAMP NABAWAN SABAH 2022**
Muhammad Abiruddin Abdul Salleh, Mohamad Norhaizam Ahmad@Narawi, Ahmad Syukri Radzran

EPIDOP15 / 112 **COMPLICATIONS OF TYPE 2 DIABETES MELLITUS (T2DM) AMONG PATIENTS IN SELANGOR: SURVIVAL ANALYSIS FROM THE MALAYSIA NATIONAL DIABETES REGISTRY**
Rimah Melati Ab. Ghani, Nor Asiah Muhamad, Izzah Athirah Rosli, Nur Hasnah Maamor, Fatin Norhasny Leman

EPIDOP16 / 20 **DESCRIPTIVE ANALYSIS OF DENGUE DEATHS IN SABAH, MALAYSIA**
Sashi Kumar A/L Balasinggam, Abdul Marsudi Bin Manah, Marilyn Charlene Montini Maluda

EPIDOP17 / 58 **MEASLES OUTBREAK AMONG SCHOOL CHILDREN IN KLANG: MANOUVERING PUBLIC HEALTH STRATEGIES**
Anussa Krishnan, Faridah Jafri, Nur Adibah Saruan, Rohana Saad, Faeiz Syezri Adzmin Jaafar, Noor Azreen Masdor, Chandrika Jeevanathan, Shameele Thinakaran, Muhammad Khairul Fazerin Adnan, Hazekel

ORAL PRESENTATION - FAMILY HEALTH & HEALTH MANAGEMENT

FHSMOP01/81 **DIMENSION OF ANTENATAL MOTHER PERCEPTION ON VIRTUAL PRIMARY HEALTHCARE USAGE: A FRAMEWORK ANALYSIS**
Rosnah Sutan

FHSMOP02/18 **TEACHERS' WILLINGNESS TO SUPPORT PRESCHOOL CHILDREN'S MENTAL HEALTH**
Mirunaaleni Selvaraju, Cheah Whye Lian, Ang Ai Ling

FHSMOP03/66 **ASSESSING THE DISTRIBUTION AND INCIDENCE OF CATASTROPHIC HEALTH EXPENDITURE FROM OUT-OF-POCKET HEALTH PAYMENTS AMONG HOUSEHOLDS IN MALAYSIA**
Mohamed Fakhri Abu Baharin, Muhamad Hanafiah Juni, Rosliza Abdul Manaf

FHSMOP04/25 **FROM PERSON-CENTRED MOMENTS TO PERSON-CENTRED CULTURE - IDENTIFYING PERSONAL AND ORGANISATIONAL INTEGRATED CARE CHALLENGES**
Pui San Saw, Nur Zahirah Balqis-Ali, Anis-Syakira Jailani, Weng Hong Fun, Sondi Sararaks, Shaun Lee

FHSMOP05/53 **ANAK SELANGOR ANAK SIHAT (ASAS); A PUBLIC HEALTH INTERVENTION BY THE SELANGOR STATE GOVERNMENT**
Mohammad Farhan Rusli, Muhammad Adil Zainal Abidin, Norhasniza Yaacob, Siti Mariah Mahmud

FHSMOP06/83 **IMPACT OF COVID-19 PANDEMIC ON SCREENING AND INTERVENTION OF ADOLESCENT HEALTH AT PRIMARY HEALTHCARE SETTING**
Jo Ann Andoy Galvan, Robert So Jr, Shannen Kay Chan, Nazifah Binti Nagoor Pitchai, Puravaindran A/L Sithamparam, Arooj Iftikhar, Karuthan Chinna

FHSMOP07/13 **MENTAL HEALTH AND OBESITY IN A B40 COMMUNITY DURING COVID-19 PANDEMIC**
Nazirah Gulam Mohamed, Lei Hum Wee, Caryn Mei Hsien Chan, Ching Sin Siau, Alfian Mohd Zin

FHSMOP08/85 **ONLINE ANIMATED VIDEO INTERVENTION EFFECT ON INTENTION AND WILLINGNESS TO SEXT AMONG UNDERGRADUATE STUDENTS**
Norliza Ahmad, Norain Mansor, Salmiah Md Said, Tan Kit-Aun, Rosnah Sutan

FHSMOP09/61 **INTEGRATED DRIVING FACTORS OF PARENTAL VACCINE HESITANCY TOWARDS COVID-19 VACCINES FOR CHILDREN IN PETALING DISTRICT, MALAYSIA**
Sarah Nabila Zulkifli, Halimatus Sakdiah Minhat

FHSMOP10/107 **REGIONAL DIFFERENCES IN HOUSEHOLD EXPENDITURE ON PHARMACEUTICALS: EVIDENCE FROM MALAYSIA**
Wei Chern Ang, Yong Kang Cheah

FHSMOP11/47 **FACTORS ASSOCIATED WITH ANEMIA AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINICS IN MELAKA TENGAH DISTRICT, MELAKA, MALAYSIA**
Syafiq S.S., Noor Aizam M.S., Nur Shyuhada A.R., Fauziah M.Y., Fauzi A.M., Rosmiza A., Nur Farhana H.

FHSMOP12/103 **AN IN-DEPTH ANALYSIS OF COMPLAINTS IN PRIMARY HEALTHCARE SETTINGS: A MIXED-METHODS STUDY IN A SOUTHERN JOHOR DISTRICT**
Muhammad Alimin Bin Mat Reffien, Muhamad Farhan Bin Ab Razak, Mohd Khairul Anwar Bin Kamdi, Haidar Rizal Bin Toha, Norli Binti Rosli, Shahraniza Binti Bahari, Ainulbariah Binti Abd Wahid

FHSMOP13/136 **DETERMINATION OF PATTERN IN DEVELOPING PREDICTIVE ANALYSIS FOR PATIENT TREATMENT COST: A STATISTICAL APPROACH TOWARDS MACHINE LEARNING MECHANISM**
Mohd Noor Afiq Ramlee, Amirah Azzeri, Mohd Hafiz Jaafar, Mohd Iqbal Mohd Noor, Maznah Dahlui

FHSMOP14/41 **EVIDENCE MAPPING AND REVIEW OF MITRAGYNA SPECIOSE (KRATOM) FOR HEALTH: A SYNTHESIS OF QUALITATIVE EVIDENCE TO INFORM POLICY**
Nor Asiah Muhamad, Nur Hasnah Ma'amor, 'Izzah 'Athirah Rosli, Fatin Norhasny Leman, Rimah Melati Abd Ghani, Muhammad Radzi Abu Hassan

FHSMOP15/104 **THE ECONOMIC BURDEN OF THE COVID-19 PANDEMIC IN THE STATE OF KUWAIT**
Amrizal Muhammad Nur, Syed Mohamed Aljunid, Mohammad Almari

FHSMOP16/130 **PREVALENCE AND FACTORS ASSOCIATED WITH THE TYPE AND NUMBER OF MUTATIONS OF SARS-COV-2 AMONG COVID-19 PATIENTS WITH CO-MORBIDITIES: EVIDENCE FROM A SOUTH-EAST ASIA COUNTRY**
Hafiz Jaafar ,Amirah Azzeri,Liyana Azmi

FHSMOP17 / 115 **BARRIERS ACCESSING MENTAL HEALTH UTILISATION SERVICE AMONG SCHOOL-GOING CHILDREN IN MALAYSIA.**
Tengku Amatullah Madeehah T Mohd, Syara Shazanna Zulkifli, Khadijah Hasanah Abang Abdullah, Suhaila Sanip, Choo Wan Yuen.

ORAL PRESENTATION - ENVIRONMENTAL AND OCCUPATIONAL HEALTH

OHEHOP01/22 **STRATEGIES FOR INTERNATIONAL STATISTICAL CLASSIFICATION OF DISEASES AND RELATED HEALTH PROBLEMS (ICD) TRANSITIONAL IMPACT ON DISEASE TRENDS AND STATISTICS – A NARRATIVE REVIEW**
Erwyn Chin Wei Ooi, Zaleha Md Isa, Mohd Rizal Abdul Manaf, Ahmad Soufi Ahmad Fuad, Mimi Nurakmal Mustapa, Azman Ahmad, Nuraidah Mohd Marzuki

OHEHOP02/28 **RETURN ON INVESTMENT OF CARDIOVASCULAR DISEASE PREVENTION POLICIES IN MALAYSIA**
Muhammad Fikri Azmi, Azimatun Noor Aizuddin, Norfazilah Ahmad, Feisul Idzwan Mustapha

OHEHOP03/82 **PREDICTORS OF SEVERE COVID-19 AMONG HEALTHCARE WORKERS IN SABAH, MALAYSIA**
Lim Kai Joo, Mohd Fazeli Sazali, Michelle Goroh, Abraham Chin Zefong, Marilyn Charlene Montini Maluda, Richard Avoi and Valentine Japulee Gantul

OHEHOP04/57 **RISK ASSESSMENT OF OCCUPATIONAL FACTORS ASSOCIATED WITH LOW BACK PAIN AMONG HEALTHCARE WORKERS IN COMMUNITY HEALTH CLINICS IN KOTA KINABALU DISTRICT, SABAH, MALAYSIA: A PREVALENCE STUDY**
Ahmad Nabeil Alias, Shamsul Bahari Shamsudin and Mohammad Saffree Jeffree

OHEHOP05/79 **CORRELATION BETWEEN FLOOD DISASTER PREPAREDNESS AND COMMUNITY DISASTER RESILIENCE IN SELANGOR FLOOD-PRONE AREAS**
Hayati Kadir Shahar, Rosliza Abdul Manaf, Najihah Muhammad

OHEHOP06/49 **RESILIENCE STATUS OF MALAYSIAN GOVERNMENT HEALTHCARE FACILITIES FOLLOWING THE FLOOD DISASTER DURING THE NORTHEAST MONSOON 2022-2023**
Mohd Shahrol Abd. Wahil, Norlen Mohamed, Anis Salwa Kamaruddin, Thahirahtul Asma' Zakaria, Ahmad Riadz Mazeli, Siti Norfadhilah Zainal Abidin, Hazlina Yahaya, Roslan Mohamed

OHEHOP07/73 **TASK SHIFTING APPROACH FOR CHRONIC DISEASE CARE: NURSE'S LEAD HEPATITIS C CARE FOR REFUGEES AND ASYLUM SEEKERS IN MALAYSIA: A PRELIMINARY PROGRAM REPORT**
Jarmila Kliescikova, Kalyan Velivela, Wan Siew Yeoh, Biruk Assefa Legese, Ramona Pereira, Chan Huan Keat, Han Yang Chung, Rosaida binti Hj Md Said, Muhammad Radzi Abu Hassan

OHEHOP08/17 **VERIFICATION OF SELF-REPORTED SMOKING STATUS WITH CARBON MONOXIDE READING AND SALIVARY COTININE AMONG ADOLESCENTS WHO USE CONVENTIONAL AND ELECTRONIC CIGARETTES IN MALAYSIA**
Nur Atikah Abdul Halim, Wee Lei Hum, Nur Zakiah Mohd Saat, Mohamad Haniki Nik Mohamed, Swinderjit Jag Singh, Siau Ching Sin, Chan Caryn Mei Hsien

OHEHOP09/7 **DENGUE ABATING SHOOTER DRONE- AN INNOVATIVE PROJECT TO BATTLE AGAINST DENGUE**
Noor Aizam MS, Intan Azura MD, Rusdi AR

OHEHOP10/52 **HORIZONTAL EQUITY IN HEALTHCARE USE IN MALAYSIA BETWEEN 2011 AND 2019**
Adilius Manual, Awatef Amer Nordin, Jabrullah Ab Hamid, Suhana Jawahir, Sarah Nurain Mohd Noh, Fathullah Iqbal Ab Rahim, Nur Elina Abdul Mutalib

OHEHOP11 / 154 **RADIATION PROTECTION LITERACY AMONG HEALTHCARE WORKERS IN MALAYSIA**
Khairul Anuar Abdullah, Ahmad Azuhairi Ariffin, Anita Abdul Rahman, Zuraida Mohamad, Ahmad Iqmer Nashriq Mohd Nazan, Hayati Kadir, Rusdi Abdul Rahman

OHEHOP12 / 120 **COST-EFFECTIVENESS OF MOBILE TARGETED ACTIVE CASE DETECTION FOR EARLY DETECTION OF TUBERCULOSIS**
Au-Chun Liaw, Abdul Rahman Ramdzan, Richard Avoi

OHEHOP13/152 **STRATEGIC PURCHASING IN THE MALAYSIAN PUBLIC HEALTHCARE SYSTEM: CURRENT STATUS AND CHALLENGES TO IMPLEMENTATION**
Aznida Firzah Abdul Aziz, Khor Swee Kheng

POSTER PRESENTATION - EPIDEMIOLOGY

EPIDPP01/10 **EFFECTIVENESS OF A SCHOOL-BASED INTERVENTION IN MANAGING OVERWEIGHT AND OBESITY AMONG ADOLESCENTS IN MALAYSIA**
Lai Wai Kent, Sherina Mohd Sidik, Lekhraj Rampal, Gan Wan Ying, Siti Irma Fadhilah Ismail

EPIDPP02/23 **THE ANALYSIS OF NATIONAL HEALTH SCREENING INITIATIVE IN KUALA LUMPUR AND PUTRAJAYA**
Waramlah Ramlan, Jaysina Ayu Jaafar Siddek, Juliena Mohd Zaini, Aashvini Prakash Rao, Syazana Mohd Nasir, Haliza Abdul Manaf, Nor'Aishah Abu Bakar

EPIDPP03/44 **USAGE OF VILDAGLIPTIIN AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS ATTENDING PUBLIC PRIMARY HEALTH CARE CLINIC IN KUALA SELANGOR DISTRICT, SELANGOR**
Farhani Samat, Sulizah Samad, Siti Khalimah Rosnan, Jasrinjeet Kaur, Nur Hidayah Zulkefli, Nur Athirah Rosli, Fateen Nadhira Ismail, Noor Rafizah Aminah Aziz

EPIDPP04/14 **BARRIER TO CORONAVIRUS DISEASE 2019 (COVID-19) VACCINE UPTAKE AMONG RURAL SIK DISTRICT RESIDENTS**
S Maria Awaluddin, Noorul Emilin Abdul Khalid, Hadzri Zainal, Suraya Said, Rosmalina Abu Bakar

EPIDPP05/24 **PREVALENCE OF DIARRHOEA AND ITS TREATMENT AMONG CHILDREN UNDER FIVE IN MALAYSIA**
Chan Yee Mang, Khaw Wan-Fei

EPIDPP06/50 **TB DEATH IN MELAKA TENGAH 2018-2022 : A RETROSPECTIV CAUSAL COMPARATIVE STUDY**
Noor Syazwani Shahar, Na'eemah Zaini, Soh Yih Harng

EPIDPP07/48 **WORK-RELATED STRESS AND COPING MECHANISM AMONG MEDICAL OFFICERS IN PENANG STATE**
Ainulfadila Abu Hassan Shaari, Chiew Wye Lee, Noor Farhana Mohd Fathil

EPIDPP08/51 **THE POWER OF TB PREVENTIVE TREATMENT (TPT) IN CONQUERING SLEPPING MONSTER**
Mohd Ihsani Mahmood, Koay Teng Khoon, Mugilan Ganason, Asmah Razali, Zirwatul Adilah Aziz, Siti Hafsah Abdul Halim

EPIDPP09/34 **PSYCHOLOGICAL DISTRESS AMONG ADOLESCENTS LIVING IN THE KLANG VALLEY PEOPLE'S HOUSING PROJECT (PPR) DURING THE COVID-19 PANDEMIC**
Noorlaile Jasman, Siti Nur Farhana Harun, Norrafizah Jaafar, Zanariah Zaini, Mohd Hairmansah Mohd Shah, Manimaran Krishnan Kaundan

EPIDPP10/74 **EFFECTIVENESS OF A THEORY-BASED HEALTH EDUCATION MODULE IN IMPROVING SELF-EFFICACY ON CONDOM USE AMONG PEOPLE LIVING WITH HIV**
Noorlaile Jasman, Siti Nur Farhana Harun, Norrafizah Jaafar, Zanariah Zaini, Mohd Hairmansah Mohd Shah, Manimaran Krishnan Kaundan

EPIDPP11/43 **THE PREVALENCE OF NON-COMMUNICABLE DISEASE (NCD) RISK FACTORS AMONG COMMUNITY IN THE KOSPEN PROGRAMME IN MALAYSIA**
Mohd Tariq M.N, Rosnah Ramly, Noraryana Hassan

EPIDPP12/67 **ASSOCIATED FACTORS OF TEMPERATURE ON HAND, FOOT, AND MOUTH DISEASE (HFMD) INCIDENCE IN KUALA PILAH DISTRICT**
Mohd Fathulzhafran Mohamed Hanan, Noraliza Radzali, Azline Abdilah, Jacinta Mary Fathi Rosary Rajan, Sharifah Aini Mohamad, David Chan Chee Hoong, Muhd Abd Hafiz Kamarul Zaman, Muhammad Syahmi Najwan Shamsudin, Nur Syazwani Khairudin, Rehemey Shamsul, Muhammad Iskandar Noh, Siti Nurliyana Nur Zahariman Shah, Muhammad Atrash Salim, Siti Nor Hidayah Mohd Nordin

EPIDPP13 / 70 **MULTIMORBIDITY AND HOSPITALISATION: TRENDS OF UTILISATION AND THE ROLE OF SUPPLEMENTARY FINANCIAL HEALTH COVERAGE**
Suhana Jawahir, Awatef Amer Nordin, Jabrullah Ab Hamid, Adilius Manual, Sarah Nurain Mohd Noh, Nur Elina Abdul Mutalib, Fathullah Iqbal Ab Rahim

EPIDPP14/87 **SOCIODEMOGRAPHIC CHARACTERISTICS AMONG HYPERTENSION IN TYPE 2 DIABETES MELLITUS CLIENT ATTENDING KUALA PILAH HEALTH CLINIC, NEGERI SEMBILAN**
Siti Munisah Mohd Shoaib, Noraliza Radzali, Azline Abdilah

EPIDPP15/16 **GEOGRAPHICAL VARIATIONS IN THE PREVALENCE OF HIGH-RISK HUMAN PAPILLOMAVIRUS: FINDINGS FROM THE PUBLIC CERVICAL CANCER SCREENING REGISTRY**
Anis-Syakira Jailani, Nur Zahirah Balqis-Ali, Sal Sabila Mohd Shaffie, Weng Hong Fun, Yuke-Lin Kong, Zen Yang Ang, Sondi Sararaks, Shazimah Abdul Samad, Zakiah Mohd Said

EPIDPP16/65 **YAWS AMONG INDIGENOUS PEOPLE OF SUNGAI KEJAR, HULU PERAK: THE PREVALENCE AND THE TREATMENT**
Nor Azila Rani, Nor Ammadah Azman

EPIDPP17/35 **DOES PHYSICAL FITNESS LEVEL ASSOCIATE WITH BODY WEIGHT STATUS AMONG SCHOOL ADOLESCENTS IN TERENGGANU, MALAYSIA?**
Nurzaime Zulaily, Aryati Ahmad, Mohd Razif Shahril

EPIDPP18/27 **TRENDS OF DENTAL CARIES STATUS OF 12-YEAR-OLD SCHOOL CHILDREN IN SARAWAK CENTRAL REGION, SARAWAK 2015-2019**
Wong Siong Ting, Aminuddin Mohd. Natar, Norkhafizah Saddki

EPIDPP19/86 **THE CHARACTERISTICS OF ZOONOTIC MALARIA PATIENTS IN KUALA PILAH DISTRICT, NEGERI SEMBILAN**
Muhammad Abdul Hafiz Kamarul Zaman, Noraliza Radzali, Azline Abdilah, Rehemey Shamsul Rosdi

EPIDPP20/90 **BIRTH COHORT EFFECTS ON OBESITY AMONG MALAYSIAN ADULTS: THE GENERATION X-ERS AND Y-ERS ARE THE HIGH-RISK SUBPOPULATIONS**
Chien Huey Teh, Chee Cheong Kee, Sanjay Rampal, Mohd Azahadi Omar, Tahir Aris

EPIDPP21/98 **COST ANALYSIS OF HUMAN PAPILLOMAVIRUS TEST AND PAP SMEAR TEST IN MINISTRY OF HEALTH MALAYSIA**
Zen Yang Ang, Yuke-Lin Kong, Mohd Shaiful Jefri Mohd Nor Sham, Anis-*Syakira Jailani, Nur Zahirah Balqis-Ali, Weng Hong Fun, Shakirah Md.Sharif, Nurul Aiman Farhana Nor Aziz Hashim, Shazimah Abdul Samad, Roziah Ismail, Zakiah Mohd Said, Rafidah Ahmed, Suhaila Md Hanapiah*

EPIDPP22/102 **HUMAN BRUCELLOSIS: A RETROSPECTIVE STUDY IN TERENGGANU 2014 - MAY 2023**
Wan Nor Hafizah Wan Baharuddin, Muhammad Naim Samsudin, Azmani Wahab, Mohd Anuar Abd Rahman, Kasemani Embong

EPIDPP23/162 **PHYSICAL ENVIRONMENT CHARACTERISTICS AMONG PHYSICALLY INACTIVE ANTENATAL WOMEN IN SEREMBAN, MALAYSIA**
Nazatul Yusrina Mohamad Yusof, Azline Abdilah, Nor Afiah Mohd. Zulkefli, Rosliza Abdul Manaf

EPIDPP24/11 **WOMEN ATTENDING CERVICAL CANCER SCREENING PROGRAMS BY THE PUBLIC HEALTH SECTOR; WHO ARE THEY?**
Nur Zahirah Balqis-Ali, Anis-Syakira Jailani, Nurul Aiman Farhana NAH, Weng Hong Fun, Sondi Sararaks, Nur Syazimah Abdul Samad, Zakiah Mohd Said

EPIDPP25/101 **SURVIVAL ANALYSIS OF NEWLY DIAGNOSED DIABETES MELLITUS : FINDINGS FROM THREE POPULATION-BASED SURVEYS.**
Mohd Azahadi Omar, Muhd Zulfadli Hafiz Ismail, Syarifah Nazeera Syed Anera, Ridwan Sanaudi, Nik Noor Syamimi Ismail.

EPIDPP26/119 **BREAKING THE CHAIN OF COVID-19 INFECTION IN THE COMMUNITY RESIDING IN CENTRAL REGION OF MALAYSIA: THE ROLE OF ENHANCED MOVEMENT CONTROL ORDER (EMCO)**
Renuga Devi Kanabalan, Rohaya Ramli, Izwan Effendy Zainuddin, Noriah Hajib, Hanis Ahmad, Nurfatehar Ramly, Winda Zulaiha Shahabudin

EPIDPP27/127 **OUTCOME OF ELIMINATION MOTHER-TO-CHILD TRANSMISSION (EMTCT) HEPATITIS B: A PILOT PROJECT IN TERENGGANU, 2019-2021**
Wan Nor Hafizah Wan Baharuddin, Mohd Fakhree Saad, Muhammad Naim Samsudin, Azmani Wahab, Mohd Anuar Abd Rahman, Kasemani Embong

EPIDPP28/160 **SPATIOTEMPORAL TREND OF HAND-FOOT-MOUTH DISEASE AND ITS RELATIONSHIP WITH ENVIRONMENTAL FACTORS IN NEGERI SEMBILAN**
Abdul Mueez Ahmad Shabuddin, Azline Abdilah, Salmiah Md. Said, Rosliza Abdul Manaf

EPIDPP29/126 **HOW WELL IS OUR B40 GROUP?**
Muhammad Shazwan Suhiman, Izzanie Mohamed Razif, Maizura Abdul Jabar, Nur Aqilah Sabrena Rahim, Anis Farhana Badrul Hisham, Nurul Hafizah Mohd Hazman, Najihah Mohd Tahir, Dr. Chin Wei Hong

EPIDPP30/29 **PATTERN OF HIV STIGMATIZING BEHAVIOUR ACROSS AGE GROUPS AMONG GENERAL POPULATION IN MALAYSIA: DOMAIN "FEAR OF HIV INFECTION"**
Norlaila Hamid, Mohd Shaiful Azlan Kassim, S Maria Awaluddin, Norhafizah Shahril, Wan Sarifah Ainin

EPIDPP31/54 **INFLUENZA VACCINE: DO THE BELIEFS OF VACCINE UPTAKE CHANGE AMONG HEALTH CARE WORKERS IN POST COVID-19 PANDEMIC ERA?**
Chia Yee, Kang, Poh Siang, Ooi, Azianey, Yusof, Azlina, Shuaib, Ying Woei, Chin, Fatimah, Abu Bakar, Izani Uzair, Zubair, Nur Sharharni, Mohd Tahir, Rohaizan, Rodzi, Tze Ling, Wong, Yusnita, Yusof

EPIDPP32/60 **SELANGOR MENTAL SIHAT (SEHAT) HELPLINE: A DIGITAL MENTAL HEALTH INTERVENTION FOR THE ADVOCACY AND INTERVENTION OF MENTAL HEALTH**
Mohammad Farhan Rusli, Muhammad Adil Zainal Abidin, Nor Faiza Mohd Tohit, Jamilah Hanum Abdul Khaiyom, Ahmad Nabil Md Rosli, Hijaz Ridzwan, Adha Radha Nasheha Mohamad Fuad, Afaf Qamelia Badrol Hisham, Iman Aisha Zamzuri, Siti Mariah Mahmud

EPIDPP33/68 **EPIDEMIOLOGICAL AND CLINICAL FEATURES OF CORONAVIRUS (COVID-19) PATIENTS IN THE SOUTHERN REGION OF MALAYSIA**
Mohamad Nasri Mohamad Isa, Khairul Anuar Abdullah, Zulraini Jusof, Ruzita Mustaffa, Rusdi Abdul Rahman

EPIDPP34/97 **READMISSION AND HOSPITAL DEATHS FOR CHRONIC OBSTRUCTIVE PULMONARY DISEASE AMONG THE ELDERLY: ANALYSIS OF HOSPITALISATIONS BETWEEN 2015-2019**
Shakirah Md.Sharif, Suhana Jawahir, Zen Yang Ang, Fun Weng Hong

EPIDPP35/99 **STIGMATIZING AND DISCRIMINATORY ATTITUDES TOWARD PEOPLE LIVING WITH HIV/AIDS (PLWHA) AMONG ADOLESCENTS IN MALAYSIA**
Wan Sarifah Ainin Wan Jusoh , S.Maria Awaluddin , Mohd Shaiful Azlan Kassim, Norlaila Hamid, Norhafizah Sahril

EPIDPP36/165b **COLORECTAL CANCER AND *STREPTOCOCCUS GALLOLYTICUS* INFECTION: ACCURACY OF STATISTICAL AND MACHINE LEARNING MODELS FOR EARLY DETECTION ALGORITHM**
Edre Mohammad Aidid, Hairul Aini Hamzah, Mohd Shaiful Ehsan Shalihin, Azmi Md Nor, Che Muhammad Khairul Hisyam Ismail

EPIDPP37/8 **SEROPREVALENCE OF LYMPHATIC FILARIASIS AMONG MIGRANT WORKERS IN SABAH, MALAYSIA**
Nur Dalila Zakaria, Richard Avoi

EPIDPP38/111 **FINDINGS OF A URTI OUTBREAK AT A TRAINING INSTITUTION IN PORT DICKSON DISTRICT, NEGERI SEMBILAN, MALAYSIA**
Aisyah Anuar, Shahdattul Dewi Nur Khairitza, Esther Rishma Sundram, Ammar Amsyar Abdul Haddi, Abdul Rahman Dashuki, Sharifah Ain Shameera Syed Rusli, Norjeehan Junadi, Muhammad Afdal Fitri Mohd Rahim

EPIDPP39/118 **CASE REPORT OF JAPANESE ENCEPHALITIS IN BATU PAHAT JOHOR: A PUBLIC HEALTH PERSPECTIVE**
Nur Ezzah Abd Rahim, Ahmad Afif Ahmad Ridzwan, Muhammad Faiz Mohd Ghafar, Atiqah Nor Ain, Amirul Akmal Sohor

EPIDPP40/134 **TRENDS IN GLUCOSE-LOWERING DRUGS: INCREASE IN INSULIN USE AMONG PATIENTS WITH UNCONTROLLED TYPE 2 DIABETES IN PUBLIC HEALTH CLINICS FROM 2011 TO 2020**
Swee Hung Ang, Sanjay Rampal

EPIDPP41/143 **SUPPLIMENTARY MEASLES IMMUNIZATION COVERAGE IN SEREMBAN, NEGERI SEMBILAN**
Muhammad Ikhwan Mud Shukri, Sharina Mohd Shah, Ariff Azfarahim Ibrahim, Nurul Fazilah Aziz, Nurul Haniza Md Yusof, Nadiatul Ima Zulkifli, Veshny Ganesan, Ahmad Husni Ariffin, Syuaib Aiman Amir Kamarudin, Ahmad Farid Nazmi Abdul Halim, Asmah Johari, Noor Khalili Mohd Ali

EPIDPP42/145 **LYMPHATIC FILARIASIS IN PAHANG, MALAYSIA : DISTRIBUTION OF CASES AND STRATEGY TOWARDS ELIMINATION**
Nurul Nadjwa, Mohd Hafeez I, Tan San Kuei, Siti Nabihah, Nor Azimi Yunus, Suzana Mohd Hashim

EPIDPP43/36 **HIV INFECTION IN BESUT, TERENGGANU: EPIDEMIOLOGIC TRANSITION, MORTALITY AND ASSOCIATED RISK FACTORS: A 17-YEAR REVIEW (2005-2022)**
Hafizuddin Awang, Mohd Fariz Zulrushdi, Sa'aidin Abdul Rahman, Noor Hadirah Zulkifli, Mahani Nordin, Mohd Anuar Abd Rahman, Kasemani Embong

EPIDPP44/129 **DIABETES MELLITUS IN KEDAH: FACTORS ASSOCIATED WITH GOOD GLYCAEMIC CONTROL**
M. Husrul Ari H., Sarmiza S., M. Fadhil M.M.

EPIDPP45/137 **Submicroscopic Malaria Plasmodium Vivax Among Orang Asli Population In Pos LENJANG, LIPIS, PAHANG**
Ahmad Rashidi bin Abdul Aziz

EPIDPP46/144 **ACCURACY OF REAL-TIME POLYMERASE CHAIN REACTION (RT-PCR) AS A SUPPLEMENTARY TEST FOR DIAGNOSING MEASLES**
Haziq Alias, Ahmad Iqmer Nashriq, Mimi Rodzaimah Abdul Karim, W Nur Afiza Wan Arifin

EPIDPP47/128 **EFFECT OF DIGITAL MOBILE OF INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS DENGUE INTERVENTION MODULE (IMODE) IN IMPROVING DENGUE PREVENTIVE PRACTICES AMONG MILITARY FAMILIES: CLUSTER RANDOMISED CONTROL TRIAL**
Nur Hidayah Shamsudin , Salmiah Md Said, Titirahmawati, Ahmad Zaid Fattah, Arshill Moideen, Norliza Ahmad

EPIDPP48/139 **MANAGEMENT OF ACUTE GASTROENTERITIS (AGE) OUTBREAK IN TENOM DISTRICT SABAH 2023**
Francesca Primus Chew, Mohamad Norhaizam Ahmad@Narawi, Amirul Ikhwan, Dadyhardafi bin Ramli, Johari bin Tasin

POSTER PRESENTATION - FAMILY HEALTH & HEALTH MANAGEMENT

FHSMPP01/33 **THE RELATIONSHIP BETWEEN QUALITY OF LIFE, SELF-ESTEEM, AND FAMILY ENVIRONMENT WITH RESILIENCE AMONG ORANG ASLI YOUTHS IN GOMBAK DURING COVID-19**
Nurjuliana Noordin, Nik Nairan Abdullah, Raudah Mohd Yunus

FHSMPP02/72 **DIRECT COSTS FOR COVID-19 PERSON UNDER SURVEILLANCE TO A DISTRICT HEALTH OFFICE - A PROVIDER'S PERSPECTIVE**
Intan Syafinaz Saimy, Noraziani Khamis, Nor Hayati Ibrahim, Nur Khairah Badaruddin, Faridah Kusnin, Nor Zam Azihan Mohd Hassan, Sukhvinder Singh Sandhu

FHSMPP03/56 **ONLINE APPOINTMENT AT PUBLIC PRIMARY HEALTH CARE (PHC) FACILITIES IN MALAYSIA: A PERSPECTIVE FROM THE DEMAND-SIDE STRATEGY**
Noor Haslinda I., Wan Nur Nabilah S., Rima Marhayu A.R., Lee Wei Jia, Maheshwara Rao Appannan, Nasrul Muhaimin M., Mastura I. & Safiee I.

FHSMPP04/89 **OUTLIER IDENTIFICATION AND QUALITY OF CARE IN HOSPITAL ADMISSIONS: A SUBSPECIALTY-LEVEL ANALYSIS**
Mohamad Helmi Bin Mohamad Yasim, Maznah Dahlui, Amirah Azzeri,Hafiz Jaafar

FHSMPP05/59 **SUBSIDISED PSYCHIATRY TREATMENT IN SELANGOR MENTAL SIHAT (SEHAT) PROGRAMME**
Muhammad Adil Zainal Abidin, Mohammad Farhan Rusli, Jamilah Hanum Abdul Khaiyom, Ahmad Nabil Md Rosli3, Hijaz Ridzwan, Nor Faiza Mohd Tohit, Adha Radha Nasheha Mohamad Fuad, Afaf Qamelia Badrol Hisham, Iman Aisha Zamzuri, Siti Mariah Mahmud

FHSMPP06/77 **HBA1C VARIABILITY AND ITS ASSOCIATED FACTORS AMONG TYPE 2 DIABETES PATIENTS IN MALAYSIA PUBLIC PRIMARY CARE CLINICS**
Xin Rou Teh, Aslene Siu Tjing Yeoh, Azah Abd Samad, Mastura Ismail, Feisul Mustapha, Sheamini Sivasampu

FHSMPP07/37 **SLIM SELANGOR: THE IMPACT OF A SIX-WEEK WEIGHT LOSS PROGRAM ON ANTHROPOMETRIC MEASURES IN SELANGOR CITIZENS**
Sufian, Siti Mariah Mahmud, Jinat Ahmed, Yamuna Rajoo, Mohammad Farhan Rusli

FHSMPP08/80 **OUTSOURCING OF PUBLIC PATIENTS IN MINISTRY OF HEALTH HOSPITALS DURING THE COVID-19 PANDEMIC**
Gunenthira Rao Subbarao, Mohd Ridzwan Shaari, Fawzi Zaidan Ali, Khairol Idham Zulkifli

FHSMPP09/92 **POOLED CONFIRMATORY FACTORIAL ANALYSIS ON AUTHENTIC LEADERSHIP, PSYCHOLOGICAL CAPITAL, JOB BURNOUT AND ORGANISATIONAL COMMITMENT BASED ON PRIMARY HEALTHCARE WORKERS IN SARAWAK**
Ainaa Anum Araffin Bakar, Noorzilawati Ishak

FHSMPP10/124 **EXPLORING THE USE OF MENSTRUAL CYCLE APPLICATIONS AMONG PHARMACY STUDENTS**
Syahiera Afieqah Rosman, Kamaliah Md Saman, Anna Liza Roslani, Aisyah Saad Abdul Rahim

FHSMPP11/146 **BUILDING RESILIENCE: THE REDESIGN OF PUBLIC PRIMARY HEALTH CARE CLINIC IN A POST-COVID-19 ERA**
Norain Ahmad , Siti Noraida Jamal, Ali Munawar, Tanty Darwinna, Khairani Halid, *Rohaizan Abd Kadir Jailani ,Enna Mohd Hanafiah, Rozita Halina*

FHSMPP12/69 **FACTORS ASSOCIATED WITH PRE-PREGNANCY CARE KNOWLEDGE AMONG UNDERGRADUATE STUDENTS IN SELANGOR**
Nur Diyana Sakinah Muhamad Rusdi, Nik Nairan Abdullah, Mohd Shahril Ahmad Saman, Suzanna Binti Daud

FHSMPP13/105 **PATIENT SATISFACTION WITH VIRTUAL CLINIC SERVICES IN MELAKA 2022-2023**
J Mohd Ridzuan, Ruzita Mustaffa, Aniza Hamzah, Akmal Afif

FHSMPP14/110 **MANAGEMENT OF SUSPECTED ACUTE CORONARY SYNDROME IN EMERGENCY DEPARTMENT OF A UNIVERSITY HOSPITAL**
Nur Aimimastura Berahim, Maznah Dahlui, Hafiz Jaafar, Amirah Azzeri, Aidawati Bustam, Abdul Muhaimin Noor Azhar, Mas Ayu Said

FHSMPP15/113 **EHEALTH LITERACY OF PHARMACY STUDENTS AT A MALAYSIAN PUBLIC UNIVERSITY**
Siti Nur Zawana Miscon, Aisyah Saad Abdul Rahim

FHSMPP16/123 **MALAYSIA NATIONAL HEALTH ACCOUNTS (MNHA) OUT-OF-POCKET (OOP) HEALTH EXPENDITURE ESTIMATES USING INTEGRATIVE APPROACH**
Ellyana Mohamad Selamat, Premila Devi Jeganathan, Hishamuden Alias, Anegala Periana Kovindear

FHSMPP17/114 **GENDER DIFFERENCES IN PERCEIVED PSYCHOLOGICAL DISTRESS OF INFERTILITY AMONG MALAYSIAN INFERTILE MEN AND WOMEN**
Noor Izni Mohamed Shapie , Nik Daliana Nik Farid , Rafdzah Ahmad Zaki

FHSMPP18 / 161 **THE PREDICTORS OF OVERWEIGHT AND OBESITY AMONG UNIVERSITY STUDENTS IN SERDANG, MALAYSIA**
Zaahirah Mohammad, Azline Abdilah, Norliza Ahmad, Halimatus Sakdiah Minhat

FHSMPP19/138 **CHALLENGES OF COMMUNITY PARTICIPATORY APPROACHES IN PUBLIC HEALTH RESEARCH TO UNCOVER THE GENDERED IMPACTS OF COVID-19 ON ESSENTIAL CARE WORKERS**
Anis Farid, Shazana Agha, Abinaya Mohan

FHSMPP20/164 **THE EFFECTIVENESS OF IFitER PROGRAM AT WELLNESS HUB ALOR SETAR IN 2022**
NorejanNordin, Mahiran Abu Bakar, Anis Anina Samhan, Zaharawati Zakaria,

FHSMPP21/148 **MATERNAL AND CHILD FACTORS AS DETERMINANTS FOR STUNTING AMONG UNDER FIVE CHILDREN IN KUANTAN, PAHANG**
Noraini Musa, Nor Azam Kamaruzaman, Hafizah Pasi, Iskandar Firzada Osman

FHSMPP22/21 **THE EFFECTIVENESS OF SEGAK-JomFitKedah TRIM & FIT (SJTF) PROGRAMME IN SIK DISTRICT, KEDAH: A PILOT INTERVENTION STUDY**
Nora Saliza M.S., Hadzri Z., Noorul Emilin A.K.

FHSMPP23/84 **HEALTH LITERACY AMONG LOCAL COMMUNITIES IN A PROTECTED AREA OF PAHANG NATIONAL PARK. BARRIERS AND STRATEGIES**
Nor Aziah Abd Kadir, Amirah Azzeri, Mohd Iqbal Mohd Noor, Mohd Hafiz Jaafar, Ratha Krishnan Suppiah, Zurina Kefeli

FHSMPP24/91 **THE LEVEL OF DIGITAL HEALTH LITERACY AND ITS ASSOCIATED FACTORS AMONG ELDERLY IN THREE VILLAGES AT JEMPOL, NEGERI SEMBILAN, 2023**
Muhammad Azri Bin Mansor , Fatimah Binti Ahmad Fauzi, Muhammad Jufri Firdaus Bin Mahathir, Tharma Seellan A/L Muniandy, Kamilia Binti Zainal Maaruf, Farah Husna Binti Muliadi, Nurul Iman Sofea Binti Suhaimi, Iwana Izah Binti Mohd Deen, Khirthanaa A/P Suparmaniam, Shanna Lyn Carino, Ang Lin, Lai Yico

FHSMPP25/109 **EXPLORING THE SOCIAL NETWORKS OF ELDERLY POPULATION IN KUCHING NORTH CITY: IMPLICATIONS FOR QUALITY OF LIFE**
Zulaikha Abdul Razak, Lee Yew Fong

FHSMPP26/157 **CORRELATION OF DEPRESCRIBING WITH SPECIFIC-NECESSITY AND CONCERN, GENERAL OVERUSE AND HARM AND LEVEL OF MEDICATION ADHERENCE AMONG ELDERLY AT THE GERIATRIC CLINIC OF A PUBLIC HOSPITAL IN MALAYSIA**
Kamaliah Md Saman, Safirah Masturina Zulkipli, Nur Athiqah Nazira Rosli, Ungku Ameen Ungku Mohd Zam, Hakima Makhtar, Mathumalar Loganathan

FHSMPP27/75 **EMERGENCY DEPARTMENT CONGESTION: FACTORS CONTRIBUTING TO CONGESTION AND SOLUTION TO RESOLVE THE SITUATION**
Nor Asiah Muhamad, Nur Hasnah Ma'amor1, Fatin Norhasny Leman, 'Izzah 'Athirah Rosli, Nor Hidayah Jamalluddin, Tengku Puteri Nadiah Tengku Bahrudin Shah, Nurul Syazwani Misnan, Nik Athirah Farhana Nik Azhan, Chan Huan Keat, Muhammad Radzi Abu Hassan

FHSMPP28/75 **IMMUNISATION OUTREACH PROGRAMME 2022 IN KEPONG HEALTH OFFICE**
Florence, Kavita Jetly, Sharanjit, A. Akashah

FHSMPP29/135 **HIGH ACCEPTABILITY AND UPTAKE IN A COVID-19 SELF-TESTING PILOT IN MANUFACTURING INDUSTRIES IN KEDAH, MALAYSIA**
Muhammad Radzi Abu Hassan, Sunita Binti Abdul Rahman, Huan Keat Chan, Nurul Farhana Zulkifli, Xiaohui Sem, Elena Marbán-Castro, Suziana Redzuan, Eliana Ahmad, Alias Abdul Aziz, Muhammad Suhail Abdul Wali, Nurhanani Ayub, Mohd Sharif Bin Mohd Ali, Lai Choon Ng, Paula Del Rey-Puech, Elena Ivanova, Olga Denisiuk, Norizan Binti Ahmad, Othman Bin Warijo, Sonjelle Shilton

FHSMPP30/140 **EXPLORATORY FACTOR ANALYSIS OF A PATIENT-REPORTED OUTCOME MEASURE: A NEWLY DEVELOPED MEDICATION ADHERENCE MEASUREMENT TOOL FOR THE ELDERLY IN MALAYSIA**
Kamaliah Md Saman, Tan Cha Sin, Lin Shu Ning, Noor Azwin Bukhori, Mathumalar Loganathan, Khairil Anuar Md Isa

FHSMPP31/151 **MOBILE HEALTH SERVICES FOR THE FIRST PEOPLE IN PAHANG. CHALLENGES AND HOPES.**
Zafrin Jamaludin, Raja Nurul Najwa Raja Ismail, Nazirah Jusoh, Mohd Hafeez Intiaz Hussein, Aznita Iryany Mohd Noor, Zulaiha Abdul Jalil, Azlan Abu Bakar, Roslina Che Cob, Mohd Nazri Awang, Suzana Mohd Hashim, Nor Azimi Yunus

FHSMPP32/163 **"IF ONLY I KNEW": A CASE STUDY OF THE LIVED EXPERIENCE OF A PREGNANT TEENAGER**
Anisah Baharom, Nor Afiah Mohd Zulkefli, Firdaus Mukhtar

FHSMPP33/131 **A SYSTEMATIC REVIEW ON PATIENTS CLASSIFICATION SYSTEM (SPECIFIC TO DIAGNOSIS-RELATED GROUP) FOR HEALTH CARE SERVICES WORLDWIDE.**
Adzly Hairee Sahabudin, Amirah Azzeri, Mohd Hafiz Jaafar and Maznah Dahlui

POSTER PRESENTATION - ENVIRONMENTAL AND OCCUPATIONAL HEALTH

OHEHPP01/09 **UNDERSTANDING THE EPIDEMIOLOGY OF HEALTHCARE WORKERS INFECTED WITH TUBERCULOSIS (TB) DISEASE IN KEDAH: MULTIPLE CASE STUDIES FROM 2017 TO 2021.**
Nur`Atiqah Mohamad`Azli , Muhammad Shauqi Abdul Kadir , S Maria Awaluddin, Harisah Mad Salim , Maznieda Mahjom

OHEHPP02/39 **TECHNOSTRESS AMONG HEALTHCARE WORKERS (HCWS) AT THE STATE HOSPITALS IN KLANG VALLEY AND EAST MALAYSIA**
Nur Hasnah Ma'amor, Nor Asiah Muhamad, Fatin Norhasny Leman, 'Izzah 'Athirah Rosli , Nor Hidayah Jamalluddin, Mohammad Zabri Johari, Norliza Chemi, Mohd Fadzli Mohamad Isa, Norni Abdullah

OHEHPP03/30 **BURNOUT AND CORTISOL LEVELS AMONG LABORATORY PERSONNEL FROM SELECTED FACILITIES IN KLANG VALLEY DURING COVID-19 PANDEMIC**
Maznieda Mahjom, Rohaida Ismail, Noor Syaqilah Shawaluddin, Lim Kuang Kuay, Tuan Mohd Amin Tuan Lah, Nadia Mohamad, Raheel Nazakat, Rosmanajihah Mat Lazim, Mizanurfakhri Ghazali, Masita Arip

OHEHPP04/93 **THE TREND OF PUBLICATION FOR VOICE DISORDERS AMONG TEACHERS**
Patrick Peng Wee Yao, Moy Foong Ming, Victor Hoe Chee Wai

OHEHPP05/117 **THE NEXUS BETWEEN WORK ENVIRONMENTAL FACTORS AND EMPLOYEES' MENTAL HEALTH WELL-BEING DURING COVID-19 PANDEMIC: A SYSTEMATIC REVIEW**
David Chan Chee Hoong, Halim Ismail, Hanis Ahmad, Hafiz Baharudin, Naiemy Reffin, Nor Azila Aris, Huam Zhe Shen

OHEHPP06 / 100 **CONTINUING PROFESSIONAL DEVELOPMENT; PRIMARY REPORT YEARS OF MYCPD**
Hazirah A, Farah Hazwani AR, Ilya Hani AR, Sabrizan O

OHEHPP07/132 **THE ASSOCIATION BETWEEN DAILY TEMPERATURE WITH NON-ACCIDENTAL MORTALITY IN PENANG, MALAYSIA: A-TIME SERIES STUDY**
Hadita Sapari, Mohamad Rodi Isa, Rohaida Ismail, Wan Rozita Wan Mahiyuddin, Mohamad Ikhsan Selamat

OHEHPP08/141 **FOSTERING RESILIENT MENTAL WELL-BEING: 'MYHAPPY PERFORMANCE' INTERVENTION FOR HEALTHCARE WORKERS WITH DEPRESSION IN KUALA MUDA DISTRICT HEALTH OFFICE**
Noor Atika A., Muhammad Hasif M.A., Mahiroh A.J, Nurul Shafiqah A.G, Mohamad Shafuden O., Masniza Izani M.S., Hasniza H., Shairah Aimi K., Suziana R.

OHEHPP09/125 **EFFECT OF INFORMATION-MOTIVATION-BEHAVIORAL SKILLS-BASED M-HEALTH EDUCATION ON INCREASING ADHERENCE TO PULHEEMS EXAMINATION AMONG MILITARY PERSONNEL IN KLANG VALLEY**
Nik Qistina Nik Abd Rahim, Nor Afiah Mohd Zulkefli, Norliza Ahmad, Lim Poh Ying

OHEHPP10/121 **PREVALENCE OF NON-COMMUNICABLE DISEASE RISK FACTORS AMONG HEALTHCARE WORKERS IN THE KOSPEN WOW PROGRAM IN KEDAH**
Rosidah Omar, Lau Shu Yee, Muhamad Fadhil Mohamad Marzuki, Liyanatul Najwa Zakaria, Norizan Ahmad

OHEHPP11/122 **WILLINGNESS TO PAY (WTP) FOR SALIVA TEST KITS AMONG HEALTHCARE WORKERS IN KEDAH**
Rosidah Omar, Lau Shu Yee

OHEHPP12/149 **RISK FACTORS OF HEARING LOSS AMONG VECTOR CONTROL WORKERS IN KEDAH**
Rosidah Omar, Lau Shu Yee, Shareh Azizan Shareh Ali, Ezy Eriyani Mohd Hadzari, Alias Abdul Aziz

OHEHPP13/150 **RECREATIONAL MARINE WATER SAMPLES AND ITS RELATIONSHIP WITH ACUTE GASTROENTERITIS (AGE) CASE REPORTING IN PORT DICKSON DISTRICT, NEGERI SEMBILAN, MALAYSIA**
Ammar Amsyar Abdul Haddi, Esther Rishma Sundram, Shahdatul Dewi Nur Khairitza Taib, Muhammad Afdal Fitri Rahim, Qaiyum Omar, Zuraida Mohamed

OHEHPP14/142 **GAMING ADDICTION AND ITS ASSOCIATION WITH DEPRESSION, ANXIETY AND LONELINESS AMONG UNIVERSITY STUDENTS IN MALAYSIA**
Mona Lisa Md Rasip, Nor Asiah Muhamad, Sharifah Zawani Syed Ahmad Yunus, Norliza Chemi, Norni Abdullah, Nur Hasnah Maamor, Izzah Athirah Rosli2, Fatin Norhasny Leman, Mohd Fadzli Mohamad Isa

PLENARIES

PLENARY 1

Reforms In Health System: Potential Impact On Public Health And Public Health Practitioners

Syed Mohamed Aljunid

Following the COVID-19 pandemic that affects all counties in the world, major weaknesses of the Malaysian health system were clearly exposed. The health system almost collapsed due to a lack of financial resources, poor health system governance, and inadequate planning of human resources. In view of all these, the Health White Paper (HWP) was recently developed and unanimously passed in Parliament. The HWP underlined four major pillars covering the transformation in delivery of health services, enhancement in health promotion, ensuring sustainability and equity in health financing and strengthening health system foundation and governance. A total of 15 strategies were listed within these four pillars that are planned to be achieved in three phases over a period of 15 years. Public health discipline will be directly affected by this reform initiative whereby the main focus of health promotion and prevention. These are needed to ensure the success of the health sector reform. Raised in chronic non-communicable diseases, emergence of new diseases, the ageing population and rise in healthcare costs are real challenges that can only be effectively managed through prevention and promotion. Previously, many public health practitioners were not well trained in health management, health financing and health policy. Hence, now they need to enhance their management skills, especially in managing hospitals in line with the plan to introduce more digital services in the hospitals and monitor the interaction with private providers in the delivery of services. In conclusion, the health sector reform designed through the HWP provides challenges and opportunities for public health practitioners in the country to play effective roles for the reform to be successful.

PLENARY 2

Adapting To Global Population Aging: Multifaceted Integrated Approach To Singapore Long Term Care System

Charlene Chang

The sharing will highlight the challenges of an ageing population in Singapore, the considerations behind the development of the action plan for successful ageing, its key themes and initiatives, and the multi-prong approach to enable ageing-in-community. Singapore's 2023 Action Plan for Successful Ageing was launched in January this year to address the evolving needs and aspirations of current and future seniors. To cater to the greater diversity in experiences, aspirations and needs of Singaporeans, the refreshed Action Plan formulates an extensive set of many ground-up responses towards ageing which involve many people-private-public sector initiatives. In the process of developing the measures, over 5,000 residents were engaged through more than 40 engagement sessions starting in 2019 to co-create the 2023 Action Plan and its new initiatives. Taking into account the feedback, the 2023 Action Plan focuses on community initiatives to empower residents to take charge of their own ageing journeys and is anchored on three 'C's – 'Care', 'Contribution' and 'Connectedness'.

PLENARY 3

The Smoke-Free Aotearoa 2025 Action Plan: Is The Endgame Now Insight

Richard Edwards

This talk will describe recent developments in endgame thinking and actions in New Zealand, some of which may be highly relevant locally - particularly the plan to introduce a smoke-free generation, which is also proposed in Malaysia. The presentation begins by describing the key features of endgame thinking in tobacco control and how that differs from non-endgame perspectives. The context for endgame thinking, the genesis of the Smokefree Aotearoa (New Zealand) 2025 goal, and the importance of Māori (the Indigenous peoples of Aotearoa) leadership will be described. Following the adoption of the endgame goal in Aotearoa in 2011, the government initially did not set out a clear strategy to achieve it and a limited range of non-endgame measures were implemented, although some such interventions as annual above inflation tax increases and plain packaging represented substantial and important measures. The talk will describe the dramatic changes in 2021-2022 when a comprehensive smoke-free action plan which included key endgame interventions was published, followed by a Smokefree Act that introduced legislation to implement these measures: mandated denicotinisation of smoked tobacco products, a smokefree generation and greatly reduced retailer numbers selling tobacco products. The supporting evidence and some key aspects of each measure will be discussed together with responses to the plan from the health sector, the tobacco industry, and its allies. The talk will finish by describing the timelines for implementation of the plan and the likely next steps.

PLENARY 4

Modelling And Forecasting Of Infectious Diseases Internationally And In Malaysia

Balvinder Singh Gill

During the initial phase of the COVID-19 outbreak, time series models were developed to forecast trends of COVID-19 cases. Time series models such as Autoregressive Integrated Moving Average (ARIMA) are statistical analysis models that use time series data based on previous events to generate forecasts of future events. To further improve the accuracy of the ARIMA models, strategies such as data smoothening and use of covariates were included into the model. The ARIMA models developed generated accurate 2 to 4 weeks forecast of COVID-19 case trends during the second and third wave in Malaysia. However, ARIMA models were unable to make long-term forecasts and model disease parameters (R-value) and dynamics (effects of PHSM, vaccination, mass gathering). To overcome these limitations, compartmental models were developed based on a set of differential equations, where the population will transit between each compartment in relation to time. Initially, SIR models developed enabled the estimation of R-value for the COVID-19 outbreak and subsequently generated longer forecasts of COVID-19 case trends. Next extended SEIR models were developed, incorporating additional state variables that accounted for the effects of control measures on the COVID-19 disease dynamics, providing more accurate forecast of COVID-19 case trends. Subsequently, to account for changes in disease dynamics over time SIR/SEIR models were developed by including time-varying functions which were applied to the transmission dynamics of COVID-19 and certain state variables. These models were able to account for the effects of control measures and propagation events on the COVID-19 disease dynamics which were then validated using the Bayesian Inferential framework. In summary, the above strategies were undertaken to model the COVID-19 pandemic in Malaysia and proven to be effective in modelling and forecasting disease outbreaks and establishing an early warning disease surveillance system for future infectious disease pandemics.

SYMPOSIUM

Symposium 1 - Molecular Epidemiology : Its' Role In Communicable Disease Control - From Global To Local

S.1.1 : The Role Of Molecular Epidemiology In Tracing Source Of Infection

Ravindran a/l Thayan

Molecular tools have now become standard tools in outbreak investigations. These tools were widely used during the COVID-19 pandemic to determine the timeline when a new variant of the virus was introduced into a country and decipher the country of origin of the variant. Examples of molecular tools used in outbreak investigations include real-time PCR techniques, rapid tests, fragment sequencing, and whole genome sequencing. Generally, key steps in outbreak investigations involve setting the definition of what constitutes a case. To facilitate case definition, molecular tools are widely used to increase specificity and reduce miscalculations. Upon identifying a case, possible transmission route and the spread's magnitude can be determined, which can assist in tracing the source of infection. In addition, these tools are used to determine whether the source of infection was internal (in country) or external (imported from abroad). Past experience where molecular tools were widely used in Malaysia to determine the source of infection were report of the first case of avian influenza in 2014 (determined to be from China), the first case of MERS-CoV in 2014 (determined to be from Saudi Arabia) and the first case of rabies in Sarawak in 2017 (determined to be from Kalimantan, Indonesia). By knowing the source of infection, appropriate mitigation steps to control the infection can be implemented.

S.1.2 : Application Of Molecular Epidemiology In Outbreak Management

Nur Aishah binti Buang

Effective outbreak management is one of the public health core functions as widespread infectious disease transmissions result in higher morbidity and using more resources for treatment, disease control, and prevention activities. Public health officials implement control measures based on strong epidemiological evidence to limit further disease transmission. However, in managing a highly pathogenic and virulent organism that can cause increased mortality and serious public health impact, the epidemiologist needs to decide early on the accurate control methods that are supported by solid evidence as provided by molecular epidemiology investigation. By identifying an epidemiologic relationship among hosts based on the genotypic characteristics of the microbes, we may determine the right route of transmission, manifestation, and progression of the infectious disease thus guiding public health officials for effective intervention. Sequence data is also crucial in detecting the signals of the emergence of Potential Variants of Interest (VOIs) and Variants of Concern (VOCs) to trigger prompt intervention. By

using data from molecular epidemiology, epidemiologists may predict the severity and size of future outbreaks and outline the preparedness plan for public health intervention.

S.1.3 : Vaccine Development In Malaysia

Masita binti Arip

Prior to the COVID-19 pandemic, human vaccine production was not a popular research topic in Malaysia. The pandemic has tested our country in many areas especially our healthcare system in their ability to handle crisis of such magnitude. The recent pandemic has made us realize the need to have our own vaccine production and manufacturing capacity for at least to be self-sufficient at a time like now. On 1st November 2021, the 9th Prime Minister of Malaysia, Dato' Seri Ismail Sabri Yaakob officiated the launch of the Malaysian Genome and Vaccine Institute (MGVI) and National Vaccine Development Roadmap (NVDR) with an effort to turn the country into a hub for vaccine production and boost confidence in vaccine use. Through NVDR and MGVI, Malaysia can produce its own quality, effective and safe vaccines in accordance with conditions set by the National Pharmaceutical Regulatory Agency (NPRA). NVDR will not focus solely on COVID-19, instead, its role will cover the development of vaccines for other diseases. The three projects are ready to be implemented through NVDR, with the first involving the production of two types of COVID-19 vaccines, using the inactivated virus and mRNA technology, developed by the Institute for Medical Research (IMR). The second project – development of mucosal/oral/subunit vaccines against Cholera, Tuberculosis and COVID-19 vaccines developed in collaboration with Universiti Sains Malaysia (USM) and Asian Institute of Medicine, Science and Technology (AIMST) University. The third project is the pre-clinical evaluation of a therapeutic cancer vaccine for the treatment of head and neck cancer by Cancer Research Malaysia (CRM).

Symposium 2 - Bridging Environmental And Human Health To Promote Global Well-Being

S.2.1 : Transforming Urban Environments For Health

Andrew Kiyu Dawie Usop

We live in an urbanised world, with 56% of the world's population living in urban areas in 2021. Urban areas are very important because they demand and overuse natural resources (land, water, energy, and biodiversity). They produce 75% of the global carbon emissions. Urban areas are also subject to global trends affecting urban areas, including climate change, resource scarcity, demographic change, social polarisation, etc. Thus, it is important to transform urban environments for human and planetary health. Urban transformations are fundamental, multi-dimensional and, in many cases, non-linear alterations in and of urban areas. One proven pathway to urban transformation is the healthy cities approach whereby the urban environment to transform are the economic, social, natural and built environments. The aims of urban transformation are resource efficiency, quality of

life, and resilience. Such transformation can be very massive in scale, for example, the Cheonggyecheon stream transformation in Seoul and the flood mitigation project in greater Tokyo. The transformation can also be done on a small scale, for example, by setting up small urban parks in Padawan Municipal Council area in Kuching and conversion of neglected urban spaces into urban community gardens. Such transformations help us mitigate and adapt to climate change, and move towards Disaster Risk Reduction, and sustainable development. In addition, the transformations will also help us to attain smart cities and age-friendly cities. On the other hand, we have to preserve many things (e.g., green areas in cities, heritage areas and buildings) in urban areas. In Malaysia, it is high time that the Healthy Cities and Urban Health Programme be re-activated in the Ministry of Health. This will enable the health sector to interact more effectively with the World Health Organization and other international bodies (e.g., the Alliance for Health Cities) regarding healthy cities and urban health.

S.2.2 : Communicating Radiation Risk

Anita Abd Rahman

As Public Health professionals, let's ask these basic questions to ourselves "Do I know about radiation and am I comfortable to talk about Radiation?" As we know, Radiation has been established as beneficial for medical, agricultural, and technological purposes. However, the use is not without its own risk and history has shown us the magnitude of such events that affect not only to human health but also to the environment and socio-economy of one's nation. At the same time, radiation has always been a topic that people are interested in and yet fearful of. Therefore, risk communication which is a process of exchanging information among interested parties about the nature, magnitude significance, or control of a risk becomes an integral part of the overall management of a radiation emergency, preparedness and response. Additionally, the lecture will cover some of the processes, flows and sense-making in conveying risks and benefits as a way to improve interpersonal communication.

S.2.3 Capacity Building For Managing Chemical Incidence; The Public Health Perspectives

Haidar Rizal bin Toha

Potential harm to public health and the environment can occur following the release of toxic substances caused by anthropogenic activities. The scale of health effects may vary from small to large depending on the toxicity of the chemical substance and the amount of released materials. The level of incident management can be divided into three governance levels; district, state and national, depending on the event's severity. Capacity-building process, as part of the preparation phase for managing chemical incidents, can use four approaches known as: (i) top-down; (ii) bottom-up; (iii) partnerships approach and (iv) community organizing approach to cater for individual, organizational and systemic needs. Components in capacity building do include skill development, establishment of procedural methods, procurement of material and resources and also engagement and collaboration with

other related organizations. This paper will discuss on an example of a capacity-building program for managing chemical incidents conducted by the Johor State Department of Health. This program utilizes elements of the four approaches in capacity building and would also discuss its challenges from a public health perspective.

Symposium 3 - Conceptualization Culture And Global Mental Health

S.3.1 : Culture Diversity And Mental Health: Consideration For Policy And Practice

Sarah Skeen

Mental health is increasingly recognised as a global health priority, across the life course, but service development is lagging. The recent WHO World Mental Health report highlights the need to transform mental health services, for both promotion and prevention efforts, as well as treatment and care. In the WHO Western Pacific region, specifically, there are number of drivers of poor mental health, including rapid urbanization, substance use and climate vulnerabilities. WHO has developed several normative tools to support countries to strengthen their mental health systems. Yet, it is critical that cultural and contextual issues are considered when transferring these models of care to new contexts. Mental health and culture are deeply connected, and mental health influences how mental health conditions are understood, how people access and remain in care, how they connect with social support, and how they are cared for by friends and family. As a result, having culturally competent mental health services ultimately improves mental health outcomes, by enhancing client satisfaction, reducing stigma, overcoming language and cultural barriers, and reducing health disparities. There are several examples of adapting mental health programmes to new settings to address and overcome cultural and contextual issues, including through engagement with people with lived experience of mental health conditions. Ultimately, the consideration of cultural and contextual issues when designing and scaling up services makes mental health services more accessible and more inclusive.

S.3.2 : Mental Health In Malaysia: Challenges And Way Forward

Nurashikin bt Ibrahim

The COVID-19 pandemic has posed unprecedented challenges to our healthcare systems, with significant impacts on individual's mental health. WHO estimates that depression and anxiety has increased by more than 25 percent since the pandemic began. Malaysia has taken significant strides to bolster our mental health services. The establishment of the National Mental Health Promotion Advisory Council since 2011 has shown a high commitment of leadership governance in addressing the mental health agenda. In addition, Ministry of Health has also taken the effort to develop the National Strategic Plan for Mental Health (2020-2025). Our approach focuses on enhancing mental health promotion, increasing access to mental health through digitalization of mental health, stepping up collaborations in between agencies and non-governmental organizations (NGOs), addressing suicide

prevention in youth through gatekeepers' training, strengthening mental health disaster preparedness through supported community-based. The National Centre of Excellence for Mental Health was established to serve as a focal point for the coordination of mental health initiatives and programmes in Malaysia through strategic partnerships with governmental and corporate organisations, academic institutions, and non-governmental organisations. Each stakeholder has its strengths and shortcomings and should not work in silo. The Ministry of Health envisioned incorporating mental health into all policies and transforming stigma into solutions.

S.3.3 : Healing Through Art: Exploring Healing Through Creativity

Azizah Abdullah

For ages, art has always been considered a therapeutic tool for creative expression and a medium for communication. However, studies have found that the impact goes far beyond the function of art for therapy alone. Art has the power to heal, transform and promote the well-being of various aspects of mental health. From drawing and painting to creative writing, music, dance-movements, sand trays, miniatures and nature-based activities, creative expression offers a unique therapeutic passage for individuals to explore their emotions, find peace and foster personal growth. In this presentation, we will delve into the profound therapeutic benefits of art and how it can aid in healing and self-discovery. We will explore healing through various creative modalities, specifically for; i) Emotional Release and Stress Reduction, ii) Self-Regulation and Identity Formation, iii) Overcoming Loss and Grief, iv) Coping with Low Mood, Anxiety and Depression, v) Dealing with Traumatic Experiences, and vi) Promoting Holistic Wellness. This presentation will also focus on various research findings of the benefits of integrating arts and creative practices as healing process, professional qualifications based on international standards needed, the essential to undergo systematic and comprehensive training as well as on-going practices to avoid potential risk to the clients/patients. Moreover, with regards to bringing Malaysia to the world stages, as well as pro-active efforts for global networking will also highlight. For instances, involving with World Health Organization (WHO), Arts & Health Lead as well as few international authorities and institutions that drive to variety of international collaboration and recognition, as eyes opening for the positive movement professionally within local context. Finally, the potential of healing through creativity in building a resilient public health system for a better future will be propose.

Symposium 4 - Sharing Solution For Occupational Health: Locally And Globally

S.4.1 : Leading To Strengthen A Resilient Workforce For Sustainable Future: A PETRONAS Journey

Norsayani Mohamad Yaakob

Petroliam Nasional Berhad (PETRONAS) is a dynamic global energy and solutions company with a core intent to power society's progress responsibly and sustainably. As the custodian of Malaysia's national oil and gas resources, PETRONAS explores, produces and delivers energy, both hydrocarbon and renewables, to ensure the security of energy supply for the nation and our customers around the globe. People are our strength and partners for growth, driving our passion for innovation to progress towards sustainable energy solutions. Our 46,884 employees worldwide, spanning over 100 countries continue to be at the forefront of executing our strategic objectives, equipped with the skills and expertise to thrive in a lower-carbon future. In an increasingly challenging environment characterised by market uncertainties and heightened geopolitical risks, PETRONAS must continue to reliably demonstrate its ability to deliver its core responsibilities while transforming to meet future energy needs. These require high performing, agile, robust and resilient workforce who can face the challenges ahead to devise new strategies, expedite transformation, be innovative and proactive, have the courage to act, be enterprising and customer focused. PETRONAS acknowledges the requirement of sustainable long-term strategy to strengthen workforce resiliency, particularly through supporting our people's health and wellbeing as one of the main efforts. PETRONAS's signature Health & Wellbeing program called MESTIfit4Health and 3-pronged mental health interventions through Leadership, Organization and Individual are amongst the strategic initiatives towards our journey to sustain the workforce's optimal health. In addition to that, the Company's focus on psychological safety culture, flexible working arrangement, fast-developing online digital platform, advanced operational technologies and many other effective and timely efforts act as the boosters in building a high-performing and resilient PETRONAS workforce.

S.4.2 : A Global Perspective To Addressing Psychosocial Risks At The Workplace; Use Of ISO 45003

Priya A/P Ragunath

Addressing psychosocial risks at the workplace has not been given sufficient consideration but rather has been seen as a disadvantage in many industries. The COVID-19 pandemic has revitalized the need to invest in mental health of employees to address the numerous psychological effects at work in the aftermath of the pandemic. The enormous burden placed on the economy of nations has impacted industries in all sectors which has translated into immense demands being placed on employers and employees thus resulting in effects towards their physical and mental health. A study by Irene Teo et al entitled The Psychological Well-Being of Southeast Asian Frontline carried out across six Southeast Asian

countries (Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam) during the COVID-19 pandemic in 2021, showed job burnout was the foremost issue among healthcare workers in all those countries. Organizations need to address the existing psychosocial hazards and mental health issues at their workplaces and subsequently move towards preventing any further impact in the future. This would require assessing psychosocial risks at the workplace and taking the appropriate measures needed to address the risks whilst also creating a healthy workplace to nurture a healthy and productive workforce.The International Organization for Standardization (ISO) has developed the standard ISO 45003: Occupational hea lth and safety management — Psychological health and safety at work — Guidelines for managing psychosocial risks, which may be used to make improvements in the workplace in order to manage psychosocial risks effectively. Giving importance to mental health and managing stress at the workplace should be given the highest priority to always ensure continued productivity be it during the time of adversity or not.

S.4.3 : A Case Of Noisy Workplace: The UMMC Experience

Rama Krishna A/L Sumpramanian

The burden of occupational Noise-Induced Hearing Loss (NIHL) remains on the rise, especially in developing countries. It has been reported that 16% of the global adult-onset hearing loss or over 4 million Disability-Adjusted Life Years (DALYs) is attributed to occupational noise exposure. Excessive noise in the workplace presents a risk of hearing damage and other non-auditory effects. This case study reports of an issue of the noisy work environment at the Central Diagnostic Laboratory (CDL) of University Malaya Medical Centre (UMMC). Area monitoring was conducted and showed steady continuous noise with levels ranging from 66 – 72 dB(A). Meanwhile, personal noise exposure monitoring showed an 8-hour TWA of 67.1 dB(A) and 77.1 dB(A) respectively. In conclusion, although the noise levels were well below the stipulated noise exposure limit and action level under Noise Regulation 2019, this is an issue of comfort for workers and action was still taken to reduce the noise levels in this lab based on the hierarchy of controls.

Symposium 5 - Health Management And Policy

S.5.1 : Challenges & Changes In Malaysian Health System: Influence By Global Scenario

Rohaizat Yon

Malaysia has greatly improved the health status of its population, dramatically reducing indicators and increasing life expectancy at birth, since independence in 1957. However, several health indicators have plateaued since late 1990s. The Malaysian health system is a success story among countries of equivalent socio-economic status. Numerous challenges faced by the nation, however, still create the need for health changes and reform. There are rising consumer demand and expectations for expanding technology and high-cost medical care due to improved standards of living, changing disease patterns and demographic shifts. There

appears inadequate integration between public and private sectors, overutilisation of MOH hospital and health clinic services. Over the years there has been a vast demography and epidemiological transition. Local challenges and global scenarios influenced Malaysia's journey toward health system changes and reforms. Among global scenarios are digitalisation, connectivity and convergence, social trends, new business models, urbanization, and wellness paradigm. Malaysia's health system developed from pre-independence when hospitals were built in the town and estate hospitals were built for estate workers. Since 1990s the federal government embarked on a comprehensive development strategy for both urban and rural health services, including maternal and child health services and primary healthcare. To further increase access regionalization and decentralization of specialist services were implemented. Other changes were privatization and corporatization of health services which was started in 1983, digitalization, internalization of quality, intensification of research in health with the establishment of the National Institutes of Health comprised of 6 research institutions, integrated health, and online health services were initiated during the 7Th Malaysia Plan, big data and Malaysian Health Data Warehouse (MyHDW) and crisis and pandemic preparedness. The changes and reforms are ongoing and gradual towards a more efficient and equitable health system that possesses a better quality of life for the population.

S.5.2 : Translating Global Value-Based Approach Towards A Sustainable Health Care System

Izzuna Mudla Muhamed Ghazali

Healthcare systems face increasing challenges in prioritizing resource allocation with the increasing prevalence of chronic diseases, emerging infectious diseases, the ageing population, and increasing patient and public expectations. Furthermore, the rapid development of more sophisticated health technologies such as gene therapy, biologics, and digital technologies which also come with high costs complicates the situation as resources are limited. Value-based care has gained interest worldwide as a strategy to improve the health care system. In value-based care, the healthcare system's focus shifts from the volume of treatment to the outcome of treatment that matters to the people receiving the treatment considering the resources expended. Health technology assessment (HTA) is a multidisciplinary process that uses explicit methods to determine the value of health technology at different points in its lifecycle. The purpose is to inform decision-making in order to promote an equitable, efficient, and high-quality health system. HTA is a powerful tool for implementing value-based health care and is integral in achieving universal health coverage. HTA determines the value of health technology by taking into account several domains such as comparative effectiveness, safety, organizational, societal and cost-effectiveness. The process involves multi-stakeholders, systematic and transparent. It is a formal process in many countries to determine the health benefits package and value-based pricing. HTA was established in Malaysia in 1995. It has evolved throughout the years from an evidence-based approach to a value-based approach and

incorporated technology lifecycle process emphasizing the health system needs, in line with the development in other countries.

S.5.3 : The Role Of Big Data In Healthcare Policy Making: A Global Trend

Mohamad Fadli Khairie

Globally, there is an increasing trend towards using big data to inform healthcare policy decisions. Big data refers to vast and complex datasets that can be analyzed to reveal patterns, trends, and associations. The healthcare industry produces a large amount of data from a variety of sources, including patient-generated data and electronic health records, among others. This presentation will portray the global trend in the usage of big data in policymaking and how it is implemented in Malaysia. The growing accessibility of digital health technology, the need for more effective and efficient healthcare systems, and the demand for personalized health intervention have all contributed to the use of big data in healthcare policymaking. Narrative Review of other countries shows that big data is being used to improve population health outcomes by discovering patterns in disease incidences and gaps in healthcare access across various population groups. Additionally, it helps to prioritise research funding, assess the efficacy of healthcare interventions and programmes, and encourage evidence-based decision-making. Despite the potential benefits of using big data in healthcare policymaking, there are also challenges that need to be addressed. These include ensuring data privacy and security, developing appropriate data governance frameworks, and addressing data quality and interoperability issues. Policymakers need to work closely with healthcare providers, researchers, and patients to ensure that big data is used in a responsible and ethical manner. The management and provision of healthcare are changing as a result of the use of big data in policymaking. Policymakers may create evidence-based policies and interventions that can enhance health outcomes and save healthcare costs by utilising the potential of big data. However, addressing the challenges associated with big data requires careful planning and collaboration among stakeholders and a commitment to responsibly and ethically using data.

Symposium 6 - Family Health - Global Update Of Reproductive Health

S.6.1 : National Implementation Of Cervical Cancer Screening: Australia Experience

Marion Saville

In May 2018, the WHO Director-General announced a global call for action to eliminate cervical cancer. Subsequently, the World Health Assembly endorsed a global elimination strategy in 2020. Australia has responded by developing its own National Elimination Strategy. Australia is a world leader in cervical cancer prevention and already has existing organised cervical screening and HPV vaccination programs. As a result of these successful programs, modelling suggests that Australia could be the first country to achieve elimination, by 2035. Although

Australia has made strong progress towards this goal, inequities do still exist. Therefore, the development of Australia's National Strategy took place through a strong equity lens, with strategic priorities identified for the screening program, including regular promotion of screening, strategic promotion with under-screened groups, increasing access to services by expanding who, where and how services are offered, and the collection, use and release of data to enable and monitor equity of access to screening. HPV self-collection will play a central role in strategy implementation. Australia's current National Cervical Screening Program changed to a 5 yearly primary HPV screening program in late 2017. In 2022, self-collection was made universally available as a choice to all routine screening participants, with evidence on the accuracy and acceptability of the method, particularly amongst under or never screened people, key considerations for the change. In addition to work done in Australia, the ACPCC has established a partnership in Malaysia with the University of Malaya resulting in the formation of the ROSE Foundation. The ROSE approach to screening features self-collection, HPV testing and a secure digital e-health platform to ensure follow-up. In the global effort to eliminate cervical cancer, self-collection is a powerful tool to facilitate scale-up and increase equity in cervical screening in Australia and worldwide.

S.6.2 : Men's Health - It's Not Only Performance And Size

Ng Chirk Jen

To achieve and maintain good health and quality of life, men need to adopt a healthy lifestyle and seek medical help in a timely and appropriate manner. However, epidemiological data has persistently shown that men, compared to women, have higher risk-taking behaviours (e.g. smoking, alcohol consumption, reckless driving) and tend to avoid screening and delay in seeking help when ill
In the context of male sexual health, sexual performance and dysfunctions are known to be the tickets to men's health; it creates unique opportunities for healthcare professionals to explore and address men's health holistically. For instance, although studies have repeatedly shown a close relationship between erectile dysfunction and cardiovascular diseases, it remains uncertain how this important piece of clinical evidence translates into counselling men in clinical practice to improve their cardiovascular health. This is but just an example how opportunities to improve men's health are missed, especially in a busy clinical setting where there are many competing health agenda.
It is time for us to '*connect the dots*' to link men's sexual function with lifestyle and health-seeking behaviour and expand it beyond sexual health to improve men's health. This requires us to: understand men's health behaviour and support change in their behaviour; challenge our traditional practice to make clinical consultations more people-centred and gender-sensitive; and redesign the health service delivery to implement clinical evidence more efficiently and effectively. Only then can we attempt to motivate men to improve their lifestyle, seek timely and appropriate health care, and adopt preventive rather than curative health behaviour. This will go a long way in improving men's sexual health, their overall health and quality of life.

S.6.3 : WHO Sexual Reproductive Health Program: Yesterday, Today & Tomorrow

Pascale Allotey

There is an inordinate level of coyness that goes with the promotion of sexual and reproductive health and rights. It is an area that on the one hand has to compete for prioritization, and on the other, raises significant backlash from politicians, religious bodies, and lobbyists. And yet, the WHO definition of sexual health is a state of physical, mental and social well-being in relation to sexuality, which is not the absence of disease, dysfunction or disability. Sexual health, when viewed affirmatively, requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be achieved and sustained, the sexual rights of all people must be respected, protected and fully exercised." (WHO, 2006a). A successful sexual and reproductive health program is a strong barometer for the pressure points to assess “A Resilient Public Health System for A Better Future.” Malaysia demonstrated this in the development of the infrastructure to address maternal mortality 3-4 decades ago. However, further lessons can be drawn from and built on to further accelerate and inform other primary health care services. Using the history of sexual and reproductive health in the World Health Organization, the presentation outlines the argument for strengthening the foundations and provision of sexual and reproductive health services as tracer indicators for the robustness of the public health system

Symposium 7 - Primary Healthcare Reform : Countries Experience

S.7.1 : Health Financing Reform: Spending On Primary Health Care

Kara Hanson

This presentation will provide an overview of the analysis and findings of the deliberations of a group of 22 global leaders in Primary Health Care (PHC) financing on how countries can best finance PHC as part of their commitments to Universal Health Coverage (UHC). New data on the levels and composition of PHC expenditure paint a picture of modest spending on PHC, particularly in low- and lower-middle-income countries where funding is fragmented and out-of-pocket payments play an important role. The analysis will follow the health financing functions, exploring potential new sources of funding for health, then tracing the processes of pooling, allocating funds to PHC, and payment to providers. It will also explore the importance of the political environment and the need for politically informed health financing strategies.

S.7.2 : Enhancing Primary Healthcare System In Malaysia

Mohd Safiee Ismail

The Malaysian primary health care delivery system provides population-based services using a life-course approach in delivering services from womb to tomb. The aim is to provide easy access, affordable and comprehensive services of high

quality to both the urban and rural populations. The public healthcare system in Malaysia, which has done remarkably well, now faces several challenges. These challenges include epidemiological shifts that have led to an increased number of people suffering from non-communicable diseases as well as a rapidly ageing population. The MOH Malaysia strives to enhance the delivery of primary health care services in-line with the agenda of the Sustainable Development Goal and Universal Health Coverage. Many initiatives were introduced to close the gaps identified. This includes initiatives to increase access and reduce patient waiting time through digitalization such as implementing electronic medical records, virtual consultation and appointment systems. As for continuity of patient care, the concept of family doctor was introduced. To provide care closer to home, apart from mobile health services, domiciliary care service was introduced for stable bedridden patients discharged from the hospitals. As more chronic diseases are reported, there is an urgent need for health care to change towards wellness service as opposed to illness service. Recently, Ministry of Health launched the Health White Paper, emphasising primary health care and person-centred care. Public-private partnership is another approach to enhance primary health care system in Malaysia. There are huge resources in the private sector that can be potentially used in collaboration with the public sector. More efforts must be taken to encourage patient empowerment so that they have greater control over decisions and actions affecting their health. In addition, community empowerment measures such as health clinic advisory panels must be encouraged to ensure the community's healthcare needs are met.

S.7.3 : The Road To Universal Healthcare In Indonesia

Shita Dewi

Indonesia currently has multiple health problems, namely persistent infectious diseases, such as malaria, drug-resistant tuberculosis, dengue fever, and other infections, non-communicable diseases as the largest contributor to disability-adjusted life years (DALYs), especially ischemic heart disease, cerebrovascular disease, and diabetes and re-emerging diseases e.g., polio and diphtheria. Primary health care as the frontline in improving public health has undergone various reforms since 2003, along with health system reforms that respond to the dynamics of health issues in Indonesia. And although national health insurance has covered more than 90% of its population, out-of-pocket payment (OOP) is still rife. In 2022, OOP expenditure on health costs reached half of the total health expenditures and most of it was used to finance curative services. Reforms in the Indonesia health systems are largely influenced by a bigger reform, often happened outside the health system realms. For instance, the reform of Public Service Agency in 2003 has resulted in some puskesmas to carry out planning and financial management more freely and independently. The second wave of decentralization reform in 2007 has led to variations in the quality of health services between regions due to differences in the performance and resources of local governments. The health law in 2009 changed the orientation from curative to more promotive and preventive. The national health insurance program in 2014 changed the payment mechanism for health including the primary health care. In 2013, there was a new medical

profession, namely primary care doctors. Lastly, in 2022, there is a health system transformation initiative. One of the pillars of the health system transformation is the transformation of primary services. This is an exciting time to observe how the health system transformation will support Indonesia's primary care services to achieve universal health coverage.

Symposium 8 - Digital Health: Transforming Global Healthcare

S.8.1 : Artificial Intelligence In Public Health

Mohd Helmi Zakariah

Artificial intelligence (AI) has tremendous potential to transform the way healthcare is delivered and improve health outcomes for people around the world. However, the development and deployment of AI in healthcare also presents significant ethical and social challenges. The session will explore AI's ethical, social, and legal implications in healthcare. The session will focus on three key themes:

- Ethical and social implications of AI in healthcare: This theme will explore the ethical and social challenges of using AI in healthcare, such as bias, transparency, and accountability. will discuss strategies for ensuring that AI is developed and deployed in a way that is ethical, equitable, and socially responsible.
- Legal and regulatory considerations: This theme will explore the legal and regulatory frameworks that govern the development and deployment of AI in healthcare. will discuss the need for clear and consistent regulations that promote innovation while protecting patients' rights and privacy.
- Real-world applications of AI in healthcare: This theme will focus on the practical applications of AI in healthcare, such as diagnostics, treatment planning, and precision medicine. discuss the challenges and opportunities of using AI in these contexts and identify strategies for scaling up AI solutions in a sustainable and equitable manner.

S.8.2 : National EMR Initiative: Towards Lifetime Health Record

Shaifuzah Ariffin

The Ministry of Health envisioned for a universal healthcare coverage and access to health care that of a high quality, responsive and safe provided in a holistic and integrated manner with care continuum across individual's lifetime, and thereby improving health outcomes. One of the strategies is to develop an integrated healthcare system using information and communication technology (ICT) as the enabler for the healthcare delivery to be carried out more effectively and efficiently. The objective of an integrated healthcare is to have an interoperable healthcare information system that allows seamless information flow across the healthcare organizations and the actors/players across all levels of care geographically as well as temporally (from womb to tomb). To realize this vision, Ministry of Health (MOH) has proposed nationwide electronic medical record (EMR) implementation in MOH facilities, including horizontal and vertical integration. The

target is for 147 hospitals to be equipped with EMR and a nationwide roll-out of system in health clinics within an appropriate period. Ultimately the MOH's way forward is to develop an integrated healthcare ecosystem involving both the public and private sectors.

S.8.3 : Nurturing Digital Health Innovations

Adina Abdullah

Nurturing digital health innovations is crucial in advancing the healthcare industry. It involves creating an environment that supports developing and adopting new technologies that can improve patient outcomes, reduce costs, and enhance overall healthcare delivery. Key factors contributing to the success of digital health innovation include collaboration among stakeholders, regulatory frameworks that support innovation, investment in research and development, and the availability of skilled professionals. Moreover, efforts must be made to address the challenges of data privacy, security, and interoperability to ensure that these technologies are trusted by patients, healthcare providers, and payers. Overall, nurturing digital health innovations can lead to more efficient and effective healthcare systems that benefit all stakeholders.

Symposium 9 - Challenges in NCD epidemic and evolution of public health approaches

S.9.1 Understanding Diabetes And Obesity Scenarios At Country Level

Majid Ezzati

Non-communicable disease risk factor collaboration (NCD-RisC) is a network of health scientists around the world that provides rigorous and timely data on risk factors for non-communicable diseases (NCDs) for 200 countries and territories. The group works closely with the World Health Organization (WHO), through the WHO Collaborating Centre on NCD Surveillance and Epidemiology at Imperial College London. NCD-RisC pools high-quality population-based data using advanced statistical methods designed to analyse NCD risk factors. This presentation will present recent results on body mass index and diabetes, and the extent of underdiagnosis in diabetes in different world regions.

S.9.2 : The burden of premature mortality due to NCD in the South-East Asia region: challenges and strategies

Chalapati Rao

Control of non-communicable diseases (NCDs) is a key target for the United Nations Sustainable Development Goals (SDGs) for 2030. Available information indicates that countries in the Asia-Pacific Region accounted for 63% of the global NCD mortality burden in 2016. There are well-known associations between these characteristics and population level epidemiological patterns of NCD burden,

mediated through a range of biological and behavioural exposures at the individual level. Reliable information on population distributions of these exposures and accurate measurement of NCD incidence, prevalence and mortality are necessary to guide national health programs to reduce the magnitude of NCD burden. Reliable information is also required on the availability and effectiveness of health services, health care-seeking behaviours, and social determinants of health at national and sub-national levels for Asian countries. Unfortunately, there are critical gaps in the availability of reliable empirical epidemiological data on NCDs for Asian countries. In particular, NCD mortality estimates are produced through statistical modelling techniques with few or no primary national data inputs. Hence, a major challenge for NCD Control Strategies is to improve primary data availability to inform health policy and program evaluation. This presentation discusses the issues with NCD data availability and a strategic approach to strengthen routine and specialised data collections that could create a robust platform for evidence-based NCD health policies in South East Asia.

S.9.3 : How Can We Manage Commercial Determinants Of Health?

Feisul Idzwan Bin Mustapha

The commercial determinants of health (CDH) have become increasingly recognized as key factors that shape individual and population health outcomes. CDH refer to the economic, social, and environmental conditions that influence the production, distribution, and consumption of goods and services, including those related to food, tobacco, alcohol, and pharmaceuticals. Focusing on Non-Communicable Diseases (NCDs) – while individual behaviour and lifestyle factors contribute to the development of NCDs, CDH in particular tobacco, alcohol, and unhealthy food industries, play a significant role in shaping population health outcomes. As such, effective management of CDH is essential to prevent and control NCDs. I will explore strategies for managing CDH in the context of NCDs. I will review the evidence base on the impact of CDH on NCDs and present a framework for understanding the pathways through which these determinants influence health outcomes. I will also discuss policy interventions, such as taxation, regulation, and marketing restrictions, that can be used to manage CDH and prevent NCDs. I hope to highlight the importance of a multi-sectoral approach that involves collaboration across government, civil society, and private sector stakeholders to address CDH. This approach should prioritize equity, sustainability, and accountability in order to ensure that policies and interventions are effective and responsive to the needs of all populations. I will also highlight the need for ongoing research and monitoring to evaluate the impact of interventions on health outcomes and identify areas for improvement. In conclusion, managing CDH is critical for preventing and controlling NCDs. A multi-sectoral approach that prioritizes equity, sustainability, and accountability is essential for success. I hope to provide insights and recommendations for policymakers, practitioners, and researchers working to address NCDs and their commercial determinants.

ORAL PRESENTATION

EPIDEMIOLOGY

EPIDOP01/12 : Exploring The Prevalence And Risk Factors Of Obesity Among Adults In An Urban Poor Community

Jo Ann Andoy Galvan, Karuthan Chinna, Neoh Beng Sheng, Saman Tayeba, Ong Shu Xin, Piravenaaeaswaary
School of Medicine, Faculty of Health and Medical Sciences, Taylor's University, Lakeside Campus, Selangor, Malaysia
1 Jalan Taylors, Subang Jaya, Selangor, 47500, Malaysia
Corresponding author's email: JoAnnAndoy.Galvan@taylors.edu.my

Summary
We investigated the prevalence of obesity among the residents of an urban poor community and explored its association with quality of life, mental health, and the sociodemographic factors. A cross sectional-study design was conducted with a sample data of 407 participants from the said urban poor community. Results have demonstrated that majority of the study participants were in the obese category, with values significantly higher compared to the national prevalence. Among all the factors investigated occupation significantly predicted the odds of being obese.

Keywords
Obesity, Prevalence, Sociodemographic factors, PPR Malaysia, Occupation

Introduction
As the world focuses its efforts on combating the COVID-19 pandemic, mental health issues continue to rise, and other risk factors of non-communicable diseases go unnoticed. Obesity is a growing public health burden among the poor, significantly increasing the risk of non-communicable diseases. If the obesity rate continues to rise, the healthcare system could face a double burden of disease in the coming years. In 2016, approximately 13% of the world's adult population was obese, while Malaysia had the highest adult obesity rates among Southeast Asian countries(1). The aim of this study is to investigate the prevalence of obesity among the residents of an urban poor community and explore its association with quality of life, mental health, and the sociodemographic factors.

Materials and Methods
A cross-sectional study was done among residents of an urban poor community. Sample size (n) was calculated using the Krejcie and Morgan formula (2). Data were collected from all 21 floors of both blocks of the community. The inclusion criteria for this study were as follows: 1) Urban Poor community resident in Sri Pantai, Malaysia, 2) 18 years old and older, 3) Malaysian. Those who were physically disabled and anthropometry could not be measured were excluded from this study. Data was compiled, organized, and analysed with Statistical Package for Social Sciences (IBM SPSS Version 28.0, New York, USA). Frequency, mean, and standard deviation were used in descriptive analysis, while Chi-Squared Test (X2) with a

standardized statistical significance of p<0.05 was used to measure associations between the variables. Logistic regression analysis was also used in analysing predictor variables.

Results and Discussion

There was a total of 407 respondents in this research study. Most of the respondents were females (74.9%), Malays (65.6%), married (68.6%), completed secondary level (60.4%) and working (52.5%) composed mostly of workers from finance and services (33.14%) as well as entrepreneur (49.14%) which includes small scale trades, sales, and business. The prevalence of people being overweight and obese in the study population compared to the national prevalence was shown in Table 1. The prevalence of obesity in this community is significantly higher compared to national prevalence based on both WHO Guidelines (28.75%, x^2 = 21.058, p = <0.001) and CPG of Malaysia (46.93%, x^2 = 31.878 p = <0.001) classification of obesity.

Table 1: Comparison of the prevalence of overweight and obesity with the general population in Malaysia (N=407), (Adapted from NHMS, 2019)

BMI Category	Prevalence (%) CPG		X^2	p value	Prevalence (%) WHO		X^2	p value
	National sample	Study sample			National sample	Study sample		
Overweight	32.3	30.47	0.625	0.429	30.4	35.87	5.760	0.016
Obese	33.7	46.93	31.878	<0.001	19.7	28.75	21.058	<0.001

CPG: Clinical Practice Guidelines, Malaysia Classification of Obesity
WHO: World Health Organization Classification of Obesity

Among all the factors investigated using logistic regression, occupation significantly predicted the odds of being obese; those who are not working are 2.79 times more likely to be obese compared to housewives (CI, 95% 1.502-5.185), p=0.001).

Table 2: Logistic regression analysis of obesity

Variables	Univariate Logistic: Obese/overweight vs Not obese/overweight N=407; OR (CI, 95%)	P-value	Multivariate Logistic: Obese/overweight vs Not obese/overweight N=407; OR (CI, 95%)	P-value
Gender				
Male	1.072 (0.631-1.824)	0.796		
Female	1			
Ethnicity			0.577 (0.316-1.054)	0.074
Malay	0.507 (0.316-0.815)	0.005		

Non-Malay	1			
Level of Education		0.031		0.969
None	1.175 (0.319-4.322)	0.808	1.299 (0.27-6.239)	0.744
Primary	1.338 (0.417-4.291)	0.625	1.382 (0.324-5.895)	0.662
Secondary	0.596 (0.179-1.98)	0.398	1.257 (0.263-6.005)	0.774
Tertiary	1			
Marital Status		<0.001		0.073
Single	3.599 (2.104-6.156)	<0.001	2.322 (1.065-5.063)	0.034
Married	2.552 (1.116-5.834)	0.026	1.387 (0.449-4.287)	0.57
Widowed	1			
Occupation		<0.001		0.005
Not working	2.789 (1.628-4.779)	<0.001	2.791 (1.502-5.185)	0.001
Working	2.875 (1.443-5.727)	0.003	1.866 (0.805-4.327)	0.146
Housewives	1			
Age	1.021 (1.004-1.038)	0.015	1.023 (0.996-1.05)	0.097
Depression	0.994 (0.968 - 1.021)	0.652		
Anxiety	0.987 (0.960 - 1.015)	0.362		
Stress	0.984 (0.960 - 1.010)	0.228	0.992 (0.962-1.023)	0.592
Physical	0.990 (0.977 - 1.004)	0.154	0.995 (0.978-1.013)	0.607
Psychological	0.995 (0.981 - 1.009)	0.497		
Social	1.006 (0.995 - 1.017)	0.287		
Environment	1.002 (0.989 - 1.014)	0.783		

CI, confidence interval; OR odds ratio; Nagelkerke R^2= .109; Cox & Snell R^2 = .068; Hosmer and Lemeshow x2 = 2.269, p = 0.811

Conclusion

This community has a higher proportion of obesity as compared to the national average. Occupation is shown to be an independent predictor of obesity; those who do not work are at a higher risk than housewives.

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EPIDOP02/42 : Predictors Of Presence Of T2DM-Related Complications In Pahang: Is Insulin Already On Board?

Aizuniza[1], Muhammad Siddiq[1], Shaiful Sharizal[1], Mohd Fahmi I[1], Sharifah Fairuz[1], Nor Azimi[1], Husnina[1]
[1] Pahang Health State Department
Corresponding author's email: drsiddiq@moh.gov.my

Summary
This study investigated the sociodemographic characteristics, risk factors, medication use, and diabetic complications among diabetic patients in Pahang. According to the study, it has been observed that ageing, male gender, prolonged duration of diabetes, hypertension, dyslipidaemia, and insulin monotherapy or combination therapy are significant predictors of complications among diabetic patients. The study provided valuable insights into the management of diabetes and its associated risk factors, highlighting the significance of early detection and intervention to prevent or delay the onset of complications.

Keywords
Diabetes, Pahang, Malaysia, risk factors, complications

Introduction
Diabetes poses a significant public health concern as it can cause a variety of medical complications, including microvascular and macrovascular complications (1). The prevalence of diabetes in Pahang, Malaysia, has more than doubled from 12.5% in 2011 to 25.7% in 2019. The most prevalent complications among diabetic patients are nephropathy and retinopathy. Insulin treatment is common in tertiary hospitals, compared to primary and secondary care. The majority of diabetic patients were prescribed oral medications such as Metformin, while 30% were prescribed insulin. (2). Early insulin therapy is recommended for the treatment of diabetes in order to prevent or mitigate diabetic complications. It is imperative to identify predictors of complications among diabetic patients to enhance the quality of diabetic care. The study aimed to identify significant predictors of complications among diabetic patients.

Materials and Methods
This cross-sectional study analysed data from the National Diabetes Registry (NDR), specifically focusing on 6092 diabetic patients who received treatment at 80

primary health clinics in Pahang from 2021 to 2022. The sample size was contingent upon the number of active patients with type 2 diabetes in the area. The study included audited registered patients in the NDR and actively follow-up at primary health clinics in Pahang. Patients with missing data, loss to follow-up, transfer of care, death, or defaulted treatment were excluded. The study adhered to ethical considerations by maintaining confidentiality and anonymity to safeguard the right and welfare of respondents. SPSS version 27 was used to analyse the data, including descriptive statistics and logistic regression analysis. The significance threshold was set at $p<0.05$ for statistical analysis.

Results and Discussion

This study's findings indicated that majority of diabetic patients were above the age of 50. Those aged 60 or older had a greater than 10-fold increased risk of developing type-2 diabetes compared to younger individuals, with Malaysia expected to be aged nation by 2030. There was a higher diabetes prevalence among the Malay population and female group; these constituted a significant proportion of respondents who attended at health facilities. Additionally, Malaysia has been identified as having the highest prevalence of obesity in the South-East Asian region (3), which increases the risk of NCDs. The prevalence of hypertension and other NCDs is attributed to high-risk behavioural factors. As individuals age, their ability to produce and utilise insulin may decrease, leading to hyperglycemia and potential damage to blood vessels, such as the development of macrovascular and microvascular complications (4). Prolonged duration of diabetes raises the risk of damaging small blood vessels in numerous organs. The presence of high blood pressure and dyslipidaemia in diabetic patients can exacerbate more damage to blood vessels. In accordance with current clinical practice guidelines, diabetic patients with complications are more likely to receive insulin monotherapy and combination medication (5). The study's limitations encompassed its cross-sectional design, which precluded the establishment of causal relationships, and restricted access to diabetic patients receiving treatment in healthcare facilities. It is recommended that future studies consider employing diverse research designs and a larger patient population.

Table 1: Association between the significant factors and the presence of complications (n=6092)

Variable	B	Adjusted Odd Ratio	95% CI	
			Upper	Lower
Age (years)	0.025	1.025***	1.017	1.018
Gender				
Female	-0.303	0.735***	0.644	0.848
Male		1		
Duration of Diabetes (years)	0.088	1.092***	1.078	1.106
BMI Group				
Underweight		1		
Normal	-0.336	0.715	0.437	1.169
Overweight	-0.419	0.657	0.410	1.054

Obese 1	-0.335	0.715	0.446	1.147
Obese 2	-0.262	0.769	0.454	1.305
Obese 3	-0.622	0.537	0.227	1.041
HbA1c group				
≤ 6.5		1		
> 6.5	0.139	1.149	0.984	1.340
Hypertension				
No		1		
Yes	0.694	2.001***	1.603	2.497
Dyslipidaemia				
No		1		
Yes	0.615	1.849***	1.527	2.238
Type of Medication				
OGLD Only		1		
Combination therapy	0.490	1.632***	1.382	1.928
Insulin monotherapy	0.952	2.590***	1.977	3.394

**p<0.05, **p<0.01, ***p<0.001*

Conclusion

This study identified significant predictors of complications in Type 2 Diabetic Patients in Pahang. The patient's age, gender, duration of diabetes, hypertension, and dyslipidaemia may all increase their risk of developing complications. Healthcare professionals should consider these predictors to optimise diabetes management to improve patient outcomes.

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EPIDOP03/64 : Human Brucellosis Outbreak Linked To Unpasteurised Goat Milk In Pulau Pinang, 2022

Tan Hooi Shyuan[1], Rozaini Mat Shah[1], Lydia Ann Ganapathi[1], Noor Farhana Mohd Fathil[2], Azizah Ab Manan[2]
[1]Timur Laut District Health Office, Pulau Pinang, Ministry of Health, Malaysia
[2]Pulau Pinang State Health Department, Ministry of Health, Malaysia
Corresponding author's email: drtanhooishyuan@moh.gov.my

Summary
In 2022, Pulau Pinang reported an outbreak of human brucellosis involving eight cases. An investigation was carried out to assess the outbreak and determine the source of infection. Blood cultures for patients, raw milk samples for the Polymerase Chain Reaction test, and animal serological testing were done. Brucella melitensis was found in all blood cultures. Seven patients had consumed raw goat milk from a farm, while one patient was the dairy farmer who had direct contact with the infected goats. Serological tests for brucellosis were positive in 28 goats. Preventive and control measures are implemented to stop disease transmission.

Keywords
brucellosis, outbreak, unpasteurised milk, zoonotic disease

Introduction
Brucellosis is one of the world's leading neglected zoonotic diseases (1). The majority of human Brucellosis cases reported in Malaysia are caused by the consumption of unpasteurised dairy products, and the number of cases has been reduced since 2019 (11 cases in 2019, 3 in 2020, 2 in 2021, and 8 in 2022) as a result of effective public health prevention and control measures (2). On 5 July 2022, Timur Laut District Health Office reported an outbreak of human brucellosis involving two hospitalised patients to a tertiary hospital in Pulau Pinang. An investigation was conducted to assess the extent of the outbreak, identify the source of the infection and the transmission mechanism, and implement control measures to prevent a similar outbreak from recurring. A total of eight cases were reported in this outbreak.

Materials and Methods
A retrospective descriptive study was conducted on all cases reported between 15 June 2022 and 19 December 2022. Diagnoses of Human Brucellosis were confirmed by blood cultures. Raw milk samples were tested for Polymerase Chain Reaction (PCR) for Brucella spp. All 269 goats and sheep from the suspected farm were tested for brucellosis by using Rose Bengal plate test (RBPT) and Complement Fixation test (CFT).

Results and Discussion

A total of eight (8) human Brucellosis melitensis cases confirmed by blood culture were reported. The mean age was 42.6 years (SD=14), with most cases being Malay (87.5%) and males (62.5%). Main symptoms reported were fever (75%), headache (75%), malaise (50%) and vomiting (50%). Seven patients had consumed unpasteurized goat milk produced by a local farmer in the previous six (6) months, and one patient was the dairy farmer who had direct contact with the infected goats. The number of days from onset to hospital admission ranged from 0 to 128 days. Brucellosis typically manifests as a variety of non-specific symptoms, with chronicity and recurring febrile conditions are common (1). This has resulted in patients delaying treatment and health care providers misdiagnosing patients (3). Serological tests on goats revealed that 28 goats were positive for brucellosis by both RBPT and CFT. However, no Brucella spp. was detected from the raw milk samples by PCR test. It was reported that milk proteins may inhibit DNA amplification and reduce the sensitivity of PCR test (4,5). Figure 1 shows an epidemic curve with a common source outbreak and intermittent exposure. Following the outbreak declaration, the unpasteurised goat milks were discarded, and 20 infected goats were culled. Unfortunately, milk was sold without permission in August 2022. Again, mandatory disposal of unpasteurized goat milk and nine (9) infected goats was carried out. All other uninfected dairy goats were also voluntarily culled. A compound was issued for violating the Food Regulations of 1985. The affected dairy goat farm was closed in accordance with the Prevention and Control of Infectious Diseases Act 1988. Brucellosis health education messages and prevention measures were distributed to the public. The outbreak was declared over on 19 February 2023, 60 days after the last case was reported.

Conclusion

Pasteurisation of milk is an effective method of killing Brucella and preventing infection in humans. Public health education is required to raise awareness about the dangers of consuming unpasteurised milk and to correct the social misconception that pasteurised milk is less nutritious.

Acknowledgments

The authors would like to thank the team from Timur Laut District Health Office, Pulau Pinang State Health Department, Department of Veterinary Services Pulau Pinang, Timur Laut District Veterinary Service Office, Hospital Pulau Pinang, and all other agencies for their dedication and efforts during the Brucellosis outbreak.

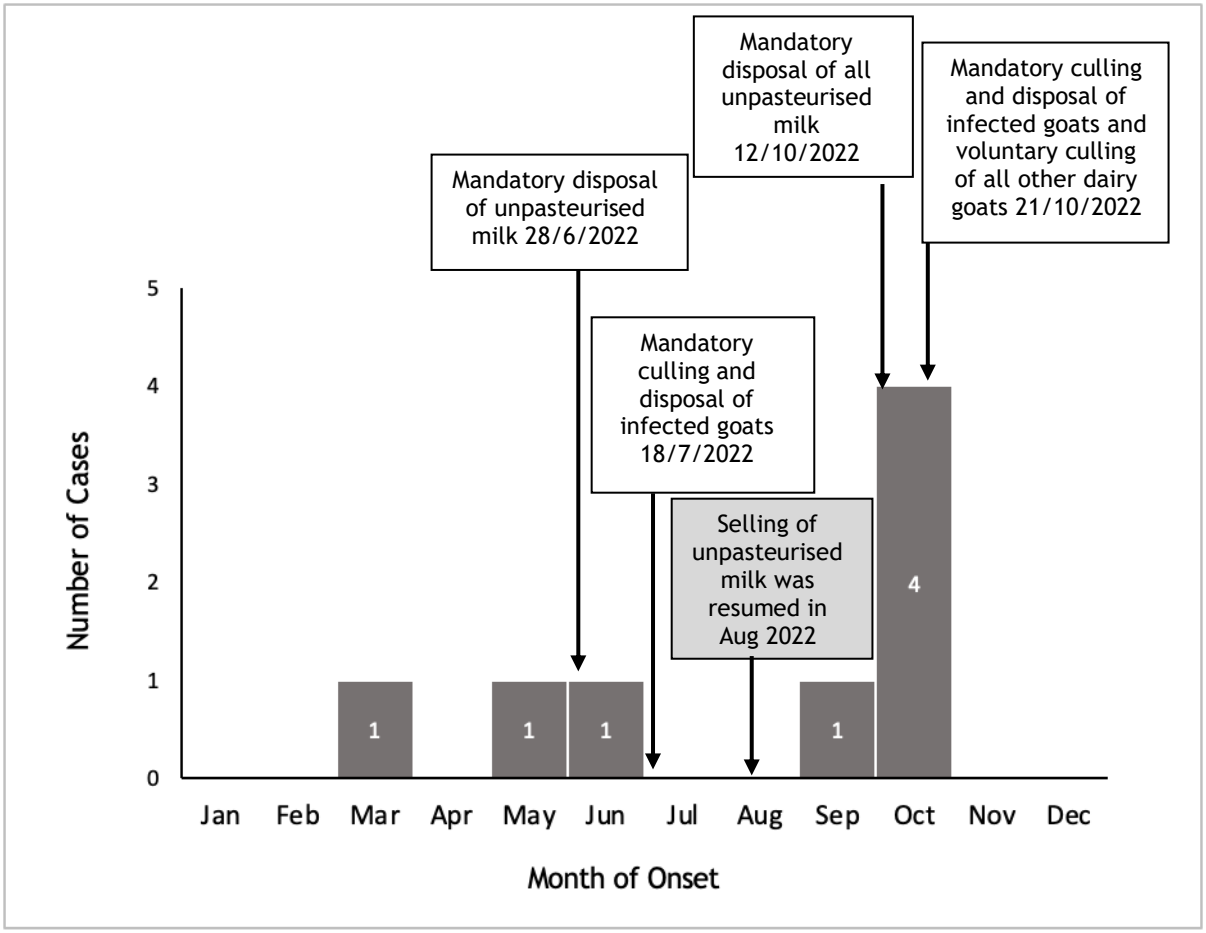

Figure 1: Epidemic curve of cases of human Brucellosis outbreak in Pulau Pinang, by month of onset, 2022

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EPIDOP04/32 : Coping Strategies For Dealing With Psychological Distress And Hindrances For Help-Seeking Among Adolescents Living In The Klang Valley People's Housing Project (PPR) During The COVID-19 Pandemic

Siti Nur Farhana H[1], Noor Laile J[1], Norrafizah J[1], Zanariah Zaini[1], Mohd Hairmansah MS[1], Feisul Idzwan Mustapha[2], Manimaran K[1]
[1] *Institute for Health Behavioural Research, National Institutes of Health, Ministry of Health Malaysia, Malaysia*
[2] *Disease Control Division, Ministry of Health Malaysia, Malaysia*
Corresponding author's email: farhana@moh.gov.my

Summary
This study aimed to explore the coping strategies and hindrances to help-seeking among adolescents living in People's Housing Project (Projek Perumahan Rakyat or PPR) communities in the Klang Valley during the COVID-19 pandemic. A total of 47 adolescents aged 10 to 17 years were interviewed. This study found that adolescents used both adaptive and maladaptive coping strategies to manage their psychological distress during the pandemic. Adaptive coping strategies included social and spiritual support, while maladaptive coping strategies included avoidance, self-harm, vaping, and smoking. The study also identified hindrances to help-seeking, including lack of trust, perceived ineffectiveness of support, and personality.

Keywords
Mental health, depression, anxiety, coping strategies, help-seeking behaviour

Introduction

The impact of COVID-19 on the population is widespread, and the low socio-economic group has been the most affected (1). In Malaysia, this group includes those living in the PPR. Adolescents living in PPR communities are among the most vulnerable populations in urban settings, as they were already experiencing pre-existing conditions of vulnerability. The COVID-19 pandemic crisis has further aggravated these deprivations, and low-income families in PPR communities are disproportionately affected. Understanding the mental health status and coping strategies of adolescents in dealing with the pandemic is crucial to comprehend the impacts of the pandemic on their mental health and well-being. This study aims to explore coping strategies for dealing with psychological distress and hindrances to help-seeking among adolescents living in PPRs during the COVID-19 pandemic.

Materials and Methods

This mixed-methods study involved adolescents aged 10 to 17 living in selected PPRs in the Klang Valley. Data collection took place from April 1 to September 30, 2022. Participants were recruited using the purposive sampling method as this study purposely selected adolescents with moderate, moderately severe, and severe for PHQ-9 and/or moderate and severe for GAD-7 based on the screening. Participants who agreed to participate were recruited (with consent from parents) and interviews were set according to the participants' convenience. A semi-

structured interview guide was used to conduct the in-depth interviews (IDI). After each IDI session was completed, the recorded interviews were transcribed. Data from the voice recorder were stored on a password-protected computer, and participants' names were replaced with specific codes to ensure confidentiality. The researchers coded all transcripts independently. The transcripts were analysed inductively using a thematic approach to identify recurring themes.

Results and Discussion

From the 37 PPRs, 194 adolescents were identified as having psychological distress based on the screening. Among them, 47 agreed to participate in in-depth interviews (IDIs), which revealed two prominent themes regarding coping strategies: adaptive and maladaptive coping. While we identified several adaptive coping strategies, such as social support (parental, family, and peer support), spiritual support, and tension reduction techniques, we also found maladaptive coping strategies, such as avoidance (cognitive distancing, externalization, and internalization), self-harm, vaping, and smoking. This study found that adolescents practised maladaptive coping strategies to deal with stressors related to COVID-19, which aligns with a previous study conducted in a European country, showing that adolescents tend to avoid their problems as a coping mechanism for stressful situations (2). Previous studies have reported that adolescents believe negative emotions do not require evaluation and regulation with rationality. As a result, avoiding problems is seen as the simplest and quickest way to cope with stress (2)(3). In this study, adolescents used self-harm (skin cutting also colloquially known as "barcode" and consuming unknown medications) to alleviate their stress. The causes of self-harm were classified into family-related, environmental, and individual factors (4). Self-harm was used to regulate negative emotions and obtain temporary relief from emotional pain (5). As for hindrances to help-seeking, three themes were identified such as lack of trust, perceived ineffectiveness of support, and personality.

Conclusion

Psychological distress among adolescents is prevalent during the pandemic, and they face hindrances in seeking help. Coping strategies have been identified to help adolescents manage their psychological distress during the pandemic. This study emphasizes the importance of strengthening mental health services and creating a community resilient in mental health.

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EPIDOP05/63 : A Comparison Between Antibiotic Consumption In Public And Private Community Healthcare In Malaysia

Audrey Huili Lim[1], Norazida Ab Rahman[1], Siti Nur Su'aidah Nasarudin[2], Tineshwaran Velvanathan[2], Mary Chok Chiew Fong[2], Sheamini Sivasampu[1]
[1]Institute for Clinical Research, National Institutes of Health, Malaysia
[2]Pharmacy Research & Development Branch, Pharmacy Policy & Strategic Planning Division, Pharmaceutical Services Programme, Ministry of Health.
Corresponding author's email audreylim.moh@gmail.com

Summary
This study aimed at measuring and comparing the utilisation of antibiotics in the public and private sectors of Malaysian primary care in 2018-2021. We used national drug procurement data for the period of January 2018 – December 2021 to report rates of antibiotic utilisation as Defined Daily Doses per 1000 inhabitants per day (DID), stratified by AWaRe categories. Antibiotic utilisation in the private sector (3.78-5.39 DID) was much higher than the public sector (0.38-1.17 DID). Use of Access antibiotics in the public sector was consistently above 90%, while use of Access antibiotics by the private sector ranged from 64.2% to 68.3%.

Keywords: antibiotic, utilisation, primary care, defined daily dose, AWaRe.

Introduction
Two parallel systems exist in Malaysian primary healthcare services: government-funded public primary care and privately-owned practices. The World Health Organization (WHO) AWaRe classification categorizes antibiotics into three groups: Access, Watch and Reserve, emphasizing the importance of appropriate antibiotics use by evaluating the impact of different antibiotics on antimicrobial resistance. Evidence shows that >60% of national antibiotic consumption should consist of Access antibiotics for judicious use of antibiotics, reduced costs, and increased access. While studies have evaluated antibiotic utilisation in Malaysian public healthcare (1-4), there is a lack of literature on using antibiotics in the private sector. This study aimed to measure and compare the utilisation of antibiotics in Malaysia's public and private community healthcare sectors in 2018-2021.

Materials and Methods

This study was a retrospective analysis of antibiotic utilisation in Malaysian primary care from 1 January 2018 until 31 December 2021. National drug procurement data obtained from the Pharmaceutical Services Programme, Ministry of Health Malaysia database was used for this study. Data on private sector procurement was derived from sales data acquired through IQVIA Solution Malaysia Sdn Bhd, representing approximately two-thirds of Malaysia's total pharmaceutical market coverage. Rates of antibiotic utilisation were reported as Defined Daily Doses per 1000 inhabitants per day, stratified by antibiotic classes. The secondary analysis included proportions of AWaRe antibiotic category use for each sector and proportion of antibiotic utilisation for both sectors. The rates of antibiotic utilisation between January 2018 and December 2021 were compared using descriptive statistics. R version 4.1.0 was used to conduct all data cleaning and analysis.

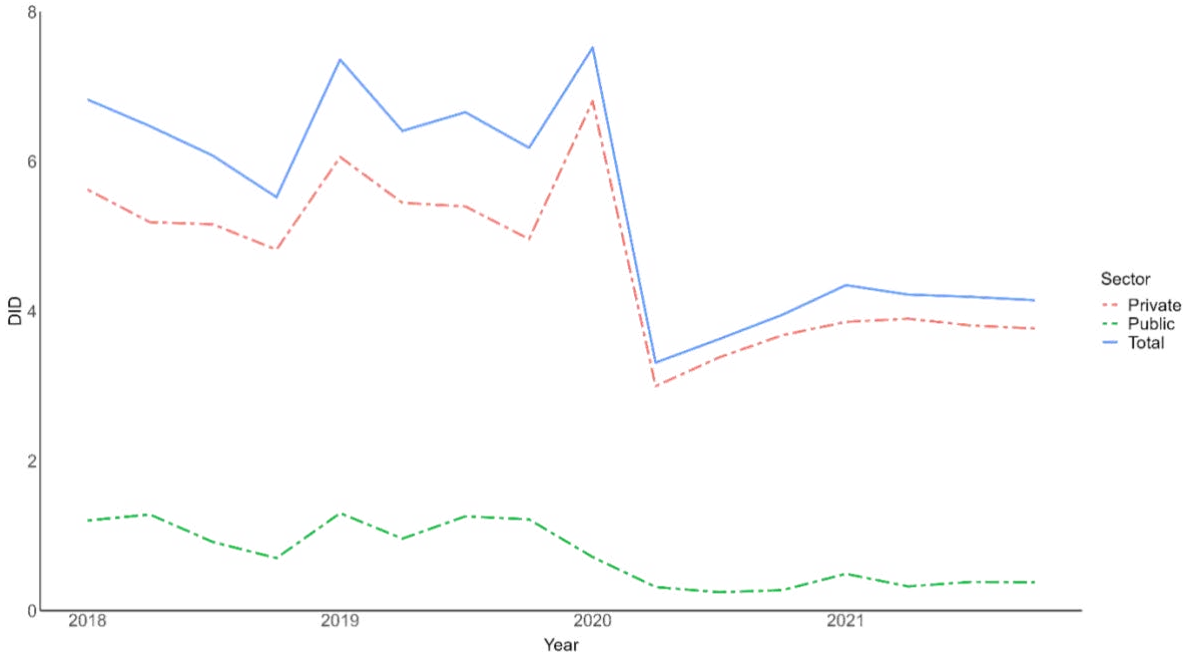

Figure 1: Overall trend of antibiotic utilisation in public and private sectors during 2018-2021
DID: Defined Daily Dose

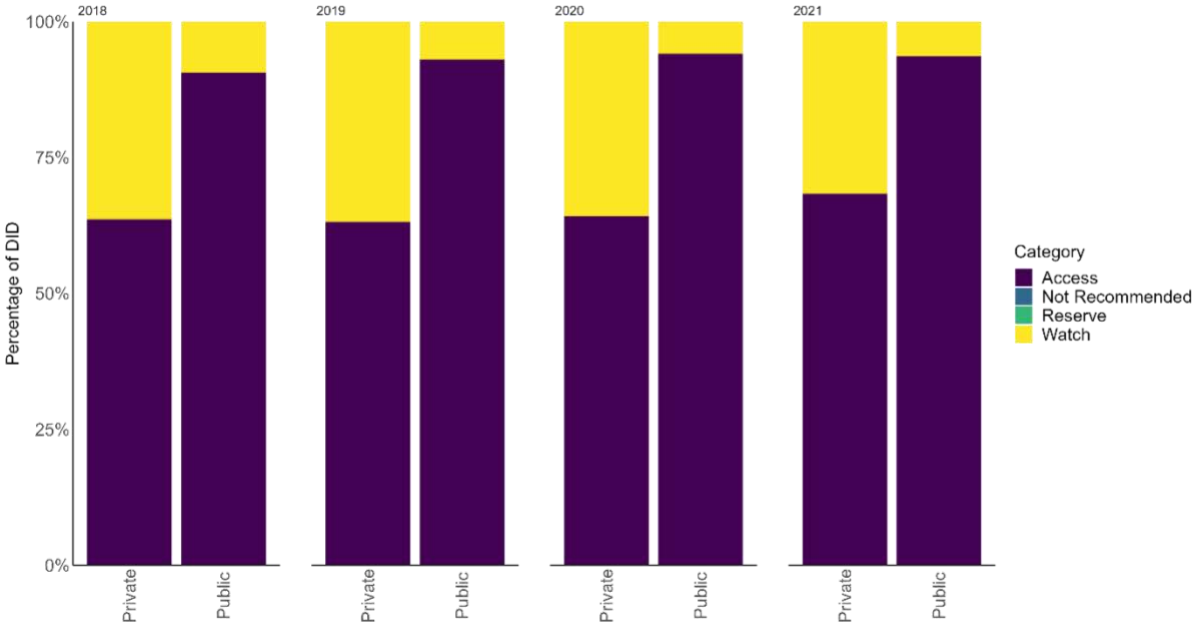

Figure 2: Proportions of different AWaRe categories of antibiotics for public and private sectors from 2018-2021.
DID: Defined Daily Dose per 1000 inhabitants per day; NR: Not Recommended
*Proportion of NR and Reserve categories are too small to be visualised.

Results and Discussion

The overall national antibiotic utilisation for 2018 was 6.14 DID, increasing slightly to 6.56 DID in 2019 before decreasing to 4.54 DID in 2020 and 4.17 DID in 2021 (Figure 1). Antibiotic utilisation in the public sector was 16.4% in 2018 but decreased to 9.4% in 2021. Use of Access antibiotics in the public sector was consistently above 90% (the remaining being Watch antibiotics), while use of Access antibiotics by the private sector ranged from 64.2% to 68.3% (Figure 2). Although the use of Watch antibiotics in the private sector decreased over the years, the use of Reserve and 'Not Recommended' antibiotics increased slightly. This study is what we believe to be the first work comparing nationwide antibiotic utilisation of the public and private community healthcare sectors in Malaysia, providing the most recent and comprehensive view on antibiotic utilisation in nationwide primary healthcare. The increase in use of Reserve antibiotics, albeit small, is also cause for worry as Reserve antibiotics are the last-line of defence for pathogens and should not be used heedlessly in primary care. Our findings also echo the findings of a previous study on antibiotic prescribing practice in Malaysia which found that antibiotic prescribing was higher in private clinics (5). Lower antibiotic utilisation in the public sector is hypothesised to be due to several factors includes, Firstly, prescribers in the public sector are restricted by formulary availability. Secondly, prescriptions are checked by pharmacists in the public sector before being supplied, functioning as a form of check and balance to the use of antibiotics in the public sector. Future work to look into prescription-level data will shed more light on the appropriateness of antibiotic use in both the public and private sectors.

Conclusion

Antibiotic consumption in Malaysia's private community healthcare sector was much higher than in the public sector. These findings highlight the need for more rigorous interventions targeting private and public prescribers. Improvement strategies should focus on reducing inappropriate and unnecessary prescribing.

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EPIDOP06/15 : Distress Tolerance And Mood Disorders Among Smoking Cessation Clinic Attendees

Nazirah Gulam Mohamed[1], Lei Hum Wee[2,3*], Caryn Mei Hsien Chan[3], Ching Sin Siau[3], Alfian Mohd Zin[1]

[1] Division of Health Education, Ministry of Health, Penang, Malaysia
[2] Faculty of Health & Medical Sciences, Taylor's University, Malaysia
[3]Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia
Corresponding author's email: caryn@ukm.edu.my

Summary

The study attempted to identify if distress tolerance is associated with mood disorders and short-term quit outcomes. Smokers attending a smoking cessation clinic were interviewed face-to-face and followed up for 4-weeks. The Distress Tolerance Scale and Mini-International Neuropsychiatric Interview were administered. 37.3% were abstainers and 62.6% were relapsers. Quit smoking outcomes at 4-weeks follow-up were not associated significantly with distress tolerance levels. 23.8% were found with at least one mood disorder. Mood disorders among low distress tolerance were significantly higher than high distress tolerance. Those with low distress tolerance were more likely to have comorbid mood disorders.

Keywords
Smoking, Psychological Distress, Anxiety, Depression, Post-Traumatic

Introduction

Studies have shown an association between smoking behaviour and mood disorders (1). However, little is known about the mechanisms underlying the relation between both constructs (2). Distress tolerance (DT) is identified as an emerging risk factor for several mood and tobacco use disorders. Individuals with low DT may more likely respond maladaptive to distress (3). The study is to explore the association between DT and mood disorders among smokers attending quit smoking clinic (QSC).

Materials and Methods

In this prospective follow-up study, 67 smokers were selected purposively. Sociodemographic characteristics, health problems and Fagerstrom Test for Nicotine Dependence (FTND) were recorded. Expired breath carbon monoxide (CO) concentration was assessed to validate physical dependence of smoking status. The 15-items DT Scale (4) was used to assess the smokers' ability to withstand negative effects. Mini-International Neuropsychiatric Interview: Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV-TR) (5) were administered. Face-to-face interviews were conducted and smokers received behavioural modification therapy and/or pharmacotherapy. Differences between low DT and high DT were determined by chi-square and Mann-Whitney U tests.

Results and Discussion

At 4-weeks follow-up, 37.3% were abstained and 47.7% relapsed. DT level was not associated with the smoking outcomes between the abstainers and relapsers. No significant relationship between planned or unplanned quitting and DT (Table 1).

Table 1: Smoking characteristics and level of nicotine dependence among clinic attendees at baseline

Smoking Characteristics	Mean (SD)			*U*	*z*	*r*	*p*-value
	Total (n=67)	Low DT (n= 36)	High DT (n= 31)				
Age initiation (yrs)	17.7 (4.0)	17.6 (3.8)	17.8 (4.2)	537.0	-.272	.03	.785
Years of smoking	33.6 (13.0)	31.7 (13.7)	35.8 (12.0)	464.0	-1.555	.19	.237
Carbon monoxide, ppm	10.1 (3.8)	10.0 (3.9)	10.1 (3.6)	551.5	-.082	.01	.935
FTND score	3.6 (2.0)	3.6 (2.0)	3.5 (1.9)	522.5	-.454	.06	.650

Smoking Characteristics	N (%) Total (n=67)	Low DT (n= 36)	High DT (n= 31)	x^2 (df)	*p*-value
Previous quit attempt					
Yes	38 (56.7)	17 (25.4)	21 (31.3)	2.857 (1)	.091
No	29 (43.3)	19 (28.4)	10 (14.9)		
Current Methods of quitting					
Abrupt cessation	26 (38.8)	14 (20.9)	12 (17.9)	.000 (1)	.988
Gradual cessation	41 (61.2)	22 (32.8)	19 (28.4)		
Current Quit Attempt					
Planned cessation	33 (49.3)	16 (23.9)	17 (25.4)	.720 (1)	.396
Unplanned cessation	34 (50.7)	20 (29.9)	14 (20.9)		
Received (Verenicline)					
Yes	7 (10.4)	3 (4.4)	4 (6.0)	-	.696
No	60 (89.6)	33 (49.3)	27 (40.3)		
Smoking Status at 1-month f/up					
Abstainer	25 (37.3)	16 (23.8)	9 (13.4)	1.692 (1)	.193
Relapser	42 (62.6)	20 (29.8)	22 (32.8)		

DT Median Score=58 cut off point (range 33-74), *p<0.05, **p<0.0001

Mood disorders were found to be significantly associated with the low DT group compared to high DT group. Those with low DT were also more likely to have comorbid mood disorders. The current major depressive episode is the one component of mood disorders to be significantly associated with low DT (Table 2).

Table 2: Mood disorders among the clinic attendees at baseline

Mood Disorder	N (%) Total (n=67)	Low DT (n= 36)	High DT (n= 31)	x^2 (df)	*p*-value
Mood Disorder (s)	16 (23.8)	15 (22.3)	1 (1.5)	13.541 (1)	<.001*
Generalised Anxiety Disorder	7 (10.5)	6 (9.0)	1 (1.5)	-	.113
Current Major Depressive Episode	16 (23.8)	15 (22.3)	1 (1.5)	13.541 (1)	<.001*
Recurrent Major Depressive Episode	3 (4.5)	3 (4.5)	0 (0.0)	-	.243
Traumatic Exposure	15 (22.3)	10 (14.9)	5 (7.4)	1.301 (1)	.254
Post-Traumatic Stress Disorder	1 (1.5)	1 (1.5)	0 (0.0)	-	1.000

DT Median Score = 58 cut off point (range 33-74), *p<0.05, **p<0.0001

Smokers with low DT demonstrate increased susceptibility towards mood disorders. However, low DT is not associated significantly with quit smoking outcomes at 4-weeks. One probable reason is that individuals with low DT respond maladaptively (2) leading to mood disorders. This is attributed to the low success

rates in quitting smoking. Those with low DT could have relapsed to cope. Findings may lead credence to the impact of DT on the psychopathology of mood disorders among smokers (2). Causal relationship between DT and mood disorders cannot be inferred.

Conclusion

DT level may be utilised to identify smokers' vulnerability to mood disorders comorbidity. 3-months and 6-months follow-ups are needed to determine significant association with DT to improve cessation outcomes.

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EPIDOP07/55 : Depression And It's Associated Factors Among Bidayuh Women In The Rural Area Of Bau, Sarawak

Punita Manoharan, and Noorzilawati Sahak
Department of Community Medicine and Public Health, Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak, Malaysia, 94300, Kota Samarahan, Sarawak, Malaysia
Corresponding author's email: Punitamanoharan@yahoo.com

Summary

Mental health is a fundamental component in everyone's life which is firmly associated with the improvement of an individual's carrier, social cohesion, and family connection. Therefore, a community-based study was conducted to determine the prevalence of depression and its associated factors among Bidayuh women in the Bau District. A cross-sectional study was conducted among 409 Bidayuh women in the Bau district using self-administered questionnaires. Center Epidemiologic Studies Depression Scale (CESD) was used as a tool to measure

depression among these women. Overall, the prevalence of depression among Bidayuh women in the Bau district is 5.4%. Based on the univariate analysis, there was a significant association among divorced women, young age group, no education or only primary education level, those who consume alcohol and those who are from other religions with depression. From the multiple linear regression, four elements were selected as the positive predictors notably age, marital status, education level, loneliness, and social support as a negative predictor for depression. This study was envisioned to be used as part of the evidence to assist Sarawak Government with the rural development plan under Malaysia's twelfth Plan from 2016-2030.

Keywords
Depression, Bidayuh Women, Bau District, Associated Factor

Introduction.
Mental health was included as a part of the United Nations Sustainable Development Goal (SDGs) in September 2015 (Votruba & Thornicroft, 2016). In the emerging global consensus on development priorities, health has been noticed as an essential component compared to other sustainable development goals (Eaton J et al., 2014). Depression is the most common mental health issue, and it is projected to be the leading cause of disease burden globally by 2030 (NHMS, 2019). Women from the rural region are the most vulnerable group to depression. The conceptual framework for this study was developed based on Socioecological Model (Kilonowski, 2017).

Materials and Method.
A cross-sectional study was conducted among 409 Bidayuh women in the Bau district using self-administered questionnaires. The duration of the study October 2020 up to July 2021. The calculated sample size is 420 based on the prevalence of depression among rural women from the previous study in Malaysia (Din & Noor, 2010) with a precision (margin of error) of 5% between sample and population parameter and 95% confidence level. A cluster random sampling was used for the sampling procedure. Those Bidayuh women who stay in the rural area of Bau district and are able to understand Malay or English language were selected as respondents to the study. Those women who have any psychiatric disorders were pregnant or in their postnatal period were excluded from this study. The overall Cronbach alpha for the set of questionnaires was 0.873. This study used descriptive analysis, independent t-test, one-way ANOVA and Pearson Correlation as Univariate analysis to test for the association between variables. The multiple linear regression was used to predict the predictors of depression and control the confounding factors. This study was approved by Unimas Ethic Committee (FME/21/16).

Result
Overall, the prevalence of depression among Bidayuh women in the Bau district is 5.4%. Based on the univariate analysis, there was a significant association among divorced women, young age group, no education or only primary education level, those who consume alcohol and those who are from other religions with

depression. Besides that, the univariate analysis suggests that a high level of loneliness has a positive effect on depression. Whereas, high level of social support, better-perceived neighbourhood, strong belief towards holistic health (HH) and use of complementary alternative medicine (CAM) showed a protective or negative effect on depression. The multiple linear regression predicted four elements as the positive predictors notably age, marital status, education level, loneliness, and social support as a negative predictor for depression.

Table 1: Association in between Loneliness, TCM and Neighbourhood Characteristics.

No	Variables	1	2	3	4	5
1	**Loneliness**	1				
2	**Social Support**	-.218**	1			
3	**Holistic Belief and Complementary Medicine Use**	-.176**	.370**	1		
4	**Perceived Neighbourhood**	-.189**	.458**	.423**	1	
5	**Depression**	.390**	-.346**	-.195**	-.258**	1

p<0.05, **p<0.001

Conclusion

This study was envisioned to be used as part of the evidence to assist Sarawak Government with the rural development plan under Malaysia twelfth Plan from 2016-2030. The responsibility in managing depression among women does not lie with the individual but at every level in the organization. Policies should be a gender-informed approach that caters for the differential needs of women and men at each stage of their life.

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EPIDOP08/78 : Gamified-Real-Time Video Observed Therapy (GRVOTS) Mobile Application Impact On The Tuberculosis (TB) Medication Adherence And Motivation

Siti Aishah Abas[1], Nurhuda Ismail[1], Siti Munira Yasin[1],Yuslina Zakaria[2], Khalid Ibrahim[1], Ismasabbah Ismail[3], Asmah Razali[4], Norliza Ahmad[5],Rohaya Ramli[6], Zamzurina Abu Bakar[7]

[1] *Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA,*
[2]*Department of Pharmaceutical Sciences, Faculty of Pharmacy, Universiti Teknologi MARA,*
[3] *Centre of Foundation Studies,Universiti Teknologi MARA,*
[4] *Sector TB/Leprosy, Disease Control Division, Ministry of Health,*
[5] *TB/Leprosy Disease Unit, Negeri Sembilan State Health Department,*
[6] *TB/Leprosy Disease Unit, Kuala Lumpur and Putrajaya State Health Department,*
[7] *Institut Perubatan Respiratory*
Corresponding author's email: aishah.abas@gmail.com

Summary
GRVOTS is a mobile application that incorporates real-time gamification elements to enhance medication adherence and motivation among TB patients. By connecting patients, supervisors, and TB administrators, this app, which is grounded in theory, represents a promising innovation for improving the efficiency of TB management systems including fast defaulter tracing.

Keywords
VDOT; tuberculosis; medication adherence; mobile health app; gamification

Introduction
Finding innovative methods to enhance Tuberculosis treatment adherence in Malaysia is imperative, given the rising trend of non-adhere TB patients. Thus, a novel approach that incorporates gamification and real-time components into Video Direct Observed Therapy (VDOTS) through mobile applications was developed with the aim is to increase motivation and sustainability use of VDOTS, as well overcome the limitations with physical Direct Observed Therapy (DOTS). The objective of this study is to determine the impact of Gamified Real-time Video Observed Therapy (GRVOTS) mobile apps on patient medication adherence rates and motivation.

Materials and Methods
A two-month single-arm intervention was conducted between three users of patients, supervisors, and TB administrators via GRVOTS mobile apps. The Malaysian Medication Adherence Assessment Tool (MyMAAT), the Intrinsic Motivation Inventory (IMI) questionnaire and the number of VDOTS were collected

at baseline,1-month, and 2-month intervals. The inferential statistic was analysed to determine the motivation and adherence level.

Results and Discussion

This study involved 71 patients from 18 healthcare facilities who showed a significantly higher treatment adherence score of 90.87% with a mean difference from standard score by 10.87(95% CI: 7.29,14.46; p< 0.001). The participants' MyMAAT and IMI scores significantly increased over 3-time intervals with the IMI Interest domain showing the highest mean difference by 19.76 (95% CI: 16.37, 21.152: p<0.001) whereas MyMAAT marks showed the lowest mean difference from T0 to T2 only increase by 5.38 (95% CI: 2.67, 8.10: p<0.001). With GRVOTS, a validated gamified mobile app (1), it was found that the increment of interest subdomain of the motivation questionnaire (IMI) was the highest. The interest component had the highest impact on IMI thus if apps can boost intrinsic motivation, the interest component has the greatest increase (2).Learners using mobile apps had significantly higher motivation scores compared to those using books (3). In our study on MyMAAT, we found that the GRVOTS mobile application improved medication adherence, which aligns with previous research indicating that using a mobile app for managing medication adherence can maintain optimal adherence rates over time (4). As for the trend of a constant small increment of MyMAAT score over time compared IMI , it may be due to habitual medication intake that is usually only created after 21 days or more according to individuals (5). Thus, more time might be needed to see the higher mean difference in MyMAAT results compared to our 2-months intervention study.

Table 1: IMI (Interest) marks changes after the intervention of GRVOTS across the 3-time interval

	Means (SD)	**F-stat (df)**	**p-value**	**Partial eta square**
T0	21.48(5.34)	194.26 (1,70)	<0.001	0.666
T1	27.48(8.63)			
T2	40.14(6.72)			

Repeated measure ANOVA (time-effect)
(Ho: There is no change of IMI (Interest) in 3 repeated measurements)

Table 2: Post hoc comparison of IMI (Interest) marks for each pair of time level

	Mean diff	**(95% CI)**	**p-value**
T0 and T1	5.75	2.635, 8.86	<0.001
T1 and T2	13.01	10.09, 15.94	<0.001
T0 and T2	19.76	16.37, 21.15	<0.001

Adjustment for multiple comparisons using the Bonferroni procedure.

Table 3: Post hoc comparison of MyMAAT marks for each pair of time level

	Mean diff	**(95% CI)**	**p-value**
T0 and T1	1.03	1.14, 3.20,	0.746
T1 and T2	4.35	1.78, 6.93	<0.001
T0 and T2	5.38	2.67, 8.10	<0.001

Adjustment for multiple comparisons using the Bonferroni procedure.

Conclusion

By utilizing GRVOTS, a mobile application based on gamification and real-time features, we can enhance motivation and medication adherence among TB patients, while also addressing the limitations of physical DOTS.

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EPIDOP09/46 : Gender Differences Associated With Other Co-Morbidities Among Low-Income (B40) Individual With Hypertension In Malaysia: The RESPOND Study

Nafiza Mat-Nasir[1], Mohamad Rodi Isa[2], Mazapuspavina Md-Yasin[1], Farnaza Ariffin[1], Fadhlina Ab-Majid[3], Benjamin Palafox[4], Martin McKee[4],

[1] Department of Primary Care Medicine, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, 47000, Selangor, Malaysia

[2] Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, 47000, Selangor, Malaysia

[3] Centre for Translation Research and Epidemiology (CenTRE), Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, 47000, Selangor, Malaysia

[4] Department of Health Service Research & Policy, London School of Hygiene & Tropical Medicine, 15 – 17 Tavistock Place, London WC1H 9SH, United Kingdom

Corresponding author's email: rodi@uitm.edu.my

Summary
Hypertension rarely presents in isolation and it is associated with CVD co-morbidities. Using a multistage sampling approach, rural and urban communities in each stratum were selected according to probability proportional to describe the co-morbidity differences between gender among low-income individuals (B40) with hypertension. There were 611 respondents involved in this study. Men have more percentage of newly diagnosed hypertension (p=0.033). In the disease burden, men have higher odds of having a stroke (p=0.025) but women have higher odds of having a heart attack (p<0.001). Men are encouraged to do health screening to prevent any complications due to hypertension and other co-morbidity.

Keywords
Gender differences, hypertension, co-morbidities low-income, Malaysia

Introduction
Non-communicable disease results in high healthcare costs, lost productivity, and catastrophic expenses. A Malaysia Global Burden of Injury Study 2009 – 2014 found cardiovascular and circulatory disease contributed to more than a quarter of fatal disease and injury burden (26.9%) (1). Hypertension rarely presents in isolation and it is usually associated with CVD co-morbidities such as chronic kidney disease, diabetes mellitus, metabolic syndrome and dyslipidaemia (2). Women and men have different levels of exposure and vulnerability to NCD risk factor (3). Women also experience less apparent symptoms of cardiovascular disease than do men and, consequently, are less likely to be diagnosed and treated (3). This study aims to compare the demographic of this population between gender and they are associated with other selected co-morbidities among hypertensive low-income individuals (B40) in Malaysia

Materials and Methods
Data were collected within the 'Responsive and Equitable Health Systems – Partnership on Non-communicable Diseases' (RESPOND) Project. RESPOND has been designed to gain in-depth knowledge of the lived experience of those with hypertension living in low-income communities using a mix of quantitative and qualitative methods. At the time when the study was conducted, the B40 category is defined as a household income of less than RM3,855 (€832; US$932) (level set in 2014). Following a multistage sampling approach, rural and urban communities in each stratum were selected according to probability proportional to describe the regular medical care for hypertension among low-income individuals (B40) with hypertension in Malaysia. Households were randomly selected. Eligible individuals were those aged between 35 and 70 years old, self-reported or identified as hypertensive at screening.

Results and Discussion
There were 611 participants where 162 (26.5%) males and 449 (73.5%) females involved in this study. 518 (84.7%) of the respondents were known hypertensive and 93 (15.3%) were newly diagnosed with hypertension. The distribution of the participants is shown in Table 1.

Table 1: The distribution of the sociodemographic of B40 hypertensive participants stratified by the gender (N=611)

Variables	Men (N=162), n(%)	Women (N=449), n(%)	Total (N=611), n(%)	p-value
Age group				
Less than 50	21 (13.0%)	61 (13.6%)	82 (13.4%)	0.798
50 – 59 years old	52 (32.1%)	155 (34.5%)	207 (33.9%)	
60 and above	89 (54.9%)	233 (51.9%)	322 (52.7%)	
Ethnicity				
Malay	159 (98.1%)	436 (97.1%)	595 (97.4%)	0.476
Non-Malay	3 (1.9%)	13 (2.9%)	16 (2.6%)	
Location				
Urban	75 (46.3%)	233 (51.9%)	308 (50.4%)	0.222
Rural	87 (53.7%)	216 (48.1%)	303 (49.6%)	
Cases				
Hypertensive	129 (79.6%)	389 (86.6%)	518 (84.8%)	0.033*
Newly-diagnosed HT	33 (20.4%)	60 (13.4%)	93 (15.2%)	
Duration of hypertension, (Median (IQR)	5.00 (7.27)	5.00 (7.00)	5.00 (7.00)	0.062#
Marital status				
Never married.	9 (2.0%)	2 (1.2%)	11 (1.8%)	<0.001*
Currently married	297 (66.1%)	144 (88.9%)	441 (72.2%)	
Widowed	124 (27.6%)	15 (9.3%)	139 (22.7%)	
Separated & Divorces	19 (4.2%)	1 (0.6%)	20 (3.3%)	
Other co-morbidities:				
Diabetes mellitus	58 (35.8%)	166 (37.0%)	224 (36.7%)	0.791
Stroke	16 (9.9%)	22 (4.9%)	38 (6.2%)	0.025*
Asthma	8 (4.9%)	23 (5.1%)	31 (5.1%)	0.939
Heart attack	18 (11.1%)	11 (2.4%)	29 (4.7%)	<0.001*
Cancer	1 (0.6%)	3 (0.7%)	4 (0.7%)	1.000#
Damage Valve Heart	0 (0.0%)	3 (0.7%)	3 (0.5%)	0.569#
Heart failure	1 (0.6%)	1 (0.2%)	2 (0.3%)	0.460#
COPD	1 (0.6%)	0 (0.0%)	1 (0.2%)	0.256#

Statistical test: Chi-square test; # Mann-Whitney U test
* Statistically significant at α = 0.05

Men have more percentage of newly diagnosed hypertension compared to women (p=0.033). Further studies should explore the reasons why men were reluctant to participate in health screening before any complication develops due to certain diseases. There was also statistically significance in marital status (p<0.001), educational status (p<0.001), smoking status (p<0.001), self-perceived on how much they know about hypertension (p=0.007) and a number of co-morbidities (p=0.033) between men and women. The mechanisms responsible for hypertension are needed to determine the best treatment options to reduce the risk of hypertension. There was a statistically significant in stroke and heart attack. Men have higher odds of having a stroke compared to women (p=0.025) but women have higher odds of having a heart attack compared to men (p<0.001). Therefore, it is very important on treating hypertension not only to prevent cardiovascular disease but other diseases to (4).

Table 2: The comparison between selected disease burden and gender among B40 group with hypertension

Variables	Diabetes mellitus			Stroke			Heart Attack			Asthma		
	Males (N=58), n(%)	Females (N=166), n(%)	p-value	Males (N=16), n(%)	Females (N=22), n(%)	p-value	Males (N=18), n(%)	Females (N=11), n(%)	p-value	Males (N=8), n(%)	Females (N=23), n(%)	p-value
Location												
Urban	25 (43.1%)	92 (55.4%)	0.106	6 (37.5%)	12 (54.5%)	0.299	11 (61.1%)	6 (54.5%)	0.728	5 (62.5%)	11 (47.8%)	0.474
Rural	33 (56.9%)	74 (44.6%)		10 (62.5%)	10 (45.5%)		7 (38.9%)	5 (45.5%)		3 (37.5%)	12 (52.2%)	
Age group												
Less than 50	6 (10.3%)	19 (11.4%)	0.623	1 (6.3%)	3 (13.6%)	0.626	2 (11.1%)	2 (18.2%)	0.218	1 (12.5%)	5 (21.7%)	0.594
50 – 59 years old	15 (25.9%)	53 (31.9%)		4 (25.0%)	7 (31.8%)		7 (39.9%)	1 (9.1%)		3 (37.5%)	11 (47.8%)	
60 and above	37 (63.8%)	94 (56.6%)		11 (60.0%)	12 (54.5%)		9 (50.0%)	8 (72.7%)		4 (50.0%)	7 (30.4%)	
Number of years since diagnosis												
Less than 1 year	0 (0.0%)	5 (3.0%)	0.596	0 (0.0%)	2 (9.1%)	0.096	0 (0.0%)	0 (0.0%)	0.350	1 (12.5%)	1 (4.3%)	0.629
1 – 5 years	29 (50.0%)	79 (47.6%)		8 (50.0%)	15 (68.2%)		16 (88.9%)	8 (72.7%)		3 (37.5%)	7 (30.4%)	
6 – 10 years	15 (25.9%)	45 (27.1%)		5 (31.3%)	5 (22.7%)		2 (11.1%)	2 (18.2%)		0 (0.0%)	0 (0.0%)	
More than 10 years	14 (24.1%)	37 (22.3%)		3 (18.8%)	0 (0.0%)		0 (0.0%)	1 (9.1%)		4 (50.0%)	15 (65.2%)	
Regular treatment				(n=15)								
Yes	55 (94.8%)	155 (93.4%)	0.694	13 (86.7%)	17 (77.3%)	0.474	16 (88.9%)	11 (100.0%)	0.252	5 (62.5)	18 (78.3%)	0.380
No	3 (5.2%)	11 (6.6%)		2 (13.3%)	5 (22.7%)		2 (11.1%)	0 (0.0%)		3 (37.5%)	5 (21.7%)	
Regular visit to health professional				(n=15)								
Yes	54 (93.1%)	155 (93.4%)	0.944	12 (80.0%)	18 (81.8%)	0.890	16 (88.9%)	11 (100.0%)	0.252	4 (50.0%)	17 (73.9%)	0.213
No	4 (6.9%)	11 (6.6%)		3 (20.0%)	4 (18.2%)		2 (11.1%)	0 (0.0%)		4 (50.0%)	6 (26.1%)	

Statistical test: Chi-square test; # Fisher exact's test
* Statistically significant at α = 0.05

The comparison of the selected disease burden is shown in Table 2. It shows that rural men had a higher percentage of diabetes mellitus and stroke but lower in heart attack and stroke compared to urban men. The percentages of age groups were increased by age in diabetes mellitus, stroke, heart attack and asthma among men respondents. Strengthening the screening for hypertension and frequent health promotion in primary healthcare settings among the high-risk group need to be conducted to enhance awareness and commitment to better living (5).

Conclusion

Although there were not many significant differences in the burden distribution of the selected co-morbidity, treating them continuously is needed without gender discrimination. However, men are encouraged to do health screening to prevent any complications due to hypertension and other co-morbidity.

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EPIDOP10/116 : Empowering Diabetes Care: Assessing The Effectiveness Of My Diabetes Apps© In Enhancing Knowledge, Compliance, And Disease Control Among Uncontrolled Type 2 Mellitus Diabetes Patients In Kedah, Malaysia

Mohd Nazrin Jamhari[1,2], Mohd Rohaizat Hassan[2], Mohd 'Ammar Ihsan Ahmad Zamzuri[1,4], Norfazilah Ahmad[2], Khaironi Yatim Sharif[3], Muhammad Sufri Muhammad[3], Mohd Hafeez Osman[3], Shareh Azizan Shareh Ali[1], Suziana Redzuan[1], Norizan Ahmad[1]

1. *Kedah State Health Department, Ministry of Health Malaysia*
2. *Department of Community Health, Faculty of Medicine, UKM*
3. *Department of Software Engineering and Information Systems, UPM*
4. *Negeri Sembilan State Health Department, Ministry of Health Malaysia*

Corresponding author's email: drmohdnazrin@gmail.com

Summary

The prevalence of uncontrolled Type 2 Diabetes Mellitus in Malaysia continues to increase every year, mostly due to lack of knowledge and adherence to the treatment. The advancement of information technology has made people prefer to obtain information through interactive media as compared to conventional methods. Thus, the use of mobile applications may be the game changer in managing diabetes patients, and ultimately reducing the percentage of uncontrolled diabetes cases in Malaysia.

Keywords

mHealth, digital diabetes apps, HbA1C

Introduction

Type 2 diabetes is a global concern, with 3.9 million adults in Malaysia affected (1). Uncontrolled diabetes leads to increased morbidity and mortality, emphasizing the importance of knowledge and treatment adherence. Patient literacy and disease knowledge influence behaviour and treatment compliance (2). Factors like age, ethnicity, and socioeconomic status contribute to uncontrolled diabetes. Mobile health (mHealth) technology, specifically smartphone apps, has potential for improving self-management and access to health information (3). However, previous studies have shown limited applicability to Malaysia's diverse population. This study aims to develop a locally tailored diabetes app, My Diabetes Apps©, and

assess its effectiveness in enhancing knowledge, compliance, and glycaemic control among diabetes patients in Kedah, Malaysia.

Materials and Methods

This randomized control trial study conducted in two districts of Kedah, Malaysia aimed to develop a diabetes mobile application and evaluate its effectiveness. The study had three phases: (1) development of the app, (2) usability testing, and (3) interventional studies. The first phase involved discussions among expert panels to determine the app's content. The second phase included pilot testing of the app prototype, and the third phase involved an interventional study among uncontrolled type 2 diabetes patients. Data collection involved registered patients from selected districts, and various instruments were used, including the app, questionnaires, and HbA1C tests. The study aimed to improve knowledge, compliance, and glycaemic. control. Statistical analysis involved descriptive statistics, independent t-tests, Chi-square tests, and analysis of covariates.

Results and Discussion

In the app's development phase, 11 expert panels utilized the NGT to generate 21 apps content. After voting, 13 priorities were identified, including diabetes, nutrition, drug information, and appointment reminders. In the usability study, 30 participants used the My Diabetes Apps© prototype for four weeks. The majority found it easy to use and expressed regular use. The intervention study involved 82 participants, with 40 in the intervention group and 42 in the control group. Demographics showed no significant differences. Paired t-tests and ANCOVA analysed knowledge, compliance, and diabetes control. The intervention group demonstrated significant increases in knowledge and compliance, with a more pronounced reduction in HbA1C levels. The study discussed the positive impact on patient knowledge, compliance, and diabetes control. Smartphone ownership contributed to health information dissemination. The reminder function modified patient beliefs and highlighted the condition's seriousness. However, optimal HbA1C levels were not achieved for most participants. The study's strengths included being the first in Malaysia to evaluate a diabetes app's usability and effectiveness, showcasing the potential of mobile apps for health promotion. Limitations included financial constraints, lack of iOS availability, limited database capacity, and absence of patient-doctor interaction and language options.

Table 1: Comparison of Mean Knowledge Scores Between Group (n=82)

Group	Adjusted Mean 95% CI	Diff Adjusted Mean 95% CI	F (df)	P value
Intervention	10.90(10.31, 11.50)	2.69(1.87, 3.52)	42.27 (1,79)	<0.001
Control	8.21(7.64, 8.79)			

CI= Confident Interval, df= Degree of freedom

Table 2: Comparison of Mean Compliance Scores Between Group (n=82)

Group	Adjusted Mean 95% CI	Diff Adjusted Mean 95% CI	F (df)	P value
Control	53.24 (51.20, 55.29)	1.85 (-1.08, 4.78)	1.58 (1,79)	0.212
Intervention	55.09 (53.00, 57.19)			

CI= Confident Interval, df= Degree of freedom

Table 3: Comparison of Mean HbA1C Between Group (n=82)

Group	Adjusted Mean 95% CI	Diff Adjusted Mean 95% CI	F (df)	P value
Control	8.902 (8.536, 9.267)	0.646 (0.123, 1.170)	6.034 (1,79)	0.016
Intervention	8.256 (7.881, 8.630)			

CI= Confident Interval, df= Degree of freedom

Conclusion

My Diabetes Apps© mobile application showed positive effects on increasing patient knowledge, compliance, and diabetes control. The study highlighted the potential of mobile applications in empowering patients to manage their disease independently. However, further improvements and considerations are necessary to optimize the application's effectiveness and reach a broader user base.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

EPIDOP11/108 : Motivation To Quit Vape Among Adult Exclusive Vape Users In Malaysia

Nizam Baharom [1], Rawaida Mat Salleh [2], Ching Sin Siau [2], Caryn Mei Hsien Chan [2], Lei Hum Wee [2,3],
[1] *Public Health Unit, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*
[2] *Centre for Community Health Studies (ReaCH), Faculty of Health Sciences, Universiti Kebangsaan Malaysia*
[3] *Faculty of Health and Medical Sciences, Taylors University Lakeside Campus, Malaysia*
Corresponding author's email: drnizamb@usim.edu.my

Summary
Some vape users use vape exclusively as their nicotine delivery system and no longer smoke cigarettes. This study aimed to describe the level of, and to determine factors associated with motivation to quit vape use among self-declared, adult exclusive vape users in Malaysia. Through an online survey, 269 vape users participated from all over Malaysia. More the half of adult exclusive vape users in Malaysia had moderate level of motivation to quit vaping. Several factors such as nicotine dependence level and health perceptions on vape are associated with motivation for cessation.

Keywords
e-cigarette, vape, nicotine, motivation to quit vape, Malaysia

Introduction
The prevalence of e-cigarettes or vape use in Malaysia has increased substantially in the past decade (1). Previously, a survey showed that prevalence of dual use among vape users was 74% (2). However, more users were claiming exclusive vape use without smoking any cigarettes. This study aimed to describe the level of, and to determine factors associated with motivation to quit vape use among self-declared, adult exclusive vape users in Malaysia.

Materials and Methods
An online cross-sectional study was conducted among vape users through a well-known vape online entity in Malaysia, in 2022. The inclusion criteria were Malaysian adults who professed to have used vape exclusively for at least six months. The online questionnaire included sections for demographic data, vape use profile, Fagerström Test for Nicotine Dependence adapted for vape use, Glover Nilsson Vaping Behavioural Questionnaire, single item perception of vape use statements and Motivation to Stop Scale (MTSS) for vape users. Data collected were analysed using the IBM SPSS version 28.0. Descriptive, univariate and general linear regression analyses were employed.

Results and Discussion
A total of 269 participants responded to the online survey. The mean (SD) age was 33.6 (6.0) years. Majority were males (n=265, 98.5%), Malays (n=242, 90.0%), married (n=206, 76.6%) and with diploma education attainment (n=109, 40.5%). More than half of self-declared adult exclusive vape users had strong desire to quit

vape use but low intention to act on it yet (n=140, 52.0%) (Table 1). Many vape users in Malaysia used it to cut down or quit cigarette smoking (3) but very few (3.3%) had managed to quit vaping (4). In this study, factors associated with higher motivation to quit vape were older age when starting vaping, lower educational level, lower nicotine dependence, perceived vape is not healthier than cigarettes and concerned that vape will affect health (Table 2). Higher nicotine dependence and subsequent withdrawals are potential barriers towards quitting vape use. Negative health perceptions towards vape were stronger predictors for motivation to quit vape, which is similar to a nationwide Malaysian study on former vape users in 2016 (5). Therefore, there is an opportunity for health sectors to disseminate evidence on harmful health effects of vaping.

Table 1 Motivation to quit vape use based on Motivation to Stop Scale (MTSS) among self-declared adult exclusive vape users in Malaysia, n=269.

Motivation to quit vape use scale	n	%
Don't want to stop	31	11.5
Think should stop but don't really want to	32	11.9
Want to stop but haven't thought about when	140	52.0
REALLY want to stop but don't know when	22	8.2
Want to stop smoking and hope soon	26	9.7
REALLY want to stop and intend to in the next 3 months	12	4.5
REALLY want to stop and intend to in the next month	6	2.2

Table 2 Factors associated with motivation to quit vaping among self-declared adult exclusive vape users in Malaysia, n=269.

Variables	**SLR[a]**			**GLR[b]**			
	***b*[c]**	**(95%CI)**	***p*-value**	**Adj. *b*[d]**	**(95%CI)**	***t*-stat**	***p*-value**
Age when started vaping	0.03	0.02, 0.06	0.036	0.04	0.01, 0.06	2.777	0.006
Educational level	-0.18	-0.35,-0.01	0.045	-0.21	-0.37,-0.04	-2.497	0.013
Income above RM3,000	-0.31	-063, 0.01	0.056	-	-	-	-
eFagerstrom Test for Nicotine Dependence	-0.10	-0.18,-0.01	0.022	-0.11	-0.19,-0.03	-2.738	0.007
Modified GN-VBQ score[e]	-0.02	-0.04,-0.01	0.026	-	-	-	-
Perceived vape is not healthier than cigarettes	1.75	0.76, 2.74	0.001	1.62	0.67, 2.58	3.355	0.001
Concerned that vape will affect health	0.50	0.15, 0.85	0.005	0.63	0.29, 0.97	3.507	0.001

[a] Simple linear regression

[b] General linear regression (R^2=0.15; The model fits reasonably well; Model assumptions were met)

[c] Crude regression coefficient

[d] Adjusted regression coefficient

[e] Modified Glover Nilsson Vaping Behavioural Questionnaire

Conclusion

The majority of adult exclusive vape users in Malaysia had a moderate level of motivation to quit vaping. Several factors such as nicotine dependence and health perceptions are associated with motivation for cessation. Health sectors could utilise this opportunity to drive vape users' motivation and action towards total nicotine abstinence.

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EPIDOP12/45 : Loss To Follow-Up During Tuberculosis (TB) Treatment Among Adult TB Patients Who Smoke: A Prospective Cohort Study.

Zatil Zahidah Sharani[1], Nurhuda Ismail[1,4], Siti Munira Yasin[1,4], Muhamad Rodi Isa[1]

[1] Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM) Sungai Buloh Campus, Selangor, Malaysia

[4] Hospital Al-Sultan Abdullah, Universiti Teknologi MARA, Bandar Puncak Alam, Selangor, Malaysia

Corresponding author E-mail: zatilzs@gmail.com

Summary

Loss to follow-up (LTFU) and smoking during TB treatment are major challenges for TB control programs. This study aims to determine the proportion and predictors of LTFU outcome among TB patients who smokes. Multiple logistic regression

analysis was performed to identify the significant predictors of TB LTFU outcome. Three important predictors for LTFU among TB smokers in this study were unemployment, retreatment case, and heavy smoker (smokes > 31 cigarettes per day). Integrated intervention for the TB-Tobacco burden should be focused on reducing the proportion of the preventable LTFU outcome and the nicotine addiction issues based on the identified predictors from this study.

Keywords
Tuberculosis, TB, loss to follow-up (LTFU), tobacco, smoking

Introduction
Tobacco smoking and tuberculosis (TB) infections are two health burdens that collide heavily and TB patients who smoke has been linked to poorer TB outcome (1). TB loss to follow-up (LTFU) is a preventable unfavourable outcome that must be intervened especially among the high-risk TB populations such as TB smokers to improve the successful TB outcome. This study aims to determine the proportion and predictors of the LTFU outcome among TB patients who smoke.

Material and Methods
This was a prospective cohort study that was conducted among all confirmed TB cases who were current smokers in selected healthcare facilities in Selangor state. Respondents aged >18 years old whose TB treatment was initiated from the 1st of January 2022 until the 30th of April 2022 were recruited. Respondents were followed up for six months duration from the start of their TB treatment and those who had interrupted treatment more than two months or longer during the TB treatment were recorded as LTFU. Those who died or were transferred out were dropped from the study. Descriptive analysis and logistic regression analysis were used to identify independent predictors for the LTFU outcome using SPSS version 26.0. The outcome is coded as 1 (loss to follow-up) and 0 (successful TB outcome) and the independent variables were sociodemographic factors (age, sex, nationality, locality, ethnicity, education level, personal income, working status, and marital status), disease profile (TB anatomical location, TB case category, TB case detection methods, BCG scar, chest x-ray status, and sputum status), high-risk behaviour (alcohol use and drug use), comorbidity (HIV status and DM status) and number of cigarettes per day.

Results and Discussion
A total of 456 adult smoking TB patients were recruited into the study, 54 cases dropped out from the study (died=43 and transferred out=11), and 402 cases were included for analysis. Majority of TB patients who smokes are among the working age population (age<50), male, Malaysian citizens, and live in an urban area. There are high proportions of LTFU rates among TB patients who smoke (14.3%), with only 73.9% of successful treatment outcomes (Table 1). More than one-fifth of the current smoker in this study have high nicotine dependence levels (17.9%).
Variables that are strongly associated with the LTFU outcome after controlling for other co-founders were TB patients who are not working (AOR 2.448; 95% CI 1.381-4.339), retreatment-case (AOR 2.602; 95% CI 1.384-4.891), and a heavy smoker (smokes > 30 cigarette per-day) (AOR 3.970; 95% CI 1.879-8.704) (Table 1).

The logistic regression model accurately classifies 70.8% of the LTFU outcome with AUC=0.708 (95% CI 0.636-0.779) (Figure 1). The high proportion of LTFU outcome among the respondents are worrying as TB patients who did not complete their TB treatment are at greater risk of multidrug resistance, failed TB treatment, relapse, and increased mortality (2). Study has shown that low socioeconomic status such as joblessness or unemployment at the time of diagnosis was one of the independent risk factors that contribute to the incidence of LTFU (3).

While Individuals with a previous history of TB treatment has also been shown to have poorer treatment outcome rate, with three times higher risk for LTFU compared to new cases (4). Other than that, a study has shown that a high level of tobacco consumption correlates with the level of nicotine addictions and increased the risk of LTFU (5). Based on the above evidence, intervention for TB and tobacco control should be strategized based on the predictors identified from this study.

This study observation is limited to only six months duration of the compulsory TB treatment recommended by the national guidelines, therefore LTFU occurring after the six months of followed-up phase cannot be ruled out.

Table 1: Overall TB treatment outcomes (n=456)

TB outcome	n	Percentage (%)
Loss to follow-up	65	14.25
Died	43	9.44
Outcome not evaluated	11	2.42
Cured	90	19.73
Completed treatment	247	54.16

Table 2: Predictors of the LTFU outcome (LTFU vs successful TB outcome) among adult TB patients who smoke during TB treatment.

Variable		Crude OR	95% CI	p-value	AOR	95% CI	p-value*
Working status	Not Working	Ref			2.448	1.381-4.339	0.002*
	Working	2.527	1.473-4.333	0.001*	Ref		
TB case categories	New case	Ref			Ref		
	Retreatment case	3.157	1.734-5.747	<0.001*	2.602	1.384-4.891	0.003*
Number of cigarettes per day	<10 sticks	Ref			Ref		
	11-20 sticks	1.552	0.749-3.215	0.237	1.572	0.806-3.660	0.161
	21-30 sticks	1.561	0.721-3.377	0.258	1.557	0.724-3.552	0.244
	>31sticks	3.646	1.760-7.554	<0.001*	3.970	1.879-8.704	<0.001*

*Test used: Multiple Logistic Regression Analysis (Backward LR method), with significant value at p<0.05
B Constant= -2.643, AUC=0.708 (95% CI 0.636-0.779), std error=0.036, Nagelkerke R^2=0.147, Hosmer and Lemeshow goodness of fit test x2=4.261, df=6 and p=0.641
Note: Crude OR=Crude odds ratio, AOR=Adjusted odds ratio, CI= Confidence interval

Logit equation:
log(P/1-P) = -2.643 + 0.895 (not Working) + 0.956 (retreatment case) + 0.542 (11-20 sticks cigarettes) + 0.472 (21-30 sticks cigarettes) + 1.397 (>31sticks cigarettes)

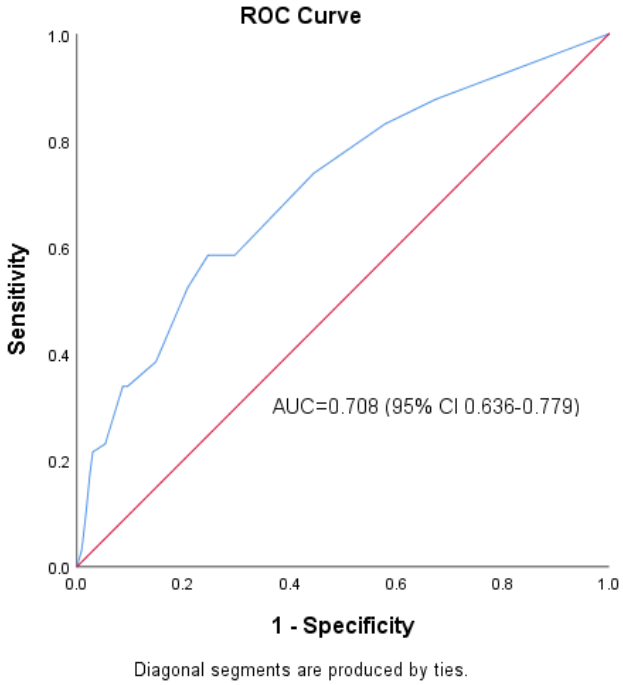

Figure 1: Receiver operating characteristics (ROC) curve of the TB LTFU logistic regression model

Conclusion

Joint intervention for TB and tobacco issues is required to reduce the LTFU outcome and to achieve the 90% successful TB outcome rate as recommended by the WHO. Emphasized should be stressed on the three important predictors for the LTFU outcome which include the individual working status, TB retreatment status, and the intensity of tobacco smoking.

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EPIDOP13/94 : Diarrhoea And Its Associated Risk Factors In A Jahai Community

Swe Swe Latt[1], Abdul Rashid[1]
[1]*Department of Public Health Medicine, School of Medicine, RCSI & UCD Malaysia Campus*
Corresponding author's email: swe.sl@rcsiucd.edu.my

Summary
This study aims to assess the prevalence of diarrhoea and the risk factors associated with it. The prevalence of diarrhoea was 14%. The findings highlighted the potential impacts of animal-human cohabitation on diarrhoea. Among the 97 respondents, some associations were found between certain behavior and diarrhoea, notably, inadequate hygiene practices, limited access to healthcare facilities, and environmental factors like water quality were identified as risk factors for diarrhoea in this community. Promoting proper hygiene practices, improving healthcare access, and addressing environmental factors are crucial for enhancing the health and well-being of the Jahai community.

Keywords
Orang Asli, Hygiene practices, animal-human cohabitation, health implications

Introduction
The Jahai are a subethnic group of Negrito, an indigenous people who commonly reside in Perak and Kelantan in Malaysia and parts of Thailand[1]. This study aims to determine the prevalence of diarrhoea and its associated factors of a Jahai community residing in the settlement located in Sungai Tiang, Royal Belum, Perak. An assessment of the relationship between living in close proximity and interaction with animals, hygiene practices, and environmental factors is done. Determining the contributing factors to diarrhoeal disease can lead to the development of effective strategies for promoting future health and well-being. Early intervention and prevention can play a crucial role in combating diarrhoea.

Materials and Methods
In 2021, a cross-sectional study was undertaken utilizing a survey questionnaire. The overall population is estimated to be around 350 people. The sample size was calculated using the projected population and a 10% diarrhoea proportion, and the predicted sample size was approximately 100. A convenience sampling method was used. Categorical data were presented using frequency and percentages, while normal distributed numerical data were summarized using mean and standard deviation to provide measures of central tendency and variability. The Chi-square test is used for analyzing associations between categorical variables, while Fisher's exact test when the sample size was small or when the expected cell counts were

below a certain threshold. A significance level of $p < 0.05$ was set to determine statistical significance.

Results and Discussion

The study involved 97 participants (aged 7-60), most were females (66%) and married individuals (60%), with education levels ranging from illiterate to primary education (62%). Fathers were predominantly engaged in village-related work (87%), while most mothers were housewives (80%). The median household income was RM 150, ranging from RM 20 to RM 1500. There were higher rates of animal ownership, with dogs (19%), cats (35%), and chicken/ducks (32%) being the most common. Feeding habits, sharing food and drink, and cleaning animal faeces varied among the community members. Approximately half of the participants did not wash their hands after handling pets, and over 40% did not use sanitary toilets. Access to health facilities was a barrier for 45.4% of the participants. The prevalence of diarrhoea was 14% within the month of the study. There was a high proportion of respondents who fed cats, did not wash their hands with soap after handling dogs, cats, and chick/ducks, and did not use the bathroom to defecate. These behaviours are connected with diarrhoea, although the relationship is not statistically significant. Moreover, using river water/wells as the primary source of drinking water (64.3%) was significantly associated with the occurrence of diarrhoea.

Table 1. Hygienic behaviors

Variable	Sub-variables	Frequency	Percentage
wash hands with soap after touching dog	No	52	53.6
wash hands with soap after touching cat	No	46	47.4
wash hands with soap after touching chicken/duck	No	46	47.4
Eat bush meat	Yes	17	17.5
wash hands with soap before eating	No	10	10.3
drink boiled water	No	12	12.4
wear slippers when out from house	No	14	14.4
Use common toilet	Yes	46	47.4
use toilet to defaecate	No	43	44.3
wash hands with soap after defaecate	No	11	11.3
main source of water for drinking and daily activities	pipe water	63	64.9
	river/well	31	32.0
	rain	3	3.1
waste disposal systems	open area	2	2.1
	bury/burn	95	97.9

Table 2. Association between living with animals and diarrhoea in a month

Variable	Diarrhoea No	Diarrhoea Yes	P value
Feed cats	41 (49.4%)	7(50.0%)	.967

Not wash hands with soap after touching dog	45 (54.2%)	7(50.0%)	.770
Not wash hands with soap after touching cat	39 (47.0%)	7(50.0%)	.835
Not wash hands with soap after touching chicken/duck	39 (47.0%)	7(50.0%)	.835
Not use toilet to defaecate	36 (43.4%)	7(50.0%)	.644
main source of water for drinking and daily activities (river water/well)	22 (26.5%)	9 (64.3%)	**.008***

*Chi-square Test

Conclusion

This study reflected the importance of hygienic practices in handling animals, the use of sanitary bathrooms, and the use of clean drinking water sources which were all linked to diarrhoea in this community. These findings highlight the need of promoting basic hygienic practices as well as addressing environmental variables such as water quality. Health promotion and teaching cleanliness practices and ensuring access to sanitary water and latrines, can all contribute to reducing diarrhoeal diseases.

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EPIDOP14/106 : Management Of Plasmodium Falcifarum Malaria Outbreak In B3 Logging Camp Nabawan Sabah 2022

Muhammad Abiruddin Abdul Salleh[1], *Mohamad Norhaizam Ahmad@Narawi*[1], *Ahmad Syukri Radzran*[2]

[1]*Keningau Area Health Office, 89007, Keningau, Sabah, Malaysia*

[2] *Department of Public Health Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia*

Corresponding author's email: abiruddinsalleh@gmail.com

Summary

Early action is essential in the control of human malaria outbreak control. This report aims to describe human malaria outbreak control in a locality in Nabawan, Sabah. An index case was reported by the local hospital through blood film for the malaria parasite. Outbreak control measure was conducted as soon as possible. Through active and intensive case finding, we identified a total of 10 individuals with positive malaria tests including the index case.

Keywords: human malaria, outbreak, Nabawan.

Introduction

Malaysia aims to eliminate indigenous human malaria by 2020. However, there are several challenges in achieving this goal, especially in Sabah, Malaysia. On 1st July 2022, two cases of *Plasmodium falciparum* from the same locality were notified to Nabawan District Health Office and an outbreak was declared. The outbreak area

was a newly opened lodging camp for logging activities. The camp started operating in May 2022 and was located near Malaysia-Indonesia border. It took about 3 hours travel on mostly gravel roads to the nearest health facility in Nabawan district from the camp. There were no malaria cases reported in the locality for the past 5 years. The objective of this report is to describe the investigation and control measures taken during the outbreak as well as to discuss the challenges faced in implementing the measures.

Methods

The malaria outbreak was investigated, and control activities were conducted in accordance with Malaysia's guideline "Pelan Pengurusan Wabak Malaria 2016". Active case detection (ACD) was conducted in the outbreak locality and case investigation was done using Malaria Investigation Form (PEM:EPID 9) to establish epidemiological links between cases as well as identify the possible source of infection. Mass blood screening for BFMP was conducted by trained health workers for all the workers living in the lodging camp (n=76). All the blood samples were then sent to Public Health Laboratory Kota Kinabalu for confirmatory test with PCR. The control measure implemented was the distribution of ITN to all the workers. This measure was complemented with IRS, fogging and larviciding. The entomological study was done by entomologist from Sabah State Health Department.

Results and Discussion

A total of 10 (11.84%) out of 76 blood samples taken were found to have *Plasmodium falciparum* parasites. All these cases were male (100%), worked in the same logging camp and aged between 32 to 52 years old. All the cases were non-Malaysian, and majority came from Indonesia (70%) and the rest were from Philippines (30%). They were all symptomatic with fever (100%) and were hospitalised and discharged from the nearest hospital with zero mortality. Upon extensive investigation, it was found that the index case was a logger in the camp and was symptomatic before he came to Nabawan, Sabah from Jayapura, Papua Indonesia on May 2022. There was no other significant travelling history after his arrival to the state. Our investigation concluded that the case was an "import A" from a Malaria endemic country. The other nine cases were categorised as "introduce cases" with symptom onset between June to August 2022. ITNs were distributed to all 76 workers in the camp. Two cycles of IRS were conducted on 4th July and 12th to 13th August 2022 respectively. Fogging was also done for two cycles for 3 continuous days starting on 8th July and 17th August 2022 respectively. The first cycle of IRS and fogging covered 26 occupied premises and the second cycle was done on 66 premises to cover the additional newly erected 40 premises. There were 10 breeding sites for Anopheles mosquitoes found on ponds and streams near the camp and larviciding was done on these sites. Adult *Anopheles balabacensis* mosquitoes were found on the lodging premises. However, no malaria parasite was seen during the dissection of the mosquitoes. The last human malaria case in the locality was reported on 30th August 2022 and the outbreak ended on 22th October 2022. Several challenges arise during the outbreak making investigation and control difficult. These include the difficult access by road to the campsite, the district health team had to enter the camp multiple times for mopping-up because some of the workers were not present in the camp when the health team arrived, there was

no telephone and internet line on the campsite to follow-up cases and some of the workers were reluctant to cooperate and receive treatment because they were worried about their illegal immigrant status. Furthermore, LLIN was not in stock during the outbreak prompting us to advise the lodging management to provide their workers with bed nets that the district health office helps treat with insecticide.

Conclusions

This report highlighted the challenges faced in malaria control efforts in Malaysia, especially in Sabah state. In Sabah, deforestation and illegal entry of foreign workers who had not undergone health screening are still commonplace. This issue increases the risk of imported human malaria cases into the state from endemic countries. Health education, routine malaria control activities and engagement with the community leaders as well as logging companies in the area are crucial in the prevention efforts for malaria transmission.

EPIDOP14/106 : Management Of Plasmodium Falcifarum Malaria Outbreak In B3 Logging Camp Nabawan Sabah 2022

Muhammad Abiruddin Abdul Salleh[1], Mohamad Norhaizam Ahmad@Narawi[1], Ahmad Syukri Radzran[2]
[1]Keningau Area Health Office, 89007, Keningau, Sabah, Malaysia
[2] Department of Public Health Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia
Corresponding author's email: abiruddinsalleh@gmail.com

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EPIDOP15 / 112 : Complications Of Type 2 Diabetes Mellitus (T2DM) Among Patients In Selangor: Survival Analysis From The Malaysia National Diabetes Registry

Rimah Melati Ab Ghani[1], Nor Asiah Muhamad[1], Izzah Athirah Rosli[1], Nur Hasnah Maamor[1], Fatin Norhasny Leman[1]
[1]Sector for Evidence Based Healthcare, National Institutes of Health, Ministry of Health
Corresponding author's email: rimahmelati@gmail.com

Summary
Type 2 Diabetes Mellitus (T2DM) is a chronic disease characterized by high levels of sugar in the blood. T2DM is also called adult-onset diabetes. T2DM occurs when body resists the normal effect of insulin, which cause insulin resistance. Prolongs high glucose in the blood leads to many diabetes complications. This study aimed to determine the overall survival rate of T2DM to complications and identified factors associated with increased risks of complications among T2DM patients in Selangor, Malaysia. Kaplan-Meier and Cox regression analyses were carried out to determine the survival of T2DM complications and its risk factors, respectively. People with T2DM live 6 years shorter than people without it at the age of 50. The

results obtained provide a better understanding of T2DM and its complications for a better management of the disease in the future.

Keywords: diabetes mellitus, T2DM, complication, survival time, survival rate

Introduction

The International Diabetes Federation (IDF) reported that diabetes affects 537 million people in 2021, equivalent to every 1 in 10 adults (1). In Malaysia, approximately of 1.7 million people had diabetes and were registered by the end of 2020, of which around 99% were diagnosed with T2DM (2). T2DM refers to the excess level of blood glucose due to insulin resistance. When excess glucose is prolonged in the blood, other serious health complications may develop as early as within two years (3). The emergence of complications is one of the causes of early morbidity and mortality. This study aims to determine the overall survival rate of T2DM complications and factors associated with increased risks of complications among T2DM patients in Selangor, Malaysia.

Materials and Methods

A retrospective study was conducted using secondary data on T2DM from the Malaysia National Diabetes Registry (NDR). A total of 80,973 audited T2DM patients in Selangor registered from 2007 until 2022 were screened. We included adult patients aged 18 years old and above, diagnosed with T2DM and had no manifestation of diabetes complications prior to T2DM diagnosis. The event was defined as the occurrence of T2DM complication, meanwhile, time-to-event was defined as the difference of years from the diagnosed date of T2DM and the diagnosed date of the first occurrence of complication. Kaplan-Meier analysis was carried out using Stata version 16 to estimate the 5- and 10-year survival of T2DM complications. The comparison in terms of survival distributions between sex, age groups, ethnic groups and BMI categories were analysed by using the log-rank test. Multiple Cox proportional hazard regression was conducted to determine the risk factors of T2DM complications.

Results and Discussion

A total of 63,062 patients were included. The 5- and 10-year overall survival rates of T2DM complications were 80.5% and 64.0%, respectively. The Kaplan-Meier overall survival curve of T2DM complications is presented in Figure 1. There were significant differences observed in survival rates between sex ($p < 0.001$), age groups ($p < 0.001$), ethnic groups ($p < 0.001$) and BMI categories ($p=0.001$) (Table 1). From the Cox regression analysis, the risk of developing T2DM complications was higher among those who were male compared to females (HR 1.30, 95% CI 1.27-1.34, $p < 0.001$). In addition, those who were 45 years old and above had an increased risk of developing complications compared to those below 45 years old (45-59 y/o: HR 1.23, 95% CI 1.15-1.33, $p < 0.001$; ≥60 y/o: HR 1.36, 95% CI 1.26-1.46, $p < 0.001$). Those who were categorised under overweight and obese also had a higher risk for T2DM complications compared to those with normal BMI (overweight: HR 1.05, 95% CI 1.01-1.09, $p=0.012$; obese: HR 1.11, 95% CI 1.06-1.16, $p < 0.001$). Around 7 million Malaysian adults are expected to be affected by diabetes in 2025, projecting to the prevalence of 31.3% of the 36.02 million

population (4). In addition, it is expected that people with T2DM live 6 years shorter than people without it at the age of 50 (5). However, good management of diabetes can help reduce the risk of complications and improve patients' quality of life, hence decreasing the risk of early death. Therefore, a better understanding on diabetes complications, including its survival rate is crucial to delay and prevent its occurrence, providing a better management of the disease in the future.

Conclusion

T2DM patients live 6 years shorter than people without it at the age of 50. The results obtained have uncovered the gaps in diabetes, especially T2DM and its complications.

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EPIDOP16/20: Descriptive Analysis Of Dengue Deaths In Sabah, Malaysia.

Sashi Kumar A/L Balasinggam, Abdul Marsudi Bin Manah, Marilyn Charlene Montini Maluda

Sector of Planning and Control Activities of Vector Borne-Diseases, Sabah State Health Department,

Corresponding author's email: sashikumar@moh.gov.my

Summary

Dengue Fever remains a burden in our public healthcare with a significant mortality rate. Dengue Deaths were relatively higher among local Malaysians and paediatric age group. They are significantly higher in East Coast of Sabah, predominantly in urban areas and Dengue Outbreak localities. Dengue Deaths were reported highest to have first seek treatment in government healthcare facilities

and deaths were much lower among those seeking early treatment. Among the Dengue Deaths in Sabah, the most common cause of deaths reported was Severe Dengue and were associated with dengue serology (DEN) subtype 1, 2 and 3.

Keywords
Dengue, mortality, Sabah, demographic, serology

Introduction
Dengue fever infection remains a notable public health burden in Malaysia with frequent epidemics occurring in urban areas (1). The mosquito-borne viral disease has a clinical spectrum that ranges from mild to severe forms and can have fatal outcomes. The state of Sabah located in the northern Borneo of Malaysia is also heavily burden with dengue disease. A total of 21,852 cases of dengue were reported between the period of 2018 to 2022. The same 5-year period a total of 86 dengue deaths were reported. The highest number of deaths were reported in 2018 which was 29 cases with the case fatality rate of 0.82%. In Sabah, the east coast area the biggest contributors of dengue cases and severe dengue cases do occur and corresponds to increasing mortality in children and infection with mixed serotype. This study attempts to provide an overview of Dengue Deaths in Sabah.

Materials and Methods
State-wide data from notified dengue deaths between the years of 2018-2022 were obtained and analyzed retrospectively. The data collected is based on reports received from respective district health offices with confirmed dengue deaths throughout the state and from mortality reviews conducted at state level.

Results and Discussion
Dengue Deaths in Sabah have higher occurrence among local Malaysians (81%) and are more common among the Pediatric age group (65%) but however equal in both genders at 50 % each. Majority of dengue deaths occurred in East Coast of Sabah (83%) with slight dominance in the urban areas (59%) and from dengue outbreak localities (62%). Our analysis of dengue deaths shows majority had first sought treatment at government hospitals (65%) followed by government health clinics (19%) and private health institutions (16%). In addition, only 27% in this study were found to have sought treatment early (<3 days) from the onset of illness. Among the 86 dengue deaths, most were diagnosed with Severe Dengue (95.3%) with 31.3% had multiorgan failure and 19.8% had single organ failure. Majority of deaths were associated with Den1/2/3 subtype dengue virus but no subtype Den 4 dengue virus was reported. The higher dengue deaths in children is likely due to children having immature innate and adaptive immune systems compared to adults (2). Dengue deaths in Sabah were seen to be higher in the East Coast regions which coincides with previous studies (3). In urban areas, dengue deaths were higher as a result of higher dengue seroprevalence found commonly in urban areas compared to rural areas (4). Our study indicates a better prognosis of the disease if patients were to seek early treatment however this differs from previous epidemiology review conducted in Malaysia in 2013-2014 (5). Our leading cause of death in Sabah was Severe Dengue compared to the previous epidemiology review in Malaysia whereby the leading cause of death was Dengue Shock Syndrome (DSS).

Table 1: Descriptive data of patient demographic among Dengue Deaths in Sabah for the year 2018-2022

Year	Dengue Deaths	Citizenship		Age		Gender	
		Malaysian	Non-Malaysian	<12 years (Pediatric)	≥12 years (Adult)	Male	Female
2018	29	21	8	21	8	17	12
2019	25	21	4	15	10	8	17
2020	17	15	2	10	7	10	7
2021	5	4	1	2	3	3	2
2022	10	9	1	5	5	5	5
Total	86	70	16	56	30	43	43

Table 2: Descriptive data of locality demographic data among Dengue Deaths in Sabah for the year 2018-2022

Year	Dengue Deaths	Region			Environmental Landscape		Dengue Locality Status	
		East Coast of Sabah	Interior of Sabah	West Coast of Sabah	Urban	Rural	Single Case Locality	Dengue Outbreak Locality
2018	29	23	0	6	17	12	14	15
2019	25	24	1	0	13	12	6	19
2020	17	13	1	3	10	7	7	10
2021	5	4	0	1	2	3	3	2
2022	10	7	0	3	9	1	3	7
Total	86	71	2	13	51	35	33	53

Table 3: Descriptive date of Cause of Deaths and Dengue Serology among Dengue Deaths in Sabah for the year 2018-2022

Cause of Deaths	2018	2019	2020	2021	2022	Total
Severe Dengue	27	24	17	5	9	82
Dengue Shock Syndrome (DSS)	1	0	0	0	1	2
Dengue Hemorrhagic Fever (DHF)	0	1	0	0	0	1
Atypical Dengue	1	0	0	0	0	1
Dengue Serology						
DEN 1	11	10	8	2	4	35
DEN 2	0	3	1	0	1	5

DEN 3	9	7	2	2	1	21
DEN 4	0	0	0	0	0	0
Mix	1	1	0	0	0	2

Conclusion:
Dengue mortality in Sabah occurs commonly among high-risk group which in our study shows the paediatric age group population. Our dengue mortality in Sabah were reported higher among the East Coast districts of Sabah due to the distribution of dengue cases that are predominantly higher there. Our study found that dengue deaths in Sabah were lesser among those whom seek treatment earlier (<3 days from onset) which shows early treatment results in better prognosis of the disease hence reducing mortality.

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EPIDOP17/58 : Measles Outbreak Among School Children In Klang: Manouvering Public Health Strategies

Anussa Krishnan[1] , Faridah Jafri[1] , Nur Adibah Mat Saruan[1], Rohana Saad[1] ,Faeiz Syezri Adzmin Jaafar[2], Noor Azreen Masdor[2], Chandrika Jeevanathan[3] , Shameele Thinakaran[4], Muhammad Khairul Fazerin Adnan[1], Hazekel Eustonia Anak Ri[1]
[1] Klang District Health Office, Ministry of Health Malaysia
[2] Department of Public Health Medicine Faculty of Medicine,Universiti Kebangsaan Malaysia [3] Department of Disease Control, Ministry of Health Malaysia.
[4] Department of Community Medicine and Public Health,University Malaysia Sarawak
Corresponding author's email: anussa.nagaratnam@gmail.com

Summary
Malaysia has set a goal to eliminate measles by the year 2025, yet there are still prevalent events of measles outbreaks within the community. A disease outbreak was reported at a school in Klang, prompting immediate public health control and

prevention measures to halt its widespread transmission. The study has revealed that the outbreak at the school was attributed to an unvaccinated group and inadequate parental awareness regarding measles vaccination.

Introduction:
A measles outbreak was reported in the end of March 2023 involving schoolchildren of a religious school in Klang, Selangor. Rapid assessment and response teams involving health and medical teams were activated to curb the transmission. Thus, we will describe the socio-demographic characteristic of measles cases and outline public health control and prevention activities specific to the particular outbreak.

Keyword:
Measles, Outbreak, Vaccination, School, SIA

Methods:
This was a cross-sectional study analysing a list of measles cases from the outbreak. An active search of suspected cases was conducted at the affected school and 1 km surrounding index houses using standard case definition. The situation was alerted to all the surrounding health facilities to enhance their surveillance. Data were collected through face-to-face interviews with the teachers and via phone calls using a standard measles investigation questionnaire. Vaccination records were gathered from teachers, guardians, and health facilities. Samples for serology and virus isolation were taken and sent to the gazetted lab.

Results/ discussions:
There were 27 measles cases detected in the outbreak among 126 exposed individuals which made up to 21.4% attack rate. The majority of cases were female (51.8%), aged between 0 to 10 years old (81.4%), with a history of partial or no MCV vaccination (88.8%). Low vaccination coverage among the students led to rapid measles dissemination through aerosol droplets, leading to widespread infection prevalence[1]. The age distribution exhibited considerable variation, spanning from 4 months to 37 years. Notably, only two individuals were above the age of 18, providing further empirical support for the hypothesis that children are more vulnerable to measles infection in comparison to adults[2]. Among the common symptoms identified were maculopapular rash (100%), fever (100%), cough (51.8%), coryza (25%) and conjunctivitis (3.6%). Medical practitioners reported 44.5% of cases, whereas active case detection detected 58%. The outbreak saw a hospitalization rate of 22%, among whom all of them did not receive MMR vaccination. The hospitalization rate among unvaccinated children was significant due to severe clinical symptoms, which could be mitigated through the administration of the MMR vaccine[3]. Strategies to control the outbreak were planned and executed, which include conducting a risk assessment at the premise, crisis and risk communication with the school management, active case detection, dissemination of alert messages to all health facilities in the district, mopping up, providing supplementary immunisation activity (SIA) to all students of the affected school, and arranging a catch-up immunisation schedule for those who missed their vaccinations. A comprehensive set of health promotion initiatives were devised

with the aim of emphasising the significance of vaccination to the general populace, with a particular focus on parents.

Conclusion:
The rapid transmission of measles has occurred due to unvaccinated children aged 1 to less than 7 years old. Thus, the awareness of the importance of vaccination to their parents needs to be emphasized to prevent further outbreaks. Continuous targeted risk assessment of all the schools involving vulnerable aged group need to be done to ensure vaccination coverage is optimized.

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FAMILY HEALTH & HEALTH MANAGEMENT

FHSMOP01/81: Dimension Of Antenatal Mother Perception On Virtual Primary Healthcare Usage: A Framework Analysis

Rosnah Sutan[1]
[1]Department of Public Health Medicine, Medical Faculty, Universiti Kebangsaan Malaysia
Corresponding author's email:rosnah_sutan@yahoo.com

Summary
Maternal health service delivery at primary healthcare is one of the priority programs that need to be delivered even during disasters using any form of appropriate technology. The present study aimed at exploring maternal perception and usage of virtual primary healthcare and social media to support their need for maternal healthcare during the pandemic Covid. A review of public health evidence was conducted with SCOPUS and PUBMED online database search from 2021 to 2022 with the keyword on maternal perception or maternal practice or maternal health seeking and antenatal care or pregnancy information. Content analysis of the study retrieved was performed after quality assessment screened. Thematic analysis showed 5 domains mostly reflected about needs: (1) in-person clinic visits versus teleconsultation (2) length of time (3) clarity (4) user friendliness and (5) influence from social media. Two themes were highlighted for barriers: (1) confidentiality and (2) internet coverage and the system suitable devices. For scope on priorities

of maternal health, only 3 domains were explored: (1) awareness of danger signs (2) fear of disease spread/ worsening condition (3) baby health status. The dimension of antenatal mothers reflected the importance of quality and reduced frequent in-person clinic visits by integrating the virtual clinic into the in-person clinic or home services to promote access and continuity of care. However, the usage will depend on maternal choice on availability and preferability to digital health. An adequate health promotion on digital health and well written guidelines for the healthcare providers with efficient infrastructure to support digital primary care needs to strengthen to improve acceptance and quality of care.

Keywords
Virtual health, digital health, social media, health-seeking behavior, maternal health

Introduction

The pandemic Covid-19 has triggered fast transformation to digital health. The aims of digital transformation are to reduce the potential risk contact and promote continuity of care during the disease outbreak. Maternal health service delivery at primary healthcare is one of the priority programs listed under the primary healthcare pillars. However, the approach of the delivery should be tailored and accommodated with the readiness to implement with the appropriate technology. The primary motivator to transform into maternal digital health care during pandemic Covid-19 is to ensure safe motherhood. Pregnant mothers are curious to seek health information online for the recent updates and as a guide. The pandemic Covid-19 is a new disease with high fatality and severe morbidity reported in which no clear successful management documented at the earlier phase. Therefore, most information seeking were focused on incidence of cases reported, location area involved in lockdown as preventive measures and paying attention to the COVID-19 transmission.

Health information-seeking behaviour (HSB) refers to intentional, active efforts to obtain specific information in improving continuum of care, enhancing coping with health threats, and preventing risk (1). It helps to evaluate the current situation and has been used as a process indicator for assessment of health intervention monitoring (2). Assessment of HSB determines what resources are available to manage risks and make informed decisions (2). Effectiveness of any health intervention program assessment normally is determined by improvement in HSB to achieve good health, reduce health threats and illness (3). Maternal misperception of antenatal risks leads to poor judgement which is detrimental to the woman's pregnancy outcome. It reduces the motivation to seek health information. Maternal antenatal health risks can be misperceived and could lead to both foetal and maternal morbidity and mortality, which is preventable. Maternal mortality rate (MMR) has plateaued since the 2000s for developed countries and is progressing on a reduction trend among the developing countries with various healthcare system improvement efforts (4).

Patient factor is essential in determining adverse pregnancy outcomes, but it is under explored in local studies. Advancement in digital technology creates a good

platform for empowering HSB. Effective communication is recognised as one of the most effective in antenatal care services to prevent adverse pregnancy outcomes. This study aims to identify factors related to social media and digital health (virtual primary care) usage that influence maternal HSB. The facilitators and barriers in maternal HSB based on patient views related to the virtual primary health care system and social media usage will help in health program planning in order to create a model to reduce adverse pregnancy outcomes in the digital era. Improper usage of social media information can promote misperception and failure to achieve shared goals between patient and care providers. Use of the virtual primary health care system and guided use of social media platforms will assist in problem-solving, decision making and personalised management practices.

Materials and Methods

Literature search of relevant published journal articles was performed using SCOPUS and PUBMED databases through Universiti Kebangsaan Malaysia digital library access for a period of two years from January 2021 to Dec 2022. The articles were then chosen following the Mixed Method Appraisal Tool (MMAT) which is a critical appraisal tool for mixed method studies (5). The Mesh word used were maternal perception or maternal practice or maternal health seeking and antenatal care or pregnancy information. Content analysis of the study retrieved was performed after the quality assessment was screened.

Results and Discussion

Participants responded to usage satisfaction with the information obtained online was reported in most studies. The aim is to assess the health information seeking using online search and virtual visit to primary healthcare websites for better understand a person's risks, make informed healthcare decisions, or to improve overall health and wellness. The sources of information retrieved were reported from social media, television and radio programs, scientific papers, books, online health information websites, healthcare professionals, family, and friends Facebook, Instagram, TikTok and WhatsApp's message shared. An increase in the use of the Internet for searching for information during the Covid-19 pandemic period as compared to the period before was reported. Thematic analysis showed 5 domains mostly reflected by the participant about needs: (1) in-person clinic visits versus teleconsultation (2) length of time (3) clarity (4) user friendliness and (5) influence from social media. Two themes were highlighted for barriers: (1) confidentiality and (2) internet coverage and suitable devices. For scope on priorities of maternal health, only 3 domains were explored: (1) awareness of danger signs (2) fear of disease spread/ worsening condition (3) baby health status. Figure 1 described the framework analysis related to maternal health-seeking behaviour.

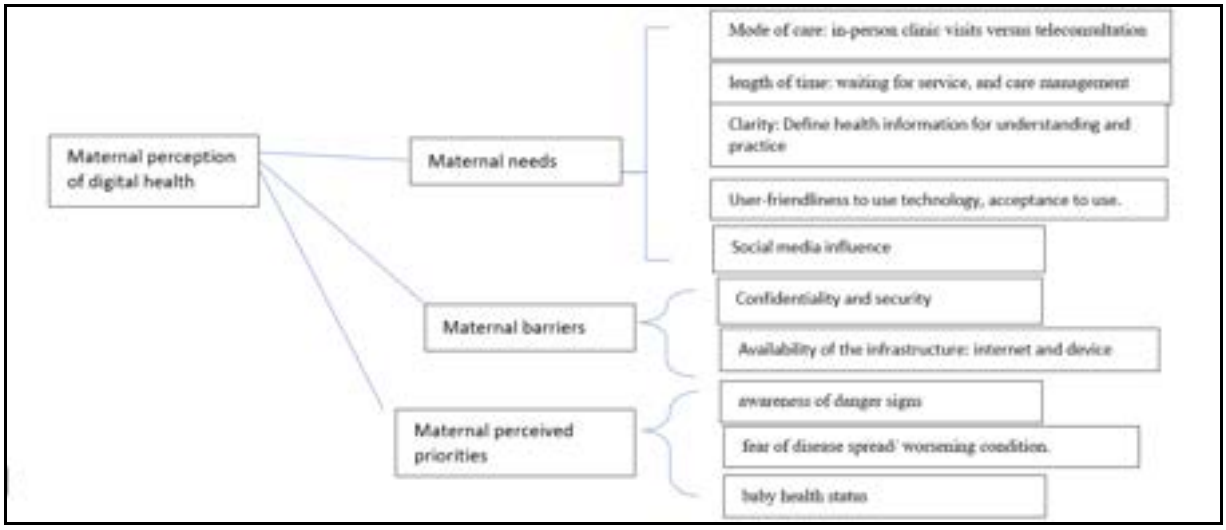

Figure 1: Dimension on maternal perception on virtual primary healthcare usage diagrammatic illustration based on evidence.

Conclusion

In conclusion, transformation of maternal healthcare services into digital health should be well promoted to the public. Having a reduction in the number of clinic visits need to be regulated through proper guidelines and training to ensure each clinic visit is supported with customized and structured quality of care. Reduction in clinic visits by integrating the virtual clinic into the in-person clinic or home services in continuity of care must be equipped with good infrastructure for digital health and adapted to client's needs, barriers and priorities.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
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FHSMOP02/18 : Teachers' Willingness To Support Preschool Children's Mental Health

Mirunaaleni Selvaraju[1], Cheah Whye Lian[1], Ang Ai Ling[1]
[1] *Department of Community Medicine, School of Medical Sciences, Universiti Malaysia Sarawak*
Corresponding author's email: mirunaaleni@gmail.com

Summary
In Malaysia, 16% of children have been reported to have mental health problems, highlighting the importance of preschool teachers having knowledge about children's mental health. Teachers can identify potential mental health issues, intervene early, provide a supportive environment for children's mental health, foster positive relationships, and collaborate with families and professionals to provide comprehensive support. A cross-sectional study was conducted among KEMAS preschool teachers in Kuching, Sarawak, to determine the factors affecting their willingness to support children's mental health needs. The study identified perception of knowledge and skills and barriers as key factors influencing teachers' willingness.

Keywords
Preschool, mental health, teachers' willingness, factors

Introduction

Malaysia has seen a rise in the prevalence of mental health problems in children, reaching 16% in 2015 (1). This highlights the importance of preschool teachers having knowledge about children's mental health, as it plays a crucial role in a child's overall development. By understanding children's mental health, preschool teachers can identify potential mental health issues in young children and intervene early to provide appropriate support. Additionally, preschool teachers' knowledge about children's mental health can help them collaborate with families and healthcare providers to provide comprehensive support for children who may require additional assistance. Therefore, this study aims to determine the willingness among preschool teachers to provide mental health support to their students and to identify factors associated with this willingness. The findings of this study can help develop effective interventions and strategies to support preschool children's mental health, which can have a positive impact on their lifelong health and success.

Materials and Methods

This cross-sectional study utilized self-administered questionnaires to investigate the willingness of KEMAS preschool teachers in Kuching District to provide mental health support to their students. The sample size for the study was calculated based on a previous study (2) where 38% of the participants strongly agreed that schools should be involved in providing mental health support to children. The study was approved by the Community Development Department (*Jabatan Kemajuan Masyarakat, KEMAS*) and the Ethics Committee of UNIMAS. A total of 250 preschool teachers participated in the study, and the instrument used was a

modified questionnaire adapted from a previous study (2). Due to COVID-19 pandemic restrictions, data collection was performed on-line. Pearson correlation and regression analysis were employed to test the association of variables, and all data were analysed using SPSS version 22.0.

Results and Discussion

The study found that the mean score for the willingness of KEMAS preschool teachers to provide mental health support to their students was 3.1 on a scale of 5, with a standard deviation of 0.61. Of the 250 respondents, 78% agreed that it is their role to screen children for mental disorders, while 66% claimed that no mental health supporting activities were conducted in their settings. Regression analysis identified three factors as predictors of the willingness to provide mental health support: the teachers' age, past experience with mental health issues, and their perception of knowledge and skills, as well as their perception of barriers faced in providing mental health support. The study findings align with previous research indicating that teachers generally recognize their responsibility to support children's mental health development (2)(3). This highlights the need for training and support for preschool teachers on children's mental health to enable early intervention (4).

Moreover, the study identified risk factors that can help prioritize elements for interventions required in the preschool mental health field. This information can guide the development of targeted and effective interventions to support preschool teachers and improve the provision of mental health support for young children. Overall, the study highlights the importance of investing in mental health education and training for preschool teachers, as well as the need for continued research to identify effective strategies for supporting children's mental health and well-being in early childhood.

Table 1 Socio-demographic and other related profiles of the respondents (N=250)

	n (%)	Mean (SD)
Age (years)		39.9 (8.98)
20 – 30	29 (11.6)	
30.01 – 40	125 (50.0)	
40.01 – 50	57 (22.8)	
50.01 – 60	39 (15.6)	
Education Level		
Secondary	48 (19.2)	
Tertiary	202 (81.8)	
Working experience (years)		15.2 (9.48)
<1	1 (0.04)	
1 – 10	119 (47.6)	

10.01 – 20	62 (24.8)
20.01 – 30	48 (19.2)
>30	20 (8.0)

Table 2: Factors associated with teachers' willingness to support mental health among preschool children (N=250)

	Willingness Mean (SD)	**R value ($R^{2)}$**	**p-value**
Age of teachers		0.01 (0.01)	0.14
Teachers Education level			
Secondary	3.07 (0.69)		0.56
Tertiary	3.12 (0.62)		
Working experience (years)		0.85 (0.73)	0.183
Perception of roles		0.63 (0.40)	0.32
Perception of knowledge and skills		0.67 (0.45)	<0.05*
Perception of barriers		0.42 (0.18)	<0.05*

p-value * <0.001

Conclusion

The study showed that teachers' willingness is dependent to their knowledge and skills and barriers pertaining to mental health issues and therefore intervention studies should be carried out to improve the outcome in future. With this in mind, the exploration of the risk factors helped prioritise the elements for the interventions required in the preschool mental health field.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

FHSMOP03/66 : Assessing The Distribution And Incidence Of Catastrophic Health Expenditure From Out-Of-Pocket Health Payments Among Households In Malaysia

Mohamed Fakhri Abu Baharin [1], Muhamad Hanafiah Juni [2], Rosliza Abdul Manaf [2]
[1] *Public Health Unit, Department of Primary Health Care, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*
[2] *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
Corresponding author's email: fakhribaharin@usim.edu.my

Summary
High out-of-pocket (OOP) health payments pose a risk of catastrophic health expenditure (CHE). This study aimed to assess the distribution and incidence of CHE from OOP health payments by utilising data from Household Expenditure Survey (HES) 2014/2015. The mean household's OOP health payments were MYR53.34 and were higher in Peninsular Malaysia, urban strata, of non-Bumiputera ethnics, and of higher income groups. The national CHE incidence was 2.22%. Among households that incurred CHE, a large proportion of payments were made for pharmaceuticals and hospital-based services. A robust health financing policy is needed to ensure financial risk protection for households at risk of CHE.

Keywords
Catastrophic health expenditure, household, out-of-pocket payments, Malaysia

Introduction
Catastrophic health expenditure (CHE) is one of the SDG indicators for financial hardship due to out-of-pocket (OOP) health spending. CHE incurs when OOP health spending exceeds a certain threshold of a household's expenditure or income (1). In Malaysia, the share of OOP payments from the national expenditure on health, rose from 30% in 2010 to 35% in 2019 (2), although there were limited studies done on CHE. The incidence of CHE From a study based on the Malaysian Household Expenditures Survey (HES) 2004/2005 was 1.44% at a 10% threshold (3). A more recent study shows an increase in CHE incidence to 2.8% (4). This study aimed to assess the distribution of OOP health payments and its CHE incidence by utilising data from Household Expenditure Survey (HES) 2014/2015.

Materials and Methods
This study utilised data from a nationally representative survey, Household Expenditure Survey (HES) 2014/2015 conducted by the Department of Statistics Malaysia (DOSM). The OOP payments for healthcare services or items in the HES were grouped into 4 groups of interest, in terms of broad functional use of healthcare services or items, which is pharmaceuticals, medical products & appliances, outpatient-based services, and hospital-based services. The amount of monthly OOP health payments made by households was assessed through its mean and median. The incidence of CHE is measured through a proportion of households with payments on healthcare items that exceed 10% of total household expenditures. The distribution of OOP health payments and its CHE incidence will

then be assessed according to the region in Malaysia, ethnic group, urban-rural strata, household income group, and a group of healthcare services or items.

Results and discussion

This study includes 14473 households from HES 2014/2015. The mean and median monthly OOP health payments from households surveyed in HES 2014/2015 were MYR54.53 (SD 143.83) and MYR12.50 (IQR 34.04) respectively. The mean (SD) monthly OOP health payments were noticeably higher among households in Peninsular Malaysia [MYR61.44(158.83)], urban strata [MYR61.06(159.54)], ethnic Non-Bumiputera [MYR75.97(184.63)] and among the T20 income group [MYR141.67(293.35)] (Table 1). There were 321 households that have incurred CHE, making the national CHE incidence at 2.22%. The incidence of CHE was higher among households in Peninsular Malaysia (2.61%), rural strata (2.24%), ethnic non-Bumiputera (2.85%), and among the B40 income groups (2.34%), as shown in Table 2. Expenditure on pharmaceuticals and hospital-based services was more prevalent among households with CHE with a mean (SD) of MYR320.55 (310.0) and MYR130.98 (472.55) respectively (Table 3). The mean OOP health payments and CHE incidence among Malaysian households are relatively small if compared globally (1). Furthermore, health expenditures were not a priority among Malaysian households, as most of the household expenditures were largely spent on food, housing, and leisure (5). Although the incidence of CHE is small, it is steadily increasing over the years from 1.44% in 2005 to 2.22% in 2015 and 2.8% in 2016 (3,4). Due to Malaysia's dual healthcare system, high-income households generally have the option to seek care in private healthcare facilities which are more concentrated in urban areas of Peninsular Malaysia. One interesting finding is that the incidence of CHE was notably highest among the B40 income group (2.34%). This could be attributed to high OOP health spending in private healthcare facilities among the urban poor, particularly on hospital-related care and community pharmacies, as these facilities are more accessible, offer lesser waiting time, and are perceived as of higher quality.

Table 1: Demographic characteristics and distribution of monthly OOP health payments (n=14473).

Variables	n (%)	Mean OOP health payments (MYR) (SD)	Median OOP health payments (MYR) (IQR)
Malaysia	14473 (100.0)	53.43 (143.83)	12.50 (34.03)
Region			
Peninsular Malaysia	10541 (72.8)	61.44 (158.83)	14.71 (50.55)
Sabah & WP Labuan	1767 (12.2)	25.95 (84.82)	5.50 (19.17)
Sarawak	2165 (15.0)	36.87 (91.70)	10.00 (30.19)
Strata			
Urban	10043 (69.4)	61.06 (159.54)	14.43 (49.58)
Rural	4430 (30.6)	36.14 (97.24)	8.33 (29.92)

Ethnic group			
Bumiputera	10116 (69.9)	43.73 (120.85)	10.00 (34.34)
Non-Bumiputera	4357 (30.1)	75.97 (184.63)	19.16 (67.71)
Household income group			
B40	9241 (63.9)	33.04 (83.49)	8.33 (28.81)
M40	3999 (27.6)	73.36 (168.81)	20.80 (65.74)
T20	1233 (8.5)	141.67 (293.35)	40.90 (170.60)
Household incurred CHE (10% threshold)			
Yes	321 (2.22)	583.56 (575.62)	416.64 (383.62)
No	14152 (97.78)	41.41 (84.52)	11.73 (39.81)

Table 2: Demographic characteristics and incidence of catastrophic health payments among Malaysian households (n=14473).

Variables	Total population, n (%)	Incidence of CHE, n (%)
Malaysia	14473 (100.0)	321 (2.22)
Region		
Peninsular Malaysia	10541 (72.8)	275 (2.61)
Sabah & WP Labuan	1767 (12.2)	23 (1.30)
Sarawak	2165 (15.0)	23 (1.06)
Strata		
Urban	10043 (69.4)	222 (2.21)
Rural	4430 (30.6)	99 (2.24)
Ethnic group		
Bumiputera	10116 (69.9)	197 (1.95)
Non-Bumiputera	4357 (30.1)	124 (2.85)
Household income group		
B40	9241 (63.9)	216 (2.34)
M40	3999 (27.6)	81 (2.03)
T20	1233 (8.5)	24 (1.95)

Table 3: Comparison of mean monthly OOP health payments for different group of healthcare services or items between households with CHE and national average.

Variables	Pharmaceuticals (MYR)(SD)	Medical products & appliances (MYR)(SD)	Outpatient-based services (MYR)(SD)	Hospital-based services (MYR)(SD)
Households with CHE (n=321)	320.55 (310.0)	23.68 (83.49)	108.36 (359.33)	130.98 (472.55)

Households in Malaysia (n=14473)	32.00 (92.90)	5.41 (22.85)	11.34 (62.04)	4.68 (75.05)

Conclusion

Household OOP health payments and their CHE incidence among Malaysian households are small and more concentrated among the higher income group. Although small, the trend is increasing over the years. A robust health financing policy is needed to protect households at risk, especially the B40 income group from financial hardship.

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FHSMOP04/25 : From Person-centred Moments To Person-Centred Culture - Identifying Personal And Organisational Integrated Care Challenges

Pui San Saw[1], Nur Zahirah Balqis-Ali[2], Anis-Syakira Jailani[2], Weng Hong Fun[2], Sondi Sararaks[2], Shaun Lee[1]

[1] *School of Pharmacy, Monash University Malaysia, Bandar Sunway, Malaysia*

[2] *Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia*

Corresponding author's email: saw.pui.san@monash.edu

Summary

Developing a workforce and community with behaviours that support and drive a person-centred care approach is important. Designed and conducted through continuous engagement with policymakers and public health specialists, this study aims to assess the practice of public healthcare providers and organisational behaviours on person-centred care to identify areas for future improvements. Questionnaires were administered to 76 primary healthcare clinic managers and 2,527 healthcare staff. The mapped findings revealed a discrepancy between healthcare staff and managers' perception of person-centred practice and the lack of organizational support, highlighting the need for a cultural shift towards more staff involvement and appreciation.

Keywords
Person-centred care, integrated care, primary healthcare, health workforce, Malaysia

Introduction

Person-centred care is an approach that places the person at the centre of healthcare and considers their needs, preferences, and values in all aspects of care (1). However, providing person-centred care requires a workforce that is trained, motivated, and supported to engage with patients as partners in care. It also requires a healthcare system that values and supports person-centred care. The increasing demands of healthcare (such as rising patient volumes, complex cases, and time pressures) often leave healthcare staff feeling overwhelmed and may resort to task-oriented, efficiency-driven approaches that prioritize completing tasks over building relationships with patients. To address these challenges, the study aims to assess the current practice and organisational behaviours of public healthcare providers in delivering person-centred care. Findings will inform policy and practice changes that support healthcare staff in creating a therapeutic environment that is relationship-focused, collaborative, and holistic.

Materials and Methods

The Person-Centred Practice Inventory-Staff (PCPI-S) questionnaire (2) was distributed to all healthcare staff comprising of family medicine specialists, medical doctors, medical assistants, nurses, pharmacists, dietitians, nutritionists, physiotherapists and occupational therapists in primary healthcare facilities in the state of Selangor. The questionnaire contains 17 constructs with 59 items which provides a generic measure of person-centredness of a staff. This was supplemented with the INTEGRATE Framework questionnaire sent to participating clinic managers (3). The questionnaire contains seven constructs with 48 items to determine the organisational support and readiness to change to implement person-centred care initiatives. Respondents rated on 7-point scales based on the frequency of person-centred practice (ranging from never; rarely, 10%; occasionally, 30%; sometimes, 50%; frequently, 70%; usually, 90%; and all the time). The mean/median scores for each construct in both questionnaires were analysed using SPSS v25 and compared across the different clinic types, job categories, and service years.

Results and Discussion

A total of 76 clinic managers and 2,527 healthcare staff from 83 primary healthcare facilities participated in the study. For clinic managers, mean scores across the INTEGRATE framework dimensions ranged from 4.13 (Systemic Integration) to 4.94 (Person-Centred Care for healthcare providers). For healthcare staff using the PCPI-S questionnaire, three constructs with the highest median score were ‘Developed interpersonal skills’ (5.75), ‘Power sharing’ (5.67), and ‘Being committed to job’ (5.60). Two constructs identified as areas for improvement include ‘Supportive organisational system (Median=4.60) and ‘Clarity of beliefs and values (Median=4.67). Wilcoxon signed-rank tests showed significant differences in responses across job categories, while respondents who have been longer in service tend to score all constructs and dimensions higher. The mapped findings

demonstrated a divergence in perception between respondents' person-centred practice and their rationalisation - healthcare staff which highlighted the lack of organisational support, but managers rated this score relatively higher. Transitioning "person-centred moments" to "person-centred culture" requires reforming workplace culture, that provides an enabling platform for integrated care at organisational, professional, and clinical levels that promotes initiative, creativity, freedom, and safety of healthcare staff and underpinned by a governance framework that emphasizes culture, relationships, values, communication, professional autonomy, and accountability (4). The strength of the study was the exploration of person-centred concepts in a theoretical framework based on established theories. This study was conducted in Selangor; thus, future nationwide study will provide a more comprehensive evaluation of person-centred practice for Malaysia.

Table 1. The scores for constructs in PCPI-S and INTEGRATE framework

	Constructs	Scores Median (IQR)
PCPI-S Questionnaire	Professional competent	5.33 (1.33)
	Developed interpersonal skills	5.75 (1.50)
	Being committed to job	5.60 (1.40)
	Knowing self	5.33 (1.33)
	Clarity of beliefs & values	4.67 (1.00)
	Skill mix	5.00 (1.33)
	Shared decision making	5.00 (1.50)
	Effective staff relationships	5.33 (1.33)
	Power sharing	5.67 (1.33)
	Potential for innovation and risk taking	5.00 (1.50)
	The physical environment	5.00 (1.58)
	Supportive organizational systems	4.60 (1.40)
	Working with patient's belief and values	5.00 (1.25)
	Shared decision making (P)	5.00 (1.33)
	Engagement	5.33 (1.00)
	Providing holistic care	5.33 (1.33)
	Having sympathetic presence	5.33 (1.00)
		Mean ± SD
INTEGRATE Framework Questionnaire	Person Centred Care	4.64 ±1.07
	Person Centred Care (Provider)	4.94 ± 1.06
	Care Coordination	4.67 ± 1.10
	Professional Integration	4.84 ± 1.19
	Organisational Integration	4.74 ± 1.17
	Systemic Integration	4.14 ± 1.08
	Functional Integration	4.64 ± 1.26
	Normative Integration	4.54 ± 1.24

PCPI-S = Person-Centred Practice Inventory-Staff , IQR = Interquartile range, SD = standard deviation

Conclusion

The transformation needed in work culture centred around giving more opportunities to healthcare staff to raise their concerns, be involved in organisational decision-making, and create a more appreciative working environment. The findings will give insight to policymakers and practitioners on improvements required in delivering integrated person-centred practice.

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FHSMOP05/53 : Anak Selangor Anak Sihat (ASAS); A Public Health Intervention By The Selangor State Government

Mohammad Farhan Rusli[1], Muhammad Adil Zainal Abidin[1], Norhasniza Yaacob[2], Siti Mariah Mahmud[3]
[1]Department of Community Medicine, Kulliyyah of Medicine, International Islamic University Malaysia
[2]Ministry of Health, Malaysia
[3]Office of Women, Unity and Public Health, Selangor State Government
Corresponding author's email: farhan@iium.edu.my

Summary
Nutrition plays a critical role in the development of a child, ensuring a steady growth of both height and weight. Deviations of this result in obesity or stunting. Stunting has been identified to affect 7 out of 10 children in Malaysia. The Selangor state government through its public health program collaborated with the International Islamic University Malaysia to conduct a long-term intervention program known as Anak Selangor Anak Sihat (ASAS), that targets vulnerable B40 children with underweight and under height for age. Food security was also taken into account and the program was performed amongst 720 recipients spread over two cohorts for a total period of ten months. A specially crafted nutritional food basket was given monthly, and progress captured on their electronic record using the Selangkah platform.

Keywords
Malnutrition, public health intervention, nutritional status, childhood nutrition

Introduction

Nutritional status is a significant measure of the overall health of the children population. A number of children suffered from malnutrition with visible stunting and underweight due to various factors such as food insecurity and household income (1, 2). However, other factors that may contribute to undernutrition such as maternal diet, nutrition education and complications from a variety of diseases should not be overlooked (3). To address this issue especially in the vulnerable populations, a public health nutritional intervention was introduced which promotes healthier outcomes - thus accelerating health policy makers in making differences in public health strategies. This public health intervention aims to highlight the importance of state government's collaboration with public health specialists in addressing the needs of the population to complement the existing healthcare system of the Ministry of Health, Malaysia.

Materials and Methods

A public health intervention program was done in Selangor for a period of 10 months involving two cohorts with each cohort lasting 5 months. Participants were enrolled through the district land office registry of low-income families, aged between 1 year old to 5 years old, with no underlying chronic medical conditions or on special diets, baseline data was below the WHO threshold for height and weight, with the participants of the lowest rank selected first. For those who refused to participate, the next name on the list was contacted until the quota for the targeted area was full. A public health nutritional intervention that involved the supply of 5.4 kg specialised formula milk and 30 tablets of multivitamin with lysine, 4 large boxes of multigrain cereal, 3 boxes of yoghourt biscuits, 2 boxes of oatmeal biscuits were given each month to the participants. Nutritional counselling was also delivered by experts. Monthly weight and height measurements were taken for each participant in each cohort for 5 months using the SECA scale model 874 and monitored using the WHO AthroPlus software, a questionnaire on nutrition and dietary intake; that was then recorded in the Selangkah application that is also accessible to the participants through their mobile phone. Participants were also enrolled in a Whatsapp group for information and access to a nutritionist and researchers for any matters related to the intervention.

Results and Discussion

A total of 720 unique participants were involved in the public health intervention program over 10 months. The majority of the participants were Malay (94%), followed by Indian (5%) and Chinese (1%). The program identified that the majority of cases involved the participants in the urban setting. The public health intervention identified that a systematic planning from the Selangor state government working in collaboration with public health experts improved accessibility of the participants to nutritional intervention, a better daily nutritional calorie goal achievement, reduction in fast-food and poor nutrition food intake, higher monthly funds for other purposes and other positive outcomes. The main ASAS program that was piloted in 2021 showed that public health interventions need to be long-term, with systematic planning to ensure a sustainable outcome. The program also highlighted the negative impacts of one-off programs and also programs that involve cash aid given directly. Intervention with

repetitive consultations and continuous counselling was also found to be widely popular among the participants as many had to take more than 3 consultations before practising good nutrition at home.

Conclusion

Nutrition with a targeted and tailor-made approach is one of the most successful and sustainable methods of public health intervention. A state government that develops policy is also at its most beneficial when collaborating with public health experts to develop and implement impact-based interventions. Participants involvement also showed the need to work with local councillors, elected representatives and state civil service to ensure the positive outcome of the intervention program.

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FHSMOP06/83 : Impact Of COVID-19 Pandemic On Screening And Intervention Of Adolescent Health At Primary Healthcare Setting

Muhammad Firdaus Ujang[1], Zamzaireen Zainal Abidin[1], Nik Abdul Muhaymin Mohd Hanapi[1], Muhammad Al-Amin Marzuki[1], Mohd Safiee Ismail[2], Saidatul Norbaya Buang[2]

[1]*Adolescent Health Sector, Family Health Development Division, Ministry of Health Malaysia*

[2]*Family Health Development Division, Ministry of Health Malaysia*

Corresponding author's email: muhammadfirdaus@moh.gov.my

Summary

Investment in adolescent health is critical and provides a triple dividend in ensuring health of, current adolescents, in adulthood and future generations. Neglecting adolescent health will further contribute to the increasing disease burden in adulthood. The Ministry of Health (MOH) Malaysia provides access to comprehensive, quality healthcare services through its network of healthcare facilities (health clinics, rural clinics and hospitals) nationwide for all age groups including for adolescent boys and girls. Secondary data collected from Health Informatics Centre, MOH (year 2018 to 2021) were obtained, coded, sorted, and analysed. There was a decline of attendance to MOH primary care facilities for years 2020 and 2021. Varying health problems among adolescent boys and girls in

different age groups had shown that adolescents have different health needs at varying ages throughout the course of adolescence. COVID-19 pandemic and MCO have caused obvious impact on screening and intervention of adolescent health service at the primary healthcare setting. Measures need to be taken actively to ensure the adolescents in this country as many as possible are screened and given with intervention at the early stage in preventing diseases among them.

Keywords
Adolescent, adolescent health, adolescent health services, primary health clinics, COVID-19 pandemic

Introduction

Evidence from the Lancet Commissions (1) shows that investment in adolescent health is critical and provides a triple dividend in ensuring the health of; current adolescents, in adulthood and future generations. Adolescents form about 1/5 of the world population and in line with SDG goals of "leaving no one behind", investment in adolescents as future leaders to thrive and transform the world into a better place for all is crucial. Neglecting adolescent health will further contribute to the increasing disease burden in adulthood. Preventive interventions during adolescence are cost-effective in reducing morbidities and mortalities in adulthood subsequently reducing cost in treatment for NCDs among adults. Published articles in the The Lancet (2) have shown that for every dollar invested in adolescent health, there is estimated 10-fold health, social and economic returns.

The Ministry of Health (MOH) Malaysia provides access to comprehensive, quality healthcare services through its network of healthcare facilities (health clinics, rural clinics and hospitals) nationwide for all age groups including for adolescent girls and boys. COVID-19 pandemic experienced by Malaysia in 2020 concurrently with the Movement Control Order (MCO) enforcement on 18th March 2020 had caused impacts to the healthcare system including adolescent health service.

Materials and Methods

Secondary data collected by Health Informatics Centre, MOH (year 2018 to 2021) were obtained, coded, sorted, and analysed using Microsoft Excel (Office 2011) and IBM Statistical Program Social Sciences (SPSS version 23.0). Descriptive analysis included frequencies and percentages.

Results and Discussion

There was an increase of adolescent boys' attendance to MOH primary health clinics (10-14 years) from 17,2767 (2018) to 17,7569 (2019) but decreased markedly to 13,1452 (2020) and subsequently to 10,0833 (2021). However, among adolescent boys (15-19 years), there was a decrease in attendance from 23,8035 (2018) to 23,2135 (2019) and similar marked declined to 18,4840 (2020) and 14,4383 (2021).

Among adolescent girls (10-14 years), there was an increase of attendances to MOH primary health clinics from 18,0422 (2018) to 18,7914 (2019) but similar marked decline to 13,9940 (2020) and subsequently to 10,8437 (2021). Likewise, among

adolescent girls (15-19 years), the attendance of 24,8907 (2018) increased to 26,1566 (2019) and subsequently decreased markedly to 20,5857 (2020) and 16,2588 (2021). The decline of attendance to MOH primary care facilities for years 2020 and 2021 was remarkable during COVID-19 pandemic, movement control order (MCO) enforcement including school closures.

In 2018 to 2020, the highest attendances were from Sarawak (amongst adolescent girls 10-14 years for two consecutive years and adolescent girls 15-19 years respectively), and from Pahang in 2021 (amongst adolescent girls 15-19 years). There were five health scopes captured (through Borang Saringan Status Kesihatan screenings) among adolescents' attendances namely, nutritional health, physical health, mental health, sexual reproductive health and high risk behaviours.

In 2018, nutritional health problems was the highest screened, followed by high risk behaviours for boys; 10-14 (59.6%, 22.7%), 15-19 (56.9%, 27.3%), and girls; 10-14 (66.4%, 14.7%), 15-19 (73.1%, 11.2%). Aside from the sexual reproductive health problem that was captured as the third highest problem among 15-19 year old boys (27.3%), the third highest problem was physical health problems for 10-14 boys (8.0%) and girls 10-14 (7.5%), 15-19 (6.2%) years.

However, in 2019, the top three health problems from BSSK screenings were related to nutritional health, high risk behaviours and physical health, for boys and girls; 10-14 and 15-19 years. In 2020 and 2021, the health problems maintained to be highest for nutritional health and high behaviours, for 10-14 and 15-19 years boys and girls.

Similar top two scopes of adolescent health problems were revealed from years 2018-2021 regardless of age groups among adolescent boys and girls. However, varying third highest scope differs among adolescent boys and girls in different age groups. Hence, it is clearly shown that adolescents have different health needs at varying ages throughout the course of adolescence.

Conclusion

COVID-19 pandemic and MCO have caused obvious impact on the screening and intervention of adolescent health service at the primary healthcare setting. The attendance of adolescents to the health clinics has absolutely decreased since 2020 which was the year of MCO enforcement in Malaysia. The health problems among adolescents captured through the screening at the health clinics have also decreased since the enforcement of MCO in 2020. Measures need to be taken actively to ensure the adolescents in this country as many as possible are screened and given with intervention at the early stage in preventing diseases among them.

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FHSMOP07/13 : Mental Health And Obesity In A B40 Community During COVID-19 Pandemic

Jo Ann Andoy Galvan[1], Robert So Jr[1], Shannen Kay Chan[1], Nazifah Binti Nagoor Pitchai[1], Puravaindran A/L Sithamparam[1], Arooj Iftikhar[1], Karuthan Chinna[2]
[1]School of Medicine, Faculty of Health and Medical Sciences, Taylor's University, Lakeside Campus, Selangor, Malaysia, 1 Jalan Taylors, Subang Jaya, Selangor, 47500, Malaysia
[2]Faculty of Business and Management, UCSI University
Corresponding author's email: JoAnnAndoy.Galvan@taylors.edu.my

Summary
The recent rise of mental health problems due to the COVID-19 pandemic, could mean a rise in obesity prevalence in the coming years. There are no current studies that explored mental health problems and obesity among communities greatly affected by the pandemic in Malaysia. Therefore, we investigated the prevalence and factors associated with obesity and explored its association with mental health problems among B40 residents in Malaysia. A cross-sectional study was conducted involving 174 adult residents of an urban poor community. Results indicated that most of the participants were obese and marital status was found to be associated with obesity.

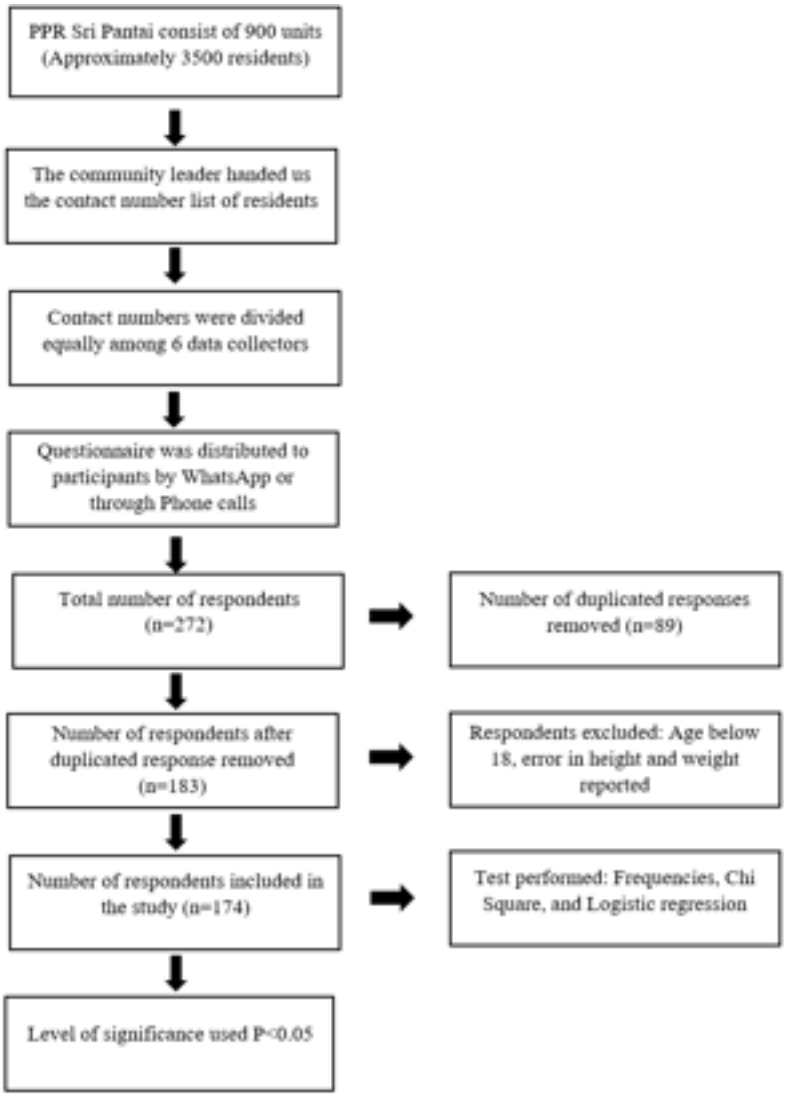
Keywords
Obesity, prevalence, B40 residents, marital status

Introduction
The COVID-19 pandemic has brought forth many issues regarding mental health among poor communities. One of the biggest contributors to unrest in families is economic unsettlement, a factor that was only exacerbated by the public health crises. Enforced lockdowns have led to isolation within the home which can worsen the mental health of already disturbed individuals. In Malaysia, the bottom 40% (B40) of the population earns a total household income of less than RM 4850 per month (1). Household income could have an impact on overweight and obesity due to the shift from consuming traditional foods to high consumption of refined grains, meat, and oils (2). It is critical to address the psychological components in the prevention and treatment of obesity because of the link that was found between mental health symptoms, abnormal eating behaviour and the reason for being overweight or obese (3).

Materials and Methods
A cross-sectional study was conducted involving residents of the Seri Pantai PPR ('Program Perumahan Rakyat' in local Malay language) in Lembah Pantai, Kuala Lumpur, Malaysia. PPRs are low-cost high-rise flats which is an initiative done by the government of Malaysia since 1998 to provide affordable housing to the low socioeconomic groups of people (4).

The questionnaire's link was distributed by data collectors through WhatsApp by contacting each household member from a list of telephone numbers provided by the community leader. The standardized self-administered questionnaire constructed in Google Survey Form was used to collect data from the participants.

Participants Flow Chart



The questionnaire consisted of four sections. Background information, personal information (socio-demographics), self-reported anthropometric measurements (height and weight), and mental health parameters (depression, anxiety, and stress) level information (DASS-21 based questions). The Malay version of Depression Anxiety Stress Scales (DASS-21) were adopted to evaluate depression, anxiety, and stress among respondents in this study.

Results and Discussion

There was a total of 174 respondents in this research study. Most respondents were females 143 (82.2%), Malays 142 (81.6%), married 112 (64.4%), employed 81 (46.6%) and their education levels were mostly up till secondary school 119 (68.4%).

The mean BMI obtained was (28.0 + 5.2kg/m^2). The median value was 27.4 kg/m2, which indicated at least 50% of the total respondents fall under the obese category.

Table 1: Logistic regression analysis of risk factors of obesity among B40 residents

Variables	OR (95% CI)	P value
Gender		
Male	0.639 (0.257 – 1.587	0.334
Female	1	
Ethnicity		
Malay	1.831 (0.757 – 4.430)	0.179
Non-Malay	1	
Level of Education		0.380
Primary	0.702 (0.344 – 4.887)	0.702
Secondary	1.833 (0.768 – 4.377)	0.172
Tertiary	1	
Marital Status		0.036
Married	2.530 (1.049 – 6.102)	0.039
Widowed/ Divorced	5.133 (1.266–20.809)	0.022
Single	1	
Occupation		0.156
Unemployed	0.400 (0.143 – 1.120)	0.081
Employed	0.957 (0.402 – 2.277)	0.921
Housewife	1	
Age		0.124
18-28	0.607 (0.203-1.813)	0.371
29-39	1.941 (0.646 – 5.829)	0.237
40-50	1.977 (0.743-5.264)	0.172
>51	1	
Depression		0.700
Normal	1.104 (0.398 – 3.065)	0.850
Mild-Moderate	1.619 (0.461 – 5.682)	0.452
Severe-Extremely severe	1	
Anxiety		0.149

Normal	1.982 (0.834 – 4.711)	0.121
Mild-Moderate	2.714 (0.908 – 8.112)	0.074
Severe-Extremely severe	1	
Stress		0.361
Normal	2.167 (0.746 – 6.299)	0.155
Mild-Moderate	1.754 (0.441 – 6.976)	0.425
Severe-Extremely severe	1	

CI, confidence interval; OR odds ratio; Nagelkerke R^2= .109; Cox & Snell R^2 = .068; Hosmer and Lemeshow x2 = 2.269, p = 0.811

This study did not find a significant association between depression, anxiety, stress, and obesity. This could be because our survey was conducted during the covid-19 pandemic and people would have learnt coping strategies as well as received family support to deal with mental health issues during the lockdown period(Mariani et al., 2020). However, the results obtained from the logistic regression as shown in the table above to determine the association between different risk factors and obesity indicated that marital status significantly predicted the odds of being obese (p =.036), and other sociodemographic factors, depression, anxiety, and stress were not associated with obesity. Married individuals were 2.5 times more likely to be obese compared to singles, p = .032, OR= 2.530; (95% CI: 1.049 – 6.102) whereas widowed or divorced individual were 5.1 times more likely to be obese compared to singles, p = .022, OR= 5.133; (95% CI: 1.266–20.809).

Conclusion

The prevalence of obesity among the B40 community is high. When compared to the national prevalence of obesity in Malaysia, the prevalence among the B40 community was significantly higher, which indicates the negative association of household income and obesity; people with lower socioeconomic status are more obese. There was also an association between marital status and obesity; married, widowed, and divorced individuals were more prone to obesity as compared to singles. Mental health and obesity however had no significant association.

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FHSMOP08/85 : Online Animated Video Intervention Effect on Intention and Willingness To Sext Among Undergraduate Students

Norliza Ahmad [1], Norain Mansor [1,2], Salmiah Md Said [1], Tan Kit-Aun [3] and Rosnah Sutan [4]
[1]Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia.
[2]Ministry of Health, Malaysia.
[3]Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor.
[4]Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak 56000 Cheras, Kuala Lumpur, Malaysia.
Corresponding author's email: lizaahmad@upm.edu.my

Summary
Sexting behaviour is becoming popular among young adults. However, this behaviour has physical and mental implications among the sexters. We developed a health education intervention module to prevent sexting behaviour targeting at the intention and willingness to sext as these variables predicted sexting behaviour. The module was in the form of five animated videos delivered using a private YouTube channel. We tested this module among undergraduates' students in a public higher education institution. The findings showed that this intervention module works. Therefore, this module can be used by relevant agencies related to sexual and reproductive health.

Keywords
Social media, intention, young adult, Malaysia, students, sexting.

Introduction
Sexting refers to exchanging sexually explicit materials using digital platforms (1). This behaviour is becoming popular among young adults (2). However, it has implications on mental and physical health among the sexters (3,4). Currently, there is a lack of intervention to curb this behaviour. As a primary prevention of sexting, this study would like to target intention and willingness to sext as these variables predicted sexting behaviour (5). Therefore, we aimed to evaluate the effect of the newly developed sexting intervention module delivered via online

animated videos in reducing the intention and willingness to sext among undergraduate students in a public university in Malaysia.

Materials and Methods

This two-armed, parallel, and single-blinded cluster randomized controlled trial (RCT) involved 300 undergraduate students from twelve programs which were randomly allocated into intervention and control groups. The intervention group received five animated videos posted on a private YouTube platform. The videos were developed based on the Prototype Willingness Model. The control group was put on the waitlist. Both groups answered a self-administered Google form assessing the outcomes at the baseline, immediate- and three months post-intervention. Data analysis was performed with IBM SPSS (version 26). The effect of the intervention was evaluated using generalised linear mixed model adjusted for age, sex, relationship status, and the amount of time spent online. P value < 0.05 was considered statistically significant.

Results and Discussion

The attrition rate was 8.3%. After adjusting for age, sex, relationship status, and the amount of time spent online, there were significant differences in the intention to sext (β=-.12; *P*=.002), willingness to sext (β=-.16; *P*=<.001) between the intervention and control group at three months post-intervention. Table 1 shows the interaction between group and time for intervention and control groups at 3-month post intervention.

Table 1. Effect of group and time interaction on the primary outcomes adjusted for age, sex, relationship status, and the amount of time spent online.

Outcomes (Measures)	Parameter	β	SE	t-test	*P* value	95% CI	
						Lower	Upper
Intention to sext	Group x Time	-0.120	0.039	-3.079	0.002*	-0.196	-0.043
Willingness to sext	Group x Time	-0.160	0.033	-4.787	<0.001*	-0.225	-0.094

Using a generalized linear mixed model adjusted for age, sex, relationship status, and the amount of time spent online. SE=Standard error. *Statistically significant at p <.05

Conclusion

These online animated videos which were developed based on the Prototype Willingness Model were effective in reducing intention and willingness to sext among undergraduate students. This intervention module can be used by relevant agencies involved in the promotion of sexual and reproductive health among young adults in Malaysia.

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FHSMOP09/61: Integrated Driving Factors Of Parental Vaccine Hesitancy Toards COVID-19 Vaccines For Children In Petaling District, Malaysia

Sarah Nabila Zulkifli[1], Halimatus Sakdiah Minhat[2,3*]
[1]*Ministry of Health, Malaysia*
[2]*Department of Community Health, Faculty of Medicine, Universiti Putra Malaysia*
[3]*Malaysian Research Institute on Ageing*
Corresponding author's email: Halimatus Sakdiah Minhat, halimatus@upm.edu.my

Summary
Parental vaccine hesitancy was triggered with the introduction of the COVID-19 vaccination for children. This mixed methods study aimed to determine the prevalence and explore the driving factors of parental vaccine hesitancy against the COVID-19 vaccination for children in Petaling district, Malaysia using the i-PEACH Framework. The prevalence of parental vaccine hesitancy was 64.4%, and 5 predictors of parental vaccine hesitancy were identified in the quantitative study, whereas 4 themes and 11 subthemes emerged from vaccine hesitant parents in the qualitative study, which include all the constructs of i-PEACH Framework. Integration of both studies resulted in mostly complementary findings.

Keywords
Parental Vaccine Hesitancy, COVID-19 vaccination, Children, Urban, Malaysia

Introduction

Since the emergence of the COVID-19 pandemic, vaccination has been regarded as one of the most effective mitigating measures to stop the virus transmission (1). The National COVID-19 Immunisation Programme was launched in Malaysia and has since expanded to include children aged 5 to 12 years old. Parental vaccine hesitancy poses as a threat to this vaccination programme as seen in other childhood vaccination programs (2). This research seeks to determine the prevalence and explore the driving factors of parental vaccine hesitancy against the COVID-19 vaccination for children in Petaling district, Malaysia using the i-PEACH Framework, a framework created by integrating the Health Belief Model and Theory of Planned Behavior (3).

Materials and Methods

A convergent parallel mixed methods study design was conducted involving parents of preschool children in Petaling district. In the quantitative study, a cross sectional study design was done. Respondents were parents of children aged 4 to 6 years old who attended registered pre-schools with The Community Development Department (KEMAS) in Petaling district, Selangor and were recruited using stratified proportionate to size random sampling method. Data was collected using validated and reliable self-administered questionnaire. data analysis was done using The IBM Statistical Analysis of Social Sciences System (SPSS) Version 27.0 in which included three levels of analysis. Meanwhile, in the qualitative study, basic qualitative design was done through in-depth interviews among vaccine hesitant parents guided by semi structured interview protocol. Thematic analysis was performed inductively and deductively based on the i-PEACH Framework. Related codes and themes were identified and subsequently integrated with the quantitative study's findings to gain a thorough understanding of the factors related with parental vaccine hesitancy.

Results and Discussion

A total of 508 parents participated in the quantitative study, with a response rate of 87.5%. The prevalence of parental vaccine hesitancy among the respondents was 64.4%, with almost similar proportion between those who delayed (34.1%) and refused (30.3%) vaccination. Perceived susceptibility, perceived barrier, subjective norms, cues to action, and age of parents predicted vaccine hesitancy. Parents who have high perceived barrier towards taking the COVID-19 vaccination are 3.26 times more likely to be vaccine hesitant (aOR=3.259, 95% CI: 1.994,5.324). Inversely, parents who have high perceived susceptibility, high subjective norms, high cues to action have lower odds of being vaccine hesitant respectively (aOR=0.286, 95% CI: 0.160,0.509, $p<0.001$; aOR=0.391, 95% CI: 0.211,0.723, $p=0.003$; aOR=0.331, 95% CI: 0.181,0.607, $p<0.001$). Also, one sociodemographic factor was found to be a negative predictor which is parental age, where parents aged more than 35 years old has 0.4 lesser odds of being vaccine hesitant than parents aged less than 30 years old of age (aOR=0.419, 95% CI: 0.186,0.943, $p=0.035$). In the qualitative study, 4 themes and 11 subthemes emerged from the vaccine hesitant parents, which include all the i-PEACH Framework constructs (Figure 1). The integration of both studies resulted in mostly complementary findings.

Table 1 Predictors for parental vaccine hesitancy

Variable	Coefficient	Standard error	Adjusted Odd ratio	95% CI for Odd ratio		p-value
				Lower bound	Upper bound	
Intercept	2.394	0.443				
Perceived susceptibility	-1.253	0.295	0.286	0.160	0.509	<0.001**
Perceived barrier	1.181	0.250	3.259	1.994	5.324	<0.001**
Subjective norms	-0.939	0.314	0.391	0.211	0.723	0.003*
Cues to action	-1.106	0.309	0.331	0.181	0.607	<0.001**
Age						
<30 years old	Ref					
30-35 years old	0.058	0.435	1.060	0.452	2.848	0.894
>35 years old	-0.870	0.413	0.419	0.186	0.943	0.035*

Note: (*) significant p<0.05; (**) significant p<0.001

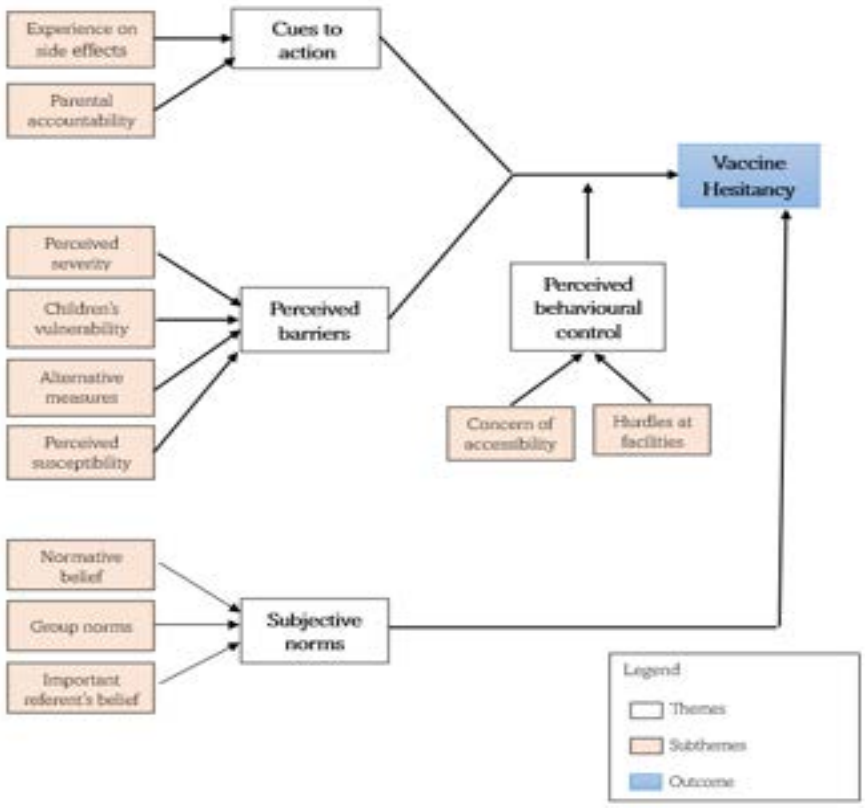

Figure 1 Thematic framework of factors contributing towards parental vaccine hesitancy

Conclusion

The prevalence of parental vaccine hesitancy was high, as reflected by the low uptake of the COVID-19 vaccination for children. Factors associated with vaccine hesitancy were multifactorial and interconnected, and corresponded well with the i-PEACH framework, necessitating a nuanced strategy that considers the specific concerns and beliefs of each parent related to the vaccination program.

Acknowledgement

The authors would like to express sincere gratitude to The Malaysian Public Health Physician's Association (PPKAM) for providing tinancial support for this research project through their PPKAM Research Grant 2022. Also, the authors also would like to express our sincere thanks to Community Development Department of Selangor & Petaling district for their cooperation and assistance for this study.

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FHSMOP10/107 : Regional Differences In Household Expenditure On Pharmaceuticals: Evidence From Malaysia

Wei Chern Ang [1,2], Yong Kang Cheah [3]
[1]*Clinical Research Centre, Hospital Tuanku Fauziah, Ministry of Health Malaysia*
[2]*Department of Pharmacy, Hospital Tuanku Fauziah, Ministry of Health Malaysia*
[3]*School of Economics, Finance and Banking, Universiti Utara Malaysia*
Corresponding author's email: angweichern@moh.gov.my

Summary

This study investigates the factors associated with pharmaceutical expenditure share (PES) among households in different regions of Malaysia. Using data from the Household Expenditure Surveys 2014 and 2016, the study found that on average, a Malaysian household had a PES of 0.8%, which was equivalent to Ringgit Malaysia (RM) 30-40 per month. In general, households with younger, male, less-educated, or Bumiputera heads were less likely to consume pharmaceutical products and had lesser PES than others. Not owning insurance reduced the likelihood of consuming pharmaceutical products and PES. Urban households in low- and middle-income states had a higher PES than rural households. This study recommends more public health clinics in urban areas of low- and middle-income states and townships with more elderly in order to improve access to essential medicines.

Keywords

Pharmaceutical expenditure, gross domestic product, regions, family

characteristics, pharmaceutical product

Introduction

Malaysian population of all income groups can access essential medicine through the two-tier healthcare systems: the government-funded public sector and the self-sustaining private sector through community pharmacies. The public healthcare sector provides almost free medical services, including free medicines. However, the problem arises when many patients still prefer to acquire pharmaceutical products through out-of-pocket expenses (1). From a societal perspective, potential catastrophic health expenditure and impoverishment should be minimised.

While a growing literature examines access to healthcare, It is unknown the likelihood of spending on pharmaceutical products and how much monthly spending in relation to household income varies by sociodemographic in Malaysia. Investigating pharmaceutical expenditure share (PES) gives a better insight into the wellbeing of households instead of pharmaceutical expenditure as an absolute value. Hence, this study aims to evaluate the factors affecting pharmaceutical expenditure share among households residing in different regions.

Materials and Methods

A secondary analysis of pooled cross-sectional data from the Malaysian Household Expenditure Survey 2014 and 2016 (2) was conducted. The survey employed stratified multi-stage probability sampling, covering both urban and rural areas in all states in Malaysia. The data were analysed descriptively, followed by a two-part regression model. The participation equation was used to examine the likelihood of purchasing pharmaceuticals, while the amount equation was used to assess PES. Most variables were categorised as in the original HES report. Household heads' age, gender, education level, ethnicity, marital status and employment status, and household income, strata, tobacco consumption, insurance ownership and year of the survey were taken into account. PES was the dependent variable. It was the monthly household expenditure on pharmaceuticals as a share of household income. The regression was stratified by regions according to the gross domestic product (GDP) per capita of Malaysian states. The regions were divided into high-income, middle-income and low-income states, according to the GDP per capita of individual states. From the 15 states (including federal territories) in Malaysia, five states recorded GDP per capita surpassed the 66.7 percentile in GDP per capita among the states (>RM 50,357.70) were categorised as high-income states. Five states with GDP per capita lower than 33.3 percentile (<RM 30,244.54) were grouped as low-income, while the remaining five were middle-income states.

Results and Discussion

A total of 29,389 were sampled, with data representative for both 2014 (n=14,838) and 2016 (n=14,551). Most household heads are 40-49 years old, male, secondary school leavers, Bumiputera, married and employed. The median household income ranged from RM 4325.83 to RM 4713.87. Most households resided in the urban areas. Half of the households had tobacco users, while most did not have insurance

owners. The households spent between RM 31.37 and RM 39.31 on pharmaceuticals, which accounted for 0.8% of the household income. Data were presented as participatory and amount decision of PES. Factors that increased both likelihood and PES were age, education levels, ethnicity of household heads and insurance ownership in all regions. The theory of ageing increases health deterioration predominates for all regions in our study. Despite the free public healthcare for senior citizens, the elderly may not have good access to it. Improved education levels promote investment in health, especially in preventive medicine. Gender only affected both likelihood and PES in high-income states. Women in high-income states tend to take more responsibility for their family members' health than men (3). Non-Bumiputera tend to have better health awareness than Bumiputera (4). Hence, they were more likely to invest and invest more in health. Insurance ownership increased the use of preventive care in all regions.

Factors associated with PES alone included the marital status of household heads and living strata. Single household heads in middle-income states may stay with their parents, while separated household heads may have less responsibility towards the family. More types of pharmaceuticals are sold in urban areas in low- and middle-income states than in rural areas, resulting in higher retail prices (5).

For factors that increased likelihood but reduced PES, higher income means a higher tendency to purchase pharmaceuticals but spending a lesser proportion due to a higher disposable income. Consuming tobacco may lead to various ailments but less allocation of resources for medicine. Compared to 2014, Malaysians had a higher tendency to spend on pharmaceuticals but spent less in 2016.

Conclusion

On average, a household spent approximately RM 30 to RM 40 on pharmaceuticals monthly, with a PES of 0.8% regardless of region. Increasing age, female (in high-income states), increasing education level, non-Bumiputera household heads, and insurance ownership (in low- and high-income states) increased both the likelihood of consuming pharmaceuticals and PES. Single household heads (in middle-income states) and residing in urban areas (in low- and middle-income states) increased PES. Increasing income, tobacco consumption, and in the year 2016 increased the likelihood but reduced PES. The employment status of household heads did not affect pharmaceutical expenditure.

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FHSMOP11/47 : Factors Associated With Anaemia Among Pregnant Women Attending Antenatal Clinics In Melaka Tengah District, Melaka, Malaysia.

Syafiq S.S.[1], Noor Aizam M.S.[1], Nur Shyuhada A.R.[1], Fauziah M.Y.[1], Fauzi A.M.[1], Rosmiza A.[2], Nur Farhana H.[3]
[1]*Melaka Tengah District Health Office, Jalan Bukit Baru, 75150 Melaka, Malaysia.*
[2]*Klinik Kesihatan Batu Berendam, Melaka.*
[3]*Poliklinik Fasya Bukit Beruang, Melaka.*
Corresponding author's email: drsyafiqsidqi@moh.gov.my

Summary
Anemia in pregnancy is still a public health issue in certain regions. The severity of the condition might contribute to the morbidity and mortality not only to the infants, but as well to the pregnant women, if not adequately managed. There are many causes of anaemia in pregnancy, and therefore, by identifying the factors that contributed to the condition, it might help in managing them, thus preventing negative outcomes.

Keywords
Anaemia, Pregnancy, Associated factors, Melaka, Malaysia.

Introduction
Anaemia during pregnancy is characterized by the haemoglobin (Hb) concentration of <11 g/dl in pregnant women. This condition decreases the oxygen-carrying capacity of the blood to the body tissues. The prevalence of anaemia among pregnant women in Malaysia ranged between 19.3 to 57.4% [1]. Studies on factors associated with anaemia in pregnancy will assist healthcare providers to anticipate proactively in treating the condition, and to reduce the associated major health consequences. Thus, this study aimed to determine the prevalence and the significant factors associated with anaemia among pregnant women attending antenatal clinics in Melaka Tengah District, Melaka, Malaysia.

Materials and Methods
A cross-sectional observational study was conducted involving 304 newly diagnosed anaemia among pregnant women attending antenatal clinics for the first time in Melaka Tengah district from June until December 2022. The Hb was measured from the Full Blood Count (FBC) investigation. Those with the Hb value of <11 g/dl were considered anaemic and were investigated further and being managed according to the standard Ministry of Health Malaysia guidelines. The outcome of this study was the Hb value at their 36 weeks of gestation. Multiple Logistic Regressions was done to determine the significant associated factors, by using IBM Statistical Package for the Social Sciences (SPSS) version 24.0.

Results and Discussion

There were 4,940 pregnant women attending the antenatal clinics from June until December 2022 [2]; with 346 were diagnosed to be anaemic (prevalence rate of 7.0%). Out of these, 240 (79%) were mildly anaemic and 64 (21%) were moderately anaemic. High prevalence of anaemia was observed in the Malays (88%), 18-29 years old group (52%), multigravida (73%), and diagnosed mostly in the second trimester (75%), as shown in Table 1. Majority of the pregnant women diagnosis were iron-deficiency anemia (54%).

Table 1. Distribution of demographic and clinical profile among pregnant women attending antenatal clinic in Melaka Tengah district, Melaka

Characteristics	n (%) Overall N=304
Age	
18-29	159 (52.3)
30-39	134 (44.1)
40-49	11 (3.6)
Parity	
Primigravida	83 (27)
Multigravida	221 (73)
Race	
Malay	266 (88)
Chinese	18 (6)
Indian	7 (2)
Others	13 (4)
Employment	
Housewife	143 (47)
Working	161 (53)
Booking	
< 12 weeks gestation	168 (55)
12 weeks and above	136 (45)
Hb upon booking	
< 11 g/dl	100 (33)
11 g/dl and above	204 (67)
Anemia by	
First trimester	47 (15)
Second trimester	228 (75)
Third trimester	29 (10)
Anemia severity	
Mild (10-10.9 g/dl)	240 (79)
Moderate (7-9.9 g/dl)	64 (21)
Severe (4-6.9 g/dl)	-
Diagnosis of anemia	
Dilutional effect	102 (33)
Iron-deficiency	163 (54)
Thalassemia	33 (11)
Other	6 (2)
Type of iron supplements	

Oral + parenteral	71 (23)
Oral only	233 (77)

As a standard care, depending on the diagnosis, once diagnosed to be anaemic, they were started on oral iron supplements, as well as being referred to the nutritionist and the pharmacist. They were follow-up on the 2-weekly basis, to observe the level of Hb, the compliance towards treatment, the patient's motivation, the patient's support, and the general well-being of both the mother and the baby. If indicated, the parenteral iron was prescribed, after discussion with the Family Medicine Specialist in charge. The final aim was to achieve the Hb level of more than 11 g/dl by their 36 weeks of gestation.

Among the anaemic group, the median Hb was 10.5 g/dl. At 36 weeks gestation, 104 out of 304 were still anaemic (34%). From the bivariate analysis, age (p=0.04), parity (0.02), late booker (p=0.01), booking Hb (p<0.001), anaemia severity (p=0.001), thalassemia status (p=0.02), type of treatment (p=0.02) and anaemia at 32 weeks gestation (p<0.001) were significant associated factors. Finally, from the multivariate analysis, the significant factors associated with anaemia among pregnant women at 36 weeks gestation were Hb upon first booking (p=0.006), types of iron supplement given (p=0.005) and anaemia at 32 weeks gestation (p<0.001), as shown in Table 2.

Table 2. Significant factors associated with anaemia among pregnant women at 36 weeks gestation

Variables	B	Sig.	OR	95% C.I.for EXP(B)	
				Lower	Upper
Hb Upon Booking	-0.380	0.006	0.684	0.522	0.896
Oral + Parenteral Iron	1.061	0.005	2.889	1.370	6.089
Hb at 32 weeks gestation	2.414	<0.001	11.178	4.533	27.565
Constant	-0.012	0.994	0.988		

Note: B = Beta Coefficient, SE = Standard Error, OR – Odd Ratio, CI = Confidence Interval, * p<0.05

Conclusion
Most of the anaemia among pregnant women resolved by 36 weeks gestation. However, there were those pregnant women who were still anaemic by that time and therefore, healthcare providers should address the associated factors in order to improve the health outcomes.

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FHSMOP12/103 : An In-Depth Analysis Of Complaints In Primary Healthcare Settings: A Mixed-Methods Study In A Southern Johor District

Muhammad Alimin Bin Mat Reffien[1], Muhamad Farhan Bin Ab Razak[1], MohdKhairul Anwar Bin Kamdi[1], Haidar Rizal Bin Toha[1], Norli Binti Rosli[1], Shahraniza Binti Bahari[1], Ainulbariah Binti Abd Wahid[1]
[1] Johor Bahru District Health Office, Jalan Abdul Samad, Kolam Ayer, 80100 Johor Bahru, Johor, Malaysia
Corresponding author's email:ainulbariah@gmail.com

Summary
This study focuses on the utilization of a complaint management system in Malaysia to analyse patient complaints received and identify associated factors. A total of 223 cases with 315 complaint issues were investigated. Complaints were categorized into clinical, management, and relationship domains, with relationship issues being the most common. Complex cases were significantly associated with complaints directed at healthcare professionals. This contradicted previous studies that highlighted clinical complaints in hospital settings. Complex cases required more time and attention due to their multifaceted nature. Implementing standardized data collection and refining taxonomies are crucial for leveraging complaint data to improve care quality.

Keywords
Complaint management system, patient complaints, associated factor relationship issues, complex cases

Introduction
A fundamental aspect of a resilient healthcare system lies in its unwavering commitment to enhancing the quality of care provided (1). Patient and family complaints serve as invaluable means to identify quality concerns within healthcare institutions (2). Despite the potential value of patient complaints in improving quality, their effectiveness is often hampered by isolated handling, complexity, and the challenges involved in identifying improvement strategies and target

audiences (3). The objective of this study is to describe, categorize, and identify factors associated with the complexity of complaints received through *Sistem Pengurusan Aduan Awam (*SiSPAA).

Materials and Methods

This research employs a combination of qualitative and quantitative approaches. A retrospective design is employed to examine patient complaints directed to primary healthcare clinics in the Johor Bahru District Health Office (PKDJB) and reported in the online SiSPAA platform, spanning from January 2018 to July 2022. To analyse the complaints, a content analysis approach based on Zhang and Wildermuth's six-step approach (4) was adapted and applied. Reader et al.'s taxonomy (5) was utilized as a framework to label each issue and its corresponding subcategory, providing a structured analysis. Descriptive statistics were employed to present the content and frequencies of the complaints, while a Pearson's Chi-Square test was used to examine relationships and significant differences. All quantitative data were analysed using SPSS version 26.0.

Results and Discussion

A total of 223 cases were investigated, revealing 315 complaint issues. These complaint issues were categorized into three domains of the patient complaint taxonomy: clinical, management, and relationships. From 2018 to July 2022, the majority of complaint issues were related to relationships, accounting for 44.9% to 63.8% of the total. This was followed by management, accounting for 25.6% to 37.2%, and clinical issues, accounting for 11.6% to 17.9%. Out of the 223 cases, 100 contained a single complaint issue per case (49.3%), while 94 cases had two complaint issues per case (42.2%). The remaining 19 cases had three complaint issues per case (8.5%). Complex cases showed a significant association with complaint issues directed at healthcare professionals (X^2= 59209 (df=1), p<0.001).
The findings of this study contradicted studies conducted by Reader et al. (16%) and Harrison et al. (35%) in which most of the complaint issues were related to clinical complaints relating to treatment, such as delayed diagnosis, misdiagnosis, medication errors and poor examination. This is because the settings of this study were in primary care where relationship and communication issues are predominant as compared to hospital and tertiary care settings. Additionally, it was discovered that complex cases, due to their multi-faceted nature, required more time and attention for resolution.

Table 1: Categorisation of complaint issues using the Reader et al. taxonomy (6) (n=355 issues)

Domain, n (%)	Category, n (%)	Subcategory, n (%)
Relationship, 198 (55.8)	Communication, 37 (10.4) Humaneness/caring, 148 (41.7) Patient rights, 13 (3.7)	Communication breakdown, 33(9.3) Incorrect information, 4 (1.1) Patient-staff dialogue, 0 (0)
Management, 105 (29.6)	Institutional issue, 93 (26.2) Timing and access, 12 (3.4)	Bureaucracy, 47 (13.2) Environment, 23 (6.5) Finance and billing, 3 (0.8)

Clinical, 52 (14.6)	Quality, 35 (9.9) Safety, 17 (4.8)	Examination, 17 (4.8) Patient journey, 5 (1.4) Quality of care, 12 (3.4)

Table 2: Factors associated with complex cases (two or more issues per case) (n=223)

Variable	Single Issue, n (%)	Two or More Issue, n (%)	Total	Chi Sq (df)	p-value
Complainant's gender					
Male	50 (50.0)	50 (50.0)	100	0.033 (1)	0.856
Female	60 (48.8)	63 (51.2)	123		
Primary care settings					
KK	90 (47.6)	99 (52.4)	189	1.447 (1)	0.229
KD/KKOM	20 (58.8)	14 (41.2)	34		
Complaint's made by					
Patient	77 (51.3)	73 (48.7)	150	0.738 (1)	0.390
Family member/others	33 (45.2)	40 (54.8)	73		
Types of complaints					
Directed at healthcare professional	39 (28.7)	97 (71.3)	136	59.209 (1)	<0.001
process/infra/equip/others	71 (81.6)	16 (18.4)	87		

Conclusion

Implementing standardized data collection procedures for patient complaints, along with the use of common terminology, would be a significant stride towards leveraging valuable data to improve the quality of care. However, refinements to existing taxonomies are necessary to effectively tackle the challenges posed by nuanced and intricate complaint data.

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FHSMOP13/136 : Determination Of Pattern In Developing Predictive Analysis For Patient Treatment Cost: A Statistical Approach Towards Machine Learning Mechanism

Mohd Noor Afiq Ramlee[1,2], Amirah Azzeri [1,2*], Mohd Hafiz Jaafar [1,2*], Mohd Iqbal Mohd Noor [3], and Maznah Dahlui [2]

[1] Faculty of Medicine & Health Science, Universiti Sains Islam Malaysia (USIM), Persiaran Ilmu, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia;
[2] Department of Research Development and Innovation, University of Malaya Medical Centre (UMMC), Lembah Pantai, 59100 Kuala Lumpur, Malaysia;
[3] Faculty of Business Management, Universiti Teknologi MARA (UiTM) (Pahang), 27600 Raub, Pahang, Malaysia;
Correspondence author's email: afiqramlee91@raudah.usim.edu.my

Summary
Forecasting patient treatment costs is crucial for healthcare management and policy formulation. This study aims to investigate the relationship between length of stay and outcome and various predictor variables such as age, ethnicity, comorbidity type, and COVID-19 severity. This study used datasets of 4,199 Covid-19 patients with comorbidity at the University Malaya Medical Centre (UMMC) in Kuala Lumpur, Malaysia. We found a positive relationship between length of stay and age, a difference in length of stay between COVID-19 severity groups, and a difference in outcome between COVID-19 severity groups. We also discovered a significant effect of ethnicity on length of stay. These findings inform clinical decision-making, resource allocation, and policymaking for the management and treatment of Covid-19 patients with comorbidity at UMMC.

Keywords
Patient treatment cost; Patient retention duration; Data analytics; hybrid model

Introduction
The cost of patient treatment is a key consideration in healthcare management and policy formulation. However, forecasting these costs is difficult due to nonlinear patterns in the data such as trends, outliers, and heteroscedasticity. Machine learning models require data processing and statistical analysis to identify predictor variables [1, 2]. The COVID-19 pandemic has challenged the global

healthcare system. Understanding factors influencing the length of stay and outcome of COVID-19 patients with comorbidity is critical for improving care and reducing hospital costs. However, few studies have systematically examined this in Malaysia [3].

Materials and Methods

This study used real datasets obtained from secondary data sources to investigate the relationship between various predictor variables. The datasets contained information on patient treatment costs, length of stay, and medical code usage for each treatment case. After data management and cleaning, a total number of 4,199 datasets were included in the study, which represent Covid-19 patients with comorbidity admitted to the University Malaya Medical Centre (UMMC), between January and December 2021. Python software was used for statistical analysis of COVID-19 patient data to identify trends, patterns, and relationships in the data that may not be immediately apparent.

Result and Discussion

The patients' mean age was 48.9 years, with an average length of stay of 10.5 days. On average, patients with hypertension and diabetes are the most common admissions, where they tend to have more complicated procedures. The same goes for older patients as well. Figure 1 indicates that Hypertension and Diabetes were the most common comorbidity cases. We found a positive relationship between length of stay and age, with longer stays for older patients. We also found in Figure 2, differences in length of stay between COVID-19 severity groups, with more severe cases having longer stays. There was a significant relationship between outcome and COVID-19 severity, with more severe cases having a higher risk of death. Age, comorbidity, and COVID-19 severity all had a positive and significant effect on length of stay, indicating that older patients, those with comorbidities, and those with more severe COVID-19 infections tended to stay in the hospital longer.

Table 1: comorbidity ranking based on diagnosis counts.

Comorbidity	Count	Percentage
Hypertension	1,234	25.13%
Diabetes	812	16.53%
Heart disease	672	13.68%
Chronic obstructive pulmonary disease (COPD)	540	11.00%
Cancer	428	8.72%
Renal disease	316	6.43%
Immunocompromised	204	4.15%
Other	102	2.08%
Non-related	603	12.28%

							4,911		100.00%	

Table 2: The correlation matrix for COVID-19 with comorbidity

Age	1	-0.02	-0.04	0.28	0.29	0.19	0.33	-0.12	0.16	0.15
Gender	-0.02	1	-0.01	-0.03	-0.04	-0.01	0.04	-0.02	-0.01	-0.01
Ethnicity	-0.04	-0.01	1	-0.06	-0.07	-0.05	-0.08	0.03	-0.05	-0.05
Comorbidity	0.28	-0.03	-0.06	1	0.99	0.16	0.18	-0.09	0.14	0.13
Comorbidity Type	0.29	-0.04	-0.07	0.99	1	0	17	19	-10	15
Covid-19 Severity	19	-1	-5	16	17	1	55	-37	49	48
Length of Stay	33	4	-8	18	19	55	1	-21	39	38
Outcome	-12	-2	3	-9	-10	-37	-21	1	-34	-33
ICU	16	-1	-5	14	15	49	39	-34	1	99
Ventilation	15	-1	-5	13	14	48	38	-33	99	1

This study found that age, comorbidity, and COVID-19 severity have a positive and significant effect on length of stay. The study suggests that Covid-19 patients with comorbidity require more attention and care from healthcare providers, and that early detection and intervention for COVID-19 infection are critical for reducing the severity of the infection and improving the prognosis of COVID-19 patients with comorbidity while become baseline for data analytics model development. However, this study has limitations such as being based on data from a single center, being an observational study, and not taking into account potential confounding factors or interactions.

Acknowledgement
This research project was funded by the Department of Higher Education, Ministry of Higher Education Malaysia (FRGS/1/2021/SSO/USIM/02/5; FRGS USIM Vote. 50621/2021-2024) and Universiti Sains Islam Malaysia (USIM) Research Grant Scheme (PPPI/FPSK/0121/USIM/16321-2021-2023).

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FHSMOP14/41: Evidence Mapping And Review Of Mitragyna Speciose (Kratom) For Health: A Synthesis Of Qualitative Evidence To Inform Policy

Nor Asiah Muhamad[1], Nur Hasnah Ma'amor[1], 'Izzah 'Athirah Rosli[1], Fatin Norhasny Leman[1], Rimah Melati Abd Ghani[1], Muhammad Radzi Abu Hassan[2]
[1] Sector for Evidence-based Healthcare, National Institutes of Health, Ministry of Health, Malaysia
[2] Office of Director General, Ministry of Health, Malaysia
Corresponding author's email: norasiahdr@gmail.com

Summary

Mitragyna speciose, MS (Kratom) is a tree-like plant that is used for maternity, fatigue and others. However, the used of this plant has been banned in Malaysia. Therefore, a group of researchers were tasked by the Ministry of Health, Malaysia to map and synthesis evidence on the use of Mitragyna speciose to inform policy. Electronic databases namely Pubmed, CENTRAL and EMBASE were searched to identify effect of Kratom (Mitragynia speciose) on health following the specific keywords. The evidence highlights the positive use of Mitragyna speciose in 5 areas; medical purpose, pain relief and tolerance, anxiety, depression and drug use or withdrawal. Our mapping and evidence synthesis will facilitate an inform discussion with policy makers and stake holders regarding Mitragyna speciose to foster the necessary research and resolve the scientific and regulatory issues in Malaysia.

Keywords

Mitragyna speciose, kratom, Malaysia

Introduction

Mitragyna speciose (Kratom) is a tree-like plant indigenous to Southeast Asia. It is used as a traditional alternative to manage drug withdrawal symptoms and to stave off fatigue among population especially in the Southeast Asia. Psychoactive effects of consuming plant material are likely to result from synergistic interactions among many substances, including possible competing agonist and antagonist effects on opioid and other receptors. Due to the easy availability and cheap cost, the use of this product has been widespread in Malaysia. Evidence also suggests Mitragyna speciose is being increasingly used by people in the United States and Europe. However, mitragynine speciose constituents is banned in Malaysia. Therefore, a group of researchers were tasked by the Ministry of Health, Malaysia to map and synthesis evidence on the use of Mitragyna speciose to inform policy.

Materials and Methods

Databases namely Pubmed, CENTRAL and EMBASE were searched to investigate relationship between Kratom (Mitragynia speciose) and health following the specific keywords. Publications reporting clinical trials, observational cohort studies, case- control studies, case-series, meta-analysis, and systematic reviews, focusing on the use of Mitragyna speciose were reviewed in detail for the narrative synthesis of the use, benefit, dose, duration, and adverse event. The process of articles selection was recorded in the Prisma flow diagram.

Results and Discussion

The map highlights the positive use of Mitragyna speciose for (i) medical purpose (such as treating diarrhoea, fever, diabetes, and hypertension) in 2 studies; (2) pain relief and tolerance in 6 studies; (3) anxiety in 5 studies; (4) depression in 5 studies and (5) drug use or withdrawal (including drug dependence, reduce or withdrawal or stop prescription or taking of opioids or heroine and stop sharing of needle injection) in 7 studies.

However, other uses are noted in some studies for energy booster and mood stabilizer. No studies were found on possible drug or other herbal interaction with Mitragyna speciose.

Table 1: Positive used of MS

Positive used of MS	No of study	Country	Prevalence (%)
Medical purposed	2	Malaysia Thailand	17.9 – 44.5
Pain relief and tolerance	6	Malaysia United State (4) Germany	29.0 - 98.7
Anxiety	5	United State (4) German	21.5 – 66.4
Depression	5	United State (3) German Malaysia	
Drug use or withdrawal	7	United State (5) Malaysia (2)	9.9 – 74.9

The kratom use has a long tradition among people in Southeast Asia mainly in rural area for fatigue, religious and others (1). Therefore, MS is widely grown in this region and most of the rural people consume MS in their daily life. This review suggested the positive used of MS in the medical purpose and there is also evidence stated the contradictory concerning the efficacy of MS as a medicine for coughing and diabetes, as a replacement for more dangerous substances or as a means of improving mental and physical functioning (2). However, data for the MS for the medical purpose for patients with comorbidity,

children, elderly, and pregnant mothers are still limited and almost non-existent. This suggests the clinical trials for the safety and efficacy of MS need to be conducted.

Conclusion

Our mapping and evidence synthesis will facilitate an inform discussion with policy makers and stake holders regarding Mitragyna speciose to foster the necessary research and resolve the scientific and regulatory issues in Malaysia.

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FHSMOP15/104 : The Economic Burden Of The COVID-19 Pandemic In The State Of Kuwait

Amrizal Muhammad Nur[1], Syed Mohamed Aljunid[2], Mohammad Almari[1]
[1] Department of Health Policy and Management, College of Public Health, Kuwait University, Kuwait
[2] Department of Community Medicine, International Medical University, Kuala Lumpur, Malaysia
Corresponding author's email: amrizal65@gmail.com

Summary

Estimating the cost of treating COVID-19 infected patients is the fundamental need that will help the clinicians, researchers as well as policymakers and health planners to handle the pandemic with competing priorities. The main aim of this study is to estimate the provider's cost, patients' cost (home and institutional quarantine cost) and the total economic burden of COVID-19 for patients with PCR positive in Kuwait. A step-down approach was done to estimate the healthcare provider cost per patient. The costing data from a General Hospital were used to estimate the national economic burden of COVID-19 for the whole country. Sensitivity analysis was carried out by varying the prevalence and economic burden value to obtain the worst-case scenario and best-case scenario. The total annual cost of care for COVID-19 patients in Kuwait was estimated at KD 147.4 (USD 488.5) million, equivalent to 5.5% of the Ministry of Health's annual budget in 2021. The national economic burden estimates based on the best and the worst-case scenario range from KD 73.6 (USD 244.2) million to KD 221.0 (USD 732.7) million.

Keywords

Keywords: COVID-19, Coronavirus, Economic burden, Provider's costs, Patient's cost

Introduction

On March 11, 2020, the World Health Organization (WHO) declared COVID-19 as a pandemic. Since then, the disease has been spreading quickly, affecting more than

5 million people, and resulted in more than 350,000 deaths, which emphasizes the threat it poses to global health (1). Among the GCC countries affected by COVID-19 infections, Kuwait was impacted, with 658,520 cases and 2,563 deaths. A total of 8,214,656 vaccine doses have been administered in Kuwait as reported by WHO on September 30, 2022, (2). From an economic perspective, the spread of COVID-19, the ever-increasing number of patients, and the complications of the disease have imposed high direct medical and indirect costs on patients, the health system and the government (3).

Materials and Methods

This retrospective study identified the cost incurred for treating COVID-19 inpatients admitted to a General Hospital in Kuwait, a designated COVID-19 treatment centre by the Kuwait Government during the pandemic. The study covered patients hospitalized with a primary diagnosis of COVID-19 with PCR positive between 1st February 2021 to 30th April 2021. Systematic random sampling was conducted to select 485 samples from medical record. A step-down approach was done to estimate the healthcare provider cost per patient. Costs were collected from three levels of cost centres namely the overhead cost centres, intermediate cost centres and patient care cost centres using the hospital costing template. Patient cost (loss of productivity due to hospitalization, institutional and home quarantine) was calculated using the human capital approach. The costing data from a General Hospital were used to estimate the national economic burden of COVID-19 for the whole country. Descriptive and sensitivity analyses were employed. All data were analysed using SPSS version 22.0.

Results and Discussion

Out of a total 485 COVID-19 patients included in the study, 54.6% were female, 87% were Kuwaitis, 80.2% were over 40 years, 82.1% were in mild or moderate category and 73.4% were discharged home well. The average length of stay for managing a COVID-19 case was 9.4 days, with a range of 1–57 days, and the average cost per admission was KD 2216 (USD 7,344). Of the total cost, 42.1% was due to physician and nursing services, 20.6% to ICU, and 10.2% to laboratory services. Considering that 9.03% (383,731) of the total population in year 2021 were COVID-19 with positive PCR, the total annual cost of care for COVID-19 patients in Kuwait was estimated at KD 147.4 (USD 488.5) million, equivalent to 5.5% of the Ministry of Health annual budget in 2021. Furthermore, the economic burden of COVID-19 was accounted for around 0.46% of the current Kuwait total GDP (5). The national economic burden estimates based on the best and the worst-case scenario range from KD 73.6 (USD 244.2) million to KD 221.0 (USD 732.7) million. The current finding is lower than a study in Russia in which the socio-economic burden of COVID-19 in the Russian Federation will amount to 4.6 trillion Rubles or 4% of GDP (6). This finding is also lower in the amount and proportion of economic burden to national GDP than a study in the UK that imposes a direct health-related economic burden of £39.6 billion (USD 49.1 billion) (1.73% of GDP) on the UK economy [4]. The reason for the cost differences may be due to differences in sample size, study time period, cost methodology, and composition of sample members.

Table-1: Demographics and other characteristics of COVID-19 Patients

Demographic and Characteristics	No. Cases (N = 485)	Percent (%)
Nationality		
Kuwaiti	422	87.0%
Non-Kuwaiti	63	13.0%
Gender		
Female	265	54.6%
Male	220	45.4%
Age group		
< 20 days	26	5.4
20-39 days	70	14.4
40-59 days	211	43.5
60-79 days	156	32.2
>= 80 days	22	4.5
Discharge Status		
Recovered	356	73.4%
Others	129	26.6%
Severity		
Mild/moderate	398	82.1%
Severe	87	17.9%

Table 2: Components of COVID-19 Patient Treatment Cost

Cost Component	Mean Cost per Patient (KD/USD) ±(SD)	SD	Total Cost All Patient (n=485) (KD/USD)	%
Administration	147 (KD)	134 (KD)	71,479 (KD)	6.7%
	487 (USD)	444 (USD)	236,896 (USD)	
Maintenance	21 (KD)	19 (KD)	10,094 (KD)	0.9%
	70 (USD)	63 (USD)	33,454 (USD)	
Store & Consumable	42 (KD)	38 (KD)	20,325 (KD)	1.9%
	139 (USD)	126(USD)	67,361 (USD)	

CSSD	23 (KD)	21 (KD)	11,186 (KD)	1.0%
	76 (USD)	70 (USD)	37,073 (USD)	
Dietetic and Food	35 (KD)	32 (KD)	17,057 (KD)	1.6%
	116 (USD)	106 (USD)	56,530 (USD)	
Laundry and Linen	20 (KD)	19 (KD)	9,958 (KD)	0.9%
	66 (USD)	63 (USD)	33,003 (USD)	
Drug	121 (KD)	110 (KD)	58,611 (KD)	5.5%
	401 (USD)	365 (USD)	194,249 (USD)	
Radiology	83 (KD)	76 (KD)	40,286 (KD)	3.7%
	275 (USD)	252 (USD)	133,516 (USD)	
Laboratory (III)	225 (KD)	205 (KD)	109,264 (KD)	10.2%
	746 (USD)	679 (USD)	362,123 (USD)	
Physiotherapy	109 (KD)	99 (KD)	52,791 (KD)	4.9%
	348 (USD)	328 (USD)	174,960 (USD)	
ICU (II)	457 (KD)	416 (KD)	221,439 (KD)	20.6%
	1515 (USD)	1379 (USD)	733,893 (USD)	
Physician and Nursing (I)	932 (KD)	849 (KD)	452,154 KD	42.1%
	3,089 (USD)	2,814 (USD)	1,498,529 (USD)	
Average Cost	2,216 (KD)	2,018 (KD)	1,074,644 (KD)	100%
	7,344 (USD)	6,688 (USD)	3,561,585 (USD)	

Notes:

(I) The highest component cost

(II) The second highest component cost

(III) The third highest component cost
CSSD = Central Sterile Supply Department
ICU = Intensive Care Unit

SD = Standard Deviation

KD = Kuwaiti Dinar, USD = US Dollar

Table 3: Economic burden of COVID-19 Pandemic with positive PCR in the State of Kuwait 2021

Variables	Base Scenario	Best Scenario	Worse Scenario
Number of COVID-19 cases	14,518	7,259	21,777

admitted in hospital			
Number of COVID-19 cases (home quarantine)	365,285	182,643	547,928
Number of COVID-19 cases (Institutional quarantine)	3,928	1,964	5,892
	383,731	191,866	575,597
A.Provider Cost (Hospital + Field Hospital)			
A.1. Hospital Cost (Admitted in Hospital)	32,171,888 (KD), 106,620,192 (USD)	16,085,944 (KD) 53,310,096 (USD)	48,257,832 (KD) 159,930,288 (USD)
A.2. Institutional quarantine cost (Field hospital)	5,031,768 (KD), 16,676,324 (USD)	2,515,884 (KD) 8,338,162 (USD)	7,547,652 (KD) 25,014,486 (USD)
Total Provider Cost A (A1+A2)	37,203,656 (KD), 123,296,516 (USD)	18,601,828 (KD) 61,648,258 (USD)	55,805,484 (KD) 184,944,774 (USD)
B.Patient Cost (Indirect cost)			
B.1. Loss of productivity cost due to hospitalization	4,168,699 (KD) 13,817,071 (USD)	2,084,349 (KD) 6,908,535 (USD)	6,253,048 (KD) 20,725,606 (USD)
B.2. Loss of productivity cost due to Institutional quarantine	1,127,886 (KD) 3,738,356 (USD)	563,943 (KD) 1,869,178 (USD)	1,691,829 (KD) 5,607,534 (USD)
B.3. Loss of productivity cost due to home quarantine	104,887,935 (KD) 347,649,040 (USD)	52,444,111 (KD) 173,824,996 (USD)	157,332,046 (KD) 521,474,036 (USD)
Total Patient Cost B (B1+B2+B3)	110,184,520 (KD) 365,204,467 (USD)	55,092,403 (KD) 182,602,709 (USD)	165,276,923 (KD) 547,807,176 (USD)
Total Economic Burden for COVID-19 (A+B)	147,388,175 (KD) 488,500,983 (USD)	73,694,231 (KD) 244,250,968 (USD)	221,082,407 (KD) 732,751,951 (USD)
GDP per capita (current USD) 2021 [34]	7,487 (KD) 24,812 (USD)	7,487 (KD) 24,812 (USD)	7,487 (KD) 24,812 (USD)

GDP (current USD) 2021 [34]	31,971,516,505 (KD) 105,960,000,000 (USD)	31,971,516,505 (KD) 105,960,000,000 (USD)	31,971,516,505 (KD) 105,960,000,000 (USD)
Current of health expenditure (% GDP) 2021	5.5	5.5	5.5
MOH Expenditure 2021 [35]	2,505,836,355 (KD) 8,304,842,847 (USD)	2,505,836,355 (KD) 8,304,842,847 (USD)	2,505,836,355 (KD) 8,304,842,847 (USD)
% As MOH expenditure 2021	5.88%	2.94%	8.82%
% As GDP-Kuwait	0.46%	0.23%	0.69%

Conclusion

The findings of this study show that severe COVID-19 in-patients requiring admissions in ICU has a significant impact on resource utilization. Cost of COVID-19 was found to be higher among patients with a higher severity level and in the 40–79 age group. In addition, COVID-19 can result in substantial economic burden for the national healthcare system, ranging from 5.9% to 8.8% of the annual MOH budget and ranging from 0.2% to 0.7% of the Kuwait GDP in 2021.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

FHSMOP16/130 : Prevalence And Factors Associated With The Type And Number Of Mutations Of SARS-Cov-2 Among COVID-19 Patients With Co-Morbidities: Evidence From A Southeast Asian Country

Amirah Azzeri [1], Liyana Azmi [2], Hafiz Jaafar [1]
[1] *Department of Primary Care, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*
[2] *Department of Medical Science II, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*
Corresponding author's email: drhafizjaafar@gmail.com

Summary
The recent pandemic COVID-19 resulted in significant disease and economic burden worldwide. One of the important contributors to the high disease burden is the number of mutations that occur in the patients. To date, information on the number of mutations among patients with comorbidities is scarce. Therefore a study was conducted at one of the gazetted Covid-19 hospitals in Malaysia, Universiti Kebangsaan Malaysia Medical Center (UKMMC) based on data from patients tested and treated in 2021. All patients with reported co-morbidities data were included in the analysis. Various sociodemographic and clinical characteristics data were collected to find the associating factors of the a) type and b) number of mutations. It was found that the number and types of comorbidities have a positive correlation with the number of mutations. In addition, other factors like the age of the patient and clinical severity of COVID-19 were significantly associated with the number of mutations. Findings from this study indicate that patients with comorbidities were highly susceptible to the more severe form of infection as they are at risk of having a higher number of mutations. Therefore, adequate resources should be allocated to treat the patients to ensure optimum outcomes and minimise further complications.

Keywords
SARS-CoV-2; single nucleotide polymorphism; comorbidities

Introduction

Previous literature showed a certain predisposition to infect patients who have diabetes mellitus and hypertension. A recent meta-analysis estimated that patients with diabetes mellitus and hypertension possess an odds ratio (OR) of 2.16-3.29 to develop a severe form of COVID-19 compared to those patients without comorbidities. The OR increases significantly when the patients have both comorbidities. Nevertheless, the association between comorbidities and the a) types and b) number of mutations is less described. Therefore, this study was conducted to understand the associations between the a) type and b) number of mutations of SARS-CoV-2 to diabetes mellitus and hypertension.

Materials and Methods

Our study used the Global Initiative on Sharing Avian Influenza Data (GISAID) database to extract single nucleotide polymorphisms from sequenced patient samples from Universiti Kebangsaan Malaysia Medical Centre (UKMMC).

Sociodemographic characteristics and clinical backgrounds for 102 patients from UKMMC from January 2021 until December 2021 were collected. The sequenced data of the selected patients were extracted from UKM Medical Molecular Biology Institute and matched to the patients based on their patient number and the GISAID identification number. The number and type of mutations were examined for any associations and correlations with the type of comorbidities, specifically for diabetes mellitus and hypertension. Associations between the exposure or independent variables and outcome or dependent variables were also examined in the bivariate analysis. The association between quantitative independent variables and dependent variables was determined using a correlation test. The association between independent variables with two categories and dependent variables was analysed using appropriate bivariate tests. The results of the bivariate analysis were presented with a p-value and the correlation coefficient when appropriate. For bivariate analysis, the level of significance was pre-set at p-value <0.05.

Results and Discussion

There were 102 patients were included in the analysis, with 70 female and 32 male. The mean (SD) age of the patients was 43.4 (20.94). About 29 patients were recorded as having hypertension while 21 patients had diabetes mellitus (DM). In patients with DM, the lowest number of recorded Single Nucleotide Polymorphisms (SNPs) is 26 and the highest was 35. In patients with hypertension, the lowest number of recorded SNPs was 26 and the highest was 37. On the other hand, patients with no known medical illness recorded the lowest number of SNP of 28 and the highest of 37. Bivariate analysis between factors and various comorbidities showed that there were statistically significant associations between DM (p-value <0.001), hypertension (p-value <0.001), dyslipidaemia (p-value <0.001), chronic heart disease (p-value <0.001) and chronic kidney disease (p-value <0.05) with several a) type and b) number of mutations. This study highlights that comorbidity was one of the major contributing factors to the a) type and b) number of mutations of COVID-19 infection. Therefore, sequencing among those with comorbidities is highly recommended to ensure timely treatment and appropriate resources can be channeled for clinical management.

Conclusion

This study indicates that patients with comorbidities were highly susceptible to the more severe form of infection as they are at risk of having a higher number of mutations. Therefore adequate resources should be allocated to treat the patients to ensure optimum outcomes can be obtained and to minimise further complications.

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FHSMOP17/115 : Barriers Accessing Mental Health Utilisation Service Among School-Going Children In Malaysia.

Tengku Amatullah Madeehah T Mohd[1], Syara Shazanna Zulkifli[2], Khadijah Hasanah Abang Abdullah[1], Suhaila Sanip[1], Choo Wan Yuen[3].
[1] Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia.
[2] Department of Psychology, Faculty of Human Development, Universiti Pendidikan Sultan Idris.
[3] Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya.
Corresponding author's email: madeehah@usim.edu.my

Summary
This scoping review determines barriers to accessing mental health among school-going children in Malaysia. This review reported barriers to utilising mental health services in Malaysia, categorised into personal, healthcare, and community barriers. Personal barriers include having low awareness and knowledge on the availability of the current services, negative perception towards oneself financial concerns, and location-wise. Barriers to healthcare were reported as being unable to fully trust the mental health professionals, having limited services and a low number of professionals, and on the community level, stigma, and limited mental health knowledge were barriers to the utilisation of mental health services.

Keywords
Mental health, utilisation, children and adolescent, school-going, barriers

Introduction
Mental health issues among children and adolescents have seen an increasing trend globally. The impact of the COVID-19 pandemic has shed a spotlight and increased the exposure of mental health issues among school-going children and adolescents. Mental health problems among children and adolescents in Malaysia have increased

in previous years. In order to plan for future mental health services, utilisation and barriers to accessing service need to be identified. This study aims to gather studies published on mental health utilisation barriers to accessing health among school-going children in Malaysia.

Materials and Methods

The search strategy for this study was conducted with electronic database searches. Seven electronic databases being used include PubMed, EBSCOHost, Scopus, Ovid, ERA, MyCite and Google Scholar. The keywords included in the systematic search were ("mental health" OR depression OR anxiety) AND ("school-based services" OR "school health services" OR hospital OR "health clinic" OR "health service" OR "school counsellor" OR clinic OR utilisation) AND ("school going children" OR "school children" OR "primary school" OR "secondary school" OR children OR adolescent OR teenager). Inclusion criteria for the studies were quantitative and qualitative studies on mental health utilisation, participants aged 7-17 years old in Malaysia and studies published in English or Malay language. From this systematic search, 2434 papers were retrieved, and the papers were removed for duplicates and screened using their title and abstract. A total of 19 papers were included in this review.

Results and Discussion

The systematic search conducted retrieved 2434 papers. Duplicate papers were removed and screened using their title and abstract by two reviewers. A total of 9 papers describing barriers to mental health utilisation were included in this review.

Common personal barriers reported include poor awareness on the services available among school going children and adolescents (1–5), feeling of shame, embarrassment or guilt and a concern of being judged by people (2,3,6,7). Children and adolescents with mental health problems also report that they want to hide their problems from others (6). In addition, the healthcare setting does not have a good reputation as a few studies reported issues of mistrust of healthcare professionals (4,6). As such, children and adolescents do not feel they can approach healthcare professionals for help. A study at the Child and Adolescent Mental Health Service (CAMHS) reported the lack of a systematic screening among children and limited available resources for mental health services for children and adolescents (8). However, there are already steps taken to screen children and adolescents for mental health problems at school.

Mental health awareness is still lacking among the Malaysian community as a whole. Having a mental health problem is still a stigma in Malaysia and this was reported in the included studies (4–6,9). Being stigmatised and labelled with a mental health problem by the community is a big barrier to patients seeking help. When the family and the community are in denial or not accepting the need to seek help for mental health problems access to mental health services will be difficult. Table 1 shows the results of scoping review.

Conclusion

To strengthen the resilience of the Malaysian mental health system and ensure its

longevity and effectivity to provide services, personal, healthcare system and community barriers need to be addressed. Increase awareness on mental health problems and the importance of seeking help should be instilled among children and adolescents. More mental health professionals as well as trained professionals are required to provide mental health services. Healthcare professional should be trained on mental health in order to gain trust and provide excellent care. Lastly, awareness on mental health problems among the society needs to be increased so that acceptable mental health problems is accepted and treated as any other disease.

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ENVIRONMENTAL AND OCCUPATIONAL HEALTH

OHEHOP01/22 : Strategies For International Statistical Classification Of Diseases And Related Health Problems (ICD) Transitional Impact On Disease Trends And Statistics – A Narrative Review

Erwyn Chin Wei Ooi [1,2], Zaleha Md Isa [2], Mohd Rizal Abdul Manaf [2], Ahmad Soufi Ahmad Fuad[1], Mimi Nurakmal Mustapa [1], Azman Ahmad [1], Nuraidah Mohd Marzuki [1]
[1] *Health Informatics Centre, Planning Division, Ministry of Health Malaysia*
[2] *Department of Public Health Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia*
Corresponding author's email: zms@ppukm.ukm.edu.my

Summary
ICD transition refers to the change in the usage of one version of the ICD to another version of the ICD. The transition significantly affects reporting disease trends and statistics due to the reclassification of certain diseases. Therefore, this review aims to identify effective strategies to tackle the impact of ICD transition

on disease trends and statistics. Multiple online databases were searched to identify relevant literature using relevant keywords, limited to studies authored in English and published up until 2023. Forty-one articles were reviewed and classified into four major themes: bridge-coding study, close clinician and clinical coder cooperation, reporting considerations, and goal-oriented mapping tables emphasizing that tactful and well-planned interventions are needed to prevent inaccurate health data analysis and interpretation.

Keywords
ICD, Strategies, Transition, Impact, Trend

Introduction

ICD is a worldwide classification system to identify and compare disease statistics. ICD-11, the latest revision of the ICD, was adopted in 2019. Malaysia, is legally mandated to use ICD-11 (1). However, new versions of the ICD create significant challenges involving the code structure and disease reclassification based on a new understanding of diseases. This affected the analysis and interpretation of existing and future datasets. Existing literature relating to the ICD-9 to ICD-10 transition has shown the transitional effects on disease trends, and statistics were mixed and disease-specific. Spurious disease reporting will fail to portray accurate health or disease statistics worldwide. Therefore, this study aimed to examine the effective strategies to address changes caused by the ICD transition on health statistics which is based on the following question: What are the strategies to address the impact of ICD transition on disease trends and statistics?

Materials and Methods

We identified materials in the English language from databases like Scopus, Web Of Science, PubMed, Google Scholar, and Dimensions.ai. Keywords such as (impact OR strateg*) AND ICD AND (transit* OR implement*) AND trend* were used. Fifteen potential articles were retrieved in this process. As part of the Screening and Eligibility processes, non-English language articles, review articles and articles deemed unsuitable were excluded. An additional 26 articles were retrieved, bringing to a total of Forty-one articles up until 2023 utilizing the snowballing technique. These articles were reviewed using narrative and thematic analysis.
The research question guided the data extraction process. The data were related to the impacts of the ICD transition on disease trends and strategies. We grouped the extracted data into two major themes impact measurement and implementation strategies along with the emerging four sub-themes bridge coding, close clinician & clinical coder cooperation, reporting considerations, and developing goal-oriented mapping tables.

Results and Discussion

Impact measurement

Defining the impact of the transition is the first step in identifying the areas of impact. This strategy aids national agencies or planners in focusing on finite resources. In this case, we identified four studies using bridge-coding studies to identify the impacted diseases.

Bridge-coding study

Bridge coding study is data coded in two versions of ICD to describe its differences via comparability ratios. It consisted of the number of identified diseases in two versions of the ICD. Previous studies have shown that the effect of ICD transition is disease specific. For example, mortality due to ischemic heart disease and influenza was unchanged, whereas deaths due to pneumonia plummeted in the UK post-transition (2).

Implementation strategies

Next, national agencies can focus on taking steps involving the impacted specialities and stakeholders. The strategies range from the human aspects, reporting and related tools like mapping tables.

Close clinician & clinical coder cooperation

Each version of ICD differs structurally and conceptually, support between clinicians and coders is vital. With ICD-11's capability to capture information of higher specificity, support is essential. Without cooperation by clinicians, coders will assign general ICD codes negatively impacting the coding quality (3).

Reporting considerations

It is not recommended to report trend analyses continuously involving the transition years, due to the differences between each version of ICD . For example, the reclassification of the 'stroke' disease from Chapter IX, of ICD-10, to Chapter 08 of ICD-11 (1). Therefore, strategies like reporting based on fiscal years, utilizing interrupted time series analysis or collation of diseases into a larger meaningful group can be considered (4).

Goal-oriented mapping tables

In ICD transition, mapping tables between versions of ICD are ubiquitous for epidemiological surveillance. However, using readily-available mapping tables as it is may lead to erroneous statistical estimates. Therefore, it is suggested that the performance of mapping tables is scrutinized before its proper use (5).

Conclusion

Recent relevant literature on strategies by relevant clinical groups and national agencies reflects a critical understanding of how they responded to challenges brought about by the ICD transition. Overall, further application of these strategies may be beneficial in line with Malaysia's ICD-11 transition efforts.

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OHEHOP02/28 : Return On Investment Of Cardiovascular Disease Prevention Policies In Malaysia

Muhammad Fikri Azmi [1,2], Azimatun Noor Aizuddin[1], Norfazilah Ahmad[1], Feisul Idzwan Mustapha[3]
[1]Department of Public Health Medicine, Universiti Kebangsaan Malaysia
[2]Disease Control Division, Ministry of Health Malaysia
[3]Perak Health State Department, Ministry of Health Malaysia
Corresponding author's email: dr.mfikri@moh.gov.my

Summary
The World Health Organization (WHO) introduced a list of actions to tackle CVD risk factors, called Best buys. This study determined the return on investments (ROI) of implementing and scaling up four CVD prevention policies in 15 years. The total cost estimated to scale up all policies is projected to be at MYR4.9 billion with ROI estimated to be at MYR7.77. Scaling up prevention policies implementation will require a structured engagement from sectors beyond the health sector and will benefit the whole of government and society.

Keywords
Return on Investment, Best buys, CVD, OneHealth Tool

Introduction
Among the major NCDs, CVD contributes to the highest and leading number of deaths globally and Malaysia Burden of Disease Study stated that death due to CVD was 34.8% in 2014. IHD and stroke are the two highest causes of death in lower-middle-income countries and upper-middle-income countries. Malaysia has implemented the prevention policies by WHO's Best buys since 2005. Despite the government having spent millions of Ringgits to implement the Best buys, economic evaluations to assess their effectiveness or gains to the country are scarce. A systematic concluded that modelling studies are sparse due to lack of expertise and the high cost of the software needed to conduct modelling in economic evaluations (1). This study determined and projected the health gains and returns on investments (ROI) of implementing and scaling up four CVD prevention policies in 15 years.

Materials and Methods

This was a cost-benefit analysis of CVD prevention policies. The baseline level of selected policies and the 15 years target goal was determined by consultation with Public Health experts from the Ministry of Health. Health gains, which are defined as the number of mortality avoided, the incidence of ischaemic heart disease (IHD) and stroke cases avoided, were calculated and projected using OneHealth Tools (OHT). The projection was converted into monetary value (R) with a series of formulas using the human capital approach to estimate the productivity gains. Costs of implementing and scaling up the policies (C) were calculated and projected using WHO Costing Tool. ROI was calculated by dividing R/C.

Results and Discussion

With the current level of implementation, 5361 mortality will be avoided and 7209 IHD cases and 8549 stroke cases will be prevented in 15 years.

The highest number of mortalities avoided due to cardiovascular disease in 15 years by scaling up a single policy is through the salt reduction policy package (Table 1). When all policies are scaled up to the highest level of implementation, the total contribution to the country is projected to be worth MYR 33 billion in 15 years.

The highest value due to avoided exit in the workforce is through the implementation of the salt reduction policy where it is projected to contribute MYR 10.9 billion to the country in 15 years.

The highest ROI is from the salt reduction policy which for every MYR 1 spent, the country will generate a return of MYR 21.50 in 15 years (Table 2).

Policy	Mortality Avoided (D)	IHD Avoided (S_{IHD})	Strokes Avoided (S_{Stroke})	Healthy Life years gain (HLY)
Current level	5361	7209	8549	59391
Scale up All policies only	67933	76660	125987	739100
Scale up Salt reduction only	32199	33831	61612	146100
Scale up Tobacco control only	8332	11260	13330	92900
Scale up Physical activity awareness only	2658	5084	3413	29154
Scale up Prevention of hazardous alcohol use only	377	743	478	5054

Policy	Costs (MYR)	Productivity Gains (MYR)	ROI (MYR)
All Policies	4,924,098,265	38,262,107,289	7.77

Salt reduction	626,020,318	13,478,222,601	21.5
Tobacco control	1,396,917,572	4,649,603,782	3.33
Physical activity awareness	561,432,593	1,473,967,210	2.63
Prevent hazardous alcohol use	233,141,481	230,791,522	0.99

The salt policy gives the highest ROI likely due to the low level of implementation of salt reduction policy across all nations in the world including Malaysia (2). This study found that the most concerning risk factor in Malaysia is tobacco where the prevalence doesn't differ much from 2011 when it was at 23.1% and the prevalence of smoking is at 21.5% in 2019 (3). As risk factors of CVD are intertwined and affect each other, it is important to scale up the level of all prevention policies simultaneously with emphasis on policy with the highest ROI.

Conclusion

Implementing the intervention packages will require extensive and structured engagement from various other sectors, such as finance, economy, and trade, with the benefits accruing to the entire government and society. It is strongly recommended that these recommendations are implemented in the near future and to strengthen and scale up the policies modelled in this study by enhancing advocacy, coordination, planning and financing for development.

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OHEHOP03/82 : Predictors Of Severe COVID-19 Among Healthcare Workers In Sabah, Malaysia

Lim Kai Joo[1,2], Mohd Fazeli Bin Sazali[3], Michelle Goroh[1], Abraham Chin Zefong[1], Marilyn Charlene Montini Maluda[1], Richard Avoi[3], Valentine Japulee Gantul[1]
[1]Sabah State Health Department, Ministry of Health Malaysia, Kota Kinabalu, Sabah
[2]Penampang District Health Office, Sabah State Health Department, Ministry of Health Malaysia
[3]Department of Public Health Medicine, Faculty of Medicine and Health Sciences, University Malaysia Sabah, Kota Kinabalu, Sabah
Corresponding author's email: limkaijoo@moh.gov.my

Summary
Healthcare workers (HCWs) is the high-risk group for COVID-19 infection. However, evidence of the disease burden on severe COVID-19 infection among HCWs is limited. Therefore, this article aims to describe the prevalence of severe COVID-19 disease among HCWs in Sabah and to determine the factors associated with severe COVID-19 infection. A retrospective cross-sectional study was carried out by assessing the data of COVID-19-infected HCWs in Sabah from 1st March 2021 until 30th September 2021. Logistic regression analysis was used in this study. Results showed that 3040 HCWs were diagnosed with COVID-19 from 1st March 2021 until 30th September 2021. Of the 3040 HCWs, 2948 (97.0%) HCWs were mild, whereas 92 (3.0%) were severe. The multivariate logistic regression model showed that severe COVID-19 among HCWs in Sabah was associated with those do not receive any COVID-19 vaccination (aOR 6.061, 95% CI 3.408 – 10.780), underlying co-morbidity (aOR 3.335, 95% CI 2.183 – 5.096), and female (aOR 1.833, 95% CI 1.090 – 3.081). In conclusion, HCWs should strictly adhere to preventive measures, including vaccination, personal protective equipment, and early referral to a physician upon identifying severe COVID-19 infection.

Keywords
Severe COVID-19, Coronavirus Disease 2019, Healthcare worker, Predictors, Factors

Introduction
Since the pandemic of coronavirus disease 2019 (COVID-19) was declared by World Health Organization (WHO) on 11th March 2020, the healthcare system has been severely impacted. All healthcare workers (HCWs) must work to face the pandemic, even during the national lockdown. HCWs are also often considered a high-risk population for acquiring the infection as this population has frequent contact with COVID-19 patients and the risky working environment, such as treating patients in the indoor setting [1]. The previous report from the Italian health authority stated that 10.7% of overall COVID-19 cases were contributed by HCWs, with a rising number of deaths among medical doctors, nurses, nurse aides, and dentists [2]. A cohort study in the United Kingdom (UK) found that the essential workers, including HCWs, the risk of acquiring severe COVID-19 infection seven times greater compared to the non-essential workers (RR 7.43, 95% CI 5.52 to 10.00) [3]. Hence, it is crucial to study the factors associated with severe COVID-19 disease in HCWs. Therefore, this article aims to describe the prevalence of severe COVID-19 infection among HCWs in Sabah and to determine the factors associated with severe COVID-19 disease.

Materials and Methods
A retrospective cross-sectional study was carried out by assessing the data of COVID-19-infected healthcare workers (HCWs) in Sabah, Malaysia, from 1st March 2021 until 30th September 2021. The study population involved all laboratory-confirmed COVID-19 infection among HCWs working in public healthcare facilities in Sabah. The study was conducted when the COVID-19 vaccine (Pfizer BioNTech©) was available in Malaysia in February 2021. Thus, secondary data of infected HCWs after vaccination was available was collected. Registered infected HCWs represent all occupational categories working in Sabah government health facilities and confirmed by laboratory tests. Confirmed COVID-19 infection among HCWs was

reported by the Occupational Safety and Health (OSH) unit from various government health facilities across Sabah state. The data contain sociodemographic characteristics, clinical characteristics, co-morbidity, occupational categories, COVID-19 patient work involvement, and probable source of infection. Data in patients' line-listing were extracted in Microsoft Excel format and analysed using SPSS version 22.0 software. Univariate and multivariate logistic regression were used to analyse factors associated with COVID-19 severity. A value of $p < 0.05$ is considered statistically significant.

Results and Discussion

Three thousand forty (3040) healthcare workers (HCWs) were diagnosed with COVID-19 from 1st March 2021 until 30th September 2021.

Table 1: General Characteristics of Confirmed COVID-19 Healthcare Workers in Sabah

Variables	Frequency (n=3040)	Percentage (100 %)
Staging		
Mild	2948	97.0%
Severe	92	3.0%
Age	Mean 35.91, S.D 7.869, min 19, max 60	
Age Group		
40 years and below	2302	75.7%
Above 40 years old	738	24.3%
Gender		
Female	2083	68.5%
Male	957	31.5%
COVID-19 Vaccination		
Not at all	127	4.2%
Incomplete vaccination	92	3.0%
Complete vaccination	2821	92.8%
Co-morbid		
No	2234	73.5%
Yes	806	26.5%
Staff Categories		
Nurses	1271	41.8%
Doctors	256	8.4%
PPP/PPK	527	17.3%
PPKP/PKA	146	4.8%
Pharmacy	87	2.9%
Dental	122	4.0%
Others	631	20.8%
Probably source of infection		
Non-work related	2383	78.4%
Work-related	657	21.6%
COVID-19 Work Involvement		
No	1808	59.5%
Yes	1232	40.5%

*PPP= *Penolong Pegawai Perubatan*, PPK= *Pembantu Perawatan Kesihatan*, PPKP= *Penolong Pegawai Kesihatan Persekitaran*, PKA= *Pembantu Kesihatan Awam*

Table 2: Univariable Logistic Regression Analysis

Predictors	COVID-19 cases, N (row %)		Total	Unadjusted OR (95% CI)	p-value
	Mild	Severe			
COVID-19 Staging	2948 (97.0)	92 (3.0)	3040	-	-
Age*			3040	1.029 (1.004 – 1.055)	0.022
Gender*					
Male	938 (98.0)	19 (2.0)	957	1	
Female	2010 (96.5)	73 (3.5)	2083	1.793 (1.076 – 2.988)	0.025
Staff Categories					
Nurses	1220 (96.0)	51 (4.0)	1271	1	
Doctors	249 (97.3)	7 (2.7)	256	0.672 (0.302 – 1.499)	0.332
PPP/PPK	511 (97.0)	16 (3.0)	527	0.749 (0.423 – 1.326)	0.321
PPKP/PKA	143 (97.9)	3 (2.1)	146	0.502 (0.155 – 1.629)	0.251
Pharmacy	84 (96.6)	3 (3.4)	87	0.854 (0.261 – 2.795)	0.795
Dental	121 (99.2)	1 (0.8)	122	0.198 (0.027 – 1.443)	0.110
Others	620 (98.3)	11 (1.7)	631	0.424 (0.220 – 0.820)	0.011
COVID-19 vaccination*	2751 (97.5)	70 (2.5)	2821	1	
Complete	87 (94.6)	5 (5.4)	92	2.259 (0.889 – 5.736)	0.087
Incomplete	110 (86.6)	17 (13.4)	127	6.074 (3.458 – 10.667)	0.000
Not at all					
Co-morbid*					
No	2190 (98.0)	44 (2.0)	2234	1	
Yes	758 (94.0)	48 (6.0)	806	3.152 (2.076 – 4.784)	0.000
COVID-19 Involvement					
No	1750 (96.8)	58 (3.2)	1808	1	
Yes	1198 (97.2)	34 (2.8)	1232	0.856 (0.557 – 1.316)	0.479
Probably Source					
Non-work related	2311 (97.0)	72 (3.0)	2383	1	
Work-related	637 (97.0)	20 (3.0)	657	1.008 (0.609 – 1.667)	0.976

* p-value ≤ 0.25 and variables included into multivariate logistic regression

Table 3: Multivariable Logistic Regression Model

Predictors	Multivariate Logistic Regression	
	Adjusted OR (aOR) (95% CI)	p-value
Gender*		
Male	1	
Female	1.833 (1.090 – 3.081)	0.022
COVID-19 Vaccination		
Complete	1	
Incomplete	2.254 (0.876 – 5.803)	0.092
Not at all*	6.061 (3.408 – 10.780)	0.000
Co-morbid*		
No	1	
Yes	3.335 (2.183 – 5.096)	0.000
Age	1.014 (0.988 – 1.040)	0.289

* p-value ≤ 0.05 as significant

Severe COVID-19 infection among healthcare workers (HCWs) in Sabah contributed to 92 cases from 3040 total COVID-19 diseases in this study which is 3.0%. The incidence of severe COVID-19 illness among the current study population is lower than in previous studies, with around 5% to 9.9% incidence of severe disease among HCWs, as reported in meta-analyses [4]. Vaccination is one of the essential public health interventions to prevent severe COVID-19 infection. The finding is supported by a previous study that found that receiving at least two doses of vaccination reduces the risk of hospital admission by 93%, 92% for severe COVID-19, and 81% for COVID-19-related deaths [5]. Co-morbidity was also significantly associated with severe COVID-19 infection among HCWs. Previous meta-analyses found that severity is most remarkable in patients with a history of cerebrovascular disease: OR 4.85 (95% CI: 3.11–7.57), cardiovascular disease: OR 4.81 (95% CI: 3.43–6.74) [5].

Conclusion

HCWs should strictly adhere to preventive measures, including vaccination, personal protective equipment, and early referral to a physician upon identifying severe COVID-19 infection. Early screening and aggressive co-morbidity treatment among HCWs are essential for public health practitioners to prevent severe COVID-19 disease.

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OHEHOP04 / 57 : Risk Assessment Of Occupational Factors Associated With Low Back Pain Among Healthcare Workers In Community Health Clinics In Kota Kinabalu District, Sabah, Malaysia: A Prevalence Study

Ahmad Nabeil Alias[1], Shamsul Bahari Shamsudin[1], Mohammad Saffree Jeffree[1]
[1] Department of Public Health Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia
Corresponding author's email: shamsul@ums.edu.my

Summary
Low back pain (LBP) is a preventable occupational hazard that can be burdensome and affect the work performance of healthcare workers. However limited studies have explored this issue in primary care settings. This study aimed to determine the prevalence of low back pain and its associated occupational factors among healthcare workers in community health clinics. The prevalence of LBP was relatively high and associated with multiple occupational factors including body twisting at work, using instrument assistance for heavy object lifting, headache, low mood, and good work support from supervisors or employers. Therefore, it is important to design a specific disease prevention program to protect the healthcare workers, so they will be able to continue providing the best care for the public population.

Keywords
low back pain, risk assessment, primary care

Introduction
Healthcare workers are also at risk of LBP and nurses have been seen to be more vulnerable to LBP than to other medical personnel in a hospital setting. However minimal focus is being given to the staff of community clinics with slightly different daily routine activities. In ergonomic perspective, home or community-targeted health services differ from hospital or institutionalized care as care is given at home which is not built for health care service (1). Therefore, this study aimed to determine the prevalence of low back pain and its associated factors among healthcare workers in community health clinics.

Materials and Methods
A cross-sectional study using stratified random sampling with the type of profession as the strata and the sample size was estimated by using a single proportion formula to be sufficient to address the objective. The probability of having LBP was set as 0.77 (2). We included consented staff with internet access for the online survey. We excluded those with less than one year of work experience, pregnant, history of recent trauma or injury to the back, or under follow-up for back problems. 360 respondents completed the study which started with the self-administration of a validated BACKS tool questionnaire (3) followed by the risk assessment of LBP using Rapid Entire Body Assessment (REBA) with the author observing the respondents at work. Descriptive analysis and then inferential analysis using simple and multiple logistic regression were done. All data were analysed using SPSS version 27.0.

Results and Discussion
The prevalence of LBP among health clinic staff was 71.7% (n = 258). One of the possible reason for community nurses especially is the need to ride motorbikes to go house-by-house providing health services at home and poor road conditions. The posture that deviates significantly and repeatedly from a neutral position poses intensified stress on the joints or spinal discs. Then the associated psychological factors were much related to their emotional problem.

Table 1.Study characteristics and simple logistic regression analysis

Variables	LBP (n=360)		Crude OR (95% CI)	p-value
	Yes(n=258)	No(n=102)		
SOCIODEMOGRAPHIC CHARACTERISTICS				
Age in years, mean (SD)	35.7 (7.6)		0.99(0.96–1.02)	0.49
Gender				
Male	49(19.0%)	24(23.5%)	1	
Female	209(81.0%)	78(76.5%)	1.31(0.76–2.28)	0.34
Profession				
Nurse	119(46.1%)	51(50.0%)	1	
Doctor	44(17.1%)	12(11.8%)	1.05(0.49–2.28)	0.90
Assistant medical officer	27(10.5%)	11(10.8%)	1.57(0.77–3.22)	0.22
Pharmacist	32(12.4%)	12(11.8%)	1.15(0.55–2.40)	0.72
Allied health (lab,x-ray,physio)	22(8.5%)	8(7.8%)	1.18(0.49–2.82)	0.71
Non-clinical worker	14(5.4%)	8(7.8%)	0.75(0.30–1.90)	0.54
Smoking				
No	246(95.3%)	90(88.2%)	1	
Yes	12(4.7%)	12(11.8%)	0.37(0.16–0.84)	0.02*
OCCUPATIONAL CHARACTERISTICS				
Ergonomics training				
No	219(84.9%)	89(87.3%)	1	
Yes	39(15.1%)	13(12.7%)	1.22(0.62 – 2.39)	0.57
Manual handling				
No	158(61.2%)	74(72.5%)	1	
Yes	100(38.8%)	28(27.5%)	1.67(1.01 – 2.76)	0.04*
Body bending				
No	49(19.0%)	41(40.2%)	1	
Yes	209(81.0%)	61(59.8%)	2.87(1.73 – 4.74)	<0.01*
Body twisting				
No	107(41.5%)	71(69.6%)	1	
Yes	151(58.5%)	31(30.4%)	3.23(1.98 –	<0.01*

			5.27)	
Instrument-assisted lifting				
No	193(74.8%)	54(52.9%)	1	
Yes	65(25.2%)	48(47.1%)	2.64(1.63 - 4.26)	<0.01*
REBA SCORE , mean (SD)	5.0 (2.0)		1.19(1.05 - 1.35)	0.01*
PSYCHOLOGICAL CHARACTERISTICS				
Headache				
No	161(62.4%)	94(92.2%)	1	
Yes	97(37.6%)	8(7.8%)	7.08(3.30–15.21)	<0.01*
Stress				
No	179(69.4%)	96(94.1%)	1	
Yes	79(30.6%)	6(5.9%)	7.06(2.97–16.79)	<0.01*
Low mood				
No	194(75.2%)	96(94.1%)	1	
Yes	64(24.8%)	6(5.9%)	5.28(2.21–12.62)	<0.01*
Work support form supervisor				
No	130(50.4%)	43(42.2%)	1	
Yes	128(49.6%)	59(57.8%)	0.72(0.45–1.14)	0.16

Table 2.Multiple logistic regression analysis factors associated low back pain

Variables	Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
Body twisting				
No	1			
Yes	3.23 (1.98 – 5.27)	<0.01	2.91(1.6-5.08)	<0.01*
Instrument assisted heavy lifting				
No	1			
Yes	2.64 (1.63 – 4.26)	<0.01	0.37 (0.21 – 0.63)	<0.01*
Headache				
No	1			
Yes	7.08 (3.30 – 15.21)	<0.01	5.58 (2.52 – 12.39)	<0.01*
Low mood				

No	1			
Yes	5.28 (2.21 – 12.62)	<0.01	3.58 (1.40 – 9.15)	0.01*
Work support				
No	1			
Yes	0.72 (0.45 – 1.14)	0.16	0.46 (0.26 – 0.79)	0.01*

No multicollinearity (VIF : 1.016-1.131) ; Hosmer-Lemeshow , p-value 0.35 ; Classification table 77.2%
Area under ROC : 0.64 ; Sensitivity 58.5%, Specificity 30.4%

Conclusion

The prevalence of LBP was high and associated with multiple factors. Therefore, it is important to design specific disease prevention program to protect the staffs, so they will be able to continue providing the best care for the public population.

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OHEHOP05/79 : Correlation Between Flood Disaster Preparedness And Community Disaster Resilience In Selangor Flood-Prone Areas

Hayati Kadir Shahar [1,2], Rosliza Abdul Manaf [1], Najihah Muhammad [1],
[1] *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
[2] *Malaysian Research Institute on Ageing (MyAgeing), Universiti Putra Malaysia*
Corresponding author's email: hayatik@upm.edu.my

Summary

Flood is the most common disaster in Malaysia. Every year many people, properties, and lives are devastated by its impacts. However, building resilience towards this disaster remains challenging as communities were unprepared for future calamities. This study aims to determine the correlation between flood disaster preparedness and community disaster resilience. It is hoped that this study will provide insights into community disaster preparedness and resilience. Disaster preparedness is the key to building resilient communities in Malaysia.

Keywords
Disaster, Resilience, Community, Flood, Preparedness

Introduction

Malaysia's community preparedness and resilience to flooding disasters remain inadequate and require improvement (1). A study showed that respondents with a moderate level of community resilience were nonetheless vulnerable and unprepared for flood disasters across all dimensions of resilience: maintenance, recovery, and adaptation (2). The Malaysian government has also adopted the Sendai framework 2015-2030 in improving disaster preparedness to "Build Back Better"(3). A community must take an active role in preparing for these inevitable events. Increased preparedness and a resilient community can help to lessen the adverse effect. Thus, this study aimed to determine the correlation between flood preparedness and community resilience to disaster.

Materials and Methods

This cross-sectional study used single-stage cluster sampling with an estimated sample size of 574 based on a formula comparing two means. Independent variables include flood disaster preparedness consisting of three components: knowledge, skills, and preparedness scores. The dependent variables were the community disaster resilience (CDR) score. An adopted and validated self-administered questionnaire was distributed with the help of community leaders. Three districts in Selangor, Petaling, Klang, and Kuala Langat were chosen purposively based on similar experiences with flood disasters. The latest list of flood-prone areas in Selangor was obtained from the Department of Irrigation and Drainage. Each household aged 18 years and above within those clusters was invited. Non-parametric test, Spearman's Rho test, was applied using SPSS version 28.0 as the dependent variable's data was not normally distributed. A significance level of less than 0.05 was statistically significant.

Results and Discussion

Two hundred eighty-two respondents completed the questionnaires with a response rate of 80.57%. Table 1 shows the strength and direction of the significant correlation between continuous variables of knowledge, skills, and flood disaster preparedness with CDR. There was a significant weak positive correlation between skills score (r_s=0.303, p<0.001), preparedness score (r_s=0.125, p=0.036), and CDR score. The strongest positive correlation for the CDR score was skills. However, there was no significant correlation between knowledge and CDR scores, as the p-value was more than 0.05.

The results illustrate how crucial disaster skills and preparedness are in fostering community disaster resilience. Skills were required to effectively anticipate, respond to, and recover from a disaster. Skills and preparedness such as learning first-aid, flood safety plans, and emergency kits such as food, clothing, documents, and medication were essential in surviving disaster. A previous study also found that residents with more public participation and awareness preparedness activities have a higher degree of community resilience assessment (4). Another study revealed that the respondent's knowledge, skills, and preparedness for flood disasters increased from the baseline after health education intervention (p<0.001)

(5). Consequently, increasing community preparedness can result in a community that is better able to recover from disasters, particularly in communities that are frequently impacted by floods. Although knowledge was not statistically significant in this study, many earlier studies have shown that knowledge raises awareness of disaster prevention and mitigation, potentially increasing community resilience.

Table 1. Correlation between Flood Disaster Preparedness and Community Disaster Resilience

Variables	Spearman's Rho Test	p-value
Knowledge	0.111	0.062
Skills	0.303	<0.001
Preparedness	0.125	0.036

Conclusion

This paper examines the correlations between flood disaster knowledge, skills, and preparedness, with community resilience. Adopting flood disaster preparedness, especially skills, and preparedness, positively and significantly correlated with CDR. Further research on disaster preparation and community resilience is needed to design robust disaster preventive systems and policies.

Acknowledgments

A sincere thank you to the supervisory committee, professors, Department of Community Health, Faculty of Medicine and Health Sciences, Research Management Centre, Universiti Putra Malaysia, the Malaysian Research University Network Grant with the project title "Integrating Community-Based Disaster Risk Management Intervention In Developing Resilient Communities" with grant number JPT.S(BPKI)2000/09/01/046(51), as well as to family, colleagues, and everyone who has supported and assisted with this study.

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OHEHOP06/49 : Resilience Status Of Malaysian Government Healthcare Facilities Following The Flood Disaster During The Northeast Monsoon 2022-2023

Mohd Shahrol Abd. Wahil [1], Norlen Mohamed [1], Anis Salwa Kamaruddin [1], Thahirahtul Asma' Zakaria [1], Ahmad Riadz Mazeli [1], Siti Norfadhilah Zainal Abidin [1], Hazlina Yahaya [2], Roslan Mohamed [3]

[1] Sector of Occupational and Environmental Health, Disease Control Division, Ministry of Health Malaysia, Putrajaya, Malaysia

[2] Sector of Disaster, Outbreak, Crisis, and Emergency Management, Disease Control Division, Ministry of Health Malaysia, Putrajaya, Malaysia

[3] Engineering Services Division, Ministry of Health Malaysia, Putrajaya, Malaysia

Corresponding author's email: shahrol.wahil@moh.gov.my

Summary

Flood is the most prevalent natural disaster in Malaysia. It has the potential to harm human life and damage infrastructure. From previous literature, there has been not much information on the recovery duration of healthcare facilities following the flood disaster to date. In our study, we examined the recovery time of flood-damaged healthcare facilities and the distance to alternative facilities that support the functioning of the impacted healthcare facilities. We discovered that the average recovery time for affected healthcare facilities was fairly quick (5.5 days ± 6.1 days) and the average distance to alternative facilities was 8.6 ± 7.3 km.

Keywords

resilience, healthcare, facilities, flood, disaster

Introduction

Flood is a common occurrence in Malaysia during the Northeast Monsoon (1). This natural disaster has the potential to severely damage infrastructure, including the Malaysian Ministry of Health healthcare facilities. Resilience is defined as the ability to anticipate and adapt to changing conditions, as well as to tolerate and recover rapidly from disruptions (2). While healthcare facility resilience is described as the ability to resist, absorb, respond, and adapt to disaster shocks while maintaining their most critical functions (3). In this study, we evaluated the resilience of healthcare facilities with regard to the recovery time for affected healthcare facilities and the distance to alternative facilities in Malaysia during the Northeast Monsoon 2022-2023.

Materials and Methods

The data on affected healthcare facilities by the flood from 18 December 2022 until 24 March 2023 were obtained from the Sector of Occupational and Environmental Health, Malaysian Ministry of Health. This data was initially verified

with the relevant State Health Department. The data was analysed using the Statistical Package for the Social Sciences (SPSS) software, version 25.

Results and Discussion

From a total of 4,188 healthcare facilities (2,893 health and rural clinics, 668 dental clinics, 254 community clinics, 167 district health offices, 161 hospitals, 25 training institutes, 15 state health departments, and 5 public health laboratories), about 200 (4.85%) were affected by floods. The states in which healthcare facilities were affected by flooding included Kelantan (65, 32.5%), Terengganu (55, 27.5%), Johor (46, 23.0%), Sabah (16, 8.0%), Pahang (15, 7.5%), Negeri Sembilan (2, 1.0%), and Sarawak (1, 0.5%). The affected healthcare facilities based on type included a rural clinic (132, 66.0%), a health clinic (40, 20.0%), a dental clinic (17, 8.5%), and a district health office (4, 2.0%). About 101 healthcare facilities were shut down. From this number, about 93 (92.1%) healthcare facilities diverted their operations to other alternative facilities. The average recovery time for affected healthcare was 5.5 ± 6.1 days (Table 1). There is a significant difference in recovery time for affected healthcare facilities between groups in terms of month, state, age of the building, the operation shifted to an alternative facility, status of facility submerged in the flood, status of accessibility, and status of electricity and water supply ($p<0.05$). The minimum, maximum, and mean ± standard deviation (SD) distances from affected healthcare facilities to alternative facilities were 0.2 km, 30.2 km, and 8.6 ± 7.3 km, respectively (Table 2). The findings revealed that the impact of flooding on healthcare facilities during March 2023 was relatively significant and primarily impacted the southern region of Peninsular Malaysia. Healthcare facilities that are more than 50 years old, have been fully/ partially submerged, have no electricity and water supply, have limited road access, and have had operations moved to other facilities have taken longer to recover.

Table 1: Recovery time for affected healthcare facility during Northeast Monsoon.

Parameters	**n (%)**	**Mean ± SD Recovery Time (days) [#]**	**p-value**
Overall	132 (100.0)	5.5 ± 6.1	
Month			
December	72 (54.5)	3.5 ± 3.3	<0.001*
January-February	12 (9.1)	1.6 ± 0.8	
March	48 (36.4)	9.4 ± 7.7	
State			
East Coast Peninsular	75 (56.8)	4.1 ± 4.7	<0.001*
Southern (including Negeri Sembilan)	45 (34.1)	8.9 ± 7.2	
East Malaysia	12 (9.1)	1.6 ± 0.8	
Type of facility			
Clinics	126 (95.5)	5.6 ± 6.1	0.051
Non-clinics [a]	6 (4.5)	1.7 ± 0.5	

Age of building			
More than 50 years	36 (27.3)	6.5 ± 6.2	0.049*
50 years or less	96 (72.7)	5.1 ± 6.0	
Operation diverted to alternative facilities			
Yes	93 (70.5)	6.8 ± 6.7	<0.001*
No	39 (29.5)	2.2 ± 1.9	
Facility submerged in the flood			
Fully/Partially submerged	45 (34.1)	7.1 ± 7.4	0.009*
Minimally submerged	25 (18.9)	5.0 ± 5.1	
Not submerged	62 (47.0)	4.4 ± 5.1	
Accessibility			
Road can only be accessed by boat/helicopter	60 (45.5)	7.1 ± 6.9	<0.001*
Road can only be accessed by heavy vehicle	47 (35.6)	5.4 ± 5.5	
Road can be accessed by light vehicle	25 (18.9)	1.6 ± 1.4	
Status of electricity and water supply			
Electricity and water supply were affected	99 (75.0)	6.7 ± 6.5	<0.001*
Electricity and water supply were not affected	33 (25.0)	1.8 ± 1.7	

[a] Including hospital, district health office and *pintu masuk antarabangsa*
[#] Comparison was performed using non-parametric test
* Significant p-value of less than 0.05

Table 2: Distance between affected healthcare facilities and alternative facilities.

State	n (%)	Minimum	Maximum	Average	SD	Median
Overall	93 (100.0)	0.2	30.2	9.0	7.3	6.9
Kelantan	29 (31.2)	0.7	24.2	7.0	5.5	4.9
Terengganu	14 (15.1)	0.2	30.2	9.3	9.3	6.2
Pahang	3 (3.2)	0.5	24.7	12.4	12.1	12.1
Johor	36 (38.7)	0.6	28.6	9.4	7.5	7.7
Negeri Sembilan	1 (1.1)	-	-	6.0	-	-
Sabah	10 (10.8)	0.7	27.3	11.8	7.2	9.3

Conclusion

The findings revealed that the resilience of government healthcare facilities is ample as demonstrated by the rapid recovery of affected healthcare facilities. A flood mitigation strategy is essential for the current healthcare facilities and flood risk assessment should be addressed prior to the development of new healthcare facilities.

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OHEHOP07/73 : Task Shifting Approach For Chronic Disease Care: Nurse's Lead Hepatitis C Care For Refugees And Asylum Seekers In Malaysia: A Preliminary Program Report

Jarmila Kliescikova[1], Kalyan Velivela[1], Wan Siew Yeoh[2], Biruk Assefa Legese[1], Ramona Pereira[2], Chan Huan Keat[3], Han Yang Chung[4], Rosaida binti Hj Md Said[3], Muhammad Radzi Abu Hassan[3]
[1]Medecins Sans Frontieres (MSF); [2]Klinik Mewah 6; [3]Kementerian Kesihatan Malaysia; [4]Drugs for Neglected Diseases initiative (DNDi);
Corresponding author email: malaysia-medco@oca.msf.org

Summary:
Task shifting via nurses-led screening and management of patients diagnosed with chronic hepatitis C among marginalized communities of refugees and asylum seekers in Penang has a positive uptake from patients. We describe the workflow, challenges during implementation, lessons learned, and preliminary outcomes. In summary, this approach has enabled the clinic to increase patient consultations with the same workforce, while maintaining high patient satisfaction and reducing workload among healthcare workers.

Introduction:
Shortage and maldistribution of healthcare workers have hampered the progress towards achieving universal health coverage and the Sustainable Development Goals. One of the strategies to address this could be through task shifting. This

approach was successfully used in many contexts (e.g. HIV care, chronic diseases etc.) resulting in good patient satisfaction and outcomes(1).
Klinik Mewah 6, a private out-patient clinic in Penang supported by the international medical humanitarian organization Médecins sans Frontières/Doctors Without Borders ("MSF"), is providing primary healthcare services to refugees and asylum seekers in Penang, Malaysia. In collaboration with the Malaysian National Hepatitis Program, it started to offer Hepatitis C care since 2022. Having challenges with the availability of adequate human resources, a 'task shifting' approach was used, based on WHO recommendations and on experiences with similar programs (1,3).

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Materials and methods:

Prior to the implementation, healthcare workers received training from the Ministry of Health of Malaysia (MoH), DNDi (Drugs for Neglected Diseases Initiative)/Hepatitis C PACT (Hepatitis C Partnership for Control and Treatment) and MSF. Adapted MSF task-shifting SOPs (Standard Operating Procedures) were used to guide the staff on the processes. Checklists, job aids, algorithms, role-playing games and specifically designed forms were used to guide the nurse consultations to ensure that the presence of side effects, adherence and complications were evaluated during every visit. Regular case reviews were implemented between doctors and nurses.
This is a descriptive analysis using routine clinic data, data from patient records and qualitative data from patient satisfaction surveys conducted on a regular basis.

Results and discussion:

From August 2022 until March 2023, 620 patients were tested for Hepatitis C, with a positivity rate of 7% (44 tested positive). Twenty-six (26) patients with confirmed chronic hepatitis C were initiated on treatment. By the end of April-2023, one (1) patient was cured, while 9 patients await laboratory results of sustainable virological response (SVR12). All enrolled patients are being followed up, with zero (0) lost to follow-up (LTFU). Trained nurses led on health promotion, testing for hepatitis C, organizing laboratory tests and appointments with doctors, and providing follow-up reviews for uncomplicated patients. Patient reviews, initiation of treatment and prescriptions were done by doctors. Complicated patients were managed by doctors in close collaboration with MoH clinics. Nurses provided 37 out of 168 consultations for a total of 80 hepatitis C positive patients. They were more confident in providing the first consultations (29% first consultations vs 15% (14) follow-up consultations (implemented only by 2023). Task shifting has allowed the clinic to absorb more patients with the same workforce, improving patient satisfaction. Currently, around 10% of overall patient consultations (including family planning and other chronic diseases) are done by nurses, which subsequently decreases patient waiting times and improves the number of patients seen by doctors. During the initial phases, the key challenges were low levels of confidence from nurses to provide consultations requiring continuous mentoring from doctors. Patients had long waiting periods prior to initiation of hepatitis C treatment as a result of the high clinic workload among doctors. With the implementation of nurse lead evaluation, it is expected to reduce the delays in treatment initiation and improve patient satisfaction and outcomes. Continuous training and mentoring,

availability of necessary checklists and algorithms, and efforts to improve staff motivation are key to ensure successful and sustainable task-shifting programs for improved patient outcomes.

Conclusion:
Nurses via task shifting can ease the burden on doctors by leading consultations, in specific for stable patients with hepatitis C, non-communicable diseases and others. Task shifting, if effectively used and implemented, is a feasible approach reducing patient waiting periods and refusals, reducing workload on doctors, and improving patient satisfaction.

Acknowledgements: Medical staff at Klinik Mewah 6 with special gratitude to nursing staff.

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OHEHOP08/17 : Verification Of Self-Reported Smoking Status With Carbon Monoxide Reading And Salivary Cotinine Among Adolescents Who Use Conventional And Electronic Cigarettes In Malaysia

Nur Atikah Abdul Halim[1], Wee Lei Hum[1,2*], Nur Zakiah Mohd Saat[1], Mohamad Haniki Nik Mohamed[3], Swinderjit Jag Singh[4], Siau Ching Sin[1], Chan Caryn Mei Hsien[1]
[1]Health Education Program, Community Health Centre, Faculty of Health Sciences, The National University of Malaysia (UKM), Kuala Lumpur, Malaysia
[2]School of Medicine, Faculty of Health & Medical Sciences, Taylor's University
[3]Kulliyah of Pharmacy, International Islamic of Malaysia (UIA), Kuala Lumpur, Malaysia
[4]National Cancer Society Malaysia (NCSM), Kuala Lumpur, Malaysia
Corresponding author's email: leihum.wee@taylors.edu.my; weeleihum@ukm.edu.my

Summary
This study attempted to validate self-reported electronic cigarette and/or conventional cigarette use through the measurement of exhaled carbon monoxide (CO) and salivary cotinine levels among students. Chi-square was used to assess the correlations between the verification methods. A binary logistic regression and ROC Curve were used to model the relationship between the predictors and salivary

cotinine. 55.9% of respondents were smokers via self-report (32.4% sole conventional cigarette users, 12.9% electronic cigarette users and 10.6% dual users). The mean CO reading was 1.91 ppm. The percentage of self-reported smoking is higher (55.9%) compared to salivary cotinine (47.1%) and exhaled CO reading (16.8%) methods.

Keywords
Smoking, Validation, Salivary Cotinine, Adolescents

Introduction

Most of the smoking prevalence surveys in Malaysia used self-administered questionnaires or self-report as the means of verifying the adolescents' smoking status (1). However, the accuracy of the self-reported method is still questionable as results may be influenced by socially desirable responses. Previous research has examined the validity of the self-reported smoking status of adolescents by employing different methods, including comparisons with cotinine concentration in saliva, urine or serum and carbon monoxide in expiratory air (2). The combination of salivary cotinine and CO expired air is important due to adolescents' smoking habits (experimenting and occasional) where rates of regular smoking are low and this may affect the CO reading (3). Thus, this study focused on the verification of adolescent smoking status using self-report in conjunction with measurements of exhaled carbon monoxide (CO) reading and salivary cotinine concentrations.

Materials and Methods

Data was from a smoking cessation intervention study involving six schools in the Klang Valley, Malaysia. Six-month follow-up data collected from 170 students in the control condition were analysed. The participants answered a self-administered questionnaire. They were then tested by a qualified senior nurse for the CO level based on a standardised protocol in the operating manual of *MicroCO Meter* (4). The participants were then asked to provide a saliva sample to be tested with the *nal von minden Drug-Screen® Saliva Classic Test* (5). The sensitivity and specificity values of different verification values were measured based on salivary cotinine as the gold standard. Chi-square was used to assess the associations between the verification methods. A binary logistic regression and the ROC Curve were employed to model the relationship between the predictors (CO and self-reported smoking status: smoker, non-smoker) and salivary cotinine (positive, negative).

Results and Discussion

The highest sensitivity was measured by self-report (87.5 sensitivity, 67.8 specificity) and the CO expired air showed only 30.0 sensitivity and 95.6 specificity. Salivary cotinine served as the gold standard (Table 1).

Table 1 The sensitivity and specificity values of different verification values

	Sensitivity (%)	**Specificity (%)**	**PPV (%)**	**NPC (%)**
CO measurement	30.0	95.6	85.7	60.6

Self-reported	87.5	67.8	70.7	85.9

Note. The gold standard is salivary cotinine. PPV = positive predictive value. NPC = negative predictive value

A moderate correlation was found between self-reported and salivary cotinine (r = 0.488, p< 0.001). However, only weak correlations were observed between CO expired air measurement with self-reported (r = 0.240, p< 0.01) and salivary cotinine (r = 0.325, p< 0.01). All the verification methods were statistically significant (Table 2).

Table 2 Correlations between the verification methods (contingency coefficients)

	CO measurement	**Salivary Cotinine**	**Self-report**
CO measurement		0.325***	0.240**
Saliva Cotinine	0.325***		0.488***
Self-reported	0.240**	0.488***	

Note. *** p < 0.001. ** p < 0.01

Results from the binary logistic regression indicated that higher risks for a cotinine positive reading were verification of smoking status based on CO reading of ≥4 ppm (OR 0.244, 95% CI 0.051-0.625), and self-report as a smoker (OR 7.055, 95% CI 0.059- 0.356). The ROC curve showed that the biggest area under the curve is self-report (AUC=0.80), followed by CO measurement (AUC= 0.63) (Figure 1).

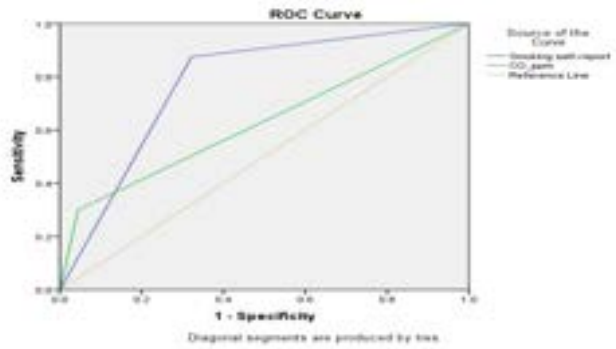

Figure 1: ROC Curve versus gold standard (Salivary Cotinine)

Self-reported smoking status is a valid method to determine smoking status among secondary school students. Biochemical tests may not be practical and cost-effective. CO expired air as a smoking status determinant showed poor validity. These results have positive implications for the validity of existing smoking prevalence surveys in Malaysia (which used self-report as a measure), and for smoking cessation program planning in Malaysia. Teachers could have the assurance of the veracity of adolescents' self-report of their smoking status as long as they practice a non-punitive approach towards students who admit to tobacco use. The validity of the self-report method is important as teachers do not have access to objective tools such as salivary cotinine or CO expired air. Additionally, self-reported methods could detect occasional smokers who cannot be confirmed through biochemical tests due to occasional smoking status. The study suggested

that participants could be prompted that their self-reported might be confirmed with biochemical testing to encourage more accurate responses for outcomes.

Conclusion
The percentage of self-reported smoking is higher compared to biochemical measurements (CO expired air and salivary cotinine) among secondary school students. This gave assurance to teachers the veracity of self-report of their students' smoking status as long as they practice a non-punitive approach towards students who admit to tobacco use.

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OHEHOP09/7 : Dengue Abating Shooter Drone - An Innovative Project To Battle Against Dengue

Noor Aizam MS[1], Intan Azura MD[2], Dr Rusdi AR [2]
[1] *District Health Office Melaka Tengah*
[2] *State Health Office of Melaka*
Corresponding author's email: dr_aizam73@moh.gov.my

Summary
Dengue Abating Shooter Drone can help Public Health Inspectors (PHIs) to identify possible mosquito breeding grounds and carry out abating to prevent the growth of the mosquito population during dengue outbreak. This study aims to look at the effectiveness of every abating activity in the outbreak locality by these drones and at the incidences of dengue in Melaka Tengah district. When using this drone, outbreaks were successfully controlled within 14 days, which complimented with fogging which is the vector control programme can be strengthening to reduce the incidence of dengue cases and outbreaks.

Keywords
Dengue, Drone, Abating

Introduction:

Dengue is one of the most rapidly spreading diseases. The WHO estimates that 390 million dengue virus infections occur annually, of which approximately one quarter result in clinical disease. Malaysia recorded 130,101 cases of Dengue in 2019 and expected to increase in 2024 or 2025; It can directly impact our country's economy. Public Health Inspectors (PHIs) in Melaka Tengah District are facing a problem of identifying certain dengue mosquito breeding sites which are capable of retaining water. There is a need to integrate modern technology in order to quickly and accurately monitor housing conditions. We created a low-cost drone called the ***Dengue Abating Shooter Drone*** that can identify possible mosquito breeding grounds with the assistance of drones and carry out abating to prevent the growth of the mosquito population.

Methodology:
Engagement with universities was made to develop prototypes that could solve Aedes control during the dengue outbreak. To ensure this innovation project's implementation had a good impact, pre- and post-testing was conducted for this innovation in the lab and field. Dengue surveillance data were derived from a web-based reporting system (e-notification and e-dengue, version 2.0). This analysis looked at the effectiveness of every abating activity in the outbreak locality and at the incidences of dengue in Melaka Tengah district. A descriptive study was conducted in two localities selected among the outbreak areas in Melaka. Secondary data from 2012-2021 was analysed. Outbreak and breeding inspection coverage reports at districts and health centres were reviewed, along with interviews with people involved in the vector control programme.

Results and discussions
The prototype of the Dengue Abating Shooter Drone was successful developed. The components used to produce this prototype include a low-cost drone and a drone thrower. Two model drones had been chosen, the Phantom 4 DJI and DJI Air 2s and they had been attached with throwers. Field-test drones were done under operational conditions and demonstrated solutions by Squad Drone-X. Field tests and experimental evaluation showed that our approach is highly effective in the identification and neutralisation of those water bodies conducive to the survival of Aedes mosquitoes. After the implementation of this project for each outbreak, it was found that it saved the cost and time, and coverage of the area being widespread. In these studies, two locality outbreaks of dengue at Pangsapuri Kota Laksamana and Taman Tasik Utama Ayer Keroh were chosen to look at how the drone significantly controlled the outbreak. There were 33 outbreaks occurring on these 2 localities within 10 years. Out of 33 outbreaks, there were 70.4% of the outbreaks were controlled after more than 14 days. After using the 'Abating shooter drone', squad Drone-X had found the major source of breeding in each locality and prevented it by successfully delivering Abate to the affected area. When using this drone, outbreaks were successfully controlled within 14 days, which complimented with fogging. An analysis was done to look at the association between successful abating by drone and outbreak control within 14 days. The study shows a significant association between successful abating by drone and controlling the outbreaks within 14 days (OR=8.75, 95%CI: 1.5-52.2).

Conclusion:
The Dengue Abating Shooter Drone was the first drone in the Ministry Health Malaysia to control dengue by identifying the risk area. The outcome and impact of dengue control are tremendous beneficial. It can be duplicated to the whole country to use to control the Dengue outbreak. Strengthening the vector control programme is important to reduce the incidence of dengue cases and outbreaks, which will ensure the incidence of dengue in Malaysia is continuously controlled.

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OHEHOP10/52 : Horizontal Equity In Healthcare Use In Malaysia Between 2011 And 2019

Adilius Manual[1], Awatef Amer Nordin[1], Jabrullah Ab Hamid[1], Suhana Jawahir[1], Sarah Nurain Mohd Noh[1], Fathullah Iqbal Ab Rahim[1], Nur Elina Abdul Mutalib[1]
[1]Centre for Health Equity Research, Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia
Corresponding author's email: adilius.m@moh.gov.my

Summary
We examined horizontal inequity in overall inpatient services in Malaysia using the National Health and Morbidity Survey. Using age, sex, and self-assessed health as proxies for "need" and income, employment status and education as "non-need", we first present the results of income-related inequality and examined inequity in the probability of inpatient services utilisation using the horizontal inequity index and followed by decomposition analysis. Overall, there is horizontal inequity favouring the rich in overall inpatient care with non-need factors being the dominant factors. Disentangle the contribution of factors, and provide information for decision-makers to re-design policy that reduces the socioeconomic gradient in healthcare utilisation.

Keywords
health services, health inequalities, inpatient, equity, horizontal

Introduction
The principle of horizontal equity refers to "equal treatment for equal medical need" or ETEN, irrespective of other characteristics such as income, race, or place of residence (1,2). Inpatient health care services have increased in Malaysia, while

the persistent income-related inequalities and inequities in the use of inpatient services remain an important public health issue (3). To inform about equity in the use of inpatient services utilisation, we would need to consider underlying need differences. We examined the horizontal inequities and identified the key determinants that can potentially explain such income-related inequalities in inpatient service utilisation.

Materials and Methods

The method used in our analyses follows the methods used by O'Donnell et al. (4) using the National Health and Morbidity Survey (NHMS) conducted in 2011 and 2019. For analysis, we used similar variables to other comparable analyses, including basic socio-demographic attributes and health status. These variables were grouped as non-need and need variables to identify their respective contributions to inequality in the use of inpatient services by income. We first present the results of income-related inequality (measured through the concentration index – CI) and inequity (measured through the horizontal inequity index – HI) in probability of inpatient service utilisation, followed by the decomposition analysis.

Results and Discussion

There is pro-rich inequality in the probability of inpatient utilisation in both surveys, as indicated by positive CIs, 0.013 and 0.044 in 2011 and 2019, respectively (***Table 1***). The need-expected distribution is also pro-rich. This is a result of the fact that "need," as proxied by demographic and morbidity characteristics, is less concentrated among the lower-income groups. Examining by income group, the probability of reporting inpatient care contact among the poorest 20%, was 0.05% lower than would be expected on average given their need, whereas the richest 20 percent of Malaysians reported a probability of such a contact that was 0.08% higher than expected. Using age, sex and self-assessed as proxies for "need" in inpatient utilisation decomposition analysis, the degree of inequalities summarised using the horizontal inequity index indicates their distribution according to need across different socioeconomic groups is lower in 2019 (***Table 2***). The horizontal inequity index denotes the degree of inequalities that exist across different socioeconomic groups after controlling for the need. A zero horizontal inequity index will indicate health service utilisation according to need is proportionately distributed across different socioeconomic groups (4). A positive horizontal inequity index will indicate, there is pro-rich inequality in utilisation after controlling for need factors. The decomposition analysis showed higher inpatient utilisation among the poor due to need factors in both data points, with 3-fold increase in contribution (23.9%) in 2019 compared to 2011 (***Table 2***). When considering the non-need factors, it reverses the CI into more pro-rich with the non-need factors' contribution of 87.3% in 2019. Similar patterns were observed in 2011, although the non-need factor contributed only 4.3% of the inequality. In other words, richer households are more likely to use inpatient care, even after controlling for need.

Conclusion

Overall, non-need factors dominate in explaining the pro-rich inequalities in the use of all inpatient services. Education, for instance, may explain the overall pro-

rich inequalities because it increases the probability of overall inpatient services regardless of income.

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OHEHOP11/154: Radiation Protection Literacy Among Healthcare Workers In Malaysia

Khairul Anuar Abdullah [1], Ahmad Azuhairi Ariffin [3], Anita Abdul Rahman [3], Zuraida Mohamad [2], Ahmad Iqmer Nashriq Mohd Nazan [3], Hayati Kadir [3], Rusdi Abdul Rahman[1]

[1] *Melaka State Health Department, Melaka, Malaysia*
[2] *Negeri Sembilan State Health Department, Negeri Sembilan, Malaysia*
[3] *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
Corresponding author's email: drkhairulanuar@moh.gov.my

Summary

Ionizing radiation can be becoming an occupational hazard that needs protection when in the form of particles which can produce biological changes to cells, tissues or organs. About 19.7% of the worldwide average radiation dose is due to the medical use of radiation and it contributes 98% from all artificial sources. In Malaysia, the number of X-ray examinations had increased by 19.02 per cent from 805,122 (2015) to 958,230 (2017); hence healthcare workers are at potential risk for occupational radiation hazards. Thus, proper training in radiation protection is pertinent to ensure safety and health at work and preserve patient safety.

Keywords

Ionizing Radiation (IR), Radiation Protection Literacy (RPL), Healthcare Worker, Knowledge, Radiation Protection Intervention (RaPI)

Introduction

The prevalence of radiation exposure is increasing in both ionizing and non-ionizing radiation throughout the world. Based on worldwide average radiation exposure, it is about 41.7 % of radiation exposure due to radon, 38.3 % due to other naturally-

occurring radiation sources, 19.7 % due to the medical use of radiation and 0.3 % due to other sources of human-made radiation (1,2,3). Radiation can be classified into ionizing and non-ionizing radiation, whereby ionizing radiation is of public health significance, produced by high-energy particles that can produce ionization or biological changes when introduced into cells, tissues or organs (4). This study aims to evaluate the effectiveness of an educational intervention module named Radiation Protection Intervention (RaPI) module on the level of radiation protection literacy among healthcare workers in Malaysia.

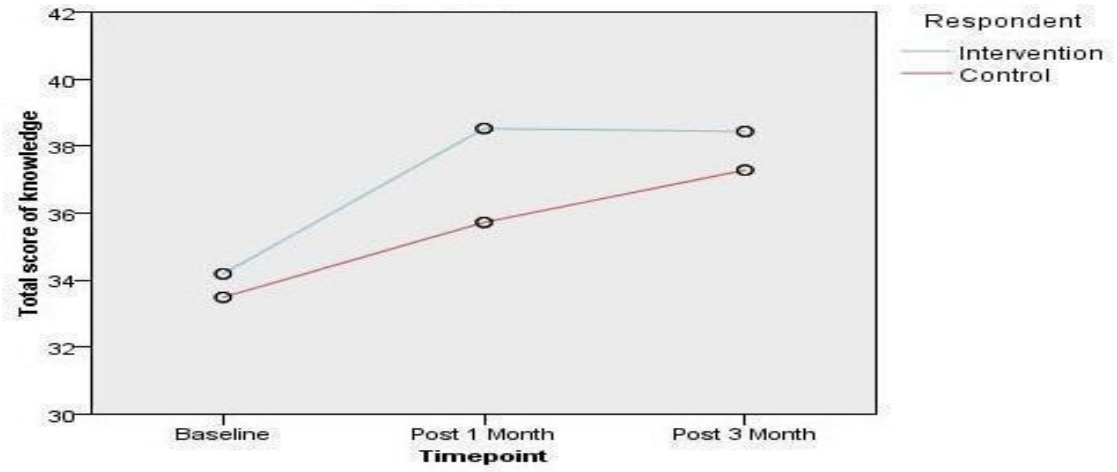
Materials and Methods

There were 158 radiation workers from the Department of Health Negeri Sembilan and the Department of Health Malacca in this single-blind, parallel randomised control trial study. The sample size required was 79 in intervention and 79 in control groups. A questionnaire about knowledge regarding radiation protection was distributed among the respondents at the baseline. An educational intervention module was introduced to the intervention group, and the mean score of knowledge level was analysed at one month and three months post-intervention. The data analysis was carried out using SPSS version 25.0. Data for respondents were analysed as per-protocol analysis and based on the intention-to-treat principle. Friedman tests, and Multivariate analysis Generalized linear model of Generalized Linear Mixed Model (GLMM) was used in the statistical analysis.

Results and Discussion

The total respondent involved in this study were 158 radiation workers, giving a 95.2% response rate at baseline. After three months post-intervention, total of 132 respondent remained in the study program which contributed 83.5% of the compliance rate with an attrition rate of 16.5%. Knowledge score in intervention group was statistically significantly different at the different time points during the intervention, $x2(2) = 37.819$, $p < 0.001$. Knowledge score in the control group was statistically significantly different at the different time points during the intervention, $x2(2) = 8.987$, ($p = 0.011$). Table 1 shows that controlling for these factors, group and time had significant effects on the total score of knowledge. The significant interaction between group and time also shows that the changes in these scores, were different between the groups over time ($F(2, 2782) = 11.068$, $p < 0.001$). It indicates that the intervention did improve radiation workers' knowledge. Table 2 presents the fixed coefficients of the outcome variables studied. The results show that controlling for all other variables, a person in the intervention group was expected to have total knowledge scores of 1.2% respectively, above one in the control group. Figure 1 demonstrates an improvement in the intervention group's total scores of knowledge at baseline and 1-month follow-up post-intervention, but almost static scores at 3 month follow-up post-intervention. There was a rise in total scores of knowledges at baseline, 1-month follow-up post-intervention and three months follow-up post-intervention for the control group.

Table 1: The effect of the Radiation Protection Intervention (RAPI) module on the total score of knowledge among radiation workers



Total score of knowledge	Parameter	F	df1	df2	p-value
Respondent	**Group**	70.461	1	2782	<0.001*
	Time	228.65	2	2782	<0.001*
	Group x Time	11.068	2	2782	<0.001*

Table 2: Fixed coefficient of outcome variables

Variable	Coefficient	Std.Error	t	Sig.	95% CI Lower	95% CI Upper
Knowledge						
Intervention	1.178	0.298	3.951	<0.001*	0.593	1.762
Control						

Figure 1: Plot of total scores of knowledges among respondents, showing the interaction between group and time.

Conclusion

Intervention strategies used in this study have elucidated a successful effect on the total score of knowledge on radiation protection among healthcare workers in Melaka and Negeri Sembilan. The total score of knowledge on radiation protection has shown an improvement from baseline to 1-month post-intervention. At 3 months post-intervention, the total score of knowledge slightly reduces from 1-month post-intervention because all of the respondents were busy as front-liner during the peak of the COVID-19 pandemic in Malaysia. Good practices on radiation protection among respondents were achieved when they had improved their knowledge regarding the importance of radiation protection thru RAPI module

training. As a conclusion, the intervention showed a change in knowledge of radiation protection at one-month follow-up and three months follow-up post-intervention. The outcome of this component is that led to changes in radiation protection practices among radiation workers in the intervention group.

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OHEHOP12/120 : Cost-Effectiveness Of Mobile Targeted Active Case Detection For Early Detection Of Tuberculosis

Yau-Chun Liaw [1,2], Abdul Rahman Ramdzan [1], Richard Avoi [1]
[1]*Department of Public Health Medicine, Faculty of Medicine and Health Sciences, University of Malaysia Sabah, Sabah, Malaysia.*
[2]*Sabah State Health Department (Sector TB/Leprosy), Ministry of Health, Malaysia*
Corresponding author's email: abdul.rahman@ums.edu.my

Summary
A key objective of Malaysia's National Strategic Plan for Tuberculosis Control (2016-2020) is to reach tuberculosis (TB) notification rate of 100 per 100,000 people by the year 2020. It is impossible to meet this objective by relying just on the passive case detection (PCD) screening method. Consequently, implementing different active case detection (ACD) strategies including mobile targeted active case detection (MTACD) method are an excellent way to raise the notification rate. The appropriate planning of allocation budgets and targeted localities or populations is mandatory to improve the yield and effectiveness of MTACD.

Keywords
Cost-effectiveness, Mobile targeted active case detection, Tuberculosis

Introduction
Mycobacterium tuberculosis, which causes TB, is an airborne infectious illness that is extremely contagious and can affect any region of the human body (1). Two crucial aspects of TB prevention and control that are acknowledged for their cost-effectiveness are case detection and treating people who have the disease (2). ACD which was recommended by The World Health Organization (WHO) involved actively searching for individuals with TB who may not have sought medical

attention or been diagnosed yet (3). Early TB case detection and treatment are priorities in order to reduce the disease burden and further transmission (4). In 2016, the state of Sabah adopted a ground-breaking ACD approach that provided a one-stop diagnosis service with an MTACD team using a mobile bus outfitted with digital chest X-rays. Finding more missing patients will help to increase the detection and notification of TB cases. Health economic evaluation provides useful data that can assess the costs and benefits of healthcare interventions (5). The purpose of this study was to determine the cost-effectiveness of the MTACD programme in the early detection of TB cases from the provider's perspective.

Materials and Methods

A cross-sectional study to determine the cost-effectiveness of MTACD as compared to passive case detection (PCD) from the provider's perspective. Data were gathered on the costs and significant dates (TB screening date, first TB symptoms date, TB diagnosis date, and TB treatment starting date) for 904 patients from five Sabah districts in 2022. A combined step-down and activity-based costing (ABC) method was used to estimate provider costs. The effectiveness parameters used were the time taken by the day to detect TB cases. Cost-effectiveness was assessed using cost per TB screening by MTACD and PCD, and the mean of the time taken by the day to detect TB cases.

Results and Discussion

The total cost for a patient to be screened by MTACD was MYR 96.6 (MYR 1=USD 0.22), while the cost by PCD was MYR 43.1. The MTACD generally costs MYR 1,727.1 to detect a case of TB, compared to MYR 586.9 for PCD. However, MTACD used a shorter mean time to detect TB cases (52.7 days) than PCD (98.9 days). Hence, an incremental cost-effectiveness ratio (ICER) of 1.2 was achieved. Despite the higher costs per screening, it indicates the cost-effectiveness of the MTACD when compared to PCD.

Table 1. Patient Characteristics (*n*=904)

Characteristics	Total Patients (*n*=904)	Detection methods		Chi-square (*x2*)	p-Value
		MTACD (*n*=381)	PCD (*n*=523)		
Age groups in years (%)				37.781	<0.001
<45	601 (66.5)	283 (31.3)	318 (35.2)		
45 - 64	231 (25.6)	91 (10.1)	140 (15.5)		
≥65	72 (8.0)	7 (0.8)	65 (7.2)		
Sex (%)				157.262	<0.001
Female	237 (26.2)	18 (2.0)	219 (24.2)		
Male	667 (73.8)	363 (40.2)	304 (33.6)		
Nationality (%)				273.534	<0.001

Malaysian	339 (37.5)	24 (2.7)	315 (34.8)		
Non Malaysian	565 (62.5)	357 (39.5)	208 (23.0)		
Employment status (%)				482.216	<0.001
Employed	424 (46.9)	16 (1.8)	408 (45.1)		
Non employed	480 (53.1)	365 (40.4)	115 (12.7)		
Sputum smear (%)				389.323	<0.001
Negative	402 (44.5)	315 (34.8)	87 (9.6)		
Positive	502 (55.5)	66 (7.3)	436 (48.2)		
CXR results (%)				1.132	0.287
No cavity	792 (87.6)	339 (37.5)	453 (50.1)		
Cavity	112 (12.4)	42 (4.6)	70 (7.7)		

Table 2. Cost analysis of the MTACD and PCD per screening (MYR)

Type of Cost	Costing Methods	MTACD	Percent of total cost	PCD (Mean)	Percent of total cost
Capital cost (MYR)					
Building	**Step-down**			**1.3**	**3.0%**
Executive Bus (MTACD Vehicle)	**Step-down**	**24.2**	**25.1%**		
Asset / Equipment	**Step-down**	**13.9**	**14.4%**	**8.4**	**19.5%**
Recurrent cost (MYR)					
Human resource	**Activity-based costing**	**41.3**	**42.8%**	**15.8**	**36.7%**
Overhead/Utilities	**Step-down**	**0.5**	**0.6%**	**1.7**	**4.0%**
Maintenance	**Step-down**	**15.7**	**16.2%**	**8.7**	**20.1%**
Consumables	**Activity-based costing**	**0.8**	**0.9%**	**7.2**	**16.7%**
Total Costs (MYR)		**96.6**		**43.1**	

Table 3. Health outcome and cost- effectiveness analysis for MTACD and PCD

Detection methods	Mean of time taken to detect TB cases (days)	Cost per screening (MYR)	ICER
MTACD	**52.7**	**96.6**	**1.2**
PCD	**98.9**	**43.1**	

ICER, Incremental cost-effectiveness ratio

Conclusion:
This study is helpful in the context of budget planning for TB programmes since MTACD can detect TB cases earlier and lead to early treatment for successful treatment outcomes.

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OHEHOP13/152 : Strategic Purchasing In The Malaysian Public Healthcare System: Current Status And Challenges To Implementation

Aznida Firzah Abdul Aziz [1,2] Khor Swee Kheng[2]
[1] *Department of Family Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia*
[2] *Southeast Asian Regional Collaboration for Health: Strategic Purchasing, Saw Swee Hock School of Public Health, National University of Singapore.*
Corresponding author's email: draznida@ppukm.ukm.edu.my

Summary
The healthcare reform in Malaysia is based on universal health coverage to ensure efficiency, equity and quality access to healthcare with better health financing. Purchasing healthcare services is one of the core functions of health financing i.e., using allocated funds to obtain goods and services on behalf of identified groups. Strategic purchasing practices guide healthcare providers to achieve efficient and effective outcomes with a set budget, supported by mechanisms and governance to improve purchasing decisions. This study explored the opinion of public healthcare

providers on current purchasing practices and future recommendations to adopt strategic purchasing measures.

Keywords
Strategic purchasing, healthcare financing, health policy, health financing

Introduction

Healthcare financing is an enabler to achieve universal healthcare coverage. The World Health Organisation (WHO) approach towards health financing covers pooling of funds, revenue generation and purchasing of health services(1). Purchasing involves the distribution of combined funds to healthcare providers with the purpose of delivering health services to specific groups or the entire population (2). Health services refer to medicines and vaccines, medical equipment and consumables, healthcare services (i.e. Consultations and surgeries) or healthcare support services (i.e., facilities management, ambulances, laundry). Healthcare services in Malaysia are provided mainly by the Ministry of Health (MOH) as well as other ministries such as the Ministry of Higher Education (MoHE), Ministry of Defence (MoD), Ministry of Home Affairs, Department of Aboriginal Affairs and Social welfare services. For Malaysia to initiate a national health financing scheme, efforts must be in tandem with healthcare providers employing efficient purchasing methods and good governance for quality delivery of health services to the population. In strategic purchasing (SP), the provider aims to achieve efficient and effective purchasing outcomes with a set budget i.e., making most efficient purchasing decisions to ensure better coverage and maximising health system efficiency gains. As healthcare reforms gain momentum with the White Paper on Health tabled in Parliament (3), there is a need to ensure that mechanisms are in place to facilitate health financing and more specifically SP.

Materials and Methods

A focus group discussion (FGD) was conducted among representatives from all Ministries and agencies involved in healthcare service delivery via Zoom. Snowballing method was used to contact the relevant agency or ministry representatives to verify information on procurement practices. The Strategic Purchasing Africa Resource Centre (SPARC) Framework(4) was used as reference to discuss strategic purchasing (SP) features. The FGD group was asked for their opinion if SP practices were currently in place as well as future plans for improvement. We also solicited views on how the health professions could support future implementation of the Procurement Act. The study were conducted under Chatham House rules. All participants were informed and gave consent for recording solely for purpose of analysis. The FGD session was transcribed verbatim and checked for accuracy. Framework analysis was used to analyse findings.

Results and Discussion

The following issues were highlighted in the FGD:

a. The lack of a national health financing scheme challenges the implementation of strategic purchasing practice in the Malaysian healthcare system.

b. The current Malaysian healthcare system procurement practices does not meet SP criteria, nor passive purchasing per se.
- The procurement procedures in place as advocated by the MoF provides some uniform structure to the process.
- There are areas which lack governance i.e., transparent and detailed specification for procurement selection or rejection.
- Overlap in role of purchaser and provider.

c. The lack of data to support strategic purchasing practices.
    - The role of Health Technology Assessment unit (aka as MaHTAS) in supporting SP is vital
    - Recommendation for MaHTAS as an independent entity rather than it being under the MOH.
    - Need to share and consolidate data on product performance (i.e. drugs, devices, high valued technologies as well as TC&M) for purchasers is much needed to help guide decision making.

d. The Health professions would support the Malaysian government Procurement Act to be implemented in the public healthcare facilities.
- The MOH should be more inclusive when purchasing for other healthcare facilities e.g., MoHE, MoD.
- The Act should include details on procurement during emergency situations e.g., pandemic, disaster situations.
- Good governance is vital to increase confidence in strategic purchasing practices.

Conclusion

The Malaysian healthcare system procurement practices is best described as in a transition between passive purchasing with some sectors incorporating strategic purchasing features. Separation in the role of the purchaser and provider as well as good governance are key to increase confidence in strategic purchasing practices.

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POSTER PRESENTATION

EPIDEMIOLOGY

EPIDPP01/10 : Effectiveness Of A School-Based Intervention In Managing Overweight And Obesity Among Adolescents In Malaysia

Lai Wai Kent [1,2], Sherina Mohd Sidik [2], Lekhraj Rampal [2], Gan Wan Ying [2], Siti Irma Fadhilah Ismail [2]
[1] *Institute for Public Health, National Institutes of Health, Shah Alam, Malaysia*
[2] *Universiti Putra Malaysia, Serdang, Malaysia*
Corresponding author's email: laiwaikent@moh.gov.my

Summary
A cluster randomized control trial was conducted to evaluate the effectiveness of a school-based intervention among overweight and obese adolescents in Negeri Sembilan, Malaysia. The intervention was based on Social Cognitive Theory and consisted of five face-to-face sessions over ten weeks. Generalised linear mixed model analysis were used to examine the effectiveness of the intervention at baseline, immediate post-intervention, and 3-month post-intervention, while controlling for covariates. A significant intervention effect was found in reducing body mass index (BMI) and BMI-for-age z-scores (BAZ). There was also significant improvement in breakfast consumption, physical activity and self-efficacy as compared with the control group.

Keywords
School-based intervention, overweight, adolescent, cluster randomised controlled trial, social cognitive theory

Introduction
The Non-Communicable Disease Risk Factor Collaboration reported an anthropometric analysis of 31.5 million children aged 5 to 19 years worldwide and found a tenfold increase in the number of obese children and adolescents from 11 million in 1975 to 124 million in 2016, with additional 213 million who were overweight.[1] In Malaysia, National Health and Morbidity Survey (NHMS) on adolescent health conducted in 2017 reported that about one in three adolescents was overweight and obesity.[2] Taking into consideration the prevalence, health effects, and cost of childhood obesity, there have been considerable benefits in determining effective methods to prevent or manage weight gain in children and adolescents.[3] There is great potential for school-based interventions for prevention of risk factors associated with non-communicable diseases. This study aimed to evaluate the effectiveness of an integrated school-based intervention on anthropometric, behavioural and psychosocial outcomes by conducting a cluster randomised controlled trial.

Materials and Methods
A single blinded, two-arm parallel, cluster randomized control trial was conducted to compare intervention group (IG, n = 200) and wait-list control group (CG, n =

200) among adolescents in Negeri Sembilan, Malaysia. A school-based intervention was developed by conceptualizing Social Cognitive Theory (SCT) and behaviour change techniques. [4] The module was delivered through five face-to-face sessions, with a two-week gap between every session (Figure 1). Each session took about 60 to 90 minutes. Data were collected during baseline(T0), immediate post-intervention(T1) and three months post-intervention(T2). The primary outcomes were body mass index (BMI) and BMI-for-age z-scores (BAZ). Secondary outcomes were measured by referring to breakfast consumption frequency, Physical Activity Questionnaire for Older Children, Healthy Eating and Weight Self-Efficacy scale, and Perceived Physical Activity Self-Efficacy Scale for Adolescents. Generalised Linear Mixed Model analysis was used to examine the effectiveness of the intervention, with the level of significance at $p < 0.05$.

Figure 1. Development and session outlines of the intervention module

Results and Discussion

Overall, the intervention adherence was 80.1%. There was no significant difference between IG and CG in all the outcome measures at baseline. A significant interaction between group and time was observed on all outcome variables. Table 1 shows the GLMM results for the effect of intervention on all outcome variables of participants over time. The BMI and BAZ reduction among the participants in IG were significantly higher as compared to those in CG. In terms of behavioural outcomes, the frequency of breakfast consumption and physical activity scores among the participants in IG were increased significantly compared to CG. In terms of psychosocial outcomes, the healthy eating and weight self-efficacy scores and perceived physical activity self-efficacy scores among the participants in IG were increased significantly compared to CG. The findings of this study are comparable to those studies of similar intervention duration where there was a significant intervention effect on lowering the BMI or BAZ. The findings of this study are also consistent with previous studies applying SCT in the intervention where there was a significant improvement on the frequency of eating breakfast daily and self-efficacy. One of the strengths of the study was the intervention was theory-based where SCT was applied. Besides, GLMM was used to perform robust analysis where

random effects, fixed effects, non-normal distributed data, and repeated measures were assessed.

Table 1. Effect of intervention on outcome variables between groups over time

Outcome variables	Coefficient	t	95% CI	p-value [a]	Effect size (Cohen's d)
BMI					
T1 x IG	-0.793	-8.355	[-0.979, -0.607]	<0.001	
T2 x IG	-0.938	-9.882	[-1.124, -0.752]	<0.001	0.1686
BAZ					
T1 x IG	-0.133	-8.010	[-0.166, -0.101]	<0.001	
T2 x IG	-0.157	-9.451	[-0.190, -0.124]	<0.001	0.2282
Breakfast consumption					
T1 x IG	0.735	3.687	[0.344, 1.126]	<0.001	
T2 x IG	0.590	2.959	[0.199, 0.981]	0.003	0.2910
Physical activity score					
T1 x IG	0.174	3.668	[0.081, 0.268]	<0.001	
T2 x IG	0.184	3.866	[0.091, 0.277]	<0.001	0.2449
Healthy eating and weight self-efficacy					
T1 x IG	2.540	3.876	[1.254, 3.826]	<0.001	
T2 x IG	2.090	3.189	[0.804, 3.376]	0.001	0.2677
Perceived physical activity self-efficacy					
T1 x IG	2.345	3.958	[1.183, 3.507]	<0.001	
T2 x IG	1.625	2.743	[0.463, 2.787]	0.006	0.2008

T0: Baseline; T1: Immediate post-intervention; T2: 3-month post-intervention; IG: Intervention Group; CG: Control Group; Reference group: T0 x CG; T0 x IG; T1 x CG; T2 x CG

[a] Used generalised linear mixed model adjusted for student's sex, age, ethnicity, and respective outcome measures at baseline

Conclusion

Findings from this cluster randomised controlled trial suggested that school-based, theory-driven intervention, delivered through face-to-face sessions may improve behavioural and psychosocial outcomes while reducing BMI and BAZ of the participants. This study also demonstrated the feasibility of conducting an intervention programme in a school setting by healthcare and/or education providers.

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EPIDPP02/23 : The Analysis Of National Health Screening Initiative In Kuala Lumpur And Putrajaya

Waramlah Ramlan[1], Jaysina Ayu Jaafar Siddek[1], Juliena Mohd Zaini[1], Aashvini Prakash Rao[1], Syazana Mohd Nasir[1], Haliza Abdul Manaf[1], Nor'Aishah Abu Bakar [1]
[1]Health Department of Federal Territory Kuala Lumpur and Putrajaya
Corresponding author's email: waramlah@moh.gov.my

Summary

The National Health Screening Initiative (NHSI) is one of the initiatives to promote regular health screening among the community to detect non-communicable diseases (NCD) at an early stage and to prevent premature mortality. The aim of this study is to determine the sociodemographic characteristics, behavioural risk factors, anthropometric measurements, blood test result and mental health screening among the NHSI clients in Kuala Lumpur and Putrajaya. A cross sectional study was conducted using ~~a~~ secondary data extracted from MyVAS system from 16 July 2022 to 16 January 2023. Majority of the findings were in line with the findings in NHMS 2019 study such as the prevalence of high blood sugar, hypertension and mental health status. In the meantime, several findings were found not tallied with NHMS study. For example, hypercholesterolemia was low in NHSI screening due to insufficiency of cholesterol strips for point of care testing and lack of declaration of tobacco and alcohol consumption due to the different method of data collection being applied. In conclusion, sufficient resources are crucial in implementing the NHSI program. Adequate cholesterol strips must be provided with enough human

resources for screening on site and to receive influx of referral to health facilities after the screening in order to ensure the successfulness of NHSI program.

Keywords
National Health Screening Initiative (NHSI), Non-communicable diseases (NCD), MyVAS, Kuala Lumpur, Putrajaya

Introduction

The National Health Screening Initiative (NHSI) is one of the initiatives of the Healthy Malaysia National Agenda (Agenda Nasional Malaysia Sihat) under Core 3: Self-Health Screening. Regular health screening can detect non-communicable diseases (NCD) at an early stage and treatment can be given immediately. Subsequently, one can improve the quality of life and prevent premature mortality due to (NCD) such as diabetes, hypertension, high cholesterol, heart disease and many more. The NHSI program was launched in July 2022 by the Ministry of Health (MOH) to address the low rate of health screening among the public. The aim of this program is to get the public to be more proactive about their health. The key objective is for them to screen and to detect any health risks and then take necessary measures to manage and modify their lifestyles. The empowerment of the people in health care is important to enable them to take appropriate action in disease prevention.

Materials and Methods

This was a cross-sectional study carried out using secondary data obtained from MyVas system that was used to store clients' health screening data. Data extracted were those who had been screened in the healthcare facilities as well as at the community level in Kuala Lumpur and Putrajaya. Data extracted was for the period of six months of the NHSI program which is between 16 July 2022 until 16 January 2023. All 58,222 clients screened for the six months period were included in this study. Duplicated data entry of the same client was not allowed by the system itself. Information on sociodemographic characteristics, behavioural risk factors, anthropometric measurements, blood test result and mental health screening were included in the study. Descriptive analysis was employed. All data were analysed using Microsoft Excel 2019.

Results and Discussion

Majority of clients were less than 40 years old (52.45%), female (56.95%) and Malay (74.97%). About 57.83% or one in two of clients were overweight and obese, in line with NHMS findings (NHMS, 2019). Clients with high blood glucose and blood pressure were 17.53% and 26.29% respectively which were slightly lower than NHMS 2019 findings. However, for blood cholesterol level, only 17.53% of total clients were having hypercholesterolemia as compared to 38.1% in NHMS 2019 study. This is because only selected 21.39% of clients (with BMI >30) have done the cholesterol blood test due to limitation of the cholesterol strips for testing. Hence, a big number of populations were missed from being diagnosed hypercholesterolemia and missed the early intervention. Among those tested, 47.53% have high blood cholesterol, a significantly high among those high risk. Apart from that, only 9.4% of clients admitted their smoking habits. This is not comparable with the NHMS

2019 study that found that the prevalence of smokers among those age 15 and above is 21.3%. Due to lack of staff, the NHSI health screening survey is based on clients' self-report rather than interview. Most of them did not admit their addiction to tobacco product. The same scenario was observed in alcohol consumption. About 2.38% NHSI clients were alcohol drinkers as compared to 11.8% among NHMS 2019 respondents.

For mental health status, 62.78% clients had done the screening. About 22.28% (8145) clients were at risk. Out of this, 971 (2.7%) clients had mild to severe depression and 54 (0.2%) clients had mild to severe anxiety disorder which is comparable with national prevalence of depression 2.3%. All screened patient with positive findings were managed accordingly in term of dietary and physical activity advice, smoking and alcohol cessation advice and/or referral to the nearest health facilities for further investigation, treatment and follow up. The findings of NHSI are shown in Table 1.

Table 1: The characteristics of NHSI clients in Kuala Lumpur and Putrajaya

CHARACTERISTICS		N	%
Age (Mean: 41.75)	**18-40**	30539	52.45%
	40-60	20872	35.85%
	>60	6807	11.68%
Gender	**Male**	25052	43.03%
	Female	33159	56.95%
Ethnicity	**Malay**	43649	74.97%
	Chinese	8784	15.09%
	Indian	3865	6.64%
	Others	1924	3.31%
Body mass index (BMI) (Mean: 27.31)	**Underweight**	2267	3.89%
	Normal Weight	22280	38.27%
	Overweight	20147	34.60%
	Obese	13528	23.23%
Blood glucose level (BGL) (Mean: 6.62)	**High Blood Glucose**	10209	17.53%
	Low Blood Glucose	441	0.76%
	Normal Blood Glucose	47572	81.71%
Blood cholesterol level (BCL) (Mean BCL: 5.27)	**High Blood Cholesterol**	5920	10.17%
	Normal Cholesterol	6535	11.22%
	Not Done	45767	78.61%
Blood pressure (BP)	**At Risk**	11150	19.15%

	High Blood Pressure	15304	26.29%
	Low Blood Pressure	1393	2.39%
	Normal Blood Pressure	30375	52.17%
Smoking status	**No**	52751	90.60%
	Yes	5471	9.40%
Alcohol consumtion	**High Risk**	14	0.02%
	Moderate Risk	52	0.09%
	Low Risk/No consumption	58156	99.89%
Mental health status	**Risk**	8145	14.00%
	No risk	28409	48.79%
	Not done	21668	37.21%
Depression	**Not at Risk/Minimal Depression**	7174	12.32%
	Mild to Moderate Depression	853	1.46%
	Moderately Severe to Severe	118	0.20%
Generalized Anxiety Disorder	**No risk/minimal anxiety**	8091	13.90%
	Mild Anxiety	25	0.04%
	Moderate to Severe Anxiety	29	0.05%

Conclusion

In conclusion, sufficient resources are crucial in implementing the NHSI program. Adequate cholesterol strips must be provided for early detection of hypercholesterolemia and prompt treatment to prevent premature mortality. Human resources also play an important role in this program in order to engage in health screening activities in the community, agencies, and in special events as well as to cater for MyVAS data entry. More professionals are in high demand specially to run the interventions after the screening such as Psychology Officers, Physiotherapist, doctors and paramedics. All these resources are important to ensure the successfulness of NHSI program.

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EPIDPP03/44 : Usage Of Vildagliptin Among Patients With Type 2 Diabetes Mellitus Attending Public Primary Health Care Clinic In Kuala Selangor District, Selangor

Farhani Samat[1], Sulizah Samad[2], Siti Khalimah Rosnan[3], Jasrinjeet Kaur[4], Nur Hidayah Zulkefli[4], Nur Athirah Rosli[1], Fateen Nadhira Ismail[1] Noor Rafizah Aminah Aziz[5].

[1]Klinik Kesihatan Tanjung Karang, Jalan Sungai Kajang, 45500 Tanjung Karang, Selangor
[2]Klinik Kesihatan Kuala Selangor, Jalan Klinik, 45000 Kuala Selangor
[3]Klinik Kesihatan Sungai Tengi Kanan, Jalan Kiai Moid 45500 Tanjung Karang
[4]Pharmacist, Pejabat Kesihatan Daerah Kuala Selangor, Jalan Semarak, 45000 Kuala Selangor
[5]Pejabat Kesihatan Daerah Kuala Selangor, Jalan Semarak, 45000 Kuala Selangor
Corresponding author's email: drsulizah@moh.gov.my

Summary
The clinical efficacy of Vildagliptin use among diabetic patients has been demonstrated in several studies in literature review. Limited data is available on usage of Vildagliptin among type 2 Diabetes Mellitus in suburban area like Kuala Selangor. This study aimed to assess real-life effect of Vildagliptin therapy in reducing Hba1c levels, treatment patterns, and reason for initiating it. Data of patients with vildagliptin were collected retrospectively in seven health clinics in Kuala Selangor District. Study showed patients on Metformin and Vildagliptin therapy showed greater HbA1c reduction. Overall mean Hba1c was improved after vildagliptin initiation post 6 months of therapy.

Keywords
Vildagliptin, DPP-4 inhibitor, usage, Type 2 Diabetes Mellitus, T2DM

Introduction

The prevalence of patients with T2DM are increasing; from 13.4% in 2015 to 18.3% in 2019(1). Concurrently, the HbA1c level findings from the latest National Diabetes Registry are also mainly in the uncontrolled group; with 7.9% to 8.1% respectively (2). Although various studies worldwide demonstrated 0.8% to 1% Hba1c reduction with usage of Vildagliptin, local data audited from several primary care clinics in Kuala Selangor district showed different patterns in real-world patients, to some extent the efficacy of Vildagliptin is conflicting. Limited data is available looking into usage of Vildagliptin among type 2 Diabetes Mellitus in suburban area like Kuala Selangor, in which their main residents are among low socioeconomic and low educational groups. Thus, this study aimed to assess real-life effect of Vildagliptin therapy in reducing Hba1c levels, treatment patterns, and reason for initiating it.

Materials and Methods

A retrospective cross-sectional study was carried out at Kuala Selangor District Health Department, Selangor Malaysia from October 2022 until December 2022. The study population were patients with T2DM on Vildagliptin therapy starting from 2016 until 2021(noted that Vildagliptin was started in 2016 in Kuala Selangor district). Data will be drawn from the Pharmacy Information System (PHIS) and

manual records. The outcome measured was usage of Vildagliptin among patients with T2DM attending public primary healthcare clinics in Kuala Selangor District. Besides that, reasons for starting treatment, treatment patterns, demographic and medical characteristics among patients with T2DM receiving Vildagliptin were assessed together with trend of HbA1c among patients on Vildagliptin therapy pre-post treatment. Data were analysed using the SPSS 23.0 version.

Results and Discussion

In total, 145 patients were on Vildagliptin therapy throughout the study period (2020-2022). Demographic data showed that there were 85 females (58.6%), 60 males (41.4%) with mean age of 61.9 (±10.2SD). Out of 145 diabetic patients studied, 110 (75.9%) had renal impairment (EGFR < 90) with 25 of them having EGFR <40 (17.2%). No significant differences in mean BMI pre Vildagliptin compared to mean BMI post Vildagliptin (pre 29.0 kg/m2, post 28.6 kg/m2). Patients with insulin plus OGLD showed greater HbA1c reduction (mean differences 0.82%). When compared between OGLD combinations or Vildagliptin alone, the group of patients receiving dual therapy (Metformin and Vildagliptin) demonstrated a better HbA1c reduction with a mean difference of 0.73%. Overall mean HbA1c was improved after Vildagliptin initiation post 6 months of therapy; 0.5 (pre-8.4, post 7.9). Reasons for initiation were insulin refusal n=41,28.3%, frequent hypoglycaemia n=6,4.1% and non-compliance n=23,15.9%. Statistically, no significant association was found between demographic, medical background, and reason for Vildagliptin initiation variables and HbA1c reduction.

Table 1: Trend of HbA1c among patients on Vildagliptin therapy pre-post treatment (n = 145). *OGLD includes metformin, sulfonylureas, vildagliptin

	Mean HbA1c (pre)	Mean HbA1c (post 6 month)
Vildagliptin alone (n=21)	8.57 (±2.51SD)	8.07 (n=17, ±2.42SD) 0.57
Vildagliptin + Metformin (n=63)	8.97 (±2.54SD)	8.15 (n=58, ±1.99 SD) 0.82
Vildagliptin + Metformin + SU (n=60)	7.88 (±1.24SD)	7.55 (n=56, ±1.59 SD) 0.33
Insulin + OGLD* (n=78)	9.25 (±2.49SD)	8.52 (n=73, ±2.04SD) 0.73
OGLD* without insulin (n=66)	7.54 (±1.03SD)	7.08 (n=58, ±1.36SD) 0.46

Table 2: Reason for initiation of Vildagliptin (n=145)

		n (%)
Non-compliant	**Yes**	23 (15.9)
	No	122 (84.1)
Frequent hypoglycaemia	**Yes**	6 (4.1)
	No	139 (95.9)

Insulin refusal	**Yes**	41 (28.3)
	No	82 (56.6)
	NA	22 (15.2)

Table 3: The association between sociodemographic and clinical characteristics of patients on Vildagliptin and mean HbA1c difference.

Variables		n (%)	df	p- value
Gender	**Male**	60 (41.4)	2	0.981
	Female	85 (58.6)		
Age	**18-59**	54 (37.2)	2	0.683
	> 60	91 (62.8)		
BMI	**18.5- 24.9**	34 (23.4)		
	25.0- 30.0	64 (44.1)	4	0.735
	>30.0	47 (32.4)		
Ethnicity	**Malay**	109 (75.2)		
	Chinese	16 (11)	4	0.435
	Indian	20 (13.8)		
Duration of DM	**<5**	21 (14.5)		
	5 -10	47 (32.4)	4	0.665
	>10	77 (53.1)		
Polypharmacy	**Yes**	137 (94.5)	2	0.2
	No	8 (5.5)		
Numbers of OGLD	**1**	21 (14.5)		
	2	64 (44.1)	4	0.857
	3	60 (41.4)		
Insulin usage	**Yes**	79 (54.5)	2	0.562
	No	66 (45.5)		
Presence of comorbidities	**Yes**	145(100)	0	
	No	0 (0.0)		
Renal impairment	**Yes**	110 (75.9)	2	0.253
	No	35 (24.1)		
Stroke	**Yes**	1 (0.7)	2	0.685

	No	144 (99.3)		
Heart disease	**Yes**	17 (11.7)	2	0.184
	No	128 (88.3)		
Obesity	**Yes**	50 (34.5)	2	0.797
	No	95 (65.5)		
HPT	**Yes**	137 (94.5)	2	0.939
	No	8 (5.5)		
HPL	**Yes**	139 (95.9)	2	0.115
	No	6 (4.1)		

Conclusion

Usage of Vildagliptin should be emphasized to all patients regardless of their background. We suggest adding Vildagliptin as a second line agent after Metformin as it showed greater HbA1c reduction compared to Vildagliptin alone.

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EPIDPP04/14 : Barriers To Coronavirus Disease 2019 (COVID-19) Vaccine Uptake Among Rural Sik District Residents

S Maria Awaluddin[1], Noorul Emilin Abdul Khalid[2*], Hadzri Zainal[2], Suraya Said[2], Rosmalina Abu Bakar[2]

[1] Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia
[2] Pejabat Kesihatan Daerah Sik, 08200 Sik, Kedah, Malaysia
Corresponding author's email: drnoorul@moh.gov.my

Summary

The reasons for missing the first dose of vaccine at the public health vaccination centre was not known particularly among rural Sik district residents. This was a cross-sectional study based on data from an outreach program. The data was analysed and the finding showed that structural barriers (54.6%) were more prevalent among rural Sik residents than attitude-related barriers (45.4%). Apart from overcoming structural barriers to deliver care to the underserved population in rural areas, outreach teams should be prepared to contend with attitude-related barriers particularly vaccine refusal.

Keywords
COVID-19, outreach program, barriers, structural, attitude-related

Introduction

The vaccination program has been proven as one of the strategies to prevent morbidity and mortality for vaccine-preventable diseases worldwide including COVID-19 (1). However, there are many barriers against the COVID-19 vaccine such as poor socioeconomic factors, a lower educational level, lack of awareness, religious and cultural beliefs (2). The barriers can be grouped into structural barriers which relate to the individual's access to vaccination and attitude-related which concern an individual's beliefs or perceptions (3). Each barrier needs to be addressed and handled adequately for a successful vaccination program, but information on structural or attitude-related barriers was unknown to the rural Sik district residents. This study aimed to determine the proportion of primary reasons for missing the first dose COVID-19 vaccine at the public health centre and to compare structural barriers and attitude-related barriers across the residents' socio-demographic characteristics.

Materials and Methods

This was a cross-sectional study based on the outreach programme which has been conducted from October 2021 to January 2022 due to inadequate COVID-19 immunisation coverage in a mainly rural population. During the outreach programme, respondents were also enquired on their primary reason for missing vaccination at the public health vaccination centre. The respondents' answers to that question were recorded verbatim. Each of the respondent's answers was coded inductively and deductively to generate a list of reasons and further categorised into structural and attitudinal barriers. The outreach team also managed to compile a total of 553 residents' data including their basic socio-demographic information such as age, gender, bed ridden status, chronic illness, average distance to the nearest clinic and transportation status. Data analysis was conducted using the Microsoft Excel and the IBM SPSS Statistics version 25.0 to tabulate the descriptive finding and bivariate analysis. A chi-square test was used to determine the level of significant differences between the two groups based on the p-value of less than 0.05.

Results and Discussion

Table 1 demonstrates primary reasons for missing vaccination compared against the outreach outcomes. In total, structural barriers involved 302 residents (54.6%) while those with attitude-related barriers numbered 251 (45.4%). The outreach programme successfully vaccinated 486 residents (87.6%) to overcome structural and attitude related barriers with the exception of vaccine refusal group whereby only 13.7% of them were successfully vaccinated. Table 2 shows the proportion of structural barriers was significantly higher among female residents, those aged 60 years and above, non-Malaysian citizens, with bed-bound status, those who have a chronic disease and residents who resided more than 10 kilometres from the nearest health clinic. The outreach programme was intended to deliver care to the underserved population residing in rural areas but as found in previous studies,

outreach teams should be prepared to contend with attitude-related barriers too (4,5).

Table 1: The overall status of *Program Immunisasi COVID-19 Kebangsaan* (PICK) outreach in the District of Sik, n=553.

Primary reason for missed 1st dose of COVID-19 vaccine at public health vaccination centre	Overall		Successfully vaccinated (n=486)		Unsuccessful (n=67)	
	n	%	n	%	n	%
Attitude-related barriers						
***Vaccine refusal**	73	13.2	10	13.7	63	86.3
Vaccine hesitancy	110	19.9	110	100	0	0
Afraid of needle	47	8.5	47	100	0	0
Feeling not well	10	1.8	10	100	0	0
Ignorance	11	2.0	11	100	0	0
Structural-related barriers						
Transportation problem	292	52.8	292	100	0	0
Not found due to incomplete address	4	0.7	0	0	4	100
No close relative	3	0.5	3	100	0	0
No smartphone	3	0.5	3	100	0	0

***** *Vaccine refusal refers to the respondent who refused vaccination despite being counselled by the Family Medicine Specialist and signed the Vaccine Refusal Form.*

Table 2: Comparison between demographic factors and barriers for missed the 1st dose of COVID-19 vaccination at public health vaccination centre.

Variables	Barriers for missed vaccination				
	Structural-related, n=302		Attitude-related, n=251		
	n	%	n	%	p-value
Gender					
Male	144	48.8	151	51.2	
Female	154	60.6	100	39.4	0.006
Age group (years)					
less than 60	133	47.0	150	53.0	
60 and above	165	62.0	101	38.0	<0.001
Citizenship					

Yes	268	53.0	238	47.0	
No	30	69.8	13	30.2	0.034
Distance to nearest health clinic					
5 km	75	44.6	93	55.4	
6-10 km	133	51.6	125	48.4	
> 10 km	90	73.2	33	26.8	<0.001
Bed-bound status					
Yes	101	82.8	21	17.2	
No	197	46.1	230	53.9	<0.001
Chronic disease					
Yes	86	62.3	52	37.7	
No	212	51.6	199	48.4	0.028

Conclusion

Structural barriers were more prevalent among rural Sik residents than attitude-related barriers. Apart from overcoming structural barriers to deliver care to the underserved population in rural areas, outreach teams should be prepared to contend with attitude-related barriers too. The Sik district vaccination outreach programme was highly successful in overcoming structural and attitude related barriers, however, only vaccine refusal group remained to be unvaccinated.

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EPIDPP05/24 : Prevalence Of Diarrhoea And Its Treatment Among Children Under Five In Malaysia

Chan Yee Mang[1], Khaw Wan-Fei[1]
[1]*Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia.*
Corresponding author's email: chanyeemang@moh.gov.my

Summary
This study aimed to identify the prevalence and treatment of diarrhoea among children under five in Malaysia using data from the Malaysian National Health and Morbidity Survey: Maternal Child Health. The prevalence of diarrhoea among children in Malaysia in the past two weeks was 3.1%, representing an estimated 75,000 children. It was concerning that only 38.4% of children with diarrhoea were treated with oral rehydration solution (ORS), and 51.1% did not receive either ORS or antibiotics. This highlights the need for educating parents on the importance of taking their children suffering from diarrhoea to healthcare facilities for adequate treatment.

Keywords
Diarrhoea, Children under five, ORS, Antibiotics, Malaysia

Introduction
According to the World Health Organization (WHO), diarrhoea is one of the leading causes of morbidity and mortality among children under five worldwide (1). Diarrhoeal disease is responsible for killing around 525 000 children annually (1). In Malaysia, diarrhoea is one of the top health issues that affect children under five in Malaysia. The existing evidence indicates that there is a prevalence of harmful practices in treating diarrhoea in certain countries where there is a significant burden of diarrhoea-related mortality (2). Providing timely and appropriate treatment for diarrhoea is essential to ensure a positive outcome and prevent complications. In Malaysia, the 4th Edition Paediatric Protocol for Malaysian Hospitals is used to manage diarrhoea in Malaysia (3). Hence, this study aimed to identify the prevalence of diarrhoea and its treatment among children under five in Malaysia.

Materials and Methods
A secondary data analysis was conducted utilising a survey subset of children under five years of age from the Malaysian National Health and Morbidity Survey: Maternal Child Health (NHMS:MCH). NHMS: MCH is a cross-sectional nationally representative population-based survey. Trained research assistants used mobile tablet devices with a questionnaire system application developed to conduct data collection through face-to-face method. The study questionnaire was adapted from the WHO Multiple Indicator Cluster Survey (4). Sociodemographic factors included locality, sex, age group, ethnicity, type of toilet used and main method of disposing garbage. Diarrhoea is defined as three or more loose or watery stools per day, or blood in stool as perceived by mother or caretaker in the last two weeks. Data analyses were conducted using SPSS Statistics 25.0 (IBM Corp., Armonk, NY, U.S.) taking into consideration the complex survey design.

Results and discussion

The prevalence of children who had diarrhoea in the last two weeks was 3.1%, who were estimated to represent 75,000 Malaysian children under five (Table 1). The prevalence has reduced in contrast to NHMS 2016 [4.4% (95% CI: 3.68, 5.33)]. The prevalence is lower in comparison to other Southeast Asian countries. A cross-sectional study conducted in five countries in Southeast Asia (Indonesia, Cambodia, Myanmar, the Philippines 669, and Timor-Leste) reported that prevalence of diarrhoea is known from 8.39% in the Philippines to 18.21% in Indonesia (5). The prevalence of diarrhoea is highest among 12-23 months (4.7%), followed by 0-11 months (3.8%), 24-35 months (2.9%), 36-47 months and 48-59 months (2.2%). The Indian ethnic group has the highest prevalence of diarrhoea (4.1%), whereas the Chinese ethnic group has the lowest (2.7%). The prevalence of children who had diarrhoea is similar regardless of locality, sex, type of toilet used and main method of disposing garbage. Among children who had diarrhoea, 48.9% (95% CI: 43.11, 54.79) received treatment. Only 38.4% were given ORS (95% CI: 33.25, 43.79) and 31.3% were given antibiotics (95% CI: 25.86, 37.23). WHO recommended that diarrhoea should be treated with ORS [1]. A total of 51.1% (95% CI: 45.21, 56.89) children who had diarrhoea did not receive both treatments (Table 2).

Table 1: Prevalence of diarrhoea among children aged 0-59 months in the last two weeks in Malaysia

Sociodemographic and housing sanitation characteristics	Diarrhoea				
	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Malaysia	583	74559	3.1	2.79	3.54
Location					
Urban	416	50920	3.0	2.60	3.50
Rural	167	23638	3.4	2.83	4.20
Sex					
Male	322	39430	3.2	2.80	3.76
Female	261	35128	3.0	2.50	3.69
Age group					
0 - 11 months	98	15258	3.8	2.81	5.13
12 - 23 months	181	22963	4.7	3.78	5.73
24 - 35 months	126	15065	2.9	2.27	3.65
36 - 47 months	97	10824	2.2	1.72	2.90
48 - 59 months	81	10446	2.2	1.66	2.98
Ethnicity					
Malay	452	47397	3.2	2.85	3.56

Chinese	26	8588	2.7	1.67	4.30
Indian	27	4432	4.1	2.38	7.04
Other Bumiputeras	67	9639	3.6	2.61	4.97
Others	10	-	-	-	-
Type of toilet used					
Sanitary toilet	557	71480	3.1	2.77	3.55
Unsanitary toilet	26	3077	3.3	2.07	5.17
Main method disposing garbage					
Sanitary	521	65774	3.2	2.80	3.60
Unsanitary	62	8783	2.9	2.07	4.15

Table 2: Percentage of children aged 0-59 months with diarrhoea in the last two weeks who received ORS and antibiotics treatment (n=583)

Treatment of diarrhoea	Count	Estimated Population	Percentage (%)	95% CI	
				Lower	Upper
Received treatment	303	36369	48.9	43.11	54.79
ORS only	117	13151	17.7	14.25	21.76
Antibiotics only	54	7841	10.6	7.08	15.44
ORS and antibiotics	132	15377	20.7	16.43	25.81
Not receiving ORS and antibiotics treatment	277	37952	51.1	45.21	56.89

Conclusion

The prevalence of diarrhoea among children under five in Malaysia has decreased since 2016. However, it is concerning that less than 40% of children with diarrhoea were treated with ORS. Parents should be educated on the importance of taking their children suffering from diarrhoea to healthcare facilities for adequate treatment.

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EPIDPP06/50 : TB Death In Melaka Tengah 2018-2022 : A Retrospective Causal Comparative Study

Noor Syazwani Shahar[1], Na'eemah Zaini[1], Soh Yih Harng[1]
[1]*Melaka Tengah District Health Office*
Corresponding author's email : wanieffe@gmail.com

Summary
It is essential to determine the factors of direct tuberculosis (TB) death to identify the targeted intervention approach to reduce the mortality due to TB infection in the future. This study aimed to describe the difference in the population profile between direct and indirect TB death, in Melaka Tengah district, Melaka. There was a statistically significant difference in the age and duration of treatment between direct and indirect TB death. The deaths due to TB happened in younger individuals and at the earlier phase of treatment compared to indirect TB deaths.

Keywords
factors, tuberculosis, direct, indirect, death, mortality

Introduction
One of the targets of the End TB Strategy is to reduce the number of TB death to 75% in 2025 compared to 2015 statistics. In Malaysia, a steady increment in the rate of TB death is alarming. There is a 25% increment in the TB mortality rate in Malaysia from 2015 (5.5 per 100,000 populations) to 2021 (7.9 per 100,000 populations). Since the World Health Organization (WHO) defined TB deaths as the number of TB patients who died during treatment, irrespective of the causes[1], most studies have examined the factors of all-cause mortality as a surrogate marker to the attributable causes of TB death. Thus, this study classified TB death into direct and indirect TB death. The direct TB death is interpreted as a death that occurred in conjunction with the diagnosis of TB, and is caused by TB infection. Meanwhile, the indirect TB death is defined as death among TB patients that is not due to TB as the direct cause. Such classification is essential to address the importance in determining the associated factors of both TB deaths, as it may help to identify the targeted intervention approach to reduce the mortality due to TB infection in the future. There were limited studies which described the factors

of TB death, and none of it had explained about the causes of direct TB death. Therefore, this study was carried out to determine the population difference between direct and indirect TB deaths in Melaka Tengah district, Melaka.

Material and Methods

This study is a retrospective causal comparative study which aims to describe the causes of direct TB death in comparison to indirect TB death. The case-based national registry, MyTB was used as a data source. All TB death from 2018 to 2022 which were discussed in the TB mortality audit in PKD Melaka Tengah were included. The direct TB death was compared to indirect TB death as the outcome of interest. The independent variables under investigation include age, gender, citizenship, level of education, number of dependents, working status, status of smoking and comorbidity, period between diagnosis and treatment, treatment period, anatomical location of TB, early sputum smear result, HIV status and status of drug-resistant TB, as suggested by other studies. IBM SPSS version 26 was used to analyse the data up to the multiple logistic regression. The odds ratio was used to determine the effect size. The p-value of ≤ 0.05 was valued as significant.

Results and Discussions

From the analysis, 93 (57.4%) deaths were indirect TB death, and 69 (42.6%) were direct TB death. The multiple logistic regression analysis showed age and duration of treatment were significantly associated with direct TB death, with patients aged 15-24 years old had 6 times higher odds (p=0.014, 95% CI: 1.446- 25.676), patients aged 25-34 years old had 9 times higher odds (p<0.001, 95% CI: 2.834- 34.450) and those aged 35-44 years old had 3 times higher odds (p=0.019, 95% CI: 1.221- 9.065) to die due to TB, and with 1-month increment of treatment duration may reduce the odds of dying directly from TB by 30% (p=0.001, 95% CI: 0.562- 0.872). A study to estimate the TB burden in adolescents and young adults in 2012, estimated 1.78 million young people aged 10-24 years old were infected with TB worldwide[2]. The significant numbers of TB incidence among these age groups reflect the high mortality rate among them. This idea is supported by the theory that young adults are more prone to develop infectious forms of TB as they have more social contacts outside of the household and the age between 12- 24 years old showed a transient increase in the risk of disease progression compared to children and older adults[3]. Besides, retrospective analysis of a 5 year- data in a county in Kenya, revealed 77% (449/585) of the all-cause TB death occurred within 3 months of starting treatment[4], almost similar to this study's findings which showed a significant reduction in the odds of direct TB death with 1-month increment of treatment duration. There were no multicollinearities between variables in the model. The model predicted 15- 20% of the outcome (Cox & Snell R^2= 0.150, Nagelkerke R^2= 0.201). Besides, the model correctly predicted 70% of the outcome (overall percentage of classification table= 69.1%), and the model had a good fit (χ^2= 26.271, p<0.001).

Conclusion

An intervention to ensure compliance and completion of TB treatment especially in young TB patients is suggested to reduce the direct TB death.

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EPIDPP07/48 : Work-Related Stress and Coping Mechanism Among Medical Officers in Penang State

Ainulfadila Abu Hassan Shaari[1], Chiew Wye Lee[1], Noor Farhana Mohd Fathil[1]
[1]Penang Health State Department
Corresponding author's email: ainulfadila@moh.gov.my

Summary
Work-related stress among medical officers is common. Having good coping mechanisms will buffer the stressors. We identified the stressors among primary healthcare medical officers and their coping mechanisms. A cross-sectional study was conducted in 2022 in Penang. *Ujian Gaya Daya Tindak,* adapted from the Coping Scale questionnaire, was used. The three highest stressors were persistent attempts to belittle and undermine work, persistent unjustified criticism, monitoring of work, and shifting the goalposts. Most had moderate to very good coping skills. Medical officers in primary healthcare in Penang had good coping skills despite facing work-related stress.

Keywords
coping mechanism, work-related stress, medical officer

Introduction
Work-related stress is common among healthcare workers. Stress can be a factor in causing mental and physical ailments such as obesity and cardiovascular disease. It can cause dissatisfaction with one's job and even take someone out of work. Psychosocial stressors are, arguably, the most predominant stress factors. These include high job demands, inflexible working hours, poor job control, poor work design and structure, bullying, harassment, and job insecurity. Workplace stress not only affects the worker; it also has adverse effects on company performance. The aims of this study were to investigate factors associated with work stress among medical officers working in district health offices and government primary health care in Penang and to evaluate their coping mechanisms.

Materials and Methods

A descriptive cross-sectional study was conducted among medical officers working in district health offices and government primary health care settings all over Penang State. We used the inventory *Ujian Gaya Daya Tindak (UGDT)* adapted from *Minda Sihat* Module, Ministry of Health Malaysia, 2005, *and the* Coping Scale questionnaire. Respondents were selected by convenient sampling. Confidentiality: particular details were explained. Data collected through the self-administered structured questionnaire were described in mean and percentage.

Results and Discussion

A total of 419 questionnaires were distributed. Of the total, 82 participants consented and submitted their questionnaires. The response rate was 19.5%. There were more female medical officers than male medical officers (71% female and male 29%), with a mean age of 36.6±6.47 years, and more than half were Malays (47; 57%). The mean duration of service in months as a medical officer was 114.2 ±79.2 months. The three highest psychosocial stressors among medical officers were persistent attempts to belittle and undermine work (35.4%), persistent unjustified criticism and monitoring of work (25.6%) and shifting the goalposts (23.2%). For coping mechanisms using *Ujian Gaya Daya Tindak (UGDT),* 50% showed good coping skills, 26.8% very good, 23.2% moderate, and 0% showed bad coping skills.

Table 1: Stressors responses of the medical officers (n=82)

Stressor	Indicator				
	Daily	Now and then	Weekly	Monthly	Never
1. Persistent attempts to belittle and undermine your work	2 (2.43%)	29 (35.37%)	3 (3.66%)	3 (3.66%)	45 (54.88%)
2. Persistent unjustified criticism and monitoring of your work	2 (2.43%)	21 (25.61%)	4 (4.88%)	3 (3.66%)	52 (63.41%)
3. Persistent attempts to humiliate you in front of colleagues	2 (2.43%)	10 (12.19%)	2 (2.43%)	1 (1.22%)	67 (81.71%)
4. Intimidatory use of discipline/competence procedures	2 (2.43%)	13 (15.85%)	2 (2.43%)	1 (1.22%)	64 (78.04%)
5. Undermining your personal integrity	2 (2.43%)	8 (9.76%)	0 (0.00%)	2 (2.43%)	70 (85.37%)

6. Destructive innuendo and sarcasm	2 (2.43%)	13 (15.85%)	1 (1.22%)	2 (2.43%)	64 (78.05%)
7. Verbal and non-verbal threats	2 (2.43%)	11 (13.41%)	2 (2.43%)	3 (3.66%)	64 (78.05%)
8. Making inappropriate jokes about you	0 (0.00%)	9 (10.98%)	3 (3.66%)	1 (1.22%)	69 (84.15%)
9. Persistent negative teasing	0 (0.00%)	5 (6.09%)	2 (2.43%)	2 (2.43%)	73 (89.02%)
10. Physical violence	0 (0.00%)	1 (1.22%)	0 (0.00%)	0 (0.00%)	81 (98.78%)
11. Withholding necessary information from you	0 (0.00%)	12 (14.63%)	4 (4.88%)	0 (0.00%)	66 (80.49%)
12. Freezing out/ignoring/excluding	1 (1.22%)	8 (9.76%)	3 (3.66%)	1 (1.22%)	69 (84.15%)
13.Unreasonable refusal of applications for leaves, training or promotion	1 (1.22%)	9 (10.98%)	0 (0.00%)	2 (2.43%)	70 (85.37%)
14. Undue pressure to produce work	3 (3.66%)	13 (15.85%)	2 (2.43%)	2 (2.43%)	62 (75.61%)
15. Setting of impossible deadlines	3 (3.66%)	15 (18.29%)	3 (3.66%)	4 (4.88%)	57 (69.51%)
16. Shifting goalposts without telling you	3 (3.66%)	19 (23.17%)	2 (2.43%)	1 (1.22%)	57 (69.51%)
17. Constant undervaluing your effort	2 (2.43%)	13 (15.85%)	2 (2.43%)	2 (2.43%)	63 (76.83%)
18. Persistent attempts to demoralise you	3 (3.66%)	8 (9.76%)	1 (1.22%)	1 (1.22%)	69 (84.15%)
19. Removal of areas of responsibility without consultation	2 (2.43%)	11 (13.41%)	0 (0.00%)	2 (2.43%)	67 (81.71%)
20. Discrimination on grounds of race or	2 (2.43%)	11 (13.41%)	2 (2.43%)	0 (0.00%)	67 (81.71%)

gender

Conclusion

This study found that coping skills among medical officers in government primary healthcare in Penang State towards work-related stressors are still under control and allow them to maintain a good working environment. Our report may contribute to the development of educational programmes designed to encourage medical officers to increase their health-promoting behaviours.

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EPIDPP08/51 : The Power of TB Preventive Treatment (TPT) in Conquering Sleeping Monster

Mohd Ihsani Mahmood[1], Koay Teng Khoon[1], Mugilan Ganason[1], Asmah Razali [1], Zirwatul Adilah Aziz [2], Siti Hafsah Abdul Halim [1]
[1] Sector of Tuberculosis/Leprosy, Disease Control Division, Ministry of Health Malaysia
[2] National Public Health Laboratary, Ministry of Health Malaysia
Corresponding author's email: dr.ihsani@moh.gov.my

Summary

TB Preventive Treatment (TPT) for Latent Tuberculosis Infection (LTBI) aims to reduce TB reactivation risk in individuals exposed to the bacteria but do not have active disease. This study aimed to evaluate the effectiveness of TPT in TB reactivation prevention among close contact smear-positive TB. Effectiveness of treatment was measured by evaluating treatment outcomes and assessing the reduction in the risk of developing active TB in individuals with LTBI. Therefore, TPT significantly reduces the risk of developing active TB in close contact smear-positive TB with LTBI. It is estimated can reduce the risk by approximately 85%.

Keywords

Close Contact Smear-Positive TB, Latent TB Infection, TB Preventive Treatment, Active TB, TB Reactivation

Introduction

LTBI serves as a reservoir for future TB cases and carries the risk of progressing to active TB disease, which can cause significant morbidity and mortality. Close contact smear-positive TB LTBI are at a higher risk of developing active TB disease. By evaluating the effectiveness of TPT helps ensure that these high-risk groups receive appropriate and timely intervention to protect their health. Besides that, can assess the impact on reducing the overall TB burden. Therefore, this study aimed to evaluate the effectiveness of TPT in preventing TB reactivation among close contact smear-positive TB with LTBI.

Materials and Methods

This was a cohort study using convenient sampling. The sample size to determine the effectiveness of TPT in preventing TB reactivation was calculated based on the proportion of TB reactivation among close contact smear-positive TB with LTBI from a pilot project of feasibility IGRA for LTBI Screening 2019. The power of the study was set at 80% with significance level 0.05. The effect size was determined and adjustment for potential attrition or loss to follow-up during the study period was made. The adjustment for intra-cluster correlation also made to account for potential correlation within clusters (eg: household or institution). The LTBI cohort for 2019 and 2020 that was registered in the National Tuberculosis Information System was tracked, and their status was updated every three months for a total of two years. The efficacy of TB reactivation prevention was defined as the proportion of LTBI patients diagnosed with active TB or TB-free during the 2-year follow-up period. Descriptive analysis and analytic analysis using survival and regression were utilised. SPSS version 22.0 was used to analyse all data.

Results and Discussion

There is a significant relationship between the treated close contact smear-positive TB with LTBI with TB reactivation outcome variable. The treated LTBI are 85% more likely prevented from TB reactivation compared with the non-treated LTBI. Therefore, TPT lower the risk of TB reactivation among the completed treatment of close contact smear-positive TB with LTBI. TPT has demonstrated significant effectiveness in preventing TB reactivation among individuals with LTBI. Multiple studies have consistently shown that TPT reduces the risk of developing active TB disease by up to 90% in individuals with LTBI. By targeting latent TB bacteria, treating subclinical infections, strengthening the immune response, reducing infectiousness, and interrupting transmission, TPT plays a crucial role in preventing TB reactivation. It helps eliminate or suppress dormant Mycobacterium TB, treats early stage of TB disease, and enhances the immune system's ability to control the infection. Close contacts of smear-positive TB cases with LTBI, in particular, benefit from TPT due to their increased risk of TB reactivation. Offering TPT to this population significantly reduces their risk of developing active TB disease and contributes to the interruption of transmission within households and communities. The effectiveness of TPT in preventing TB reactivation depends on factors such as treatment adherence, the potency of the medication regimen, and the duration of treatment. Ensuring high treatment completion rates and adherence is crucial to maximizing the preventive effects of TPT.

Table 1: Descriptive results of Close Contact Smear Positive TB with LTBI on TPT Enrollment and TB Reactivation Outcome

Variables	No TB Reactivation	TB Reactivation
TPT Enrolment		
Treated	10229 (70.2%)	77 (25.2%)
Not Treated	4345 (29.8%)	228 (74.8%)
Gender		
Male	9,473 (65.0%)	183 (60.0%)
Female	5,101 (35.0%)	122 (40.0%)
Age		
5 - 14 years	600 (4.1%)	15 (4.9%)
15 - 17 years	1,002 (6.9%)	30 (9.8%)
18 – 39 years	7,287 (50.0%)	138 (45.3%)
40 - 59 years	3,935 (27.0%)	77 (25.2%)
60 years and above	1,750 (12.0%)	45 (14.8%)

Table 2: TB Preventive Treatment effectiveness Against TB Reactivation in Close Contact Smear-Positive TB with LTBI

	No Active TB	Active TB	Total
Treated LTBI	10229	77	10306
Non-Treated LTBI	4345	228	4573

Step 1 : Risk of TB Reinfection in Treated LTBI : 77 / 10306 = 0.001

Step 2 : Risk of TB Reinfection in Non Treated LTBI : 228 / 4547 = 0.05

Step 3 : Dividing the risk gives : 0.0075 / 0.05 = 0.02

Step 4 : TB Preventive Effectiveness against infection is (1 – 0.15) * 100 = **85%**

TB Preventive Treatment lower the risk of TB reactivation about 85% among Treated Close Contact Smear-Positive TB with LTBI compared with non-treated LTBI.

Conclusion

TB Preventive Treatment is highly effective in preventing TB reactivation among the close contact smear-positive TB with LTBI. High treatment completion rates and adherence important to maximize the preventive effects of TPT. It serve as a vital strategy for TB control and elimination efforts by reducing the burden of active TB disease, interrupting transmission and protecting the health of individuals at risk. Implementing and scaling up TPT programs can have a significant impact on reducing the global burden of TB and achieve the EndTB strategy.

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EPIDPP09/34 :Psychological Distress Among Adolescents Living In The Klang Valley People's Housing Project (PPR) During The COVID-19 Pandemic

Noorlaile Jasman[1], Siti Nur Farhana Harun[1], Norrafizah Jaafar[1], Zanariah Zaini[1], Mohd Hairmansah Mohd Shah[1], Manimaran Krishnan Kaundan[1]

[1] Institute for Health Behavioural Research, National Institutes of Health, Ministry of Health Malaysia, Malaysia

Corresponding author's email: noorlaile@moh.gov.my

Summary

The COVID-19 pandemic has impacted people's psychological health as well as society as a whole. The purpose of this study was to determine the prevalence of

psychological distress among adolescents living in the People's Housing Project (Projek Perumahan Rakyat or PPR) during the COVID-19 pandemic including negative psychological effects such as depression symptoms and anxiety symptoms.

Keywords
Mental health, depression, anxiety, adolescents, psychological distress

Introduction
COVID-19 has had a massive, extensive impact on Malaysians, particularly those within the lower socioeconomic group (1) and live in PPRs. With various pre-existing socio-economic problems, adolescents of PPRs communities were bound to face lots of urban setting difficulties and challenges during the pandemic (2). The different periods and levels of lockdowns, restricted movements within already cramped and crowded living spaces, prolonged online schooling despite limited access to sustainable internet, poor living environments and family issues, etc. had easily caused stress to the adolescents' psychological and mental health. There is an imperative need for their mental health status and coping strategies to be studied and understood so that we can better recognise how their mental health and well-being are affected by the pandemic (3). The purpose of this study was to determine the prevalence of psychological distress among adolescents living in the PPRs during the COVID-19 pandemic.

Materials and Methods
The study applies a quantitative investigation. The questionnaire was completed by 1,578 adolescent participants aged between 10 to 17 years old living in 37 Klang Valley PPRs. Data collection began on April 1, 2022, and ended on September 30, 2022. This study used a questionnaire in dual language (Bahasa Melayu and English), which consisted of two sections: the sociodemographic profile of respondents (section A); as well as Patient Health Questionnaire-9 (PHQ-9) to measure depression and Generalized Anxiety Disorder-7 (GAD-7) to measure anxiety (section B). Descriptive analysis was used to describe the sociodemographic of the participants and the prevalence of mental health status is reported in frequency and percentage. Inferential analysis was used to find the association between sociodemographic factors and psychological distress of the participants.

Results and Discussion
Overall, our study found that 12.3% of the adolescents surveyed suffered from psychological distress. Of these, 10.7% have depression symptoms and 7.2% showed anxiety symptoms. In addition, 212 participants (13.4%) reported suicidal and self-harm thoughts. Depression symptoms were found to be significantly higher among females, within the older age group (16-17 years old), owning electronic device, showed risky behaviour, living with single parent/guardian and with working mothers. Anxiety symptoms were found to be significantly higher among females, within the older age group (16-17 years old), showed risky behaviour and have lived at PPRs for longer duration.

Table 1: Sociodemographic factors associated with Depression

Variables		n	Depression				P value
			No	%	Yes	%	
Gender	**Male**	781	739	94.6%	42	5.4%	<0.001***a
	Female	797	671	84.2%	126	15.8%	
Owns any electronic device	**No**	347	323	93.1%	24	6.9%	0.011*a
	Yes	1,231	1,087	88.3%	144	11.7%	
Parental/ guardian marital status	**Single Parent/Guardian (divorced, widow, separated, never married)**	293	252	86.0%	41	14.0%	0.040*a
	Married/living with partner	1,285	1,158	90.1%	127	9.9%	
Risky behaviour	**No**	1,509	1,357	89.9%	152	10.1%	0.001**a
	Yes	69	53	76.8%	16	23.2%	
Respondent's age groups	**Primary school age (10-12 years old)**	548	517	94.3%	31	5.7%	<0.001***a
	Lower secondary school age (13-15 years old)	673	593	88.1%	80	11.9%	
	Higher secondary school age (16-17 years old)	357	300	84.0%	57	16.0%	
Mother's employment status	**Not working**	899	818	91.0%	81	9.0%	0.008**a
	Working	575	498	86.6%	77	13.4%	

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001
a Pearson Chi Square test
b Fisher Exact test

Conclusion

The COVID-19 pandemic has disrupted lives and livelihoods all over the world. The COVID-19 pandemic had an impact on people's psychological health as well as society as a whole. This study found that the COVID-19 pandemic has a variety of negative psychological effects on adolescents living in Klang Valley PPRs, which are

exacerbated by, among others, poor living conditions, family issues and extensive online schooling.

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EPIDPP10/74 : Effectiveness of A Theory-based Health Education Module in Improving Self-Efficacy on Condom Use among People Living with HIV

Azline Abdilah[1], Noraliza Radzali[1], Hayati Kadir Shahar[2], Ganesh Muthiah[2], Kulanthayan K.C Mani[2]
[1] Kuala Pilah Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia
[2] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Corresponding author's email: enilzaabdilah@gmail.com

Summary
This theory-based education module has a positive effect on increasing PLHIV's self-efficacy in condom use in compared to the standard care provided. The *Intention to Treat* (ITT) model demonstrates a significant difference in increasing self-efficacy in condom use both within and between groups. Even after three months of follow-up, the increase in self-efficacy on condom use was sustained. Nevertheless, the module can be used as a preventive measure against HIV reinfection and STIs that may worsen morbidity and mortality among PLHIV, particularly those who are sexually active (1). Otherwise, the module is a relatively simple, quick, and non-invasive technique.

Keywords
Self-efficacy; Sexual Transmission Infection; Condom use; People living with HIV, Malaysia

Introduction
Malaysia's HIV epidemic trend has shifted to increasingly more sexual transmission than injecting drugs to 90% of the annual total in 2018 (2). It is reported that the

surge was resulted from poor adherence to condom use among PLHIV and lacking health program related to sexual transmission infection (STI) preventions that focusing on PLHIV (3). Hence, the study is needed to determine the effectiveness of the health education intervention to improve self-efficacy on condom use among PLHIV.

Materials and Methods

A single-blinded, parallel randomised controlled trial was conducted in Seremban district. Sexually active HIV-infected person attended health clinics in Seremban was recruited in the study. The sample size (n) in this study was calculated using the two population means formula, with an additional 20% dropout rate given the total final sample size was 100. Participants in the control group received standard care, while the intervention group received an additional Health Education Module based on Social Cognitive Theory (SCT). Follow up was done at first and third months to measure the changes of self-efficacy on condom use. An intention to treat analysis was conducted as the primary analysis, and the Generalised Linear Mixed Model (GLMM) was used to assess the overall effects of the intervention. All data were analysed using the IBM Statistical Package for Social Science (SPSS) version 25.

Results and Discussion

100 hundred PLHIV were finally selected to participate in the study, with 50 in each of the two groups. All of the participants in the intervention (100%) and control groups (100%) had attended their respective health education and scheduled standard care sessions. The response rates for the intervention and control groups at 1-month follow-up and 3 month follow-ups were 90.0 and 86.0%, respectively. At baseline, the characteristics of sociodemographic, sexual history and mean of self-efficacy on condom use, shows no significant difference between groups. Besides, there was significant improvement of self-efficacy on condom use in intervention group as compared to the control at the first- and third-months follow-up. In the GLMM analysis, receiving the module is associated with improved self-efficacy on condom use (β = 13.08, 95% CI= 9,230, 16.934). From the baseline to the first- and third-month follow-up, the intervention group improves more than the control group in total self-efficacy scores on condom use. The adaptation of SCT in this module can provide those in the intervention group with a proper cognitive process to change for better self-efficacy in condom use (4). Furthermore, the method used to deliver intervention content to participants may increase the participant's interest in fully cooperating during the intervention. They were becoming more aware of and knowledgeable about HIV and STIs (5). A sensitivity analysis was also performed and shows that the effects of the group on the outcome variables remained significant.

Table 1. Baseline sociodemographic and sexual characteristics (n=100)

	Group median (IQR) / n (%)		*Statistical Test*	*P*-value
	Control	Intervention		

Age (years)	31.00(14)	33.5(13)	1096.50φ	0.29
Household Income(RM)	2500(2800)	1850(1800)	1046.50φ	0.16
Male	41(82.0)	35(70.0)	2.07β	0.35
Female	6(12.0)	9(18.0)		
Transgender	3(6.0)	6(12.0)		
Ethnicity				
Malay	36(72.0)	36(70.0)	1.00β	0.91
Chinese	5(10.0)	3(6.0)		
Indian	6(12.0)	8(16.0)		
Others	3(6.0)	4(12.0)		
Mode of Sexual Transmission				
Heterosexual	16(32.0)	24(48.7)	2.68β	0.26
Gay	27(54.0)	21(42.0)		
Bisexual	7(14.0)	5(10.0)		
Sexual Partner/s				
Spouse or Lovers	21(54.0)	23(46.0)	2.09β	0.35
Casual Partner	24(48.0)	18(36.0)		
Sex workers or paid for sex	5(10.0)	9(18.0)		
Multiple Partners				
No	17(34.0)	25(50.0)	2.63β	0.11
Yes	33(66.0)	25(50.0)		
Condom use frequency	3.00(2.0)	3.00(2.0)	1122.50φ	0.36
STI				
No	20(40.0)	19(38.0)	0.042φ	0.84
Yes	30(60.0)	31(63.0)		

βx2 Chi-squared Test, φU Mann-Whitney Test, STI: Sexual Transmission Infections

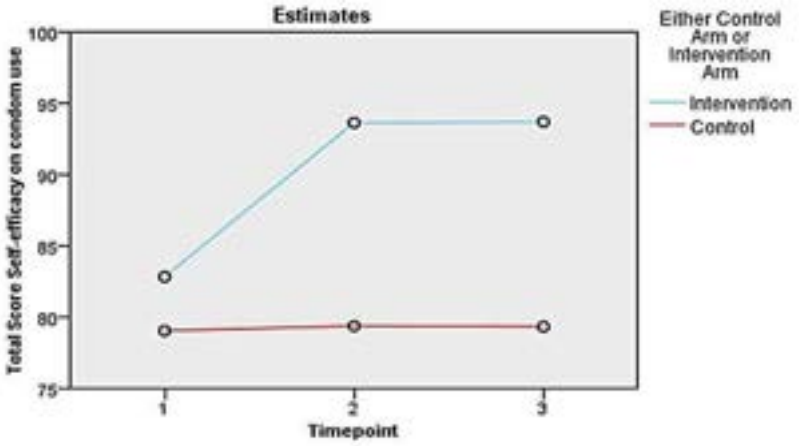

Figure 1. Interaction Plot between Group and Time Point for Self-Efficacy on Condom Use

Table 2. Comparison of fixed coefficients for the group, with and without

Variable	Intention to treat		Per-Protocol Analysis		Coefficient difference	Percentage coefficient difference
	Coefficient	Sig.	Coefficient	Sig.		
Self-efficacy on condom use						
Intervention	13.082	<0.001	14.365	<0.001	-1.283	-9.81
Control	1		1			

*Significant at p ≤ 0.05

Conclusion

This module positively affects PLHIV's self-efficacy on condom use. Thus, adding this module on standard care is beneficial among PLHIIV who is sexually active to prevent HIV reinfection and other STIs.

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EPIDPP11/43 : The Prevalence Of Non-communicable Disease (NCD) Risk Factors Among Community In The KOSPEN Programme In Malaysia

Mohd Tariq M.N[1], Rosnah Ramly [1], Noraryana Hassan[1]
[1] *Disease Control Division, Ministry of Health Malaysia*
Corresponding author's email: drtariq@moh.gov.my

Summary
KOSPEN stands for Komuniti Sihat Pembina Negara. This initiative is between the Malaysian Ministry of Health (MOH) and other relevant agencies. This initiative transforms the public health service to ensure community participation in public health programs. KOSPEN aims to reduce the occurrence of NCDs and associated risk factors and promote healthy behaviors such as non-smoking, healthy nutrition, and physically active lifestyles. The program's primary goals are to improve population-wide behavior, prevent and control common risk factors for NCDs, delay the onset, reduce disability, and postpone death from NCDs.

Keywords
KOSPEN, Noncommunicable Diseases, Community, Behaviors, Health Promotion

Introduction
Non-communicable diseases (NCDs) significantly burden Malaysia, accounting for approximately 73% of all deaths and working population contribute 35%(1). In Malaysia, the most common NCDs are cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases. The NHMS also showed that lifestyle factors like smoking, physical inactivity, and unhealthy diets cause the high burden of NCDs in Malaysia(2). Many NCDs are prevalent in Malaysia, with 2.6 million Malaysians having high cholesterol and 6.4 million Malaysians with hypertension, and 3.9 million Malaysians having diabetes in 2019 (2). The Malaysian government has launched several initiatives to combat the country's NCD burden, including the National Strategic Plan for Noncommunicable Diseases (NSP-NCD) 2016-2025, KOSPEN, and NHSI on promoting healthy lifestyles, improving access to NCD

screening and treatment, and strengthening health systems to manage NCDs better(3).

Materials and Methods

This study is a retrospective descriptive analysis of community reporting of NCD risk factors over time in the area where the KOSPEN program was implemented. This study used secondary data from the National KOSPEN Programme database covering January through December 2022.

Results and Discussion

From January to December 2022, the total adult population that has been screened is 46,722 people from 901 localities that implement the KOSPEN program. Selangor and Sarawak have the highest number of KOSPEN localities, with 126 localities each.

The largest contributory state in the implementation of health screening in 2022, was Melaka was 10,557 adult residents screened, while other states such as Kelantan, with 5,511 screenings, and W.P. Kuala Lumpur and Putrajaya, with 5,478 screenings. In contrast, other states contributed more than 1000 screenings for each state implementing the KOSPEN Program. At the same time 6,351 out of 9,988 (63.5%) screening participants with BMI ≥35 kg/m^2 were referred to the health clinic. While 7,659 out of 9,062 (84.5%) screening participants who were detected to have blood pressure SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg were referred for confirmation of hypertension. At the same time 6,274 out of 8,363 (75%) screening participants were detected to have blood glucose levels (RBS ≥ 5.6 mmol/L) and were referred to the health clinic for a diabetes confirmation test. The result also showed 2,965 out of 5,641 (52.6%) smoking participants intend to quit smoking and are referred to a smoking cessation clinic. For the healthy mind health scope, 708 out of 708 (100%) healthy mind screening participants were referred to the health clinic because they had severe and very severe screening values for stress, anxiety and depression. For the alcohol harm program, 194 out of 203 (95.6%) alcohol intake screening participants were referred to the health clinic for having a screening score ≥ 5.

The findings found that volunteers implemented interventions for the population involved, such as weight management programs, healthy eating programs, smoking cessation programs and regular physical activity. Volunteers promote and advocate to ensure that every individual in the community practices a healthy lifestyle.

Conclusion

In conclusion, the KOSPEN Program can help in the early detection of NCD cases in the field. It can implement appropriate intervention programs for the communities involved to prevent and control NCD diseases.

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EPIDPP12/67 : Associated Factors Of Temperature On Hand, Foot, And Mouth Disease (HFMD) Incidence In Kuala Pilah District

Mohd Fathulzhafran Mohamed Hanan [1], Noraliza Radzali [1], Azline Abdilah [1], Jacinta Mary Fathi Rosary Rajan [1], Sharifah Aini Mohamad [1], David Chan Chee Hoong [1,2], Muhd Abd Hafiz Kamarul Zaman [1], Muhammad Syahmi Najwan Shamsudin [1], Nur Syazwani Khairudin [1], Rehemey Shamsul [1], Muhammad Iskandar Noh [1], Siti Nurliyana Nur Zahariman Shah [1], Muhammad Atrash Salim [1], Siti Nor Hidayah Mohd Nordin [1]
[1] *Kuala Pilah District Health Office, Kuala Pilah, Negeri Sembilan*
[2] *Department of Community Health, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia*
Corresponding author's email: fathulbk46@gmail.com

Summary
Hand, Foot, and Mouth Disease (HFMD) is a highly contagious viral infection. This study examined the correlation between temperature and HFMD cases in Kuala Pilah district. Retrospective analysis of 2022 HFMD cases and meteorological data was conducted. Results showed HFMD mostly affected children aged 0-4 years, particularly the Malay ethnic group. Cases varied across subdistricts. Temperature exhibited a moderate positive correlation with HFMD incidence. These findings emphasize the vulnerability of young children, need for culturally sensitive prevention measures, and the potential impact of temperature on HFMD transmission. Integrating climate into surveillance and control strategies can enhance public health measures.

Keywords
Hand, Foot, and Mouth Disease (HFMD), Temperature, Incidence, Coxsackie, Correlation

Introduction
Hand, Foot, and Mouth Disease (HFMD) is a highly contagious viral infection that has become a major public health concern. It is caused by viruses like Coxsackievirus A16, Enterovirus 71, and other enteroviruses, spreading through saliva, blister fluid, or the faecal-oral route (1). Infected individuals experience oral ulcers and characteristic rashes on their palms and soles, with symptoms ranging from mild to severe. While studies have explored the relationship between

temperature and HFMD cases (2, 3), no such investigation has focused on the Kuala Pilah district. Understanding this association is crucial for anticipating trends and implementing effective preventive measures. Additionally, considering the impact of global warming, it is important to explore the use of weather forecasting in predicting and managing HFMD outbreaks. This study aims to bridge this knowledge gap by examining the correlation between temperature and HFMD cases in the Kuala Pilah district.

Materials and Methods

The study employed a retrospective analysis of HFMD cases reported in the Kuala Pilah district in the year 2022. Data on weekly confirmed HFMD cases in Kuala Pilah were obtained from the Ministry of Health, Malaysia, encompassing information on gender, age, ethnicity, and location. Historical meteorological data, specifically mean weekly temperature records, were obtained from the Malaysian Meteorological Department.

To examine the pattern of HFMD disease in Kuala Pilah during 2022, descriptive statistics were conducted as a preliminary analysis. Spearman's correlation analysis was then employed to determine the association between HFMD incidence and temperature, considering the non-normal distribution of the data. The data was analysed using SPSS 22.0.

Results and Discussion

The study involved a population of 317 individuals, with 61.5% being male and 38.5% female. HFMD cases were primarily observed among children aged 0-4 years (65.6% of total cases), followed by the age group of 5-9 years (31.5% of total cases). Individuals aged 10 years and above had a low incidence of HFMD, with no reported cases in the 15-19 years age group. Regarding ethnicity, the majority of HFMD cases were among individuals of Malay ethnicity (95.0% of total cases), followed by Chinese individuals (2.8% of cases), and smaller proportions among the Indian and Orang Asli communities (0.9% and 1.3% respectively). These proportions reflect the ethnic composition of the Kuala Pilah district, where Malays comprise the largest population. The distribution of HFMD cases across subdistricts within the Kuala Pilah district showed variations. Juasseh had the highest number of cases (25.2% of total cases), followed by Ampang Tinggi (14.8%) and Pilah (12.6%). Other subdistricts reported lower case numbers, including Johol, Ulu Muar, Terachi, Parit Tinggi, Ulu Jempol, Seri Menanti, Kepis, and Langkap. The analysis revealed a moderate positive correlation between HFMD incidence and temperature, with a correlation coefficient (r) of 0.283 and a statistically significant p-value of 0.021. The results suggest that as temperature increases, there is a tendency for an increase in HFMD cases reported in the Kuala Pilah district. This study highlights the vulnerability of young children, particularly those aged 0-4 years, to HFMD infection. It emphasizes the importance of culturally sensitive approaches for prevention and control, considering the predominant Malay ethnicity in the district. Variations in HFMD distribution across subdistricts and the correlation between temperature and incidence provide valuable insights for targeted interventions and surveillance systems to mitigate HFMD outbreaks effectively.

Table 1: Sociodemographic characteristics of the HFMD cases

Characteristic	n (%)
Sex	
Male	195 (61.5%)
Female	122 (38.5%)
Age	
0-4 years	208 (65.6%)
5-9 years	100 (31.5%)
10-14 years	8 (2.5%)
15-19 years	0 (0.0%)
20 years and above	1 (0.3%)
Ethnicity	
Malay	301 (95.0%)
Chinese	9 (2.8%)
Indian	3 (0.9%)
Orang asli	4 (1.3%)
Subdistrict	
Juasseh	80 (25.2%)
Ampang Tinggi	47 (14.8%)
Pilah	40 (12.6%)
Johol	37 (11.7%)
Ulu Muar	35 (11.0%)
Terachi	22 (6.9%)
Parit Tinggi	18 (5.7%)
Ulu Jempol	14 (4.4%)
Seri Menanti	12 (3.8%)
Kepis	11 (3.5%)
Langkap	1 (0.3%)

Table 2: Correlation between HFMD incidence and temperature

Spearman's correlation coefficient, r	p-value
0.283	**0.021**

Conclusion

This study demonstrates a moderate positive correlation between HFMD and temperature in Kuala Pilah district. Temperature should be considered as a potential influencing factor for HFMD transmission. By integrating climatic factors into surveillance and control strategies, public health measures can be optimized to protect the population, especially vulnerable children.

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EPIDPP13 / 70 : Multimorbidity And Hospitalisation: Trends Of Utilisation And The Role Of Supplementary Financial Health Coverage

Suhana Jawahir[1], Awatef Amer Nordin[1], Jabrullah Ab Hamid[1], Adilius Manual[1], Sarah Nurain Mohd Noh[1], Nur Elina Abdul Mutalib[1], Fathullah Iqbal Ab Rahim[1]
[1]Centre for Health Equity Research, Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia
Corresponding author's email: suhana.j@moh.gov.my

Summary
Multimorbidity, the presence of multiple chronic conditions, has gained attention in the literature due to its high prevalence and impact on healthcare utilisation. Further, multimorbidity has been associated with high hospital-based care use and costs. This study aimed to explore the trends in multimorbidity prevalence and to assess the association of multimorbidity and possession of a supplementary health coverage with hospitalisation, among adults in Malaysia. Hospital services are accessed by multimorbid individuals and among those with supplementary health coverage. Both multimorbid and non-multimorbid individuals heavily rely on the public sector, necessitating the development of strategies that foster equitable access.

Keywords
Multimorbidity, Hospitalisation, Healthcare utilisation, Supplementary financial health coverage, Malaysia

Introduction
Multimorbidity can be viewed as an inevitable rise in NCDs, where multiple NCDs co-exist within the same individual. Patients with multimorbidity have been

reported to have the greatest healthcare needs (1). In terms of hospital-based care, multimorbidity has been associated not only with overall hospitalisation (2), but also with unplanned or preventable admissions (3). Among known enabling factors for healthcare utilisation are financing-related factors such as supplementary funds. This study aimed to 1) explore the trends in the prevalence of multimorbidity and hospitalisation, 2) explore the trends in the public-private composition for hospitalisation, for those with and without multimorbidity, and 3) assess the association of multimorbidity and supplementary financial health coverage with hospitalisation, among adults in Malaysia.

Materials and Methods

Data of Malaysian adults aged ≥ 18 from three nationwide community-based surveys, which were conducted in 2011, 2015 and 2019, were analysed. Multimorbidity was defined as having ≥2 chronic conditions. The conditions include diabetes mellitus, hypertension, and hypercholesterolemia. Hospitalisation was defined as overnight stay for treatment in the last 12 months prior to survey. Supplementary financial health coverage includes government guarantee letter, government specific health fund, employee health benefit, SOCSO and personal health insurance. Trends over three years were described. Association was assessed using multivariable logistic regression on 2019 data. Significance level was set at 5%. Descriptive and multivariable logistic regression analyses were conducted using STATA 14 and sampling weight was applied. Variables with a p-value of less than 0.25 in the univariate analysis were included in the final model. Crude odd ratios (COR) and adjusted odd ratios (AOR) with 95% confidence intervals (CI) were reported.

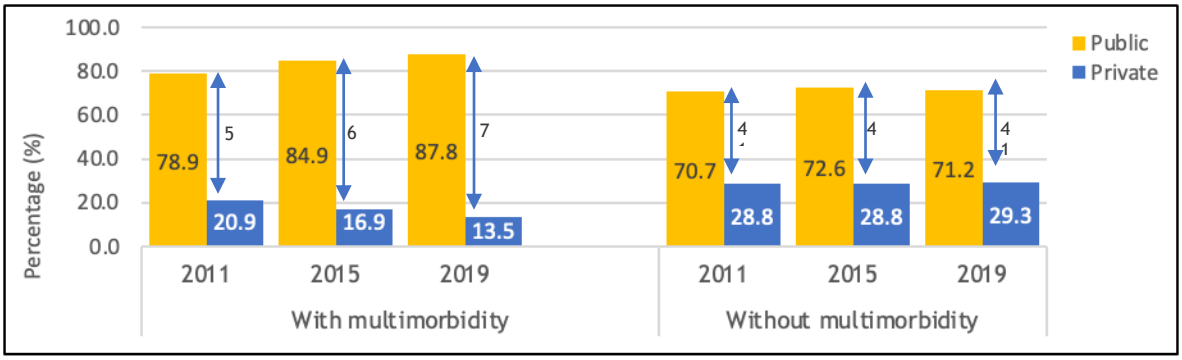
Results and Discussion

Multimorbidity increased from 2011 (6.7%, 95%CI 5.9-7.5) to 2015 (7.9%, 95%CI 7.4-8.4), and almost doubled by 2019 (11.7%, 95%CI 10.7-12.7). Individuals with multimorbidity showed prevalence of hospitalisation that was at least double that of individuals without multimorbidity, across years (Table 1). The overall number of hospitalisations for multimorbid and non-multimorbid patients fluctuated throughout time, with the former dropping and the latter increasing. Next, the public-private hospitalisation gap is widening, especially for multimorbid patients (Figure 1). Public hospitals are used by multimorbid and non-multimorbid patients. For association with hospitalisation, multimorbidity (OR = 2.02, 95% CI = 1.50, 2.72) and possession of supplementary financial health coverage (OR = 1.81, 95% CI = 1.42, 2.31) showed significance, after adjustment for sex, ethnicity, age, marital status, perceived self-rated health and working status (Table 2). Between the two, multimorbidity showed a higher effect measure compared to supplementary financial health coverage. This hints that load of illness is a substantial consideration when seeking and accessing healthcare services. Hospitalisation is known to incur various costs to the patient (1), hence the significant association with supplementary financial health coverage concurs with reported importance of financial-related factors to generate access to care. This study found that multimorbidity among Malaysians is rising, along with hospital use.

Other research has linked multimorbidity to greater healthcare use (2). This study's strength is its nationally representative sample, which allows robust cross-sectional level assessments for important variables. However, multimorbidity epidemiology and its effects on Malaysian health care use and expenditures need additional study.

Table 1: Prevalence of hospitalisation and frequency number of admissions, 2011-2019

Characteristic	2011 (n=18,058)	2015 (n=19,865)	2019 (n=11,119)
Prevalence of hospitalisation, % (95% CI)			
With multimorbidity	15.9(13.2-18.9)	16.3(13.9-19.1)	11.1(9.2-13.3)
Without multimorbidity	7.4(6.7-8.1)	7.9(7.3-8.5)	5.2(4.6-5.9)
Frequency of admission (times), mean (SD)			
With multimorbidity	1.60(1.40)	1.58(1.37)	1.53(1.06)
Without multimorbidity	1.22(0.80)	1.29(1.35)	1.28(1.38)



Note: The arrow refers to percentage differences between the public and private sector hospitalisation

Figure 1: Public-Private composition for hospitalisation, for those with and without multimorbidity (2011-2019).

Table 2: Determinants of inpatient utilisation, 2019

Variable	COR	95%CI LL	95%CI UL	p - value	AOR	95%CI LL	95%CI UL	p - value
Multimorbidity								
Yes	**2.28**	1.79	2.90	<0.001	**2.02**	1.50	2.72	<0.001*

No	1.00			-	1.00			-
Possession of any health coverage[a]								
Yes	**1.31**	1.05	1.63	0.018	**1.81**	1.42	2.31	<0.001*
No	1.00			-	1.00			-

Note: COR: Crude Odd Ratio, AOR: Adjusted Odd Ratio, CI: Confidence Interval, LL: Lower limit, UL: Upper limit. Model adjusted for sex, ethnicity, age, marital status, perceived self-rated health and working status. [a]health coverage refers to supplementary financial health coverage *p-value < 0.05.

Conclusion

Our study demonstrates the growing burden of NCD multimorbidity in Malaysia and implications of multimorbidity on hospitalisation. Understanding association of multimorbidity and health coverage with hospitalisation could assist in reviewing existing policy, which aims to facilitate the transition needed and further anticipated to develop a resilient public healthcare system.

Acknowledgments

We would like to thank the Director-General of Health Malaysia for his permission to present these findings.

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EPIDPP14/87 : Sociodemographic Characteristics Among Hypertension In Type 2 Diabetes Mellitus Client Attending Kuala Pilah Health Clinic, Negeri Sembilan

Siti Munisah Mohd Shoaib [1], Noraliza Radzali [1], Azline Abdilah [1]

[1] Kuala Pilah Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia

Corresponding author's email: dr_sitimunisah@moh.gov.my

Summary

Non-communicable disease (NCD) is the leading cause of death and health burden not only in Malaysia but worldwide. This study aimed to determine sociodemographic characteristics among hypertension patients with type 2 diabetes

mellitus attending Kuala Pilah Health Clinic, Negeri Sembilan. The client's blood pressure was regularly measured during follow-up, and those with blood pressures of more than 140/90 mmHg were then treated accordingly by medical personnel attending. The majority of hypertension in type 2 diabetes mellitus occurs in the elderly. Hypertension raises the likelihood of macrovascular and microvascular diabetes complications, so optimal blood pressure should be achieved in all diabetes patients.

Keywords
Hypertension, type 2 diabetes mellitus, prevalence, sociodemographic characteristics, Kuala Pilah

Introduction

A major cause of premature death worldwide is hypertension. According to the World Health Organisation (WHO), it is estimated that 1.28 billion adults living in low- and middle-income countries worldwide have hypertension (1). Malaysia, being a middle-income country, also has a high prevalence of hypertension among people aged 18 and older. According to the National Health Morbidity Survey in 2019, the prevalence of hypertension among 18-year-olds and older in Negeri Sembilan was 31.6% (2). However, there is no sociodemographic data on hypertension in diabetes mellitus patients. Diabetes is well recognized to increase the risk of death from renal failure, coronary artery disease, and cerebrovascular illness, and the risk may increase up to fourfold if hypertension is present (3). Thus, this study was aimed at determining sociodemographic characteristics among hypertension patients with type 2 diabetes mellitus attending Kuala Pilah Health Clinic, Negeri Sembilan.

Materials and Methods

A cross-sectional study was conducted among all active diabetes mellitus clients attending Kuala Pilah Health Clinic, Negeri Sembilan, from January 2022 to April 2023. The client's blood pressure was regularly measured during follow-up, and those with blood pressures of more than 140/90 mmHg were then treated accordingly by medical personnel attending. Clients who had been diagnosed with hypertension were recorded in the National Diabetic Registry (NDR). Data for a total of 1924 clients with type 2 diabetes mellitus were collected from the NDR.

Results and Discussion

Among the 1,924 types 2 diabetes mellitus patients attending Kuala Pilah Health Clinic, a total of 1,459 (75.83%) also had hypertension, using the definition of hypertension based on a pre-existing history of hypertension. The results show that the majority of those are in the elderly group, age 60 and above, which is 73.34%. This finding is consistent with a cross-sectional study conducted in 140 randomly selected adults with a prospective follow-up descriptive study carried out in Kelantan from January to December 2008, and a prospective cohort study conducted at Al-Faiha Diabetes and Endocrine Centre in Basrah from August 2008 to April 2011 (4). In our study, among 1,459 clients, 37.42% were male and 62.58% were female, consistent with the findings in other studies carried out in Kelantan (4). The present study showed that among diabetes patients, the majority of

hypertension was present in Malay (73.06%), followed by Chinese (20.01%), Indians (6.72%), and others (0.21%). This finding is comparable to findings reported in other studies. The result may perhaps be due to the fact that Malays are the majority ethnic group in Malaysia. Lastly, the majority of hypertension in type 2 diabetes mellitus clients is in the married group (85.81%).

Table 1: Sociodemographic Characteristics among Hypertension in Type 2 Diabetes Mellitus Client attending Kuala Pilah Health Clinic

Variables	Category	Frequency (n=1459)	Percent (100%)
Age	**20-29 years**	1	0.07
	30-39 years	31	2.12
	40-49 years	86	5.89
	50-59 years	271	18.57
	60 years and above	1070	73.34
Gender	**Male**	546	37.42
	Female	913	62.58
Race	**Malay**	1066	73.06
	Chinese	292	20.01
	Indian	98	6.72
	Other	3	0.21
Marital Status	**Married**	1252	85.81
	Unmarried	35	2.4
	Divorced	11	0.75
	Widowed	161	11.03

Conclusion

According to our study, the majority of diabetes patients attending Kuala Pilah Health Clinic have hypertension (75.83%). Few studies showed that the presence of hypertension raises the likelihood of macrovascular and microvascular diabetes

complications in these patients. Thus, optimal blood pressure should be achieved in all diabetes patients.

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EPIDPP15/16 : Geographical Variations In The Prevalence Of High-Risk Human Papillomavirus: Findings From The Public Cervical Cancer Screening Registry

Anis-Syakira Jailani[1], Nur Zahirah Balqis-Ali[1], Sal Sabila Mohd Shaffie[1], Weng Hong Fun[1], Yuke-Lin Kong[1], Zen Yang Ang[1], Sondi Sararaks[1], Shazimah Abdul Samad[2], Zakiah Mohd Said[2]

[1] Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia

[2] Family Health Section, Family Health Development Division, Ministry of Health, Malaysia

Corresponding author's email: dr.nurbalqis@moh.gov.my

Summary

Determining the prevalence of high-risk Human papillomavirus (HPV) infection is critical in planning strategies towards cervical cancer elimination. The study aims to outline the prevalence of high-risk HPV infection across four different states, along with their sociodemographic characteristics. Data from the Malaysian public cervical cancer screening registry were analysed to determine the prevalence of high-risk HPV infection. A comparison was made across sociodemographic characteristics. The prevalence and characteristics of women with high-risk HPV infection differed across states. Therefore, they could be used for customised, targeted screening plans to improve awareness and reach more women among the identified high-risk subgroups.

Keywords

Cervical cancer, high-risk HPV, screening, prevalence, Malaysia

Introduction

Human papillomavirus (HPV) is a group of common viruses worldwide, of which at least 12 are cancer-causing (1). An estimated 10% of women with high-risk HPV infection develop persistent HPV infections, making them at risk for cervical cancer (2). Malaysia began HPV DNA-based testing as the primary screening method and established a public cervical cancer screening registry in 2019 (3). Determining the prevalence of high-risk HPV infection is critical for policy and decision-making since it reflects the disease burden and may inform strategic planning towards cervical cancer elimination. While previous studies in Malaysia have reported HPV prevalence ranging from 4.4 to 14.0%, it is unclear how the prevalence varies across different states. This paper aims to understand the disease burden by outlining the prevalence of high-risk HPV infection across different states in Malaysia and their sociodemographic characteristics.

Materials and Methods

We analysed cross-sectional data from the Malaysian public cervical cancer screening registry by the Family Health Development Division, Ministry of Health, between 2019 – 2021. Among the six states implementing HPV DNA-based tests for cervical screening in Malaysia, four states with more than 2000 women screened were included in the analysis to minimise random error in generating confidence intervals. The four states were: Wilayah Persekutuan Kuala Lumpur and Putrajaya (WPKL&P), Selangor, Kelantan, and Kedah. We determined the overall and state prevalence of high-risk HPV infection by calculating the proportion of women who tested positive for high-risk HPV among women screened, reported with a corresponding 95% confidence interval, and compared based on several sociodemographic characteristics, including strata, ethnicity, age groups, income levels, levels of education, and the number of children. Analysis was conducted using the STATA software package (Version 14; Stata, College Station, TX)

Results and Discussion

Of the 34,507 women screened, the prevalence of high-risk HPV infection was 4.5%. WPKL&P had the highest prevalence (6.1%), while the prevalence in the other three states ranged from 2.1 – 3.0%. The prevalence was higher among urban than rural settlers. The mean age of women screened was 39.1 years (SD = 7.59). The age group with the highest prevalence differed across states. In WPKL&P and Selangor, the highest prevalence was observed in the age group 40 to 49 years old, while in Kelantan and Kedah, it was the age group 20 to 29 years old. Of the major ethnicities, the prevalence was consistently higher among Indian and Chinese across all states but with different margins. Indians residing in WPKL&P had the highest prevalence (10.9%). However, the highest prevalence was among women from 'other ethnicity' in Kedah (12.5%), with no specific ethnic detail in the registry. The prevalence tends to become lower with the increasing level of education, except in Kelantan. In general, the prevalence was similar across different income levels and decreasing trends with a rising number of children in all states. Figure 1 illustrates the differences based on overall prevalence and strata across the four states. Figure 2 compares four other sociodemographic variables. The similarities and differences across states may be influenced by various factors, including sexual practice, health literacy, biogenetic

predispositions and cultural norms (4). In addition, selection bias may be present since this screening was conducted at public primary healthcare facilities, missing those attending private and other women in the community. The variations in sample size across states may also affect the findings. A future reanalysis is warranted when the screening program has reached more women in the community.

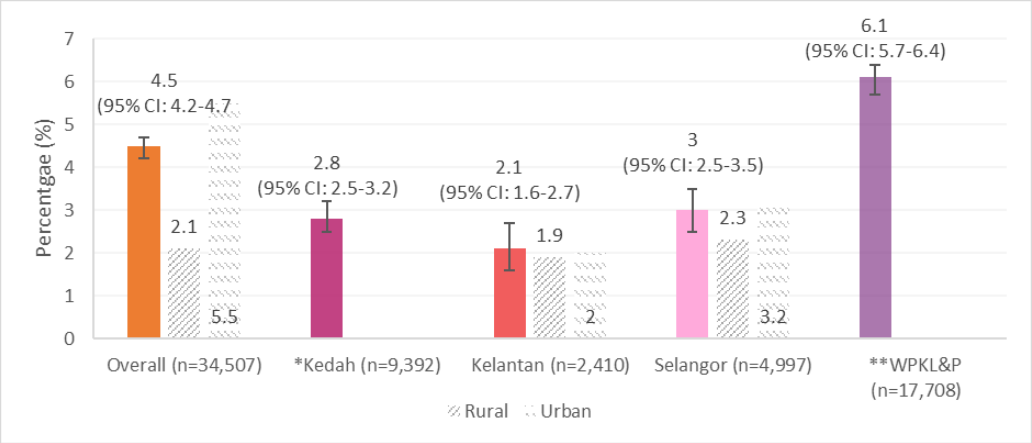

Figure 1: Prevalence of high-risk HPV overall, states, and strata
** Information on strata not available for Kedah*
***WPKL&P is entirely urban*

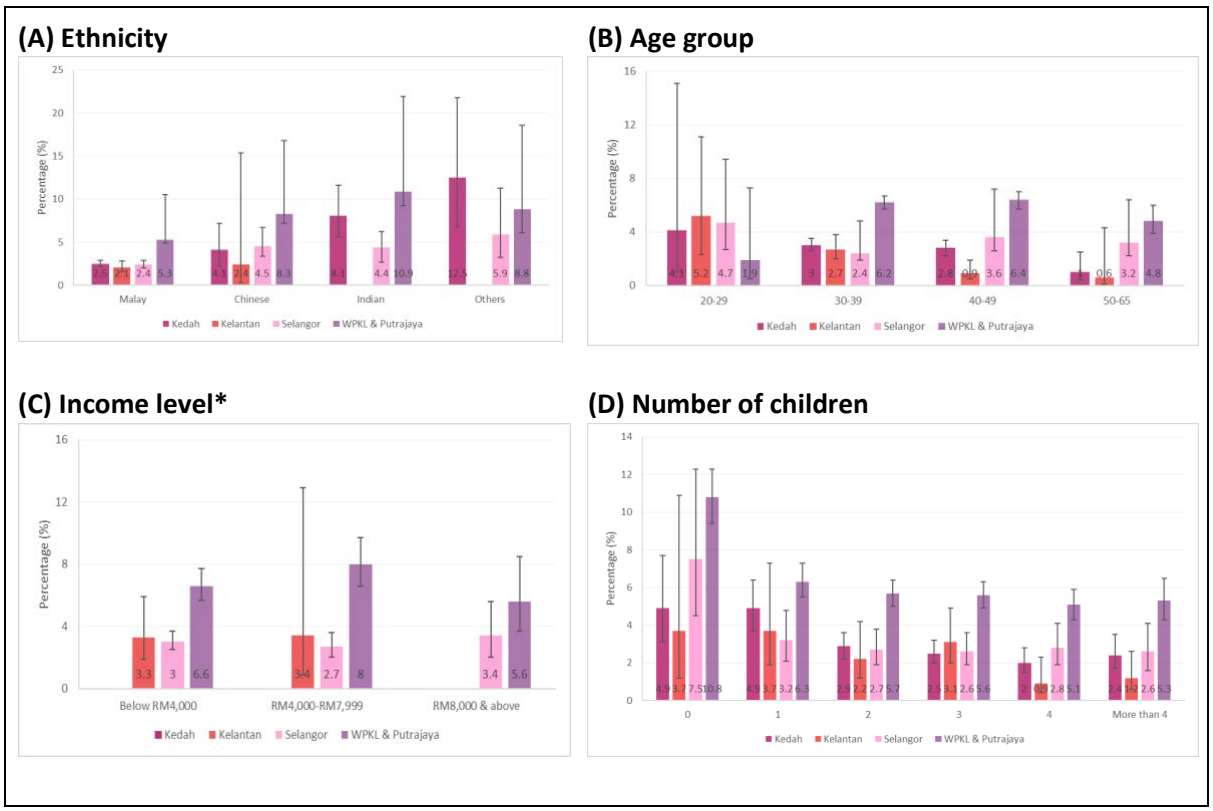

Figure 2: Prevalence of high-risk HPV by states and other sociodemographic profiles
**Information on the income level of Kedah was not captured*

Conclusion

Despite having a national strategic plan and guidelines towards cervical cancer elimination, customised, targeted strategies should be employed in each state based on the identified high-risk groups. The findings could be used to expand the screening program to increase awareness and reach more women in the community.

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EPIDPP16/65 : Yaws Among Indigenous People Of Sungai Kejar, Hulu Perak: The Prevalence And The Treatment

Nor Azila Rani [1], Nor Ammadah Azman [1]
[1] *Communicable Disease Control Unit, Hulu Perak District Health Office, Ministry of Health Malaysia*
Corresponding author's email: dr.azilarani@moh.gov.my

Summary
Yaws, caused by Treponema pallidum subspecies pertenue, is among the neglected tropical diseases. In 2006, the first yaws case was reported in Sg Kejar, Hulu Perak. We aimed to determine the yaws' prevalence among indigenous people in Sungai Kejar and administered treatment via mass single-dose azithromycin. From July to October 2022, three outreach activities were conducted to actively detect cases. Only latent yaws cases (17.9%) were identified, and about 22.3% of the villagers were successfully treated. Continual health education and rapid field diagnostic tests are needed to improve case detection and treatment of yaws in rural communities.

Keywords
Yaws, Indigenous people, Treponema, Azithromycin, Mass Drug Administration (MDA)

Introduction

Yaws, a nonvenereal treponemal infection, is commonly misdiagnosed in rural children (1). It is characterised by highly contagious primary and secondary skin lesions and non-contagious tertiary destructive bone lesions with a long latency period (2). Hulu Perak's mobile health team first reported a case of yaws in 2006 in an indigenous child who resided in Sg Kejar and presented with aggressive, multiple skin lesions successfully treated by a single dose of benzathine penicillin. The skin biopsy sent to the CDC in Atlanta confirmed it (3). Contact tracing and active case detection (ACD) were carried out then but were less successful as most villagers were constantly migrating thus untraceable. A recent outreach programme in the same community surprisingly tested many villagers with positive TPPA and RPR. We aimed to determine the prevalence of yaws in Sg. Kejar and to treat the community through mass drug administration (MDA) with azithromycin.

Materials and Methods

Three rounds of ACD were conducted from July until October 2022. Five teams of trained personnel were allocated to five small villages in Sg. Kejar. Villagers were screened for skin lesions and subjected to rapid diagnostic tests (RDT) for Treponema pallidum antibodies. Positive RDT results were followed by Treponema pallidum particle agglutination (TPPA) and rapid plasma 218egain (RPR) blood testing. Any yaws-like skin lesions were sampled for PCR. Consented villagers six months and older were treated with a single azithromycin dosage (30 mg/kg) during the third round of ACD to reach 80% coverage. A positive TPPA suggests a past or current infection. A dual-positive test of TPPA and RPR (titre of ≥1:4) was considered an active infection, whether symptomatic or not. Individuals with no current clinical signs but having dual positive tests were considered to have latent yaws. All data were analysed descriptively using Microsoft Excel 2019.

Results and Discussion

A total of 140 out of 367 villagers (38.2%) were screened, with the majority being male (88; 62.9%) and above 15 years old (108; 77.1%). Out of those screened, 36 (25.7%) had positive RDT. Of these, 25 (69.4%) individuals agreed to venepuncture for the TPPA and RPR tests, whereas 11 (30.6%) refused the invasive procedure. We discovered 23 cases of latent yaws, with 19 individuals classified as having active infection with an RPR titre of ≥1:4. Only one yaws-like skin lesion were detected and sampled during ACD; however, the PCR came back negative for Treponema pallidum subspecies pertenue. Nonetheless, multiple yaw-like scars were seen among the adults. Since all those with dual-positive serology are over age 15, it supports the notion that yaws is in its latent phase based on the first infection reported in 2006. Treatment coverage during the third round of ACD was unsatisfactory; only 22.3% of the villagers received azithromycin. The Morges approach to yaws eradication by WHO recommended that mass therapy reaches at least 90% of the target population (2). The nomadic lifestyle, low health awareness as well as the beliefs and traditions of the locals, were among the hurdles to achieving 80% treatment coverage of yaws among this community. Additionally, for now, the Dual Path Platform (treponemal and non-treponemal) (DPP) test, a point-of-care test widely used in yaws-endemic countries (4), is still lacking in Malaysia.

If made available, this will definitely enhance field screening and surveillance of yaws in rural communities in Malaysia.

Table 1: Demographics (n=140)

Variables	Quantity	(%)
Sex		
Male	88	62.9%
Female	52	37.1%
Age		
<15 years old	32	22.9%
≥15 years old	108	77.1%
Presence of active Yaws-like skin lesion		
Yes	1*	0.7%
No	139	99.3%
Positive RDT	36	25.7%
Sample sent for TPPA and RPR test	25	69.4%
Treated with Azithromycin	82	22.3

*PCR negative.

Table 2: Diagnostic result of Yaws and its interpretation

	Quantity	Interpretation
Reactive TPPA	23	Possible past or current infection
Reactive TPPA and RPR (dual positive) titre of ≥1:4	19	Active yaws

Reactive TPPA and RPR (dual positivity) with active lesion	0	Infective yaws
Reactive TPPA and RPR (dual positivity) with NO active lesion	23	Latent yaws

Table 3: Demographic of individuals with dual positivity of TPPA and RPR test (n=23)

Variables	**Quantity**	**(%)**
Sex		
Male	**11**	**47.8%**
Female	**12**	**52.2%**
Age		
<15 years old	**0**	**0%**
≥15 years old	**23**	**100%**
Marital status		
Yes	**22**	**95.7%**
No	**1**	**4.3%**

Conclusion

This study highlights the re-emergence of yaws in marginalized populations. It emphasises the need to continuously educate the high-risk community and the healthcare providers serving them to improve case detection and treatment of yaws to prevent a resurgence and achieve the 2030 WHO eradication target.

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EPIDPP17/35 : Does Physical Fitness Level Associate With Body Weight Status Among School Adolescents In Terengganu, Malaysia?

Nurzaime Zulaily[1], Aryati Ahmad[2], Mohd Razif Shahril[3]
[1] *Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia*
[2] *School of Nutrition and Dietetics, Faculty of Health Sciences, Gong Badak Campus, Universiti Sultan Zainal Abidin*
[3] *Centre for Healthy Ageing and Wellness (H-CARE), Faculty of Health Sciences, Universiti Kebangsaan Malaysia*
Corresponding author's email: nurzaime@moh.gov.my

Summary
Despite the fact that body weight is highly correlated with physical fitness levels, it is unclear whether this is true among Terengganu school adolescents. The study examined the relationship between physical fitness level and body weight status among adolescents in Terengganu, Malaysia. Physical fitness level was assessed using National Physical Fitness Standard and body weight and height were measured to calculate the body mass index (BMI). Physical fitness level was found to be associated with school locations and districts in all age groups. Whilst the physical fitness levels of obese adolescents were negatively correlated with their BMI categories.

Keywords
Physical fitness, School adolescents, Body Mass Index, Terengganu, Obesity

Introduction
Physical fitness (PF) is relatively different from physical activity but is interconnected with each other in contributing to health outcomes. Previous study suggested that PF acts as a marker for health outcomes during childhood and adolescence (1). Decreased PF among children and adolescents was found to be associated with the increased in total and abdominal adiposity, increased prevalence of cardiovascular risk factors, whilst also negatively impact bone health, psychosocial well-being and academic performance (2). However, physical fitness status among school adolescents especially in Terengganu is not well established. This study was conducted to examine the association between physical fitness level and body weight status among adolescents in Terengganu, Malaysia.

Materials and Method

A cross-sectional baseline study was conducted using whole population of school adolescents aged 10 to 17 years from all primary and secondary schools in Terengganu. Schools within districts were classified as rural and urban by the Terengganu State Education Department (JPNT). A total of 512 schools involved in this study with 366 primary schools (n=35,460) and 146 secondary schools and comprised of 31,708 boys and 30,859 girls. Data on height, weight, gender, and age were obtained from the first school term of 2015 National Fitness Standard (SEGAK) test. BMI and BMI-for-age z-scores were computed and categorised based on the WHO Growth Reference 2007. Physical fitness level was assessed based on SEGAK using four tests and categorized into five levels ranging from very fit to unfit. Data was analysed using SPSS-IBM (version 22.0) (IBM Corporation, New York, USA). A two-sided p value of less than 0.05 was considered as statistically significant.

Results and discussion

The mean BMI of adolescents aged 10 to 12, 13 to 15 and 16 to 17 years old were ranging from 18.0±4.2 kg/m2 to 21.4±4.5 kg/m2 (Table 1). In total, the prevalence of thinness (<−2SD), normal (−2SD to +1SD), overweight (+1SD to +2SD) and obesity (>+2SD) were 8.4%, 64.7%, 15.0% and 12.0%, respectively (Table 2). While girls had a higher prevalence of overweight, boys showed a higher prevalence of thinness and obesity. There was a significant positive association between BMI categories with genders and school locations. Additionally, there were significant differences in mean physical fitness scores between boys and girls, school locations and districts in age groups of 10 to 12 and 13 to 15 years old for all tests. Nearly 50% from all age groups were categorized as fit and only 4.7% to 6.6% were categorized as very fit, whilst 0.9% to 2.3% were categorized as unfit (Table 3). Overall, significant associations were found between BMI categories and physical fitness levels for boys and girls ($p<0.001$). There was also a significant association between physical fitness levels and gender, school location and also districts in all age groups. The association between BMI categories and PF level especially among obese can be explained by the high fat mass due to lack of exercise that leads to lower fitness level (3). Nonetheless, Fogelholm et al. suggested that negative association between being overweight and PF may prevent physically active overweight individuals from achieving better PF level (4).

Table 1: Subject characteristic according to age group (n=62, 567)

	10-12	13-15	16-17	All
Age (years)				12.7 ± 2.3
Height (cm)	138.1 ± 8.9	154.0 ± 8.8	159.6 ± 8.2	145.9 ± 12.7
Weight (kg)	34.9 ± 10.8	48.7 ± 13.1	54.7 ± 13.0	41.9 ± 14.4
BMI (kg/m^2)	18.0 ± 4.2	20.4 ± 4.6	21.4 ± 4.5	19.2 ± 4.6

Fitness test				
Step-up	3.5 ± 1.2	3.2 ± 1.2	3.0 ± 1.2	3.3 ± 2.0
Push-up	3.3 ± 1.5	3.2 ± 1.4	3.4 ± 1.4	3.3 ± 1.5
Partial curl-up	3.8 ± 1.4	4.2 ± 1.2	4.2 ± 1.1	4.0 ± 1.3
Sit and reach	2.5 ± 1.0	2.7 ± 1.0	2.8 ± 1.1	2.6 ± 1.0

Data are Mean±SD;

Table 2: Percentage of BMI categories by age groups

	10-12	**13-15**	**16-17**	**All**			***p*-value[a]**
				Boys	Girls	Overall	
BMI categories							
Thin	10.1	6.6	5.3	9.0	7.7	8.4	<0.001
Normal	60.9	66.3	74.7	62.9	66.4	64.7	
Overweight	15.3	16.0	12.4	14.2	15.9	15.0	
Obese	13.7	11.1	7.6	13.9	10.0	12.0	
School location							
Rural							
Thin	10.4	6.4	5.2	9.2	7.8	8.5	<0.001
Normal	62.3	65.9	74.5	63.2	67.2	65.2	
Overweight	14.6	16.4	12.6	14.1	15.5	14.8	
Obese	12.6	11.3	7.7	13.5	9.5	11.5	
Urban							
Thin	9.9	6.7	5.3	8.9	7.6	8.3	<0.001
Normal	59.7	66.7	74.8	62.7	65.8	64.2	
Overweight	15.9	15.7	12.3	14.2	16.2	15.2	
Obese	14.5	10.8	7.5	14.2	10.4	12.3	

Data are percentage. [a]BMI categories versus genders in all subject (Pearson's chi-square test)

Table 3: Distribution of physical fitness level by BMI groups and gender

Variabes	**Total SEGAK score**	**Very fit**	**Moderate fit**	**Fit**	**Less fit**	**Unfit**	***p*-value**
All	13.1 ± 3.0	3503 (5.6)	19333 (30.9)	32034 (51.2)	62567 (10.5)	1126 (1.8)	0.001[a]

BMI categories							
Thin	13.1 ± 2.6	2690 (4.3)	18582 (29.7)	33598 (53.7)	6569 (10.5)	1126 (1.8)	<0.001[b]
Normal	13.3 ± 2.8	3754 (6.0)	19833 (31.7)	31971 (51.1)	6131 (9.8)	938 (1.5)	
Overweight	13.0 ± 3.1	3503 (5.6)	17643 (28.2)	32722 (52.3)	7257 (11.6)	1439 (2.3)	
Obese	12.3±3.6*	3065 (4.9)	13889 (22.2)	31533 (50.4)	11324 (18.1)	2690 (4.3)	
Gender							
Boys	12.7±3.0	3441 (5.5)	19896 (31.8)	31846 (50.9)	6256 (10)	1063 (1.7)	<0.001[c]
Girls	13.4±2.9	3566 (5.7)	18770 (30.0)	32159 (51.4)	6819 (10.9)	1188 (1.9)	

Data are frequency (%), [a]Total SEGAK score *vs*. BMI categories (One-way ANOVA); [b]Physical fitness level *vs*. BMI categories (Pearson's chi-square test); [c]Physical fitness level *vs*. genders (Pearson's chi-square test)

Conclusion

In conclusion, BMI, genders, school locations and districts of living were associated with physical fitness level among school adolescents. Understanding the factors associated with low physical fitness level among school adolescents can alert targeted interventions and public health initiatives aimed at promoting healthier lifestyles and reducing obesity in this population.

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EPIDPP18/27 : Trends Of Dental Caries Status Of 12-Year-Old School Children In Sarawak Central Region, Sarawak 2015-2019

Wong Siong Ting [1], Aminuddin Mohd. Natar [2], Norkhafizah Saddki [3]
[1] *Sibu Divisional Dental Office, Ministry of Health Malaysia*
[2] *Oral Health Division, Sarawak State Health Department, Ministry of Health Malaysia*
[3] *School of Dental Sciences, Universiti Sains Malaysia*
Corresponding author's email: stwong@moh.gov.my

Summary

Dental caries is recognised as the most prevalent oral disease globally, affecting most individuals including school children. This study was aimed to assess dental caries prevalence, experience and treatment needs of 12-year-old school children (Standard 6) under the Ministry of Health Malaysia (MOH) incremental dental care (IDC) programme in Sarawak Central Region from 2015 to 2019. Despite being rendered orally-fit via IDC annually since Standard 1, more than one-third of them still suffering from dental caries at Standard 6. Multisectoral collaborative efforts involving various stakeholders should be taken to promote oral health for all.

Keywords
Dental caries, caries prevalence, caries experience, Sarawak

Introduction

Dental caries is the most prevalent oral disease affecting most individuals worldwide during their life course despite being largely preventable (1). It shares many similar common risk factors, social and commercial determinants with non-communicable diseases. The latest National Oral Survey of School Children in 2017 demonstrated that dental caries status of Sarawak school children was generally poor compared to other states (2). Limited data was available at divisional and district levels in Sarawak Central Region (Sibu Division, Sarikei Division, Kapit Division and Mukah Division). Availability of such data is imperative for evidence-based planning of school oral health care service in Sarawak with large land areas, diverse ethnicities, cultural backgrounds, and lifestyles. Therefore, this study aimed to assess dental caries prevalence, experience and treatment needs of 12-year-old school children (Standard 6) under the Ministry of Health Malaysia (MOH) incremental dental care (IDC) programme in Sarawak Central Region from 2015 to 2019.

Materials and Methods

This was a secondary data analysis study involved five cohorts of Standard 6 students enrolled in primary schools under the purview of Ministry of Education (MOE) in Sarawak Central Region from 2015 to 2019 [*n* (2015) = 10,509, *n* (2016) = 10,277, *n* (2017) = 10,782, *n* (2018) = 10,767 and *n* (2019) = 10,398]. Data was extracted from the MOH Health Information Management System (HIMS) - Oral Health Sub-System. The diagnosis and reporting of dental caries status followed the World Health Organization (WHO) criteria using the Decayed, Missing, and Filled Teeth (DMFT) index by trained MOH Dental Therapists providing oral health care services to school children in Sarawak Central Region. All data were analysed using the Microsoft Excel 2019 to generate descriptive statistics.

Results and Discussion

Caries prevalence among five cohorts of Standard 6 children in Sarawak Central Region over five-year period was constant at about 40%, except for 2016 (45.9%) (Figure 1). For caries experience (mean DMFT), the results showed a reducing trend from 1.01 in 2015 to 0.85 in 2019. Dental caries treatment needs based on the mean decayed teeth (mean D) also exhibited decreasing trend from 0.31 (2015) to 0.23 (2019) (Figure 2). Similar trend was observed for caries experience (mean

DMFT) at the national level, from 0.82 (2015) to 0.68 (2019). However, contrasting to this study finding, at the national level, caries prevalence showed decreasing trend from 44.0% (2015) to 43.1% (2019) (3). Despite being rendered orally-fit via incremental dental care annually since Standard 1, more than one-third of them still suffering from dental caries at Standard 6. The findings from this study should serve as a wake-up call for us to collectively take more pragmatic multi-sectoral approaches involving various stakeholders to address social and commercial determinants of dental caries. All oral health care workers need to champion that all sectors are related to oral health. The best buy interventions should be established for cost-effective priority interventions for preventing common oral diseases and promoting oral health. It is hoped that such concerted efforts can chart the way forwards for sustainable oral health and lifetime smile, while strengthening of universal oral health coverage (4, 5).

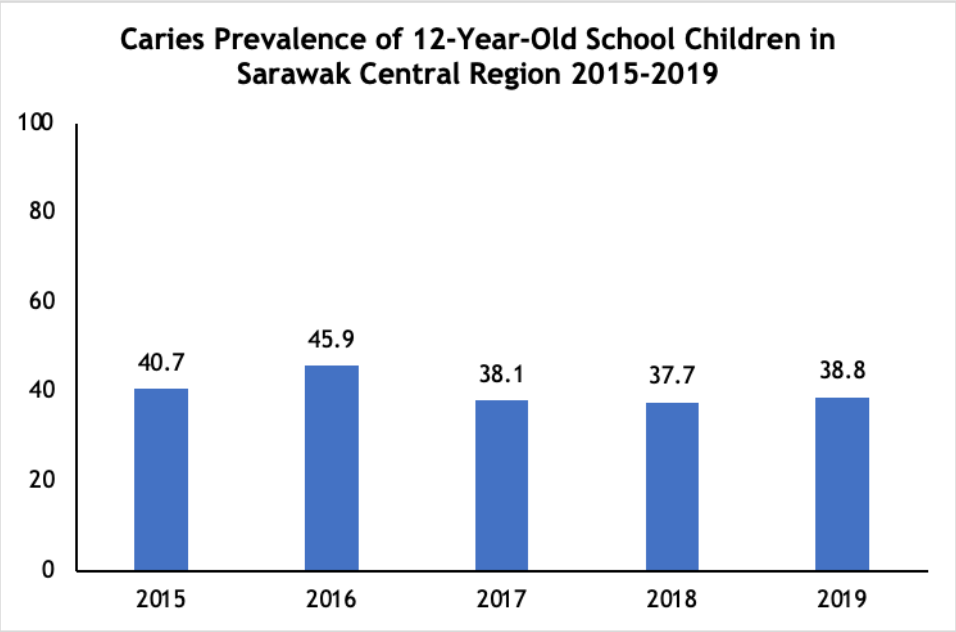

Figure 1: Caries Prevalence of 12-Year-Old School Children in Sarawak Central Region 2015-2019

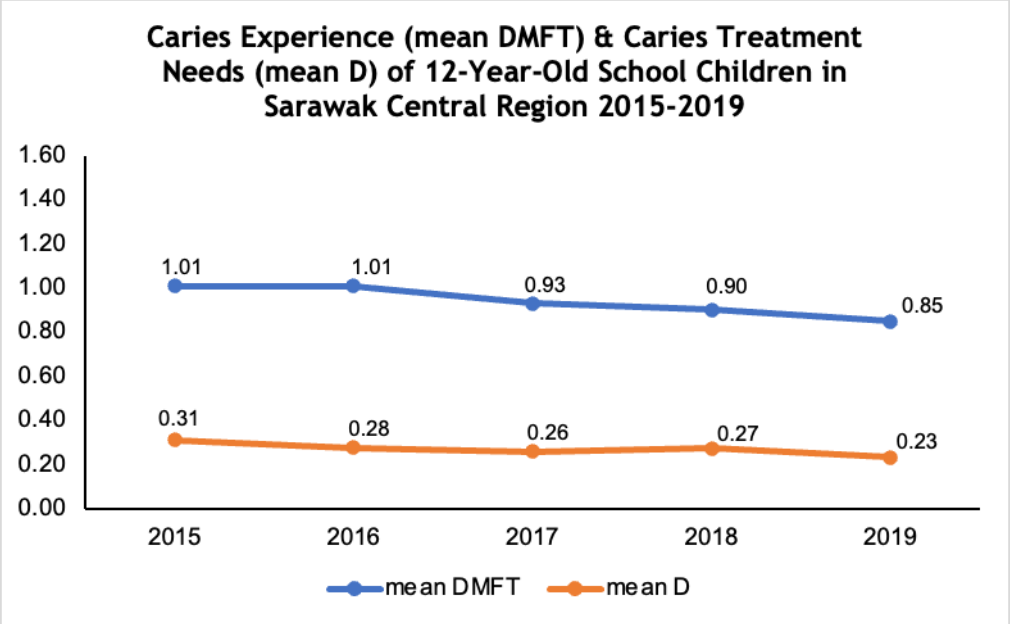

Figure 2: Caries Experience (mean DMFT) & Caries Treatment Needs (mean D) of 12-Year-Old School Children in Sarawak Central Region 2015-2019

Conclusion

The dental caries status of 12-year-olds in Sarawak Central Region was static from 2015 to 2019. Thus, more need to be done to ensure sustainable orally-fit status following treatment completion among school children.

Acknowledgements

Director General of Health, MOH; Principal Director of Oral Health Programme, MOH; all Divisional Dental Officers, Dental Matrons, Dental Sisters and Dental Therapists in Sarawak Central Region.

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EPIDPP19/86 : The Characteristics Of Zoonotic Malaria Patients In Kuala Pilah District, Negeri Sembilan

Muhammad Abdul Hafiz Kamarul Zaman[1], Noraliza Radzali[1],Azline Abdilah[1],Rehemey Shamsul Rosdi[1]
Kuala Pilah Health District Office, Negeri Sembilan State Department, Malaysia Ministry of Health
Corresponding author's email: dr.hafiz@moh.gov.my

Summary
Malaysia is moving towards the elimination of Human Malaria. Since 2018, there is no reported Indigenous Human Malaria in our country. However, Zoonotic Malaria has risen since then and contributed to the majority number of Malaria cases. This study aimed to determine the characteristics of Malaria infected patients in Kuala Pilah district, Negeri Sembilan from 2018 to 2022. This study shows most of the zoonotic Malaria patients were Malay, male, and aged between 16 and 64. Otherwise, the symptoms of Malaria infections were non-specific and the majority had delayed diagnosis as most of the cases were diagnosed after 4 days of having symptoms.

Keywords: Malaria, Plasmodium knowlesi, Delayed Diagnosis, Socio-demographic, Kuala Pilah.

Introduction
Since early 2000, it was reported Zoonotic Malaria was the main type of Malaria infection in Malaysia and other several countries (1). In Kuala Pilah, Zoonotic Malaria Contributes 88% of Total Malaria cases from 2018 to 2022. It was found that the contributing factors due to environmental and ecological changes(1). The long-tailed and pig-tailed macaques are known to be the main reservoirs of Zoonotic Malaria(2). Therefore, the understanding of this disease among local exposed risk groups and healthcare personnel should be improved to prevent mortality and morbidity. This study aimed to determine the characteristics of Malaria infected patients in Kuala Pilah District, Negeri Sembilan.

Methods
This study uses a cross-sectional study design. All cases were selected based on those that had been registered into the Kuala Pilah district's E-Notification CDCIS system between 2018 and 2022. A confirmatory test utilizing Blood Film for Malaria Parasite (BFMP) must be done prior to notification with a result of Plasmodium Knowlesi infection. All Human Malaria cases were excluded. We gathered information based on sociodemographic variables (age, race, gender, and comorbidities) and clinical variables (symptoms, duration from onset to diagnosis, and types of malaria infection) for each of these cases.

Results and Discussion

During the 5 years period, there were a total of 22 cases of Zoonotic Malaria in Kuala Pilah. There is an increase in the trend of cases observed from 2020 until 2022. In the year 2022, Kuala Pilah recorded its highest number of Zoonotic Malaria cases with 9 cases. From the total number of cases, none of the cases were from young ages, 19 cases were from the working age group (86%) and 3 cases were from the elderly (14%), mean age was 44 with a standard deviation of 15.40. Most of these cases are male, contributing to 20 cases (91%). Regarding race, 18 (81.8%) cases were Malay; the rest were Orang Asli with 4(18.2%). When it comes to comorbidities, we found out that 17 (77%) cases had no comorbidities and 5 (23%) cases had history of comorbidities.

All cases (100%) exhibit fever symptoms from a clinical standpoint. Besides, other clinical manifestations were headache (63%), gastrointestinal symptoms (27.3%) and arthralgia (22.7%). Most of the cases were categorized as severe or complicated infections (12,54.5%), while the remaining cases were categorized as uncomplicated infections. The duration between the onset of symptoms and the time of diagnosis was another factor that was observed. 7 cases were diagnosed within 4 days (31.8%) and the rest were more than 4 days (68.2%) with a mean of 6 days and a standard deviation of 3.25.

This study shows majority had delayed diagnosis which accounts for 68.2% of cases that did not meet the standard requirement by World Health Organisation (WHO). WHO had suggested diagnosis of Malaria should be made within 24 hours after the onset of symptoms(3). A study by Bastaki et al uses the definition of delayed diagnosis of more than 4 days from the onset of symptoms(4). Besides, most Malaria-infected cases in Kuala Pilah exhibit non-specific symptoms. There is a need to determine the contributing factor towards the delayed in diagnosis. For example, a study showed the reason for the delay in diagnosis of Malaria infection was due to poor health-seeking behavior and delay in diagnosis by healthcare personnel(5).

Table 1: Characteristics of Malaria infected patients in Kuala Pilah District, Negeri Sembilan

Variables	Category	Frequency (n=22)	Percent (%)
Age	Young Ages (1-15)	0	0
	Working Age (16-64)	19	86
	Elderly (> 65)	3	14
Gender	Male	20	91
	Female	2	9
Race	Malay	18	81.8
	Chinese	0	0
	Indian	0	0
	Orang Asli	4	18.2
Comorbidities	Yes	5	23
	No	17	77

Types of Malaria	Severe	12	54.5
	Uncomplicated	10	45.5
Duration from Onset to Diagnosis	< 4 days	7	31.8
	> 4 days	15	68.2

Conclusion

Further study should be done to determine the cause of the delay in diagnosis of Malaria infection among patients from the district of Kuala Pilah, Negeri Sembilan, and its relation to cases of severe Malaria. Creating awareness of Malaria among high-risk groups is essential to ensure health-seeking behavior in the community. Regular discussion among healthcare regarding the situation of Malaria will prompt awareness and improves the index of suspicion for diagnosing Malaria infection.

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EPIDPP20/90 : Birth Cohort Effects On Obesity Among Malaysian Adults: The Generation X-ers and Y-ers Are The High-Risk Subpopulations

Chien Huey Teh [1], Chee Cheong Kee [2], Sanjay Rampal [3], Mohd Azahadi Omar [2], Tahir Aris [1]

[1] Institute for Medical Research, National Institutes of Health, Ministry of Health, Setia Alam, Selangor, Malaysia

[2] Biostatistics and Data Repository Sector, National Institutes of Health, Ministry of Health, Setia Alam, Selangor, Malaysia

[3] Centre for Epidemiology and Evidence-based Practice, Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia

Corresponding author's email: chienhuey@moh.gov.my

Summary

Obesity is a common public health issue worldwide. This study used the extended hierarchical age-period-cohort (HAPC) model to illuminate the BMI and waist circumference trajectories of Malaysia adults across the 20th and early 21st century and its variations by socio-demographics. Generally, BMI and waist circumference increased with cohort recency. BMI trajectories across birth cohorts varied by ethnicity whilst waist circumference trajectories varied by both gender and ethnicity.

Keywords
cohort effect, generational differences, trajectories, obesity, Millennials

Introduction
Obesity is a complex health issue influenced by various factors such as diet, physical activity levels, socio-economic and environmental factors that are unique to individuals that share similar historical, environmental and societal experience (cohort effect) (1). In the recent decades, Malaysia has seen a transition from traditional to westernised lifestyle, therefore, it is timely to estimate cohort effect on obesity in order to provide additional understanding on the driving factors behind the obesity epidemic in Malaysia.

Materials and Methods
The present study combined data from four population-based cross-sectional studies, the National Health and Morbidity Surveys (NHMS) 1996, 2006, 2011 and 2015 (n=94,537) and performed extended Hierarchical Age-Period-Cohort (HAPC) analysis to examine the BMI and waist circumference trajectories across birth cohorts as well as gender and ethnic variations in such trajectories while controlling for the confounding effects of age and period. These models were fitted using the mixed programme in STATA version 14 (StataCorp., College Station, TX, USA).

Results and Discussion
Generally, BMI (Figure 1) and waist circumference (Figure 2) increased with cohort recency. These findings are consistent with many previous studies (2,3). Exposures to the progressively more obesogenic environment, such as increased accessibility, availability and affordability of calorie-dense food, advent of automated devices for household chores and urbanisation, could be the driving factors for the monotonic increase in BMI and waist circumference across birth cohorts.

There were significant gender differences ($p<0.001$) in waist circumference across birth cohorts, with a more pronounced increase among women of more recent cohorts. Such trends could be attributable to a greater likelihood of sedentary behaviours among the women as a result of increased women participation in white-collar jobs and advanced home technologies in these modern days.

In terms of ethnic differences, the Chinese have a less profound BMI ($p<0.001$) and waist circumference ($p<0.001$) increase across birth cohorts compared to other

ethnic groups. The well-recognised ethnic variations in body fat composition at a given BMI (4), genetic predisposition (5) and differences in dietary habits among Malayians are among the plausible factors for the observed ethnic heterogeneity.

Conclusion

The increasing BMI and waist circumference among those born in more recent cohorts, particularly the late Generation X-ers (born between 1970-1979) and Generation Y-ers (born between 1981-1996), is alarming. Future studies to identify risk factors that are associated with such high cohort-specific susceptibility to obesity among these sub-populations are necessitated to prevent excess weight gain among the future generations.

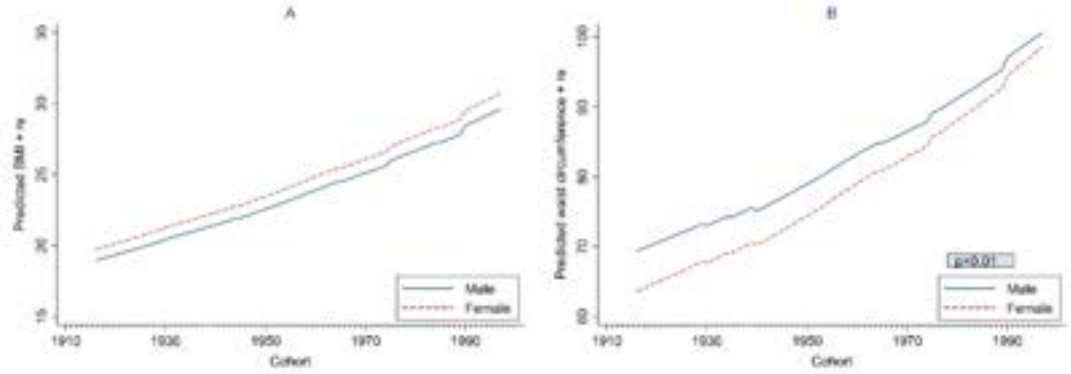

Figure 1: Cohort trajectories of BMI and waist circumference, by gender

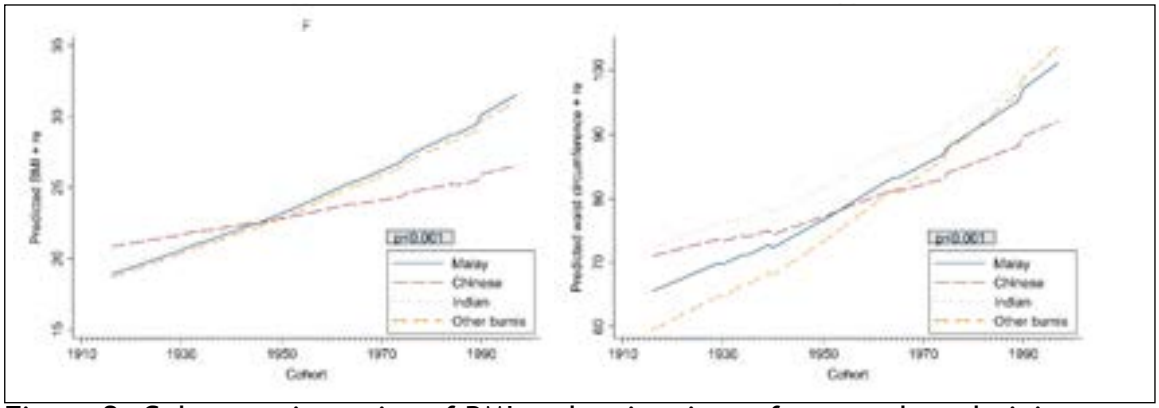

Figure 2: Cohort trajectories of BMI and waist circumference, by ethnicity

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EPIDPP21/98 : Cost Analysis Of Human Papillomavirus Test And Pap Smear Test In Ministry Of Health Malaysia

Zen Yang Ang[1], Yuke-Lin Kong[1], Mohd Shaiful Jefri Mohd Nor Sham[1], Anis-Syakira Jailani[1], Nur Zahirah Balqis-Ali[1], Weng Hong Fun[1], Shakirah Md.Sharif[1], Nurul Aiman Farhana Nor Aziz Hashim[1], Shazimah Abdul Samad[2], Roziah Ismail[2], Zakiah Mohd Said[2], Rafidah Ahmed[3], Suhaila Md Hanapiah[3]

1. Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia.
2. Adult Section, Family Health Development Division, Ministry of Health Malaysia.
3. Pathology Department, National Cancer Institute, Ministry of Health Malaysia.
Corresponding author and presenter's email: angzenyang@moh.gov.my

Summary

This study aimed to estimate the cost of performing a cervical cancer screening using Human Papillomavirus (HPV) tests and pap smears at Ministry of Health (MOH) facilities. The findings revealed that the estimated total cost per HPV test, using in-house and outsourced laboratory services, was MYR102.86 (USD22.43) and MYR84.55 (USD18.44) respectively. Meanwhile, the estimated cost per pap smear test was MYR58.66 (USD12.79). The main cost driver across different modalities was the cost of contract services. Before expanding the screening services, contract negotiation played a crucial role to ensure the quality and sustainability of the services.

Keywords

Cervical cancer screening, Human papillomavirus, HPV test, Pap smear, Cost analysis

Introduction

Since 2019, the Ministry of Health Malaysia (MOH) has introduced a cervical cancer screening programme using the Human Papillomavirus (HPV) test at its primary care clinics. The programme was expanded in phases to increase access to the population in response to the World Health Organization's recommendation that 70% of women should undergo high-performance testing twice in their lifetime between the ages of 35 and 45 (1). Initially, the analysis of HPV test samples was conducted by the MOH laboratory, utilising in-house laboratory services. To enhance screening capacity, several states started to outsource HPV specimen analyses to private laboratories. Hence, this study aimed to estimate the cost of various cervical screening modalities, which include HPV tests performed using both in-house and outsourced laboratory services, along with pap smear tests conducted through outsourced laboratory services.

Methods

A mixed approach of activity-based and top-down costing from a healthcare provider perspective was employed in this study. We collected the relevant direct medical costs, which were fixed, semifixed and variable costs, of screening activities for HPV tests from seven clinics and one clinic for pap smears from January to March 2023 (Table 1). Costs incurred for in-house laboratory HPV analysis activities were collected from one MOH laboratory. The estimated cost of contract services for i) in-house HPV test analysis, ii) outsourced HPV test analysis and iii) outsourced pap smear test analysis, were obtained from expert interviews. HPV and Pap smear screening using outsourced laboratory services did not incur any laboratory costs other than contract services. The costs of the HPV test and pap smear test were calculated using Microsoft Excel.

Table 1: Cost components of the study

Direct Medical Cost Components
A. Fixed costs (Capital)
1. Medical equipment
2. Office equipment
3. Vehicle
4. Information and communication technology (ICT)
B. Fixed costs (Overheads)
1. Utilities (electricity, water, sewerage, telephone, internet bills)

2. Non-clinical support - clinical waste management, cleaning, hospital information system, maintenance and repair work
3. ICT
C. Semifixed costs (Staff costs)
D. Variable costs
1. Consumables
2. Vehicle operating costs (fuel, toll, maintenance)
3. Contract services cost

Results and Discussions

The estimated cost per HPV screening using in-house and outsourced laboratory services, as well as pap smear screening using outsourced laboratory services, were MYR102.86 (USD22.43), MYR84.55 (USD18.44) and MYR58.66 (USD12.79), respectively (Figure 1). The main cost driver of screening services was the variable costs, particularly the cost of contract services (In-house laboratory services: MYR69; Outsourced laboratory services: MYR60) followed by staffing and overhead costs (Figure 1). The cost of HPV and Pap smear screening could be lowered through appropriate contract negotiation. Different from other local cost analysis studies(3-4) where staffing cost was the cost driver, our study illustrated the cost of contract services as the main cost driver which was due to the fact that contract services consisted of multiple sub-components including private laboratory staffing cost, instrument placement cost and so on.

For HPV screening using in-house and outsourced laboratory services, the estimated staffing costs were MYR23.74 (min: MYR21.77, max: MYR49.68) and MYR18.63 (min: MYR17.58, max: MYR32.43), respectively. The wide range in staffing costs was likely due to differences in the time taken to accomplish screening tasks and additional work processes in certain clinics. This might need to be considered during policy decision-making. The staffing cost incurred in pap smear screening using outsourced laboratory services was MYR15.61 (Figure 1).

The higher cost for HPV test screening using in-house laboratory services compared to outsourced was due to the difference in cost for contract services (MYR 9) and the extra cost of the in-house laboratory processes.

Figure 1: Cost of HPV test and pap smear test screening (per test basis)
* Estimated total cost might not be equal to the sum of the value of each cost component as clinic costs were expressed in median value.

Conclusion

The estimated cost of HPV tests using in-house laboratory services was the highest, followed by HPV and pap smear screening using outsourced laboratory services. As the cost of contract services was the main cost driver, contract negotiation plays a vital role in reducing the total screening cost.

Acknowledgements

The authors wish to thank the Director-General of Health, Malaysia for his permission to publish this research highlight. We also express our gratitude Dr Nor Zam Azihan Mohd Hassan, Dr Farhana Aminuddin, Dr Nur Amalina Zaimi and Mr Sivaraj Raman as well as liaison officers at MOH clinics and laboratory for their guidance and support in this study.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

EPIDPP22/102 : Human Brucellosis: A Retrospective Study In Terengganu 2014 - May 2023

Wan Nor Hafizah Wan Baharuddin[1], Muhammad Naim Samsudin[1], Azmani Wahab[1], Mohd Anuar Abd Rahman[1], Kasemani Embong[1]
[1]Terengganu State Health Department
Corresponding author's email: dr.wnhafizah@moh.gov.my

Summary
In Malaysia, brucellosis is considered a rare disease, and the incidence of human cases has been relatively low compared to some other regions. Despite having a low prevalence, human brucellosis poses a significant threat to the public's health. We found that brucellosis infection was more likely to occur in males, adults aged 15-65 years, main symptom was prolonged fever and the high percentage of cases that reported having consumed unpasteurised milk products. Therefore, targeted health education campaigns are needed to improve knowledge and awareness in these populations. There is a need for updated and comprehensive epidemiological data on human brucellosis in Malaysia to strengthen prevention and control strategies and to assess the impact of the disease on public health and socio-economic development.

Key Words
Human Brucellosis, Terengganu

Introduction
Human brucellosis is a zoonotic disease caused by bacteria of the genus Brucella. In a study done from 2004 to 2009, the seropositivity was low (5.4 %) among suspected human brucellosis cases. This indicates that brucellosis is not very common in Malaysia among individuals who have contact with infected animals. Since then, sporadic cases and outbreaks have been reported, mainly among farmers, veterinarians, and abattoir workers who are exposed to infected animals or their products. However, the true burden of human brucellosis in Malaysia remains unknown due to underreporting, lack of diagnostic facilities, and low awareness among health professionals and the public (1). Human brucellosis is transmitted to humans through contact with infected animals or their products, such as milk, cheese, meat, or placenta. The symptoms of human brucellosis include fever, headache, muscle pain, fatigue, and enlarged spleen and liver. Human brucellosis can be treated with antibiotics, but relapses are common, and complications can occur. Prevention of human brucellosis requires proper hygiene and sanitation measures, as well as vaccination and control of animal reservoirs (2). The objectives of the study were to describe the epidemiology and risk factors of brucellosis cases.

Methodology
This retrospective study involving all Brucellosis cases notified to the health office in all districts in Terengganu from 2014 to May 2023. These data extracted from line listing of brucellosis cases reported to Communicable Disease Sector, Terengganu State Health Department. The gold standard for diagnosis of Brucellosis

remains isolation of Brucella sp. bacteria from samples (3). For this study, blood specimen was sent for blood polymerase chain reaction (PCR) in Institute for Medical Research (IMR) after Brucella sp. was cultured from blood culture and sensitivity (C&S) specimen.

Results And Discussion

During the study period, a total of 13 human brucellosis cases in Terengganu with 2 outbreaks were reported which occurred in Setiu (2018) and Kuala Terengganu (2023). All brucellosis cases were Malays (100%) and had prolonged fever (100%). Most brucellosis cases were in the age group of 15-65 years old (6, 46.2%) and most of them were housewives/ unemployed (8, 61.5%). Consumption of unpasteurised milk was significantly associated with human brucellosis in this study (11, 84.6%) and the majority of cases were living on farms and contacted with livestock or (8, 61.5%).

Table 1: Characteristics of human brucellosis cases from 2014 – May 2023

Factor	No. of Cases (n=13)	%
Age (years)		
Less than 15	5	38.4
15-64	6	46.2
65 and above	2	15.4
Gender		
Male	7	53.8
Female	6	46.2
Race		
Malay	13	100%
Chinese/ Indian	0	0
Occupation		
Clerk	1	7.7
Student	1	7.7
Pensioner	1	7.7
Unemployed	8	61.5
Goat breeder	2	15.4

Figure 1: Symptoms of human brucellosis cases

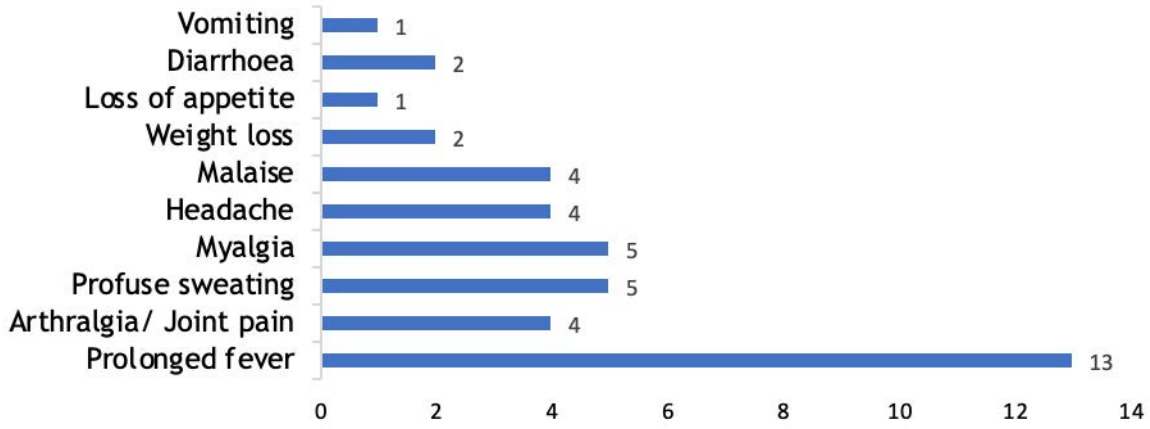

Table 2: Risk factors associated with human brucellosis cases from 2014 – May 2023

Risk Factor	No. of Cases (n=13)	%
Consumption of unpasteurized milk		
Yes	11	84.6
No	2	15.4
Working with livestock		
Yes	2	15.4
No	11	84.6
Lives at farm		
Yes	8	61.5
No	5	38.5
Contact with livestock		
Yes	8	61.5
No	5	38.5

Conclusions

We found that brucellosis infection is a rare disease in Terengganu. It was more likely to occur in males, adults aged 15-65 years, main symptom was prolonged fever and the high percentage of cases that reported having consumed unpasteurised milk products. The interdisciplinary approach combines the

veterinary, medical, and public health disciplines working together could have positive effects on the prevention and management of brucellosis.

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EPIDPP23/162 : Physical Environment Characteristics Among Physically Inactive Antenatal Women In Seremban, Malaysia

Nazatul Yusrina Mohamad Yusof[1], Azline Abdilah[2], Nor Afiah Mohd. Zulkefli[3], Rosliza Abdul Manaf[3]

[1] Tampin Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia

[2] Kuala Pilah Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia

[3] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Corresponding author's email: yusrina_1206@yahoo.com

Summary

Physically inactive antenatal women are associated with adverse pregnancy and birth outcomes such as preeclampsia, gestational diabetes mellitus, preterm birth, and others. The physical environment is known to influence the amount and type of physical activity, which can be positive or negative. This study aimed to determine the characteristics of the physical environment among physically inactive antenatal women. There was an association between the availability of transportation, safety in conducting physical activity, and weather influence on physical activity in physically inactive antenatal women. Nevertheless, focused intervention toward reducing the significant barriers to physical activity can be done effectively.

Keywords

Physical activity, physical environment, antenatal women, observational study, Malaysia

Introduction

Physically inactive antenatal women are associated with adverse pregnancy and birth outcomes. The American College of Obstetrics and Gynaecology (ACOG) recommends that all pregnant women should engage in regular physical activity with a total amount of 150 minutes per week (1). However, only a few follow the

recommendation. Various factors were found to affect physical inactivity among antenatal women, including the physical environment. For example, the availability of transportation to the site, safety issues, unpredictable weather, and others, are likely to influence the amount and type of physical activity among antenatal women. A study done in South Carolina stated that perceived safety in performing physical activity was significantly associated with the level of physical activity. Hence, this study aimed to determine the physical environmental characteristics among physically inactive antenatal women, so that further targeted and effective intervention can be done to improve their physical activity.

Materials and Methods

This study used a cross-sectional study design and proportionate stratified random sampling in the selection of 936 participants, of antenatal women attending 12 government health clinics from September 2017 to July 2020 in Seremban, Negeri Sembilan. The selected participants were Malaysian and able to read and write in the Malay language and used a self-administered questionnaire for data collection. The independent variables that were measured for physical environments include the availability of physical activity facilities, availability of transportation, weather influence on conducting physical activity and safety in performing physical activity, as well as the availability of childcare. A total of 936 questionnaires were distributed to eligible respondents with a response rate of 94.0 %. Descriptive analysis and reliability analysis using ICC were employed. All data were analysed using SPSS version 23.0.

Results and Discussion

The majority of the respondents claimed that weather's influences on physical activity and the availability of childcare were crucial environmental factors, which was 78.30% for both. Otherwise, there was a significant association between the availability of transportation in doing physical activity (p-value<0.001), safety in conducting physical activity (p-value<0.001), and weather influence on physical activity (p-value <0.001) with physical inactivity among antenatal women. The unavailability of transport makes women struggle to go anywhere, including recreational areas or parks, to take part in physical activity. A study was done in Malaysia in regards to the satisfaction of using public transport in 2012 reported that most of the participants preferred to use private transport because of the poor quality of services, such as the failure of public transport to adhere to the scheduled operating time, and poor vehicle maintenance to provide a conducive and safer environment (2). Nevertheless, bad weather was found to influence antenatal women's physical activity levels. Hot seasons trigger women to be physically inactive (3). This was possibly due to the effect of pregnancy thermoregulation which increases body heat production (4). Therefore, it is good to suggest indoor exercise in an ambient environment to perform physical activity.

Table 1. The distribution of physical environmental factors of respondents (n=880).

Variables	n (%)

Availability of Physical Activity Facilities	
Yes	441 (50.10)
No	439 (49.90)
Availability of Transport in Doing Physical Activity	
Yes	340 (38.60)
No	540 (61.40)
Safety in Conducting Physical Activity	
Yes	532 (60.50)
No	348 (39.50)
Weather Influence on Physical Activity	
Yes	689 (78.30)
No	191 (21.70)
Availability of Childcare	
Yes	689 (78.30)
No	191 (21.70)

Table 2. The association between physical environment and physically inactive antenatal women in Seremban (n=880)

	Inactive n = 565 (%)	**Active n = 315 (%)**	**Test Statistics**		
			X^2	*df*	*P-value*
Availability of PA Facilities					
Yes	294 (66.70)	147 (33.30)	2.332	1	0.127
No	271 (61.70)	168 (38.30)			
Availability of Transport in Doing PA					
Yes	247 (72.60)	93 (27.40)	17.184	1	<0.001*
No	318 (58.90)	222 (41.10)			
Safety in Conducting PA					
Yes	369 (69.40)	163 (30.60)	15.564	1	<0.001*
No	196 (56.30)	152 (43.70)			
Weather Influence on PA					
Yes	467 (67.80)	222 (32.20)	17.652	1	<0.001*
No	98 (51.30)	93 (48.70)			

Availability of Childcare					
Yes	302 (63.80)	171 (36.20)	0.057	1	0.812
No	263 (64.60)	144 (35.40)			

* Significant at P < 0.05

Conclusion

Physically inactive antenatal women were associated with the availability of transportation for doing physical activity, the safety of conducting physical activity, and the influence of weather on physical activity. Further targeted and effective intervention should be done to improve the physical activity among antenatal women in Seremban.

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EPIDPP24/11 : Women Attending Cervical Cancer Screening Programs By The Public Health Sector; Who Are They?

Nur Zahirah Balqis-Ali [1], Anis-Syakira Jailani [1], Nurul Aiman Farhana NAH [1], Weng Hong Fun [1], Sondi Sararaks [1], Nur Syazimah Abdul Samad [2], Zakiah Mohd Said [2]

[1] *Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia*

[2] *Family Health Section, Family Health Development Division, Ministry of Health, Malaysia*

Corresponding author's email: dr.nurbalqis@moh.gov.my

Summary

High-risk Human papillomavirus (HPV) screening is critical in preventing cervical cancer. The study aims to outline the characteristics of women attending Malaysia's national cervical cancer HPV-based screening programme. Data from the National Health and Morbidity Survey and the Malaysian public cervical cancer screening registry were analysed to highlight the characteristics and compare them to the general population. Attendees represent a subset of women using public healthcare facilities, which differed from the general population characteristics. The national registry should be extended to include more screening done elsewhere, and targeted planning must be employed to reach more women in the community.

Keywords
Cervical cancer, screening, characteristics, Malaysia

Introduction

Detection of cervical cancer at an early stage via screening programs is crucial for effective treatment and greater survival probability (1). With the shift in cervical cancer screening towards more straightforward and practical testing, HPV DNA-based testing has been available at healthcare facilities under the Ministry of Health Malaysia (MOH) through the national cervical cancer screening programme since 2019 (2). In the dichotomous Malaysian healthcare system, women may choose to attend the screening in either the public or private sector. The extensive public screening program constitutes more than 80% of all screening. This paper aims to outline the characteristics of women attending the HPV-based screening program in public healthcare facilities to understand who is reached by the program.

Materials and Methods

Cross-sectional data were extracted from the National Health and Morbidity Survey (NHMS) 2019 to describe the prevalence of women attending public healthcare facilities (3). In addition, the socio-demographic and economic conditions from the Malaysian public cervical cancer screening registry by the Family Health Development Division, MOH, between 2019 – 2021 were analysed to highlight the characteristics of those who accessed the public screening program. The differences in characteristics from the general population were generated by comparing with the distribution data by the Department of Statistics Malaysia (DOSM) (4). All data were analysed using Stata version 14.

Results and Discussion

According to the NHMS 2019, 68.6% of women used public healthcare services, and the remaining 31.4% were likely to use private healthcare services (3). Analysis from the MOH's cervical cancer screening registry found that of the 36,378 women screened through the HPV-based general program between 2019 - 2021, urban localities, particularly WP Kuala Lumpur & Putrajaya (48.20%), had the highest attendance. Most attendees were Malay (83.40%), followed by Chinese (8.29%), Indians (6.66%), and others (1.61%). The majority age group was comprised of individuals aged 30-39 years old. In addition, 32.26% were government employees with an income below RM4000. The distribution by state, locality, and ethnicity differed from the population distribution. Only two-thirds of women utilised public healthcare, with the majority attending the public screening program being of Malay ethnicity, from urban areas, and few states. Other women were assumed to participate in private screening programs or missed out.

Table 1: Characteristics and distribution of women attending cervical cancer screening via HPV DNA testing between 2019-2021

Variables	n	%	% By population distribution

Total	Overall	36,738	100.00	
Strata				
	Rural	3,489	13.01	22.31
	Urban	23,248	86.95	77.69
State				
	Johor	979	2.66	21.62
	Kedah	9,392	25.56	12.13
	Kelantan	2,410	6.56	10.37
	Negeri Sembilan	1,252	3.41	6.66
	Selangor	4,997	13.60	37.98
	WP KL & Putrajaya	17,708	48.20	11.23
Age group (years)				
	20-29	587	1.60	28.15
	30-39	21,478	58.46	28.19
	40-49	11,073	30.14	21.02
	50-65	3,600	9.80	22.64
Ethnicity				
	Malay	30,638	83.40	69.80
	Chinese	3,046	8.29	22.40
	Indian	2,447	6.66	6.80
	Others	591	1.61	1.00
	Unknown	16	0.04	
Education level				
	Never attended school/Primary	655	5.74	9.50
	Secondary	4,816	42.77	50.00
	Certificate/Tertiary	5,923	51.98	40.50
Income level				
	<=RM3999	6,656	58.47	Monthly household income in the year 2020: Median=RM5,209; Mean=RM7,089.
	RM4000-RM7999	3,637	31.95	
	>=RM8000	1,091	9.58	
Occupation				
	Self-employed	758	6.65	-
	Government employee	3,675	32.26	
	Private employee	2,665	23.39	
	Pensioner/Housewife	4,294	37.69	

RM: Malaysian Ringgit, WPKL: Wilayah Persekutuan Kuala Lumpur, n = number, % = percentage

Conclusion
Targeted and strategic planning must be employed to reach more women in the community. The registry served as a promising platform to provide valuable information on the HPV screening progress but should be expanded to include screening done in the private sector to be more comprehensive.

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EPIDPP25/101 : Survival Analysis Of Newly Diagnosed Diabetes Mellitus : Findings From Three Population-Based Surveys.

Mohd Azahadi Omar, Muhd Zulfadli Hafiz Ismail, Syarifah Nazeera Syed Anera, Ridwan Sanaudi, Nik Noor Syamimi Ismail.
Sector for Biostatistics & Data Repository, National Institutes of Health (NIH), Ministry of Health Malaysia
Corresponding author's email: drazahadi@moh.gov.my

Summary
Diabetes is a long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide. This study was conducted to determine the contributing factors for mortality among newly-diagnosed Diabetes Mellitus (DM). The study population were newly diagnosed DM in three National Health and Morbidity Survey (NHMS). Mortality data were obtained via record linkages with the Malaysian National Registration Department. Multiple Cox regression was applied to compare risk of mortality. The risk of dying was higher among males, those in rural areas and with increasing age. Those diagnosed in 2006 had higher risk compared to 2015.

Keywords : Newly Diagnosed, Diabetes Mellitus, Survival Analysis, NHMS, Cox Regression

Introduction
Diabetes is a serious, long-term condition with a major impact on the lives and well-being of individuals, families, and societies worldwide. In Malaysia, the number of cases with diabetes is increasing. The National Health and Morbidity

Survey (NHMS) in 2019 reports that the prevalence of diabetes among adults in Malaysia was 18.3%[1] Diabetes is among the top 10 causes of death in adults and was estimated to have caused four million deaths globally in 2017[2]. This study was conducted to determine the mortality and its contributing factors among newly diagnosed DM.

Materials and Methods

We analysed the data from NHMS 2006, 2011 and 2015. These national population-based was a cross-sectional study with two-stage stratified random sampling. The population in this analysis were newly-diagnosed DM in these three NHMS. Fasting blood glucose was performed on respondents who claimed not to have been previously diagnosed as DM, using the portable CardioChek blood test system (finger-prick method). Participants were followed up for 7.5 years from the day they were interviewed in respective NHMS. Mortality data were obtained via record linkages with the Malaysian National Registration Department. Multiple Cox regression was applied to compare risk of mortality among newly diagnosed DM

Results and Discussion

There were 5021 newly diagnosed DM in this study. Total follow-up time was 36,638 person-years with 461 deaths (9.2 %). The risk of dying was higher among male, rural area and with increasing age. The timing of diagnosis also a significant factor as those diagnosed in 2006 had higher risk compared with those diagnosed in 2015. No association of mortality with ethnicity and hypertension status.

Men may have a higher risk of mortality from diabetes due to differences in disease management and health behaviour. Men are often less likely to seek regular medical care and may have poorer adherence to medication and dietary guidelines[3]. Age is a well-known risk factor for many diseases, including diabetes. As people age, they are more likely to develop comorbidities, which can complicate the management of diabetes and increase the risk of mortality[4]. People living in rural areas often have less access to healthcare services, including regular check-ups, screening, and management of diabetes. This can lead to poorer health outcomes and higher mortality rates[5].

Table 1: Risk factors for mortality among newly diagnosed Diabetes Mellitus

Variable	HR	p-value	Adj. HR	p-value
Age	1.08 (1.07-1.09)	<0.001	1.08 (1.07-1.09)	<0.001
Gender :				
- Male	1.45 (1.15–1.83)	0.002	1.62 (1.30-2.02)	<0.001
- Female	Ref		Ref	
Ethnicity :				
- Malays	1.96 (0.80-4.60)	0.145	1.11 (0.46-2.65)	0.821
- Chinese	1.45 (0.59-3.89)	0.424	0.60 (0.24-1.49)	0.267
- Indians	1.17 (0.44-3.16)	0.751	0.99 (0.37-2.66)	0.980
- Other Bumis	1.07 (0.40-2.87)	0.892	0.82 (0.31-2.15)	0.688
- Others	Ref		Ref	
Locality :				
- Rural	1.71 (1.35-2.17)	<0.001	1.35 (1.06-1.72)	0.014

- Urban	Ref		Ref	
NHMS :				
- NHMS 2006	1.63 (1.26-2.11)	<0.001	1.59 (1.22-2.07)	0.001
- NHMS 2011	1.33 (0.98-1.79)	0.063	1.31 (0.98-1.74)	0.071
- NHMS 2015	Ref		Ref	
Hypertension :				
- Yes	2.80 (2.16-3.64)	<0.001	1.20 (0.92-1.57)	0.171
- No	Ref		Ref	

Conclusion

The risk for mortality among newly diagnosed DM was higher among male, increasing age and living in rural area. Therefore, early detection with prompt treatment should be targeted among this groups in order to reduce the number of mortalities among newly diagnosed DM.

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EPIDPP26/119 : Breaking The Chain Of COVID-19 Infection In The Community Residing In Central Region Of Malaysia: The Role Of Enhanced Movement Control Order (EMCO)

Renuga Devi Kanabalan [1*], Rohaya Ramli [1], Izwan Effendy Zainuddin [1],

Noriah Hajib [1], Hanis Ahmad [2], Nurfatehar Ramly [2], Winda Zulaiha Shahabudin [2]
[1] *Pejabat Kesihatan Cheras, Cheras, 56000, Kuala Lumpur, Malaysia*
[2] *Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Cheras, 56000, Kuala Lumpur, Malaysia*
Corresponding email:drrenuga1911@gmail.com

Summary
The Malaysian government implemented the Enhanced Movement Control Order (EMCO) to limit community transmission of the virus. The study aimed to assess the effectiveness of EMCO in breaking the chain of COVID-19 in Cheras, Kuala Lumpur. By comparing the positivity rate in high-risk areas before and after EMCO, it was observed that pre-EMCO rates ranged from 10% to 50%, while post-EMCO rates ranged from 0% to 20%. The significant decrease in local infections following EMCO suggests its effectiveness in curbing the spread of the virus. The success of EMCO relies on strong collaboration between agencies, establishing a framework for managing future pandemics efficiently.

Keywords
Enhanced Movement Control Order, Interagency collaboration, COVID-19, Risk assessment, Positivity Rate

Introduction
The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has led to a global public health emergency. The Malaysian government has implemented various measures to control the spread of the virus within the community. One such measure is the Enhanced Movement Control Order (EMCO), which restricts the movement of people in and out of affected areas. The primary goals of EMCO are to reduce the number of positive cases and break the chain of infection. During the initial phase of the pandemic, the positivity rate played a crucial role in decision-making, with localities having a rate exceeding 10% being designated as high-risk and subject to mandatory local control orders under the National Recovery Plan. Therefore, the main objective of this study is to assess the effectiveness of EMCO in breaking the chain of COVID-19 in Cheras, Kuala Lumpur, by comparing the positivity rate in high-risk localities before and after its implementation. The study aims to demonstrate whether EMCO effectively contributes to controlling the pandemic and reducing infections in the identified areas.

Method
A descriptive observational study was conducted utilizing the secondary data reported in the local infectious disease surveillance system, Communicable Disease Control Information System (CIS) from April until September 2021. Sample from 5 high-risk localities which reported >10% increment in positive Covid-19 cases were selected by using a universal sampling technique, involving patients who had been diagnosed with Covid-19 and their close contacts. Samples who had been re-infected were excluded from this study. Any incomplete data were omitted from further analysis. The positivity rate was measured at two-time points before and after the implementation of EMCO, which was determined based on the percentage

of people who have tested positive by polymerase chain reaction (PCR) test out of the number of people who have been tested for nasal swab.

Result and Discussion

Five high-risk localities were identified and immediately put under 14 days period restricted movement control order. The reported positivity rate before EMCO ranged between 10 - 50 %, the highest was 44.8 % in Pangsapuri Permai while the least was in Apartment Sri Rakyat, 15.7 %. Meanwhile, after EMCO, the positivity rate ranged between 0 – 20 %. Four localities showed significant improvement in positivity rate and thus, duration for EMCO was not extended. Results were summarized in Table 1.

Localities	Positivity Rate		Remarks
	Before EMCO	After EMCO	
Pangsapuri Sri Penara	40.8 %	5.95 %	Declined local infection
Pangsapuri Permai	44.8 %	2.67 %	Declined local infection
Taman Ikan Emas	35.6 %	5.47 %	Declined local infection
Flat Sri Sabah 3A	17.9 %	5.35 %	Declined local infection
Apartment Sri Rakyat	15.7 %	18.9 %	Increased local infection

Table 1: Positivity rate at high-risk localities in Cheras, District.

Based on these findings showed a notable decline in local infections following the EMCO. This is probably due to its effectiveness in controlling and breaking the chain of COVID-19 transmission. Multiple studies from neighbouring states such as in Johor, Selangor and etc have provided compelling evidence supporting the success of MCOs in preventing the onward spread of the infection within the communities, especially in a high-density population such as in the current study. Additionally, MCOs also allow healthcare authorities to efficiently conduct contact tracing, investigate potential clusters, and optimize the allocation of healthcare resources for effective screening and treatment purposes. As the nature of infection spread in a community is like a chain which comprises several interconnections links between the pathogens and hosts or reservoirs, any infection control and contact tracing activities which aim to break this chain and stop the pathogen from spreading can be carried out easily during MCOs.

Conclusion

The implementation of Enhanced Movement Control Orders (EMCO) represents a viable strategy to decrease the number of positive cases in identified high-risk infection localities, effectively containing the spread of infections within the community. The pivotal factor for the success of EMCO lies in fostering robust interagency collaboration, thereby establishing a pathway for proficient management of future pandemics.

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EPIDPP27/127 : Outcome Of Elimination Mother-To-Child Transmission (EMTCT) Hepatitis B: A Pilot Project In Terengganu, 2019-2021

Wan Nor Hafizah Wan Baharuddin[1], Mohd Fakhree Saad[1], Muhammad Naim Samsudin[1], Azmani Wahab[1], Mohd Anuar Abd Rahman[1], Kasemani Embong[1]
[1]*Terengganu State Health Department*
Corresponding author's email: dr.wnhafizah@moh.gov.my

Summary
In Malaysia, hepatitis B virus (HBV) screening is mainly performed among high-risk groups but not as routine antenatal check-ups. According to WHO, the most common route of transmission is through vertical, thus the child is at risk of infection from an unscreened mother [1]. Aligned with the WHO commitment to triple elimination initiatives (HIV, Hepatitis B and Syphilis) [2], the Ministry of Health has conducted a pilot project called as EMTCT Hepatitis B to prevent the transmission. The initial impact showed a promising result as it successfully prevents the transmission of Hepatitis B infection to children. This project could scale up to nationwide program.

Key Words
Hepatitis B, EMTCT Hepatitis B, Terengganu

Introduction
In Malaysia, hepatitis B screening is mainly conducted among high-risk groups but not among antenatal mothers. According to WHO, the main mode of transmission is through vertical transmission. Aligned with the WHO commitment to triple elimination initiatives (HIV, Hepatitis B and Syphilis), the Ministry of Health has conducted a pilot project called as EMTCT Hepatitis B to prevent the transmission.

Methodology
This pilot project started in June 2019 which involved 8 health clinics and 2 hospitals in Terengganu. The components include universal screening of hepatitis B, anti-viral treatment for those who indicated, active (4 doses + 1 booster of hepatitis B vaccine) and passive (Hepatitis B immunoglobulin) immunization, and follow up both mother, husband, and child. Finally, the outcome was to screen the child for Hepatitis B surface antigen (HBsAg) and Hepatitis B antibody tests at 9 months old. The outcome is classified into 3 categories:
1) responder (HBsAg negative and presence of antibody >10 ui/l),

2) non-responder (HBsAg negative and antibody <10 ui/l) and
3) infected.

Results And Discussion

From 2019 until 2021, a total of 18,725 antenatal mothers were screened and 62 were reported Hepatitis B positive. Out of these, only 20 infants were eligible for further analysis as 6 had miscarriages, 4 had neonatal deaths, 2 missing data and 30 not yet due for screening at 9 months. The result showed that all infants were responders (20/20) and none of them infected.

Table 1: Socio-demographic Characteristics of Hepatitis B Mothers

Variables	N=62	%
Age (years)		
20 – 24	3	4.8
24 – 29	12	19.4
30 – 34	25	40.3
35 – 39	16	25.8
40 – 44	6	9.7
Ethnicities		
Malay	60	96.8
Thailand (PR)	1	1.6
Myammar (PR)	1	1.6
Marital Status		
Married	62	100.0
Single Mother	0	0.0
Risk Factors		
Mother-to-child	8	12.9
Unknown	54	87.1
Partners' HBsAg Screening		
Reactive	1	1.6
Non-reactive	61	98.4

Table 2: Clinical Status of Hepatitis B Mothers

Variables	N=62	%
Hepatitis B 'e' Antigen (HBeAg)		
Reactive	50	80.0
Non Reactive	12	20.0
Co-infection (Reactive)		
HIV	0	0.0
Hepatitis C	0	0.0
Syphilis	0	0.0
Complications (Yes)		
Cirrhosis	0	0.0
Chronic Liver Disease	0	0.0
Hepatocellular Carcinoma	0	0.0

Hepatitis B Viral Load (iu/ml)		
< 20,000	56	90.3
20,000 – 200,000	2	3.2
> 200,000	4	6.5

Table 3: Preventive measures given to the children of Hepatitis B Mothers

Indicators	**N=20**	**%**
Hepatitis B Immunoglobulin (HBIG) given within 12 hours of delivery		
Yes	20	100%
No	0	0
Hepatitis B vaccine given within 24 hours of delivery		
Yes	20	100%
No	0	0
Coverage of third dose Hepatitis B vaccine		
Yes	20	100%
No	0	0

Table 4: Outcomes of the children of Hepatitis B Mothers

Indicators	**N=20**	**%**
Hepatitis B surface antigen (HBsAg) at 9 months		
Reactive	0	0
Non-reactive	20	100
Hepatitis B antibody		
> 10 IU/L	20	100%
< 10 IU/L	0	0

Conclusions

This study showed that infants were protected from Hepatitis B because of EMTCT services, as this successful in preventing the vertical transmission, hence this screening should be expanded to national level.

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EPIDPP28/160 : Spatiotemporal Trend Of Hand-Foot-Mouth Disease And Its Relationship With Environmental Factors In Negeri Sembilan

Abdul Mueez Ahmad Shabuddin[1], Azline Abdilah[2], Salmiah Md. Said[3], Rosliza Abdul Manaf[3]
[1] *Tampin Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia*
[2] *Kuala Pilah Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia*
[3] *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
Corresponding author's email: dr.mueez@yahoo.com

Summary
HFMD is a rising public health concern with exorbitant potential pandemic risks. In the public health field, tools such as GIS and forecasting are gaining importance due to their capability of anticipating the future trend of disease distribution through space and time. This study aimed to produce a thematic map of HFMD case distribution and develop a forecasting model using environmental factors to predict the cases of HFMD. This study has shown that GIS has facilitated the identification of the significant hotspot in the study area and the ARIMA model was able to predict HFMD cases.

Keywords
HFMD, environment factors, GIS, ARIMA model, forecasting modelling

Introduction
By August 2018, Negeri Sembilan had been shown as the third state with significant Hand-Foot-Mouth Disease (HFMD) cases reported. The state of Negeri Sembilan also recorded a significant case increment of 281 percent to 2,386 compared to 627 cases in the same period in 2017(1). Nonetheless, the HFMD study involving GIS and forecasting modelling has not been extensively studied in Malaysia. Earlier epidemiological spatial research on HFMD concludes that Geographic Information System (GIS) data on the spatial distribution of HFMD cases had been useful in assisting decision-making in outbreak control measures (2). Similarly, a study done in (2016), discussed the application of GIS in mapping the distribution of HFMD and also attempted to model a time series forecasting of HFMD cases in Sarawak. This study found that the ARIMA model fits the trends of HFMD in the study area very well (3). Unfortunately, neither of these studies examined the effect of environmental factors on the incidence of HFMD. Therefore, Spatial-temporal analysis modelling was preferred by combining GIS and time series analysis, which will help to recognise the spatial and temporal trend of HFMD disease and determine the contributing effect of environmental factors.

Materials and Methods
GIS was used to map the distribution of HFMD and identify the significant hotspot locality using Moran's I cluster analysis. While autoregression integrated moving average (ARIMA) was constructed to create an optimal forecasting model based on the weekly HFMD cases and weather parameters from 2013-2017 in Negeri Sembilan, Malaysia. The performance of the model was evaluated using Bayesian

Information Criteria (BIC), Root Mean Square Error (RMSE), and Mean Absolute Percentage Error (MAPE).

Results and Discussion

Moran's I spatial analysis reveals a significant clustering from 2013-2017 with hotspots identified consistently in the central, southwest, and northwest areas of Seremban District. Six ARIMA models were constructed, with three univariate ARIMA models (0,1,1),(1,1,1), and (2,1,1) and three multivariate ARIMAX models of the same order. The performance of these models was compared and analysed. The univariate ARIMA model (0,1,1) (BIC = 4.039, RMSE=7.455, MAE=5.553) was chosen as the base model, and adding weather factors as external regressor significantly increases the model prediction accuracy (0,1,1)x (BIC=4.001, RMSE= 7.229, MAE=5.501).001. The minimum temperature was the only significant factor in predicting HFMD cases. An increase of 1°c in minimum temperature will increase HFMD cases by 27.7% in 4 months. The trend of HFMD in Negeri Sembilan is still increasing. GIS has enabled this study to visualize the spatial distribution pattern of HFMD and Moran' I spatial analysis has facilitated the identification of hotspots in the study area. This study has also shown that the ARIMA model was able to predict HFMD cases with fairly good estimation. The introduction of the weather factors and their one-lagged order significantly improved the prediction accuracy of the ARIMA model and revealed that weather parameters could be incorporated into disease surveillance as an early warning system for potential outbreaks (4).

Table 1. Statistics Summary of Model Performance Measures

Model ARIMA (p,d,q)	**Value of Model Selection Criteria**				
	R^2	**RMSE**	**MAPE**	**MAE**	**BIC**
(0,1,1)	0.625	7.455	51.815	5.553	4.039
(1,1,1)	0.637	7.362	51.891	5.496	4.057
(2,1,1)	0.637	7.379	51.848	5.495	4.083
x(0,1,1)*	**0.658**	**7.229**	**51.630**	**5.501**	**4.001**
x(1,1,1)	0.677	7.091	55.441	5.382	4.089
x(2,1,1)	0.653	7.251	49.142	5.436	4.112

x( ) ARIMAX model, (*) model selected with highest performance measures

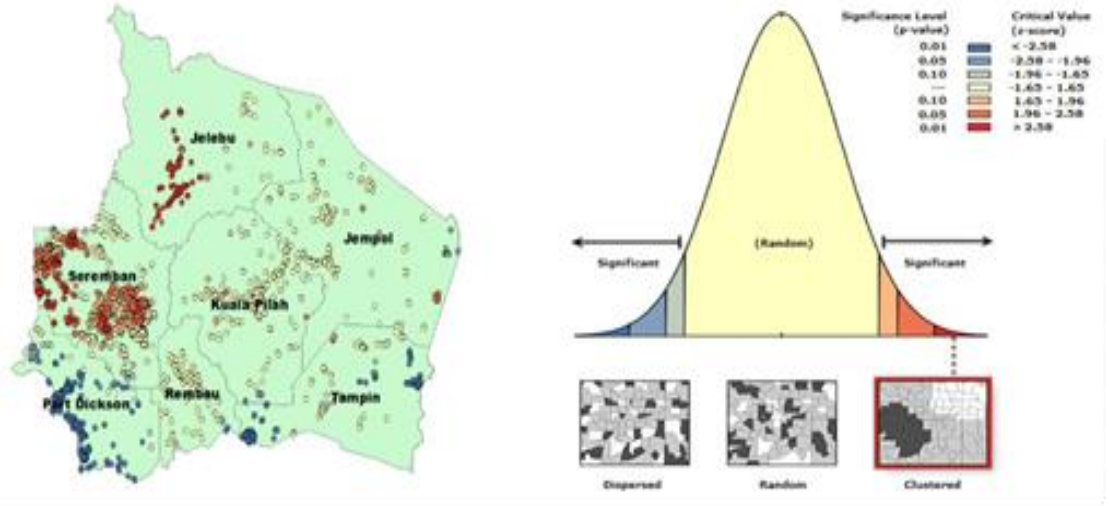

Figure 1. Moran's I analysis of HFMD Cases from 2013-1017 in Negeri Sembilan

Conclusion

The combination of Spatio-temporal analysis in this study allows for HFMD preventive measures to be planned and implemented by public health authorities ahead of any predicted outbreak in the identified disease-prone area.

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EPIDPP29/126 : How Well Is Our B40 Group?

Muhammad Shazwan Suhiman, Izzanie Mohamed Razif, Maizura Abdul Jabar, Nur Aqilah Sabrena Rahim, Anis Farhana Badrul Hisham, Nurul Hafizah Mohd Hazman, Najihah Mohd Tahir, Dr. Chin Wei Hong
Corresponding author's email: Muhammad.Shazwan@protecthealth.com.my

Summary

This study examined health screening outcomes, demographic characteristics, and the prevalence of NCDs among PeKa B40 beneficiaries, who are among the B40 population. Health screening findings for 670,747 beneficiaries who completed health screenings between April 2019 and December 2022 were being analysed. The

analysis found that hypertension, hypercholesterolemia, and diabetes mellitus were among the top three diseases. Hypercholesterolemia had the highest prevalence of newly diagnosed NCDs (30.0%), followed by hypertension (13.9%) and diabetes mellitus (10.5%). These findings provide important insights targeted initiatives and policy planning to improve the health status of the B40.

Keywords
PeKa B40 initiative, health screening, newly diagnosed NCDs, early intervention, quality of life

Introduction

PeKa B40 is a government initiative introduced in 2019 for the recipient (and spouse) of cash transfer assistance for the B40 (now call *Sumbangan Tunai Rahmah*) age 40 years and above. PeKa B40 Health Screening Benefit primarily aim for early detection of Non-Communicable Diseases (NCDs) and early intervention which can improve well-being and prevent disease progression among low-income individuals. However, there is a lack of information about program participation rate and disease burden distribution by different demographic characteristics. This study aims to fill that gap by understanding the demographic characteristics of beneficiaries screened, exploring factors affecting program participation, describing health screening outcomes, and identifying the most common diseases reported.

Materials and Methods

The health screening process involved two clinic visits. During the first visit, beneficiaries underwent history taking, physical examination, physical activity assessment, mental state assessment, and blood and urine samples collection for laboratory investigations. The second visit was a follow-up to review the laboratory results, consultation, and referrals for further management if indicated. The analysis of this study utilized data from the BMS, a system used for PeKa B40 data management. All beneficiaries who had completed the two clinic sessions were included in the study. Descriptive statistics, including frequencies, percentages, and cross-tabulations were employed to analyse the data. The Chi Square test was conducted to determine the association between gender and age, ethnicity, employment, education, body mass index (BMI), smoking and physical activity. All data were analysed using STATA version 17.0.

Results and Discussion

The study findings revealed that out of 5,950,291 PeKa B40 eligible beneficiaries, 670,747 (11.3%) completed[1] PeKa B40 health screenings. The socio-demographic analysis showed that the highest number of beneficiaries were from Sarawak (14.4 followed by Kedah (13.2%) and Perak (11.4%). Many beneficiaries were female (57.6%), and the largest age group was 60-69 years old (35.5%). Malays constituted the largest ethnic group (52.2%), and most beneficiaries had upper secondary education (78.2%). The highest proportion of newly diagnosed NCDs was for hypercholesterolemia (30.0%). Additionally, there are significant differences in health screening participation between gender and age groups, ethnicity, work, education level, smoking status, BMI group, and physical fitness status. These

findings provide valuable insights into the demographic characteristics, prevalence of NCDs, and gender-related differences in health screening participation among PeKa B40 beneficiaries.

Table 1: Socio demographic of beneficiaries based on Health Screening

Socio demographic	Male	Female	Total	Chi Square	p-value
Age Group					
40 to 49 years old	35,581	58,065	93,646	$2.3*10^3$	0.00
50-59 years old	73,656	111,539	185,195		
60-69 years old	104,011	134,034	238,045		
70 years old and above	70,919	82,942	153,861		
Ethnicity Category					
Malays	146,384	203,693	350,077	209.97	0.00
Chinese	63,928	83,175	147,103		
Indian	27,076	38,686	65,762		
Indigenous Sabah	18,818	24,048	42,866		
Indigenous Sarawak	22,853	30,329	53,182		
Orang Asli (Peninsular)	1,757	2,355	4,112		
Others	3,351	4,294	7,645		
Work					
Government Employee	9,234	5,618	14,852	$1.4*10^5$	0.00
Private Sector Employee	41,587	28,180	69,767		
Self-employed	78,818	44,993	123,811		
Non-paid	12,259	153,797	166,056		
Unemployment	73,238	113,837	187,075		
Retired	64,929	34,194	99,123		
Student	131	239	370		
No info	3,971	5,722	9,693		
Education					
No formal schooling	1,406	1,095	2,501	$7.6*10^3$	0.00
Lower secondary education	39,122	83,303	122,425		
Upper secondary education	232,860	291,423	524,283		
Tertiary education	6,808	5,037	11,845		
No Info	3,971	5,722	9,693		
Smoking Status					
No	212,762	383,489	596,251	$9.8*10^4$	0.00
Yes	71,405	3,091	74,496		
BMI Group					
Less than 20	24,926	31,382	56,308	$8.0*10^3$	0.00
20-24	113,037	129,550	242,587		
25-29	103,324	134,221	237,545		
30 and more	42,880	91,427	134,307		
Physical Fitness Status					
Active	2,775	2,796	5,571	186.13	0.00
Minimally Active	267,400	366,250	633,650		
Inactive	13,992	17,534	31,526		
State					
Johor	28,942	39,826	68,768	-	-

Kedah	36,783	51,770	88,553
Kelantan	27,833	41,121	68,954
Melaka	10,564	13,541	24,105
Negeri Sembilan	14,814	19,495	34,309
Pahang	8,692	11,288	19,980
Penang	15,844	23,113	38,957
Perak	32,560	44,291	76,851
Perlis	3,341	4,776	8,117
Selangor	20,018	27,297	47,315
Terengganu	10,638	14,926	25,564
Sabah	25,882	31,449	57,331
Sarawak	41,832	54,883	96,715
W.P. Kuala Lumpur	6,001	8,285	14,286
W.P. Labuan	210	231	441
W.P. Putrajaya	213	288	501

Table 2: Top Diseases Among PeKa B40 Beneficiaries

Disease	Frequency	Percentage (%)
Epilepsy	783	0.1
Breast Cancer	2,074	0.3
Mental Illness	6,774	1.0
Stroke	7,292	1.1
Asthma	8,789	1.3
Coronary Heart Disease	16,302	2.4
Diabetes Mellitus	268,337	40.0
Hypertension	395,669	59.0
Hypercholesterolemia	464,117	69.2

Table 3: Non communicable disease among PeKa B40 beneficiaries. (Newly Dx)

NCD	Newly diagnosed NCD (N)	Percentage (%)
Anxiety	3,336	0.5
Depression	7,724	1.2
Diabetes Mellitus	70,720	10.5
Hypertension	93,506	13.9
Hypercholesterolemia	201,168	30.0

Conclusion

Since its inception in 2019, the PeKa B40 initiative has screened 11.3% of BSH beneficiaries aged 40 and above, detecting a notable number of newly diagnosed NCDs. Early intervention and treatment for these conditions prevent disease progression and complications, ensuring better quality of life and reducing healthcare costs.

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EPIDPP30/29 : Pattern Of HIV Stigmatizing Behaviour Across Age Groups Among General Population In Malaysia: Domain "Fear Of HIV Infection"

Norlaila Hamid [1], Mohd Shaiful Azlan Kassim [1], S Maria Awaluddin [1], Norhafizah Shahril [1], Wan Sarifah Ainin [1]
[1] Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia

Summary
Fear of HIV infection facilitates the development of HIV stigma among the general population towards people living with HIV/AIDS (PLWHA). This is considered as a sensitive issue, but there was lack of information among the Malaysian general population. This study aimed to determine the prevalence and associated factors of fear of HIV infection and to compare across age groups of the Malaysian general population. The overall prevalence was 65.8% and there was an inconsistent trend across age groups. A widely accessible HIV awareness campaign should be conducted to reduce stigma and fear of HIV infection among the general population in Malaysia.

Keywords
HIV stigma, fear of infection, population-based, National Health and Morbidity Survey, Malaysia

Introduction
Stigmatizing and discriminatory attitudes toward people living with HIV/AIDS (PLWHA) consisted of six domains. One of the domains is fear of HIV infection which facilitates the development of HIV stigma among the general population (1). This topic is categorised as a sensitive issue in Malaysia, however, the prevalence of fear of HIV infection may differ across age groups. A targeted group for any health intervention may minimise the resources and maximise the general outcome. Therefore, this study aimed to determine the prevalence of fear of HIV infection across the age groups and determine the association across the age category in relation to fear of infection.

Materials and Methods

Data HIV stigma domain fear of HIV infection was extracted from the National Health and Morbidity Survey 2020. It was a cross-sectional study among national representative sample. The sampling strategy was two-stage stratified random cluster sampling. The survey was conducted via multiple approaches such as face-to-face interviews, clinical blood sampling, telephone interviews and self-administered questionnaires. The Malay version HIV stigma questionnaire consisted of six domains was used. It is a self-administered questionnaire and eligible for consented respondents age 13 years and above. A parental consent was obtained for those aged less than 18 years. In this study, the domain fear of HIV infection was targeted for data analysis across the age group. The question was "*Do you fear that you could contact HIV if you come into contact with the saliva of a person living with HIV* ?" with a dichotomous answer of "Yes" and "No". Descriptive statistics were used to summarise the characteristics of the study population. The Chi-Square test was used to determine the bivariate relationships between the studied variables and HIV stigma. Univariable and multivariable logistic regression analyses were carried out to investigate the association between fear of HIV infection, sociodemographics and all other selected independent variables. All analyses were carried out using IBM SPSS Statistics version 25.0, taking into consideration the sample weighting and complex sampling design.

Results and Discussion

A total of 4421 respondents aged 13 years and above were eligible in this study. However, only 3729 respondents answered this question, yielding a response rate of 84.3%. The prevalence of fear of HIV infection in this study was 65.8%; (95% CI: 62.1, 69.4). A similar study was conducted in Thailand and showed a lower prevalence of fear of HIV infection of 57% (3). There was no specific pattern in the prevalence of fear of HIV infection across the age groups but showed a peak at the age group of 13-19 years and 50-59 years. The lowest prevalence was observed among those aged group of 40-49 years (Figure 1) which was also found to be similar in a study conducted in Thailand (3). When adjusted for the other covariates, respondents aged 50-59 years and 30-39 years were more likely to have higher odds of fear of HIV infection. Although aged 13-19 years had the highest prevalence of fear of HIV infection, but it was not significant in the final model (Table 1). The overall prevalence fear of HIV infection differed between Malaysia and Thailand but the trends were similar across the age groups (3). The study in Thailand revealed that 57% of Thai adults aged 20-39 and aged 50-59 still had misconceptions about HIV transmission that led to fear of acquiring HIV through casual contact with people living with HIV (3). This issue needs to be addressed in an education campaign to reduce stigmatising attitudes among the population.

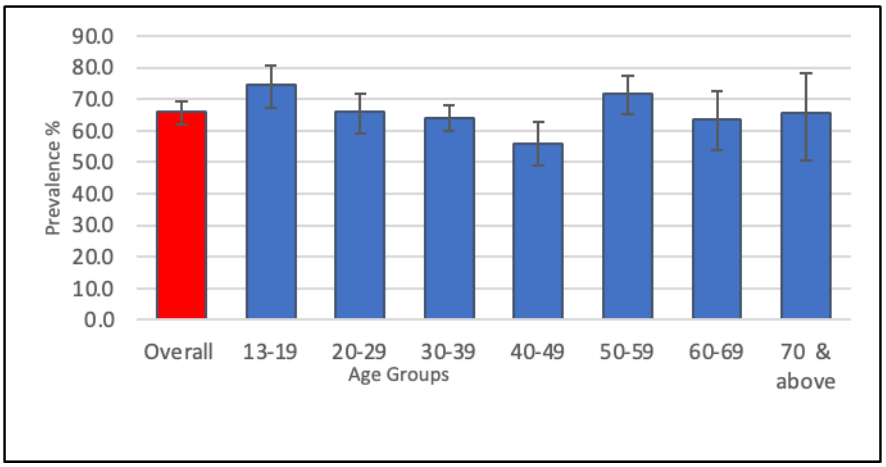

Figure 1: Fear of HIV infection across the age groups in Malaysia's general population.

Table 1: The association between age groups and fear of HIV infection among the general population in Malaysia via logistic regression analysis.

Variable	Crude OR	95% CI		#Adjusted OR	95% CI		p-value
		lower	upper		lower	upper	
Age group (years)							
40-49 (reference)	1.00	-	-	-	-	-	
13-19	2.29	1.63	3.24	1.64	0.89	3.04	0.112
20-29	1.51	1.08	2.10	1.38	0.95	2.00	0.094
30-39	1.39	1.08	1.80	1.52	1.16	1.98	0.002
50-59	1.98	1.40	2.80	2.03	1.37	3.01	< 0.001
60-69	1.38	0.81	2.32	1.31	0.78	2.18	0.307
70 & above	1.49	0.74	3.02	1.42	0.68	2.96	0.345

#The final model adjusted with geographical zone in Malaysia, strata, gender, educational level, ethnicity, marital status, occupation. The model fitness was 68.6%. Group 40-49 with the lowest prevalence was the reference category in the analysis.

Conclusion

The prevalence of fear of infection across age groups in Malaysia's general population was high, but no specific pattern was found across the age groups. HIV awareness campaigns should be strengthened and promoted via popular media platforms to reduce the stigma towards PLWHA.

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EPIDPP31/54 : Influenza Vaccine: Do The Beliefs Of Vaccine Uptake Change Among Health Care Workers In Post COVID-19 Pandemic Era?

Chia Yee, Kang[1]; Poh Siang, Ooi[1]; Azianey, Yusof[1]; Azlina, Shuaib[1]; Ying Woei, Chin[1]; Fatimah, Abu Bakar[1]; Izani Uzair, Zubair[1]; Nur Sharharni, Mohd Tahir[1]; Rohaizan, Rodzi[1]; Tze Ling, Wong[1]; Yusnita, Yusof[1]
[1] Pejabat Kesihatan Daerah Seberang Perai Utara, Penang, Malaysia
Corresponding author's email: chiayeekang@gmail.com

Summary: The influenza vaccine is being offered to health care workers (HCW) in Malaysia yearly. In this study, we would like to explore the encouraging factors and barriers of influenza vaccine uptake among HCW in Malaysia in post COVID-19 era. The uptake of influenza vaccine among HCW remained low (62.7%) although being offered as free. The effectiveness of vaccines for self and family protection towards influenza remains the main factor of influenza vaccine uptake. The main barrier is worried of the side effects of vaccines. The beliefs regarding influenza vaccination among HCW are similar as compared to beliefs pre-COVID-19 era.

Keywords: Influenza vaccine, vaccine uptake, health care workers, post-COVID-19

Introduction: In Malaysia, selective high-risk HCW would be offered free influenza vaccination yearly. HCW are strongly recommended for taking yearly influenza vaccine due to the risk of contracting and transmitting the influenza to the patients and family members. The prevalence of influenza vaccine uptake varies among HCW across the world ranging within 9 – 92% (1). The world was hit by COVID-19 pandemic since 2019, we received many information regarding vaccination during pandemic. Does this pandemic have an effect on the beliefs of influenza vaccine among HCW? In this study, we would like to explore the encouraging factors and barriers of influenza vaccine uptake among HCW in Malaysia in post COVID-19 pandemic era.

Materials and Methods: A cross-sectional study was conducted among the 295 HCW working in Seberang Perai Utara district, Penang in January 2023. The sample size was calculated using single proportion formula. Respondents from all categories working in government health clinics, inspectorate units and government dental clinics were selected randomly to answer the self-administered questionnaires regardless of their risk of getting influenza infection. The HCW who were not eligible for the influenza vaccination due to medical reasons were excluded from the study. The questionnaires were adopted from local studies which comprised of social demography, knowledge and behavioural determinants (2,3). Data entry, descriptive and analytic analysis using SPSS version 22 were performed.

Results and Discussion: The prevalence of influenza vaccine uptake among HCW was 62.7%. When comparing the social demographic characteristics and knowledge of the HCW who was vaccinated and non-vaccinated for influenza vaccine in year 2022, there were significant difference in terms of educational level, working departments, job categories and knowledge of influenza. The majority of the HCW who took influenza vaccine had diploma educational level and above (72.4%), worked in the maternal and child health department (28.6%) and worked as nurses (33.0%). The top three encouraging factors to take influenza vaccine were beliefs in the effectiveness of vaccine in preventing influenza (81.6%), to protect the family from influenza infection (63.8%) and trusting the safety profile of vaccine (63.8%). The main barriers of influenza vaccine uptake included worried about the side effect of vaccine (22.7%), forgot to get or no time to get the vaccine (21.8%) and not eligible for free influenza vaccination (18.2%). The mean (SD) knowledge scores were low for both vaccinated and non-vaccinated groups, 4.49 (1.29) and 3.96 (1.56) respectively, maximum scores were 8.

Compared to the systematic review regarding influenza vaccine uptake pre-COVID-19 era, the beliefs in the effectiveness of vaccine in preventing infection and the vaccine safety profile still remained the main factors of influenza vaccine uptake in post COVID-19 era (1). Similarly, our findings supported another literature review pre-COVID-19 era in which the factors of influenza uptake more towards self and family protection rather than protection of the patients around (4).

Table 1: Social demographic characteristics and knowledge scores of vaccinated and unvaccinated HCW (n=295)

Variables	Vaccinated n=185 n (%)	Unvaccinated n=110 n (%)	*p* value
Educational level			< 0.001
Secondary school	51 (27.6)	54 (49.1)	
Diploma and above	134 (72.4)	56 (50.9)	
Working area			< 0.001
Outpatient department	50 (27)	27 (24.5)	
Registration counter	6 (3.2)	9 (8.2)	
Maternal and child health department	53 (28.6)	9 (8.2)	
Medical laboratory	10 (5.4)	5 (4.5)	
Pharmacy	13 (7.0)	13 (11.8)	
Dental clinic	20 (10.8)	36 (32.7)	
Inspectorate unit	20 (10.8)	9 (8.2)	
Others	13 (7.0)	2 (1.8)	
Job categories			< 0.001
Medical doctor	26 (14.1)	4 (3.6)	
Nurse	61 (33.0)	12 (10.9)	
Assistant medical officer	12 (6.5)	6 (5.5)	
Medical laboratory technician	9 (4.9)	2 (1.8)	
Pharmacist/assistant pharmacist	9 (4.9)	12 (10.9)	

Supportive officer	7 (3.8)	2 (1.8)	
Health Attendant	23 (12.4)	22 (20.0)	
Driver	4 (2.2)	17 (15.5)	
Administrative staff	0 (0)	4 (3.6)	
Dental medical officer	13 (7)	6 (5.5)	
Dental assistant	4 (2.2)	11 (10.0)	
Dental technician	0 (0)	2 (1.8)	
Dental therapist	2 (1.1)	8 (7.3)	
Public health inspectors	15 (8.1)	2 (1.8)	
Knowledge	4.49 (1.29)[1]	3.96 (1.56)[1]	0.049

[1] Mean (Standard deviation SD), maximum scores are 8

Table 2: Encouraging factors and barriers for influenza vaccination uptake among the HCW (n=295)

Factors	n (%)
Encouraging factors (vaccinated HCWs, n=185)	
1. Effective protection from influenza infection	151 (81.6)
2. Responsibility to protect family	118 (63.8)
3. Vaccination is safe	118 (63.8)
4. Vaccination is free	108 (58.4)
5. Being at risk for getting influenza infection	88 (47.6)
6. Influenza is a serious disease	78 (42.2)
7. Vaccination will protect patients	73 (39.5)
8. Influenza is a threat to health of patients around	66 (35.7)
9. Influenced by mass media	8 (4.3)
10. Others (Mekah)	1 (0.5)
Barriers (unvaccinated HCWs, n=110)	
1. Worried about side effects of the vaccine	25 (22.7)
2. Forgot to get or no time to get the vaccine	24 (21.8)
3. Not eligible for free vaccine	20 (18.2)
4. Safety precautions are sufficient for protection	11 (10.0)
5. Not sure about the effectiveness of the vaccine	10 (9.1)
6. Pregnant	9 (8.2)
7. Not aware that the vaccine is available for them	9 (8.2)
8. Had not heard about the vaccine	6 (5.5)
9. Cost/expensive	5 (4.5)
10. Experienced serious side effect before this	5 (4.5)
11. Perceived to not be at risk for getting influenza	3 (2.7)
12. Needle phobia	1 (0.9)
13. Fear of becoming infected because of the vaccine	0

Conclusion: The beliefs of influenza vaccine uptake among HCW in post-COVID-19 era are similar to the beliefs in pre-COVID-19 era. The awareness on the effectiveness of vaccine in preventing influenza and family protection from influenza should be increased, besides alleviate the concern regarding the side effects of vaccine among HCW to encourage the vaccine uptake.

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EPIDPP32/60 : Selangor Mental Sihat (SEHAT) Helpline: A Digital Mental Health Intervention for The Advocacy and Intervention of Mental Health

Mohammad Farhan Rusli[1], Muhammad Adil Zainal Abidin[1], Nor Faiza Mohd Tohit[1], Jamilah Hanum Abdul Khaiyom[2], Ahmad Nabil Md Rosli[3], Hijaz Ridzwan[3], Adha Radha Nasheha Mohamad Fuad[1], Afaf Qamelia Badrol Hisham[1], Iman Aisha Zamzuri[1], Siti Mariah Mahmud[4]

[1]Department of Community Medicine, Kulliyyah of Medicine, International Islamic University Malaysia

[2]Abdulhamid Abusulayman Kulliyyah of Islamic Revealed Knowledge and Human Sciences, International Islamic University Malaysia

[3]Department of Psychiatry, Kulliyyah of Medicine, International Islamic University Malaysia

[4] Pejabat Ahli Majlis Mesyuarat Kerajaan Negeri Selangor, Bangunan Sultan Salahuddin Abdul Aziz Shah

Corresponding author's email: farhan@iium.edu.my

Introduction

According to the World Health Organization (WHO), over 450 million people around the world are affected by mental disorders; with the estimation that one in four people experiences mental illness at some point in their lives. In Malaysia, one in three citizens suffers from mental health problems. The existence of COVID-19 may be exacerbating the trend of mental health. One's mental health might suffer through financial crises, relationship challenges, isolation, losing loved ones, uncertainty, anxiety, and powerlessness. The emergence of mental health applications through the pandemic era has tried to address mental health issues among the public. Digital technologies can facilitate direct supportive care and treatment by connecting the health care providers to consumers. These digital technologies have also helped to promote self-advocacy and empower oneself in their mental health and the people surrounding them. Moreover, mental health applications can fill up the lack of availability of mental health professionals and

reduce the logistic barriers to service utilization and its costs.It also helps to promote health-seeking behaviour as it involves their representation virtually.
Understanding the gaps, needs, and benefits of digital health technology in the community, a proactive initiative was taken by the Selangor state government to develop a mobile application that provides screening and intervention for mental health issues. The Mental SEHAT module, embedded in the SELangkah application, is Malaysia's first state-funded mobile application.
The Selangor Mental Health program (SEHAT) was introduced in 2021, to which it offered a holistic approach to mental health issues starting from avocation and promotion to screening and early intervention. The SEHAT helpline was also established as a Mental Health and Psychosocial Support (MHPSS) initiative to help individuals who needed psychosocial support during the crises.
The MHPSS are psychosocial support services that cater to the psychological needs of those who suffered or were exposed to crises. These services are made available digitally, which include helplines, psychoeducation, and other forms of communication technology. The objectives of MHPSS activities throughout the pandemic are to increase awareness on mental health, educate people on self-help techniques and stress management skills, and increase screening activities for early detection of mental health issues. This study aims to describe the characteristics of SEHAT helpline users since it was first introduced in June 2022.

Keywords
Mental health issues, psychosocial support, mental health helplines, digital health technology, mental health advocacy, mental health intervention.

Materials and Methods
In the SELangkah application, Mental SEHAT provides validated questionnaires to screen for users' levels of depression, anxiety, and stress through DASS-21, PSS-10, PHQ-9 and GDS-15. Based on their scores, users' will then be encouraged to follow the modules and watch the 60 psychoeducation videos to have a better understanding of their situation. Meanwhile, the establishment of the SEHAT helpline for those who are anxious and in distress, helps them to reach trained counsellors via phone calls. The helpline is available throughout the weekday working hour. The collaboration between SEHAT and Selangor Counselling Center, which consists of trained and experienced counsellors all over Selangor, ensures the smooth running of the help process.

Results and Discussion
As of 1st May 2023, there have been a total of 610 calls from the SEHAT helpline that were directed from the screening tool in the MENTAL SEHAT SELangkah apps. More than 94% of the callers were of Malay ethnicity and, more than 70% of the callers were within the age range of 20-40 years old followed by 41-59 years old. Most of the online counselling sessions were conducted individually (68%) and family sessions (32%). The issues discussed during the counselling sessions were mainly family issues (50%), psychopathology (15%) and self-development (12%). The majority of the users were from the Petaling district (39%).

Conclusion

Overall, the SEHAT helpline has benefited many individuals with various mental health conditions. It also has successfully reduced the barrier to seeking help in getting the diagnosis and intervention for mental health conditions. The initiative should be continued and embedded in each state's mental health programme.

EPIDPP33/68 : Epidemiological And Clinical Features Of Coronavirus (COVID-19) Patients In The Southern Region Of Malaysia

Mohamad Nasri Mohamad Isa[1], Khairul Anuar Abdullah[1], Zulraini Jusof[1], Ruzita Mustaffa[1] ,Rusdi Abdul Rahman[1]
[1]Melaka State Health Department, Melaka, Malaysia
Corresponding author's email: m_nasri.isa@moh.gov.my

Summary
Amid the ongoing COVID-19 pandemic, an understanding of the disease's sociodemographic and clinical features is alarmingly critical for improving management and preventive measures. To this end, a two-year study in Melaka analysed positive cases to characterize their epidemiological characteristics, determinants, and risk factors. The resulting information can help healthcare workers to improve public health policies by stopping the spreading of the disease and minimizing fatalities. Such situational analysis is crucial for predicting and addressing future outbreaks through multi-agency collaboration, which is necessary to maintain health security.

Keywords
COVID-19, Situational analysis, Epidemiology, Melaka, Malaysia

Introduction
About 45,000 fatalities and over 10 million new COVID-19 cases were recorded globally until 31st March 2022. Similarly, COVID-19 infection in Malaysia has been alarmingly spreading across the country, with recorded cumulative cases totalling over 4 million and over 30,000 fatalities until 31st March 2022 (1). Given the number of COVID-19 cases, analysing the sociodemographic and clinical features of COVID-19 cases is crucial to improve our understanding of the disease. By doing so, we can better manage and prevent the spread of COVID-19. This study aimed to determine the epidemiological characteristics of COVID-19 infection in Melaka from 1st March 2020 to 31st March 2022.

Materials And Method
This is a cross-sectional study involving all individuals in Melaka state with confirmed positive laboratory reverse transcription polymerase chain reaction (RT-PCR) Test, Rapid Molecular Test, Rapid Test Antigen (RTK-Ag), or Rapid Self-Test and notified to Melaka State Health Department from 1st March 2020 until 31st March 2022. The sources of the data include SIMKA Outbreak system (online database for Covid-19 test), mySejahtera data, e-COVID system or data from Health District Offices in Melaka. The independent variables analysed included socio-

demographic and clinical characteristics such age, gender, presence of symptom, COVID-19 severity and presence of comorbidity.

Results And Discussions

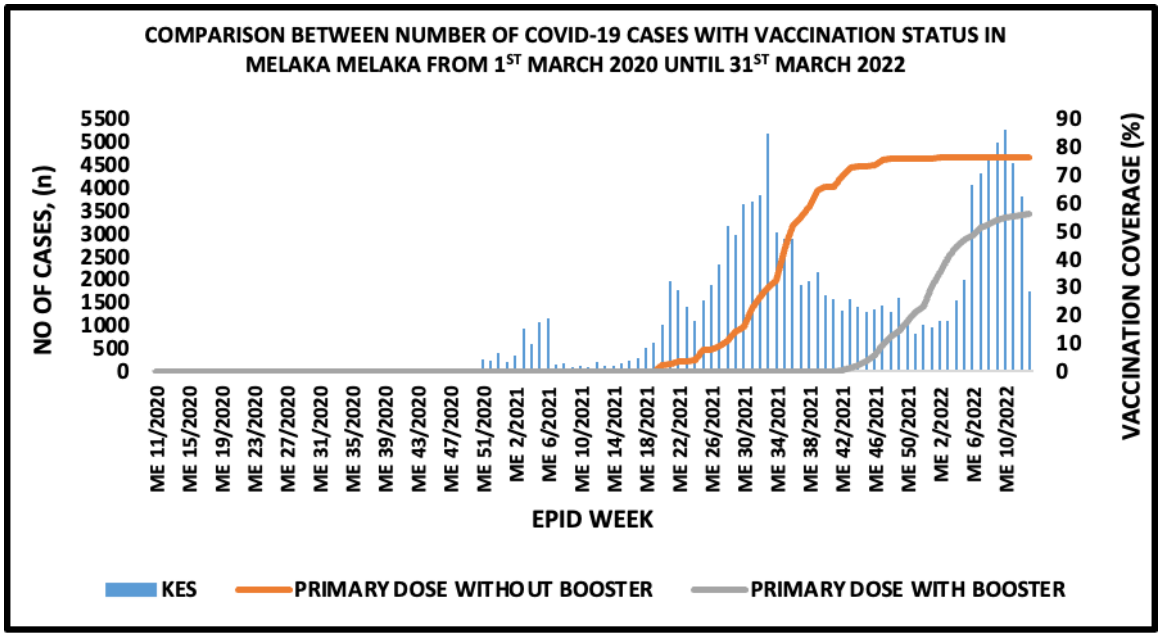
A total of 116,521 COVID-19 positive cases with 1,097 deaths were recorded. Majority of cases were from Melaka Tengah District (53.3%), were male (55.2%), and aged between 18 to 40 years (53.2%)

Table 1: Sociodemographic characteristics of Melaka COVID-19 cases from 1st March 2020 until 31st March 2022.

Characteristics	Frequency (n)	Percentage (%)
District		
Alor Gajah	32898	28.2
Jasin	21531	18.5
Melaka Tengah	62092	53.3
Age		
Paediatric (0 - 11) years	16143	13.9
Adolescent (12 - 17) years	7255	6.2
Young Adult (18-40) years	62024	53.2
Adult (41 - 60) years	22130	19.0
Elderly (> 60) years	8969	7.7
Gender		
Male	64325	55.2
Female	52196	44.8
Citizenship		
Malaysian	101894	87.4
Non-Malaysian	14627	12.6
Ethnicity		
Malay	86103	73.9
Indian	5796	5.0
Chinese	9252	7.9
Others	15370	13.2

Table 2 : Distribution of types of comorbidity among Melaka COVID-19 cases from 1st March 2020 until 31st March 2022.

Comorbidity	No of cases (n)	Percentage (%)
Diabetes mellitus	6720	5.77
Hypertension	5025	4.31
Lung diseases	3226	2.77
Other diseases	1222	1.05
Cardiovascular disesase	556	0.48
Hyperlipidaemia	424	0.36
Obesity	420	0.36
Cns diseases	247	0.21
Cancer	148	0.13
Renal disease	127	0.11



Graph 1 : Comparison Between Number Of COVID-19 Cases With Vaccination Status In Melaka Until 31st March 2022

During the study period, our borders remained closed to other countries (2), resulting in local infections accounting for 95.8% of the cases, predominantly among Malaysians (87.4%), with the highest cases involving Malays (74.2%). Among the common symptoms seen were fever (42%) and cough (41%) and similar to studies done by Terengganu and Selangor (2,3). Diabetes mellitus (6 %) and hypertension (4.5 %) were the most common comorbidity seen and our findings were similar to multiple studies in Malaysia (3,4). The most risk factor seen was close family contact (36.3%) which maybe was been influenced by our country's multiple movement restriction order. Upon comparing the first and second years of COVID-19 in Melaka, most clusters involved factories. However, during the second year of the pandemic in Melaka, workplaces clusters (17%) and educational institutions clusters (15%) were predominantly seen. Our National Recovery Plan, which allowed for more businesses and workplaces to resume operations and the reopening of schools may contribute to the increase in cluster.

Conclusion

Melaka's COVID-19 incidence has changed due to policy shifts, new variants, and vaccination coverage. Strict enforcement and awareness campaigns have helped control infections, but community involvement is crucial to make the disease endemic. Educating our citizens about infection control and keep analysing epidemiological changes in the disease can aid policymakers in planning public health measures for better prevention.

Acknowledgement

We would like to thank Melaka State Health Departments and all District Health Offices in Melaka for their cooperation and support for this study.

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EPIDPP34/97 : Readmission And Hospital Deaths For Chronic Obstructive Pulmonary Disease Among The Elderly: Analysis Of Hospitalisations Between 2015-2019

Shakirah Md.Sharif[1], Suhana Jawahir[2], Zen Yang Ang[1], Fun Weng Hong[1]
[1] Centre for Health Outcomes Research, Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia
[2] Centre for Health Equity Research, Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia
Corresponding author's email: shakirah.ms@moh.gov.my

Summary
Chronic Obstructive Pulmonary Disease (COPD) is prevalent among older individuals. Readmissions for these conditions may reflect poor provider care or poor disease control. This study aimed to explore hospitalisation and readmission for COPD among the elderly in Malaysia by analysing hospital admissions data from 2015-2019. Findings show an increasing trend of admissions and readmissions for COPD between the 5-year period, suggesting high healthcare burden of COPD among the elderly that warrants attention of policymakers. Hospital deaths among the elderly due to COPD remained stable with an average of 2.7% per year.

Keywords
COPD, readmission, elderly, hospitalisation, Malaysia

Introduction
Ageing comes with diminishing respiratory function. COPD prevalence increases with age; however, good control is paramount to avoid exacerbations requiring hospitalisation. Management of COPD among the aged population can be challenging as typical management requires good physical

co-ordination and cognition (1). COPD readmissions have been shown to be higher among the elderly (2), which may implicate healthcare costs and quality of life. Moreover, COPD hospitalisation is associated with worse outcomes in older age groups (3). This study therefore aims to describe the 5-year hospitalisations, readmissions and hospital deaths for COPD among the Malaysian elderly.

Materials and Methods

Hospitalisation data of Malaysian adults aged ≥60 from 2015-2019 from Malaysian Health Data Warehouse were analysed. Included were admissions with discharge diagnosis of COPD, determined from ICD code J44. For years 2017 onwards, those with hospital deaths did not have main ICD code recorded. For these admissions, ICD code for underlying cause of death was used as a proxy of main hospitalisation diagnosis. Readmission was defined as hospitalisation ≤30 days from last discharge from the same hospital. Hospital death due to COPD was defined as admissions for COPD that resulted in deaths. Age was recoded into 10-year groups. Descriptive analysis was conducted using STATA 16. Graphs were plotted using Microsoft Excel to illustrate trends over 5 years.

Results and Discussion

Between 2015-2019, there were 105,873 admissions for COPD among older adults aged 60 and above. Figure 1 illustrates number of admissions, readmissions and hospital deaths across the 5 years. In general, there was an increasing trend of hospitalisation for COPD. In total, 2,891 admissions for COPD resulted in hospital deaths, with an average of 2.7% per year. Among the hospital deaths, 7% (n=201) occurred on the same day of admission. Rate of readmission per year increased from 17% in 2015 to 22% in 2019 (Figure 2). The rate of 30-day readmission found was similar to those reported in other Asian studies (4, 5). Further, inequalities in readmission by age group was observed. Except for year 2018, readmission was the highest among 60–69-year-olds. There was a larger difference between readmissions for age groups 60-69 and 70-79 in 2017 and 2019 respectively. Readmissions among above 80-year-olds were the lowest compared to the other age groups across the years, however, there was a steadily increasing trend from 13% to 18% over the 5-year period. The gap in readmissions between above 80-year-olds and younger age groups persisted over the years. One possible hypothesis is that those with COPD who survive to older age have better control of their COPD, thus resulting in lesser exacerbations compared to the younger age groups. As administrative data was used in the analysis, we were not able to build a model with good fit using available variables to explore the factors associated with readmissions. Nevertheless, as COPD hospitalisation is avoidable, further research is needed, looking into associated risk factors, post discharge care as well as strategies and policies in preventing hospital readmissions.

Conclusion

We found increasing trend of hospitalisation and readmission for COPD among the elderly, highlighting the burden it poses on healthcare resources.

Moreover, readmission differed between age groups. This provides opportunity for improvement as COPD hospitalisations can be prevented with good disease control and treatment optimisation.

Figure 1: Number of COPD admissions, readmissions and hospital deaths, 2015-2019

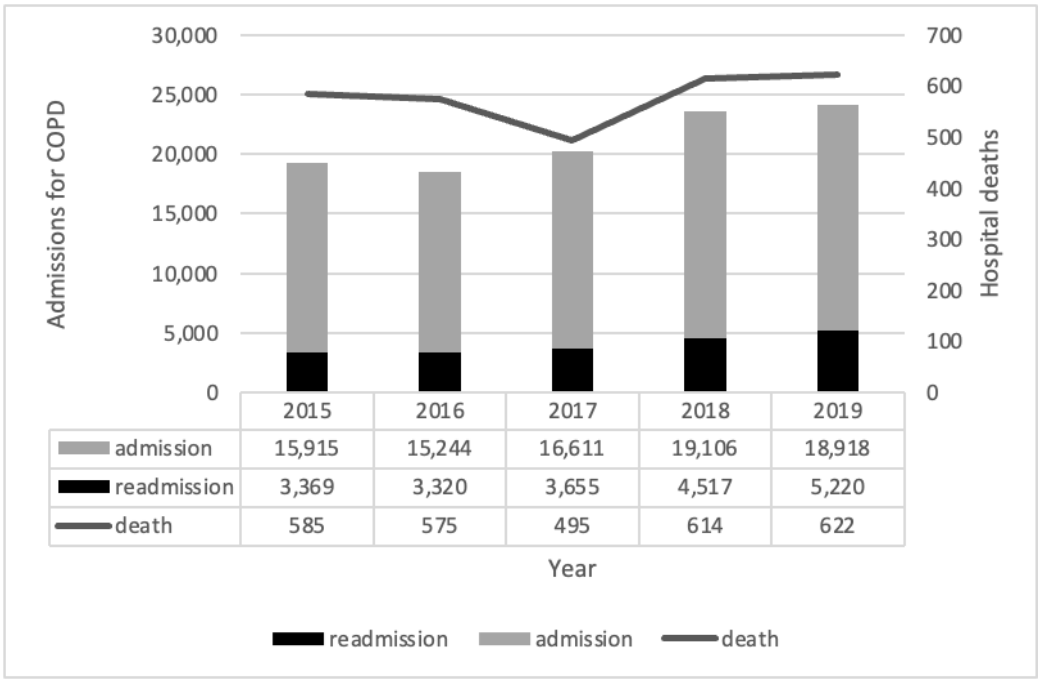
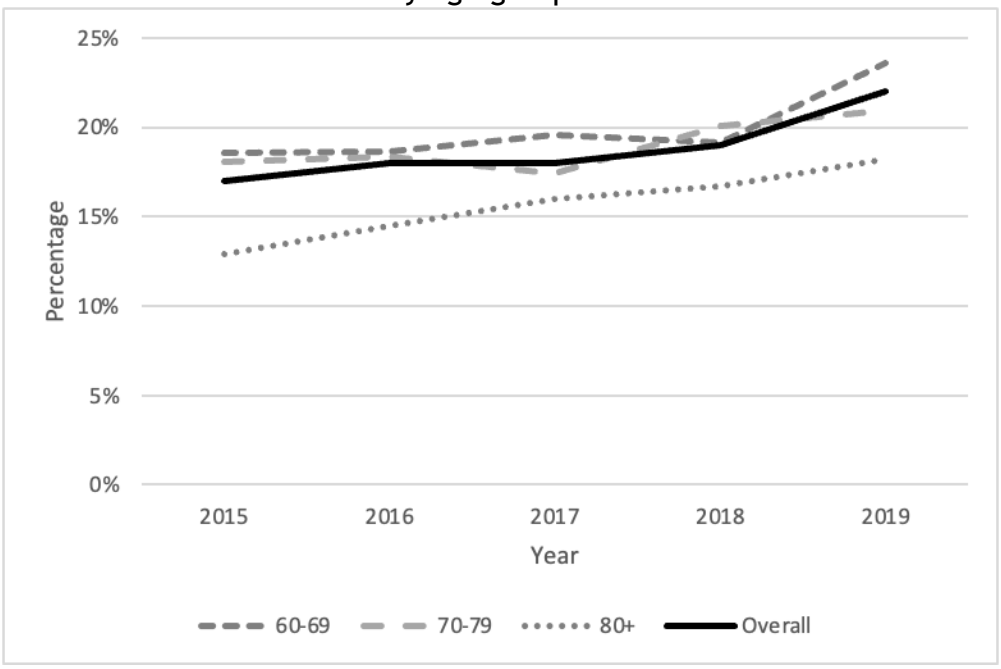


Figure 2: Trend of readmission by age group between 2015-2019



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EPIDPP35/99 : Stigmatizing And Discriminatory Attitudes Toward People Living With HIV/AIDS (PLWHA) Among Adolescents In Malaysia

Wan Sarifah Ainin Wan Jusoh [1], S.Maria Awaluddin [1], Mohd Shaiful Azlan Kassim [1] Norlaila Hamid [1] Norhafizah Sahril [1]
[1] Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia
Corresponding author's email: wansarifahainin@moh.gov.com

Summary
Human immunodeficiency virus (HIV) stigma is a negative attitude which leads to a bad health impact among people living with HIV/AIDS (PLWHA). This topic was understudied among Malaysian adolescents, therefore this study aimed to determine the prevalence of stigmatizing and discriminatory attitudes toward PLWHA. This study found that the stigmatizing and discriminatory attitudes toward PLWHA among adolescents in Malaysia is considered high and show a geographical and ethnicity variation. The HIV awareness programme should be promoted through a school-based approach under the sexual reproductive health umbrella to support the global ending HIV epidemic campaign.

Keywords
HIV stigma, adolescent, population-based, National Health and Morbidity Survey, Malaysia

Introduction
The stigmatizing and discriminatory attitudes toward people living with HIV/AIDS (PLWHA) among the general population lead to negative impact in terms of delay in seeking help and treatment besides increased risk of HIV transmission (1). The attitude may be contributed by a social and cultural beliefs but the main problem

is lack of HIV knowledge (2). In Malaysia, the main ethnicity consists of Malay, Chinese, Indian and Bumiputera Sabah and Sarawak who may have differences in the socio-cultural belief towards PLWHA. However, the adolescent population in Malaysia receives education via the mainstream public education system in which some of the elements of sexual education are taught including HIV awareness. This topic is categorised as among the sensitive issues in Malaysia, thus a lack of study focussing on this topic, particularly among adolescents. Therefore, this study aimed to determine the prevalence of stigmatizing and discriminatory attitudes toward PLWHA among adolescents in Malaysia. The second objective is to compare the prevalence of HIV stigma across the sociodemographic characteristic of the adolescent population.

Materials and Methods

This study utilized data from the National Health and Morbidity Survey 2020, a cross-sectional study among national representative sample focussing on communicable diseases in Malaysia. A self-administered Malay validated questionnaire was used to collect data on HIV stigma via its six domains. The domains were elaborated in the table of findings (3). An ascent consent and parental consent were obtained prior to the survey. A total of 705 respondents aged 13 to 19 years were extracted from the data set. A descriptive, bivariate analysis with a chi-square test was conducted using IBM SPSS Statistics version 25.0.

Results and Discussion

The prevalence of HIV stigma was shown in Table 1 with the highest prevalence was the global indicator for discriminatory attitudes toward PLWHA (87.9%; 95% CI: 82.0, 92.1). Table 2 shows only the significant result association of the HIV stigma with ethnicity and zone of data collection. A study conducted among adolescents who live with HIV/AIDS in other counties stated that they experienced multiple forms of discrimination toward themselves, families and discrimination in the healthcare setting which contributed to negative impacts (4). However, the finding in this study was a survey on stigmatising and discrimination attitudes towards PLWHA among general population of adolescent which lack comparison with previous studies (3,5).

Table 1: Prevalence of HIV stigma toward people living with HIV/AIDS (PLWHA) among adolescent in Malaysia.

No.	Domain	Prevalence	95% CI	
			lower	upper
1	**Fear of HIV infection** (*Adakah anda takut bahawa anda boleh dijangkiti HIV jika terkena air liur seseorang yang menghidap HIV?* Do you fear that you could contact HIV if you come into contact with the saliva of a person living with HIV?)	74.5	67.4	80.5
2	**Social judgement** (*Adakah anda bersetuju dengan pertanyaan berikut? "Saya akan berasa malu jika ahli*	48.2	43.0	53.5

	keluarga saya menghidap HIV." Do you agree with the following statement? "I would be ashamed if someone in my family had HIV."			
3	**Anticipated stigma** (*Pada pendapat anda, adakah seseorang berasa ragu-ragu untuk membuat ujian HIV kerana takut akan reaksi masyarakat jika keputusan ujian adalah positif HIV?* In your opinion, are people hesitant to take an HIV test due to fear of people's reaction if the test result is positive for HIV?	63.0	58.0	67.7
4	**Perceived stigma** (*Adakah orang yang menghidap atau disyaki menghidap HIV akan hilang rasa hormat atau kedudukan?* Do people living with or thought be living with HIV lose respect or standing?)	38.7	33.8	43.8
5	**Experienced stigma** (*Adakah anda akan membeli sayur-sayuran segar dari pekedai atau pembekal tersebut jika anda mengetahui bahawa dia menghidap HIV?* Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had HIV?)	79.3	73.8	84.0
6	**Discrimination** (*Adakah anda berpendapat bahawa kanak-kanak penghidap HIV sepatutnya boleh bersekolah Bersama dengan kanak-kanak yang bukan penghidap HIV?* Do you think children living with HIV should be able to attend school with children who are HIV negative?	75.2	69.7	80.0
7	**The Joint United Nations Programme on HIV/AIDS (UNSAIDS) global indicator for discriminatory attitudes toward PLWHA** (answered "No" to question No. 5 or No. 6)	87.9	82.0	92.1

Table 2: The association of HIV stigma with ethnicity and zone of data collection.

Variables	Prevalence	95% CI		p-value
		lower	upper	
Fear of HIV infection				
Ethnicity				
Malay	81.8	76.3	86.2	
Non-Malay	63.4	49	75.7	0.008
Social judgement				
Ethnicity				
Malay	57.4	52.8	61.8	
Non-Malay	35.8	26.5	46.3	<0.001

Zone				
East Peninsular Malaysia	53.7	44.1	63.0	
Sarawak	53.4	41.6	64.8	
South Peninsular Malaysia	52.6	45.0	60.0	
North Peninsular Malaysia	51.5	41.0	61.9	
Central Peninsular Malaysia	50.2	37.9	62.4	
Sabah & Labuan	31.7	23.0	42.0	0.045
Anticipated stigma				
Zone				
Sabah & Labuan	71.0	61.5	78.9	
Sarawak	68.6	60.2	76.0	
Central Peninsular Malaysia	66.2	56.7	74.6	
North Peninsular Malaysia	63.0	54.7	70.6	
East Peninsular Malaysia	60.2	48.0	71.3	
South Peninsular Malaysia	47.8	34.7	61.3	0.033

Conclusion

Stigmatizing and discriminatory attitudes toward PLWHA among adolescents in Malaysia is considered high and show a geographical and ethnicity variation. Therefore, the HIV awareness programme should be promoted through a school-based approach under the sexual reproductive health umbrella.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

EPIDPP36/165b : Colorectal Cancer And *Streptococcus Gallolyticus* Infection: Accuracy Of Statistical And Machine Learning Models For Early Detection Algorithm

Edre Mohammad Aidid[1], Hairul Aini Hamzah[2], Mohd Shaiful Ehsan Shalihin[3], Azmi Md Nor[4], Che Muhammad Khairul Hisyam Ismail[5]

[1] Department of Community Medicine, Kulliyyah of Medicine, International Islamic University Malaysia

[2] Department of Basic Medical Sciences, Kulliyyah of Medicine, International Islamic University Malaysia

[3] Department of Family Medicine, Kulliyyah of Medicine, International Islamic University Malaysia

[4] Department of Surgery, Kulliyyah of Medicine, International Islamic University Malaysia

[5] Kulliyyah of Medicine, International Islamic University Malaysia

Corresponding author's email: edreaidid@iium.edu.my

Summary

The research aims to determine the diagnostic accuracy of single and simultaneous testing of stool polymerase chain reaction (PCR) for *Streptococcus gallolyticus* (SGG) and immunochemical faecal occult blood test (iFOBT) in detecting Colorectal Cancer (CRC) and to compare statistical and machine learning models using a case-control study. Simultaneous testing produced net sensitivity (54%) that was higher than a single test (iFOBT=12%, Stool PCR=49%). CRC classification performance of the Bayesian Decision Tree (BDT) ensemble approach was highest at 78%, with stool PCR, body mass index and age as the predictors. In conclusion, the ensemble ML model incorporating SGG infection screening was the best model.

Keywords

Streptococcus gallolyticus, colorectal cancer, diagnostic accuracy, bayesian, ensemble machine learning

Introduction

Various studies look for lifestyle factors but do not highlight infection as the potential driver for CRC development. Many epidemiological studies highlighted the importance of the SGG infection in carcinogenesis of CRC (1-4). It is regarded as a highly important and treatable disease that is also linked to meat consumption. However, it is often overlooked and not tested as compared to stool occult blood. ML has been used to predict cancers but not specifically look at multivariable infection models. Techniques such as decision trees and artificial neural networks suffer from either underfitting or overfitting. One potential technique to improve model accuracy is by ensemble methods such as boosting (5). The research objectives are thus twofold, which are to determine the diagnostic accuracy of simultaneous testing of stool PCR for SGG and iFOBT in detecting CRC and to compare the prediction accuracy of statistical and machine learning models.

Materials and Methods

The research was carried out for 3 years duration (2019-2022). It was a case-control study with reversed flow design with an allocation ratio of 1 case to 2 controls. The study population was patients who came to the surgical clinic of Sultan Ahmad Shah Medical Centre (SASMEC@IIUM) for colonoscopy. A case was defined as patients who attended the colonoscopy and were diagnosed as CRC, and controls were patients who attended the colonoscopy but were diagnosed as other than CRC. The total sample size calculated was 120. Age, gender, family history, body mass index (BMI) and smoking status were defined according to validated modified Asia Pacific Colorectal Screening (APCS) score. ABON qualitative iFOBT was used. Stool PCR were tested for evidence of SGG. Data was analysed using RapidMiner Studio version 9.10.011. -Three models were developed for performance comparisons which are logistic regression (LR), Bayesian decision tree (BDT) ensemble and decision tree (DT).

Results and Discussion

The proportion of CRC among positive iFOBT was higher than negative iFOBT by almost 60%, indicating the relevance of screening asymptomatic population in the guidelines. Stool PCR is not routinely done worldwide as a screening tool. However, our study proved its relevance as a potential screening marker as it was detected more in CRC cases, similar to previous studies (1,3). The sensitivity of stool PCR was higher than iFOBT, indicating a negative test will rule out CRC. In addition, the negative predictive value was higher than iFOBT by almost 7% as in Table 1, signifying the probability of not having CRC following a negative test was higher. This gave a promising clue for stool PCR as a screening tool rather than diagnostic tool. When both tests are done simultaneously, gains in sensitivity were observed, indicating that iFOBT and stool PCR, if done concurrently, can improve early detection rates for CRC. CRC classification performance of the BDT ensemble approach was superior (BDT accuracy= 78.1%; DT accuracy= 72.4%; LR accuracy= 69.9%) as in Table 2. Based on Figure 1, the DT algorithm generated only iFOBT as the predictor, whereas the ensemble BDT approach produced positive stool PCR for SGG as the main branch followed by normal to overweight body mass index and adults above 53 years of age. Thus, it can be inferred here that DT model accurately detects CRC by only iFOBT, but BDT was able to accurately predict CRC much better with multivariable inputs. The BDT algorithm provided clues that a positive stool PCR patient should be , risk-stratified into normal and overweight BMI and age more than 53 years old to be advised for early colonoscopy.

Table 1: Single and simultaneous testing results

Parameter	iFOBT	Stool PCR for SGG	Simultaneous testing
Positive cases, n (%)	4 (80.0)	16 (50.0)	-
Sensitivity[a] (%)	12.1	48.5	54.7
Specificity[b] (%)	98.8	80.0	79.0
Positive predictive	80.0	50.0	-

value (%)			
Negative predictive value (%)	73.1	79.9	-
Diagnostic accuracy (%)	73.5	70.8	-

[a]For simultaneous testing, net sensitivity was calculated
[b]For simultaneous testing, net specificity was calculated

Table 2: Performance metrics of the models compared

Parameter	Logistic Regression (LR)	Decision Tree (DT)	Bayesian-Decision Tree (BDT) ensemble
Accuracy (%)	69.0	72.4	78.1
Sensitivity (%)	36.0	15.8	56.6
Specificity (%)	82.2	96.0	85.8
Positive predictive value (%)	39.3	62.5	62.5
Negative predictive value (%)	76.5	73.2	84.3
Area under the curve (AUC)	0.74	0.53	0.74
Significant predictors	Gender, Stool PCR, iFOBT	iFOBT	Stool PCR, BMI, Age

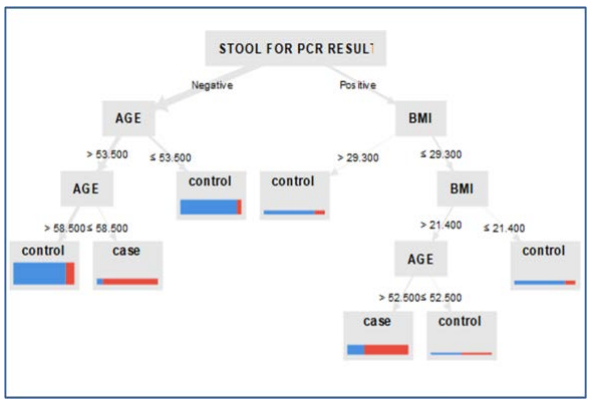

Figure 1: Best model algorithm generated from the BDT ensemble method. Larger red horizontal bar indicates dominant class will be a case, while a larger blue horizontal bar indicates control as the dominant class.

Conclusion

In conclusion, ensemble ML model incorporating SGG infection was superior to other models in predicting CRC. SGG screening for early CRC detection is recommended for those with normal to overweight BMI and aged above 53 years old. Further longitudinal and validation studies are recommended so strengthen these findings.

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EPIDPP37/8 : Seroprevalence Of Lymphatic Filariasis Among Migrant Workers In Sabah, Malaysia

Nur Dalila Zakaria[1], Richard Avoi [2]
[1] *Sabah State Health Department, Ministry of Health Malaysia*
[2] *Department of Public Health Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah*
Corresponding author's email: dr.nurdalila.z@moh.gov.my

Summary
Malaysia is endemic for brugian filariasis and aims to eliminate lymphatic filariasis (LF) as a public health problem by the year 2025. The World Health Organization (WHO) recommended a target antibody of <2% to halt transmission of lymphatic filariasis in areas where *Brugia* spp. is endemic. The antibody prevalence of lymphatic filariasis among the migrants in the sub-district Tangkarason was 1.9% (95% CI 0.8 to 3.9) and the locality with the highest number of positive tests was Meridien Tangkarason Estate.

Keywords
brugian filariasis, Malaysia, migrant workers

Introduction
This cross-sectional study was conducted to determine the seroprevalence of lymphatic filariasis among migrant workers in Sabah and to identify the sociodemographic factors associated with positive LF antibodies.

Materials and Methods
Eligible migrant workers ≥ 20 years of age in twelve estates in vicinity of endemic villages in Beluran, Sabah, were interviewed using a standardized questionnaire and tested for filarial antibodies using Brugia rapid test kits. The study was conducted in July 2021 involving 278 houses with approximately 1106 population. Every second person who was registered and consented for the study was enrolled. The continuous variables were further analysed using an independent t-test. The socio-demographic factors for LF infection were compared between subjects positive for and subjects negative for brugian filarial antibody using Pearson's chi-squared test or Fisher's exact test. All analyses were conducted using SPSS Statistics version 22.0 (IBM, Armonk, NY, USA). The level of significance was set to a p-value <0.05.

Results and Discussion
A total of 367 subjects were included in the study. The antibody prevalence of brugian filariasis in the study population was 1.9% (95% CI 0.8 to 3.9). The zone with the highest antibody prevalence was zone 1 (3.7%, 95% CI 0.5 to 12.7) and locality with highest number of positive tests was Meridien Tangkarason Estate. All positive cases were men (2.8%, p=0.101). Their mean age was 40.9 years (SD±11.0, p=0.196). They have lived in Sabah for approximately 13 years (mean: 156.0±27.7 months, p=0.949) and have worked almost 8 years in the estates (mean: 97.7±75.5 months, p=0.302). They planned to work in Sabah for another 5 more years (mean: 68.6±43.1 months, p=0.661). The prevalence of brugian filarial infection was higher among the Filipinos than in the Indonesians/East Timorese (3.1% vs 1.5%; p=0.387).

In Sabah, the two predominant migrants are the Filipinos (15%) and the Indonesians (85%). Both the Phillippines and Indonesia were endemic for *Wuchereria bancrofti* and *Brugia malayi*. Malaysia harbors the vectors for the parasite. Being the host of the highest number of non-Malaysian citizens in comparison to other states in Malaysia, Sabah is at risk for bancroftian filariasis infection. Hence, the migrant workers should be monitored for this infection.

Table 1: Seroprevalence according to locality and zone

Zone	Locality	Total number tested	Number of positive test	Prevalence, % (95% CI)	Prevalence by zone, % (95% CI)
1	Jayasama Estate	7	1	14.3 (0.4 to 57.9)	3.7 (0.5 to 12.7)

	Max Century Oil Palm	9	0	0	
	Khoon Siah Maidan Estate	36	1	2.8 (0.1 to 14.5)	
	Inai Lambang Estate	2	0	0	
2	Low Seow Wing Golong Estate	27	0	0	0
	Tobe Property Estate	30	0	0	
	Khoon Siah Pinangkau Estate	5	0	0	
3	Grezzing Estate	4	0	0	1.9 (0.5 to 4.9)
	Low Seow Wing Tangkarason Estate	8	0	0	
	Meridien Tangkarason Estate	195	4	2.1 (0.6 to 5.2)	
4	Great Surplus Estate	10	0	0	2.3 (0.1 to 12.0)
	Meridien Tanjung Nipis Estate	34	1	2.9 (0.1 to 15.3)	
	Total	367	7	**Overall prevalence**	1.9% 95% CI (0.8 to 3.9)

Table 2: Comparison of characteristics of respondents with positive and negative Brugia Rapid test results

Variable	Total (N=367)	Brugia Rapid Result		p-value[a]
		Negative, n (%)	Positive, n (%)	
Age (years), mean±SD		35.8±10.1	40.9±11.0	0.196
Gender				
Male	248	241 (97.2)	7 (2.8)	0.101[b]
Female	119	119 (100.0)	0 (0.0)	
Country of Origin				
Indonesia/East Timor	270	266 (98.5)	4 (1.5)	0.387
Philippines	97	94 (96.9)	3 (3.1)	
Duration of stay in estate (months), mean±SD		69.4±71.7	97.7±75.7	0.302

Duration of stay in Sabah (months), mean±SD	159.0±121.6	156.0±27.7	0.949
Remaining period to stay in Sabah (months), mean±SD	103.5±210.7	68.6±43.1	0.661

[a]Independent t-test [b]Chi-squared test

Conclusion

A low antibody prevalence of brugian filariasis was confirmed in the study sites, which achieved the target of <2%. The sociodemographic factors were not associated with positive LF antibody. Other factors that prevent transmission of LF among the migrant workers living in vicinity of endemic villages need to be determined to further strengthen the current filariasis elimination program.

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EPIDPP38/111 : Findings Of A URTI Outbreak At A Training Institution In Port Dickson District, Negeri Sembilan, Malaysia

Aisyah Anuar[1 2], Shahdattul Dewi Nur Khairitza[1], Esther Rishma Sundram[1], Ammar Amsyar Abdul Haddi[1], Abdul Rahman Dashuki[1], Sharifah Ain Shameera Syed Rusli[1], Norjeehan Junadi[1], Muhammad Afdal Fitri Mohd Rahim[1]

[1] Port Dickson District Health Office, Negeri Sembilan, Ministry of Health Malaysia,
[2] Faculty of Medicine and Health Sciences, University Malaysia Sarawak
Corresponding author's email: draisyahanuar@gmail.com

Summary

A URTI outbreak occurred in a training institution in the Port Dickson district on the 26th of February 2023. The investigation carried out was aimed to describe the epidemiological characteristics, identify the risk factors, and implement effective control and preventive measures for the outbreak. Epidemiological, environmental and laboratory investigations were performed. High magnitude of infections with an attack rate of 77.2%. Pathogens that were isolated show various viruses. Risk factors identified; delay in seeking treatment in symptomatic cases, failure to isolate sick trainees, poor compliance to good health practices such as wearing masks and using hand sanitiser, and mass gathering.

Keywordsoutbreak investigation, URTI, Respiratory Tract Infection, Port Dickson, Risk factor

Introduction

Upper respiratory tract infections (URTIs) are common infections which occur 2-8 times per year depending on age groups with an average incubation period of 5-7 days (1–3). Port Dickson District Health Office declared a URTI outbreak in a training institution on 26th February 2023. This report describes the steps of diagnosis verification, case identification, determining related risk factors, and initiating control measures in outbreak management.

Materials and Methods

The case was defined as any person in this training institute presenting with an acute URTI or having at least two of these symptoms; cough, sore throat, nasal congestion, or running nose with or without fever within the past 2 weeks. Epidemiological, environmental and laboratory investigations were carried out to determine the source of infection and the cause or aetiology of the outbreak, while a cohort study was conducted to identify the risk factors. Data collection was done and compiled in the Microsoft Excel application and analysed using the crosstabulation technique and chi-square test in the SPSS application.

Results and Discussion

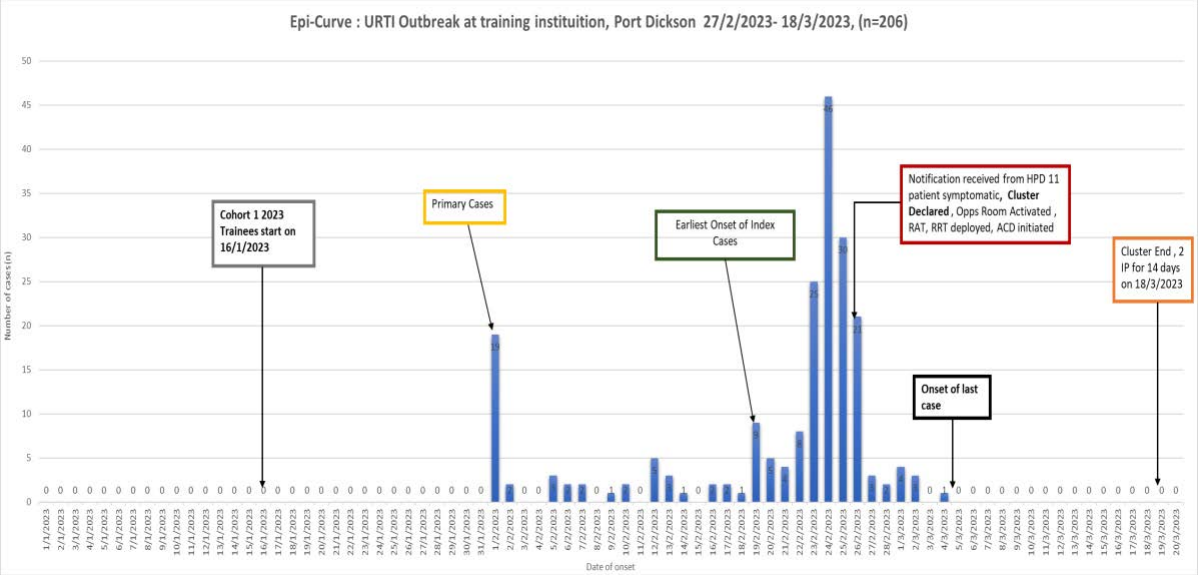

Figure 1: Epi-Curve of URTI Outbreak at one training institution, in Port Dickson District.

Figure 1 is the epi curve indicating the propagated mode of spread of the outbreak, which supports the transmission from person to person (4). Of 267 people who are at risk of getting URTI, 206 cases were detected in the institution with an attack rate of 77.2%. Looking at the magnitude of the infection with a high attack rate shows that this is a viral infection, and it is transmitted airborne(5). This finding is supported by confirmation of laboratory test results. Table 1 shows the

characteristic and symptoms of cases. There is no significant difference in cases between gender and battalion. Cases' ages ranged from 20 to 42 years, with a median of 25 years. The discrepancies in attack rate among trainees and trainers are huge with 90.4% and 6.45% respectively. This may be attributed to environmental factors and individual factors such, as poor distancing in mass gathering activities, physical exertion, and poor compliance with proper health practices. Statistical analysis found a person who had poor compliance with hand hygiene and not wearing a mask had a higher risk of getting URTI with RR of 1.475 and 1.636 respectively (See table 2). Out of all symptomatic cases, only 10 cases (4.85%) had positive results from the SARS CoV-2 Rapid Test Kit (RTK). Out of 10 nasopharyngeal swab samples sent for culture and PCR (Polymerase chain reaction), 4 were positive for COVID-19, 8 were positive for influenza A virus, 8 were also positive for Seasonal Flu A (H3), 1 for Adenovirus, 1 for Rhinovirus, 5 for Coronavirus OC43 and 1 for Bocavirus. The clinical sample result also shows that one person is infected by more than one virus, and most are 4 viruses concomitantly. The most prominent cause of infections in this outbreak was Influenza A viruses and Seasonal Flu A(H3) viruses.

Table 1 Sociodemographic characteristics of the training institution population with and attack rate.

Characteristic	N (267)	N%	n (206)	n%(Attack rate)
Gender				
Male	182	62.8	140	76.92
Female	85	31.8	66	77.64
Status/Occupational				
Trainees (TRAINEES)	227	85.02	204	90.75
Support Staff (Urusetia)	9	3.37	0	0
Trainers/Coach	31	11.61	2	6.45
Age Group				
11-20	17	6.4	12	70.59
21-30	183	68.5	159	86.89
31-40	47	17.6	32	68.08
41-50	12	4.5	3	25.00
51-60	8	3	0	0
Battalion				
Khas	10	3.7	10	100
Alpha	33	12.4	23	69.69
Bravo	32	12	25	78.13
Charlie	33	12.4	26	78.78
Delta	36	13.5	27	75.00
Foxtrot	27	10.1	23	85.19
Oscar	25	9.4	20	80.00
Sierra	27	10.1	25	92.59
Tango	28	10.5	26	92.85
Trainers/staff (nonspecific)	16	5.99	2	12.50

Presentation			
Healthy	61	22.84	
ILI	14	5.24	6.80
URTI	191	71.53	92.72
Symptoms			
Fever	146	54.7	70.53
Cough	195	73	94.20
Flu	140	52.4	67.63
Sore Throat	105	39.3	50.70
Shortness of Breath (SOB)	14	5.2	6.76

N= total number of populations
n= total number of persons with URTI

Table 2: Crosstabulation table for an odds ratio of compliance with wearing masks and usage of hand sanitiser.

Variables		Symptomatic for URTI		OR	95% CI	p-value
		Yes N (%)	No N (%)			
Usage of face mask	**Non-compliance**	182 (83.5)	36 (16.5)	4.85	2.50-9.43	<0.001
	Compliance	25 (51.0)	24 (49.0)	1		-
Usage of hand sanitiser	**Non-compliance**	173 (83.6)	34 (16.4)	3.90	2.07-7.30	<0.001
	Compliance	34 (56.7)	26 (43.3)	1	-	-

Table 3: Crosstabulation table for the relative risk of compliance with wearing masks and usage of hand sanitiser.

Variables		Symptomatic for URTI		RR	95% CI	p-value
		Yes N (%)	No N (%)			
Usage of face mask	**Non-compliance**	182 (83.5)	36 (16.5)	1.64	2.50-9.43	<0.001
	Compliance	25 (51.0)	24 (49.0)	0.34	0.22-0.51	
Usage of hand sanitiser	**Non-compliance**	173 (83.6)	34 (16.4)	1.48	2.07-7.30	<0.001
	Compliance	34 (56.7)	26 (43.3)	0.38	0.25-0.58	

Conclusion

The URTI outbreak in this training institution was caused by multiple viral infections with probable sources being the primary cases. The outbreak was attributed to environmental and human factors. Proper isolation of cases, wearing masks and self-hygiene were among the vital factors in breaking the transmission of the URTI outbreak.

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EPIDPP39/118 : Case Report Of Japanese Encephalitis In Batu Pahat Johor: A Public Health Perspective

Nur Ezzah Abd Rahim [1], Ahmad Afif Ahmad Ridzwan [1], Muhammad Faiz Mohd Ghafar[1], Atiqah Nor Ain[1], Amirul Akmal Sohor [1],
[1] Batu Pahat District Health Office, 83000 Batu Pahat, Johor
Corresponding author's email: nur.ezzah@moh.gov.my

Summary
A 9-year-old girl from Batu Pahat, Johor, presented with acute encephalitis syndrome to the hospital on 31st October 2022. Subsequently, the diagnosis of JE was confirmed by a positive serum JE IgM and radiological findings suggestive of JE on MRI. The patient received treatment at Hospital Sultanah Aminah Johor Bahru (HSAJB) from 2nd November 2022 to 12th December 2022 and then finally discharged home in good health. This paper describes the case and public health interventions including case investigation, case detections, entomological investigation, control, and preventive measures.

Introduction
Japanese Encephalitis (JE) is a mosquito-borne viral infection primarily transmitted by Culex mosquitoes. Pigs and birds act as amplifying hosts for the virus (1). Patients who were infected with JE virus (JEV) may have central nervous system disorders or features of acute encephalitis signs and symptoms. This case report presents a comprehensive approach to detection and control in response to the reported case of JE in Batu Pahat.

Materials and Methods
Case definitions of JE used in this study were based on the Third Edition Case Definition of Infectious Disease in Malaysia. The clinical case definition of JE is a

febrile illness of variable severity associated with neurological symptoms ranging from headache to meningitis or encephalitis. Symptoms can include headache, fever, meningeal signs, stupor, disorientation, coma, tremors, paresis (generalized), hypertonia, and loss of coordination. A laboratory-confirmed JE case is one with either JE virus-specific IgM in the CSF, or a four-fold or greater rise in the JE virus-specific antibody in paired sera, or detection of the JE virus, antigen or genome in tissue, blood or other body fluid (2). The case was investigated by interviewing the patient's family members, reviewing the case hospital notes, and conducting field investigations. Active and passive case detections as well as environmental and entomological investigations, were carried out, covering a 2km radius area from the case house. Data were entered and analysed using Microsoft Word and Excel.

Results and Discussion

Case Description

The District Health Office (PKD) in Batu Pahat, Johor, has received a report of a single case of JE from PKD Johor Bahru on 29th November 2022 involving a previously healthy primary school student from who lives in Parit Sulong, Batu Pahat. She presented with first episode of seizure on 31st October 2022, which later progressed to status epilepticus that required intensive care in Paediatric Intensive Care Unit (PICU) HSAJB. Within 2 weeks prior to symptoms, she attended school as usual and had no history of travelling to endemic area of JE. She received treatment at HSAJB and was discharged well after hospitalised for a month.

Field and Environmental Investigations

A field investigation was carried out from 29th November 2022. It was revealed that the case was a student at Sekolah Kebangsaan Parit Sulong in the morning from 0730H to 1300H and attended Sekolah Rendah Agama Parit Sulong in the afternoon from 1530H to 1830H. She resides in a suburban area at Jalan Tiong, Parit Sulong. The surrounding environment of the case's house is near oil palm plantations and shrubs. Malays are the majority of residents in the area. There was no evidence of livestock farms such as pigs, horses, cattle or goats in a 2km radius of the patient's residence. However, there were stagnant water bodies and groundwater found in the area that could become potential breeding spots for JE vectors. In addition, rumour surveillance found reports on multiple sightings of wild boar near the case's residential area.

Case Detections

Active case detection (ACD) activities were carried out by PKD Vector Unit in collaboration with the Parit Sulong Health Clinic staff within 2km radius of the town. A total of 2246 people were screened to identify individuals exhibiting JE symptoms. Nevertheless, there was no clinical cases of JE identified during the ACD surveillance period. Passive case detection (PCD) gathered no other cases from nearby clinics and hospital.

Entomological Investigations (EI)

Multiple *Culex* species were identified within 2km radius from the case's residence. Larva survey was done using Dipping technique while adult mosquitoes were captured using Center of Disease Control (CDC) light traps and Human Landing Catch (HLC) technique, further confirming their presence. Entomological findings highlight the importance of control of JE vector to mitigate the risk of JE virus transmission.

Control Measures

A series of control and prevention activities, including inspection and destruction of potential breeding sites, larviciding and ultra-low volume (ULV) spraying were performed aimed to reduce the vector population and minimize the risk of JE transmission. Moreover, health promotion and education activities were conducted to promote awareness among the local merchants, local populace and school administrators.

Discussions with representatives from the Veterinary Department and Wildlife Department of Batu Pahat, was a success and samples from local wild boars were sent to detect JEV. Although none of the samples came back positive, it is still possible that local wild boars may serve as amplifying hosts for JE transmission in this case.

Public health interventions of JE encompass multiple approaches. One of the successful interventions includes vaccination. JE vaccine has been integrated into the National Immunisation Programme in Malaysia since 2007. However, it is only compulsory for those living in the endemic area of JE in Malaysia, which is Sarawak (3). Effective vector control is crucial to cut off the transmission of JEV including the elimination of mosquito breeding grounds, application of larvicides and sprinkling of insecticides. Moreover, community education programmes to raise awareness of the significance of practising personal protection measures such as the use of insect repellants and bed netting should be empowered (4). Early detection of JE cases is essential for disease containment and prompt intervention. Cross-sector collaboration, such as with the Veterinary Department in enhancing surveillance of livestock populations, may provide early warning signs of viral activity, especially among pigs that serve as the most common amplifying hosts (5).

Conclusion

The case report highlights the importance of public health interventions which are active case detection, vector control measures, entomological investigations and collaboration with other agencies in managing JE. The absence of clinical JE cases during the surveillance period showed the effectiveness of the conducted control measures. With the presence of vectors in the area, it is possible that JEV was coming from the wild boars or other amplifying host in that area. Hence, it is crucial to maintain the public health surveillance of JE cases and empower JE awareness to the communities.

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EPIDPP40/134 : Trends In Glucose-Lowering Drugs: Increase In Insulin Use Among Patients With Uncontrolled Type 2 Diabetes In Public Health Clinics From 2011 To 2020

Swee Hung Ang[1], Sanjay Rampal[1]
[1] *CEBP, Department of Social and Preventive Medicine, Faculty of Medicine, Universiti Malaya*
Corresponding author's email: sweehung@live.com

Summary
Glucose-lowering medications are essential in diabetes control and complications prevention. We described the trends in GLD, in terms of medication class, number and regimen, by levels of HbA1c control among type 2 diabetes patients in public health clinics from 2011 to 2020. Metformin, dual GLD and oral combinations were the most frequently prescribed class, number, and regimen. Use of sulphonylureas decreased over time with a concurrent increase in the use of insulin among uncontrolled diabetics (HbA1c>7%).

Keywords
Type 2 diabetes, antidiabetic medications, trends, primary care, insulin

Introduction
Glucose-lowering drugs (GLD) are prescribed for patients with type 2 diabetes (T2D) when good glycaemic control could not be achieved with lifestyle modification alone. Choices of treatment (oral or injectable, single drug or in combination) differ depending on the levels of HbA1c and patient conditions. With advancement in technology and new research evidence, newer drugs were developed and recommendations for management were updated including approaches in pharmacotherapy. This study aimed to assess patterns and trends in GLD among T2D patients with different HbA1c control. The findings could help better understanding of current practice, serve as baseline and guide direction for further improvement in policy implementation and clinical practice.

Materials and Methods

We used data from the annual clinical audits, which were randomly sampled from the National Diabetes Registry. We included all adult Malaysian T2D patients (aged ≥18), with a recorded HbA1c from 2011 to 2020. If a patient was audited more than once during this period, only the first record was included. We measured GLD in three ways: (a) medication class comprising metformin, sulphonylureas, alpha-glucosidase inhibitors (AGI), insulin, and other GLD (thiazolidinediones, meglitinides, dipeptidyl peptidase-4 inhibitors (DPP4-i), sodium-glucose cotransporter-2 inhibitors (SGLT2-i)), (b) number of GLD, and (c) regimens categorised as no medication (NM), oral monotherapy (OM), oral combinations (OC), insulin only (IN) and insulin plus oral (IO). Percentages of use were calculated for each year stratified by HbA1c control, defined as controlled (≤7%) and uncontrolled (>7%). All analyses were performed using R (4.2.2) and RStudio (2023.03.0).

Results and Discussion

Majority of the 313,086 patients included in this study were women (61%), Malay (64%), with a mean age of 60±11 years, and had a median (Q1, Q3) diabetes duration of 5.1 (2.5, 9.0) years. More than half (55%) had uncontrolled HbA1c. Metformin was the most frequently prescribed medication throughout the study period, followed by sulphonylureas, and insulin. From 2011 to 2020, the use of sulphonylureas and AGI decreased. In contrast, insulin usage increased, specifically among the uncontrolled group from 21% in 2011 to 41% in 2020. The proportion of controlled diabetics on monotherapy increased over time with a concurrent decrease in dual therapy. Among uncontrolled diabetics, the proportion receiving dual therapy has remained similar whereas the proportion on three or more GLD has decreased over time. In 2020, a higher proportion of controlled diabetics were on lifestyle modifications (without medication) compared to uncontrolled diabetics (2.5% vs 6.6%). Use of oral combination (OC) declined over time whereas oral monotherapy (OM) increased among controlled diabetics. Among uncontrolled diabetics, there was a rising trend in the use of insulin plus oral combinations with a parallel decreasing trend in OC. The increasing use of insulin among uncontrolled diabetics appeared to follow the recommendations from the 2015 Malaysia clinical practice guidelines (CPG) on diabetes management.[1] However, it is uncertain whether this increased use of insulin improved glycaemic control and patient outcomes. Low usage of other GLD with additional cardiovascular and kidney protective effects such as glucagon-like peptide-1 receptor agonists (GLP1-RA) and SGLT2-i may be due to high cost and limited availability.[2] The 2020 CPG on diabetes management recommends earlier use of combination therapy and encouraged the use of GLD with cardiorenal benefits.[3] Further research is needed to assess the trends in GLD use following the updated CPG.

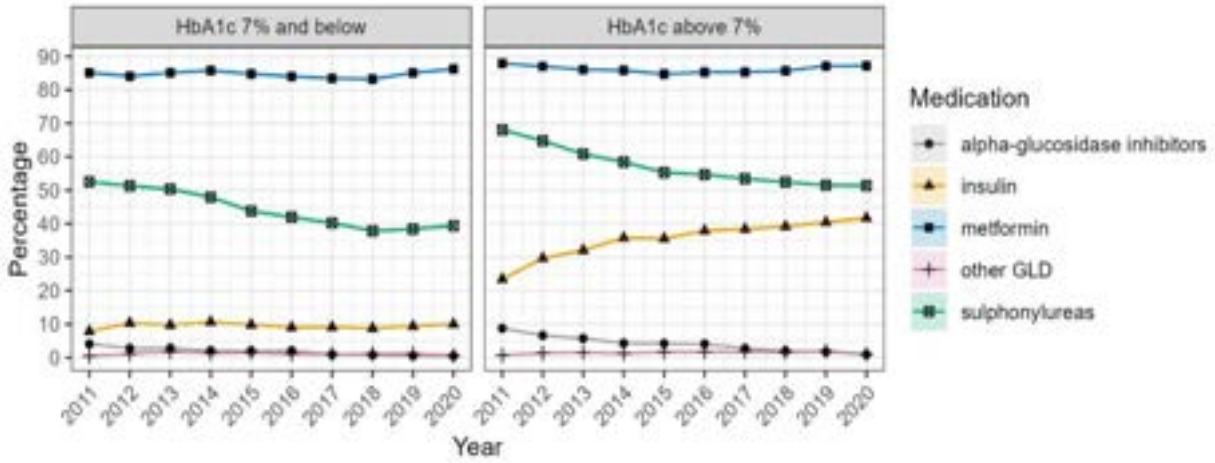

Figure 1: Trend in medication class among type 2 diabetic patients in public health clinics, 2011-2020. "Other GLD" included mainly thiazolidinediones and meglitinides before 2015, and thiazolidinediones, dipeptidyl peptidase-4 inhibitors (DPP4-i) and meglitinides from 2015.

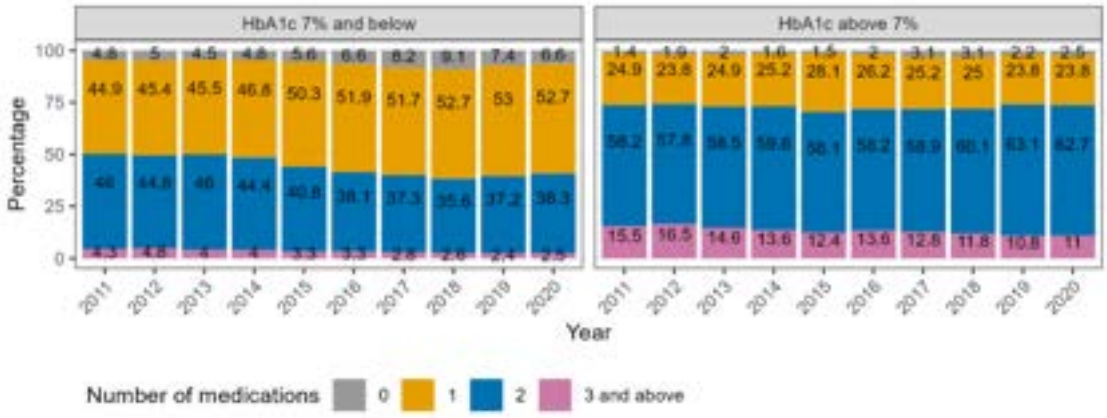

Figure 2: Trend in number of glucose-lowering drugs among type 2 diabetic patients in public health clinics, 2011-2020.

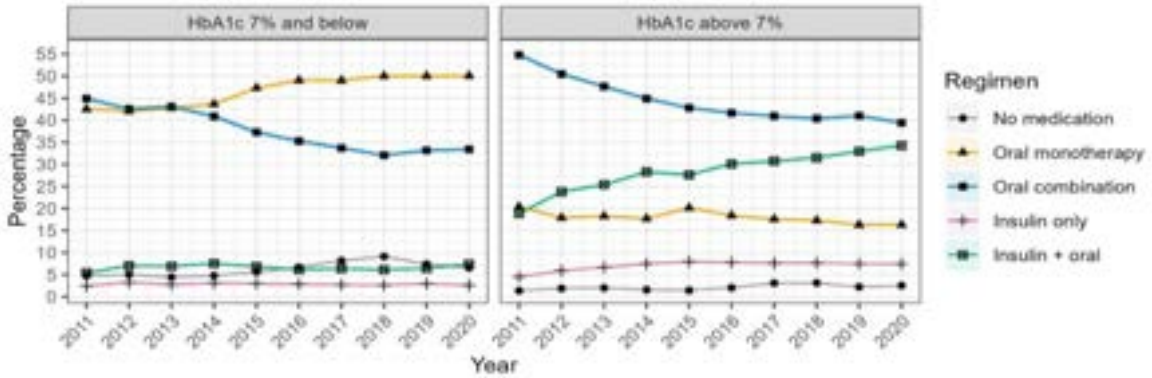

Figure 3: Trend in glucose-lowering drug regimens among type 2 diabetic patients in public health clinics, 2011-2020.

Conclusion

Metformin was the most frequently prescribed medication for T2D patients between 2011 and 2020. The use of sulphonylureas decreased concurrently with the rising use of insulin among patients with uncontrolled T2D. Further study is required to examine the impact of these trends on patient outcomes and assess the trends in GLD use following the updated CPG.

Acknowledgments
We would like to thank Dr. Feisul Idzwan Mustapha, Dr. Noraryana Binti Hassan, and the officers from the Disease Control Division, Ministry of Health Malaysia for their support in the provision of the data.

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EPIDPP41/143 : Supplimentary Measles Immunization Coverage In Seremban, Negeri Sembilan

Muhammad Ikhwan Mud Shukri*, Sharina Mohd Shah, Ariff Azfarahim Ibrahim, Nurul Fazilah Aziz, Nurul Haniza Md Yusof, Nadiatul Ima Zulkifli, Veshny Ganesan, Ahmad Husni Ariffin, Syuaib Aiman Amir Kamarudin, Ahmad Farid Nazmi Abdul Halim, Asmah Johari, Noor Khalili Mohd Ali
Pejabat Kesihatan Daerah Seremban, Negeri Sembilan
Corresponding author's email: ikhwanpkdgombak@gmail.com

Summary
Measles supplementary immunization activities (SIA) aimed to boost population immunity during the outbreak. District SIA was conducted in Seremban to limit measles outbreak transmission to the population at risk. This study revealed low supplementary measles vaccine coverage among eligible children due to multiple challenges encountered. This study provides insight to explore future research on SIA challenges especially factors determining parental acceptance towards supplementary measles vaccination during outbreak.

Keywords: Supplementary immunization activity, measles, Malaysia, outbreak, measles vaccine coverage

Introduction
Measles is prevalent in low- and middle-income countries (LMIC) such as Malaysia[1]. The incident rate increased from 6.1 per million population in 2013 to 52.1 per million population in 2017 even Malaysia has good measles vaccine immunization

(MCV) coverage (96% for MCV first dose and 99% for MCV second dose)[2]. Similarly, Seremban recorded high MCV for both doses in 2022. During measles outbreak, supplementary immunization activities (SIAs) are conducted to deliver supplementary measles vaccination (SMV) to all targeted individuals regardless of their prior measles vaccination (PMV) status to rapidly raise population level immunity and to control measles transmission[3]. Successful SMV coverage is determined by 95% of children vaccinated during SIA[4]. Recent measles outbreak in Gadong Jaya, Seremban with 6 confirmed cases called for an urgent district SIA. This study aimed to describe SIA coverage and characteristics and to explore the challenges of SIA in Gadong Jaya and possible recommendations.

Materials and Methods

This study is cross-sectional. SIA is operationalized by definition as a single-day, centralized SIA (cSIA) where immunizations were conducted in the local mosque as cSIA centre with subsequent SIA follow-up at the nearest health clinic and home visit for a month (till outbreak cessation). During cSIA on 26.3.2023, the eligible children were surveyed house-to-house involving 1152 residential houses and registered using Google Form. The inclusion criteria include: 1) Children aged between 1 and 7 years; 2) staying in Taman Gadong Indah and Taman Gadong Jaya and the exclusion criteria include: 1) children with severe allergy after previous dose of MMR, 2) symptomatic (fever, upper respiratory infection), 3) measles immunization less than 1 month prior to SIA, and 4) immunodeficient children. Parental consents were retrieved and being referred to the cSIA centre. For houses with absent occupants, notice of reminder was placed to require them to go for SMV at the nearest clinic in 3 working days. Using data from a post-SIA coverage survey, all data collected were analysed descriptively using Statistical Package for the Social Sciences (SPSS) Software, Version 26.

Results and Discussion

After excluding symptomatic children (n=9), children who had measles vaccination less than 1 month prior to SIA (n=7), and immunodeficient child (n=1), the total eligible children for SIA are 315. This includes 7 children with incomplete PMV. Table 1 shows the distribution of eligible children based on SIA characteristics. The majority of them are from the age group between 4 and 7 years, male, Malay and received complete PMV. The measles SIA coverage was 86%. Among the 7 children with incomplete prior measles vaccination status, only 2 children consented by parents to receive SMV.

Table 1: Distribution of Eligible Children based on SIA Characteristics (N=315)

Demographic Characteristics	Frequency (%)
Age groups (years)	
1-3	102 (32.3)
4-7	213 (67.7)
Gender	
Male	177 (56.1)
Female	138 (43.9)
Ethnicity	

Malay	312 (99.0)
Indian	3 (1.0)
Prior Measles Vaccination Status	
Complete	308 (97.8)
Incomplete	7 (2.2)
Received SIA Immunization	
Yes	271 (86.0)
No	44 (14.0)
Absent during SIA, loss to clinic follow-up and home visit	26 (8.2)
Parental refusal	18 (5.7)

The major obstacle to achieve high SMV coverage is the absence of children during cSIA and loss to clinic follow-up and home visits. One of the possible explanations is the poor perception of parents regarding the importance of SMV during the outbreak. Although SIA education and promotion were rigorously conducted beforehand, they may perceive the SIA as unimportant. The PMV is believed to be sufficient to protect their children from measles infection. This is supported by a recent study in Selangor which showed poor knowledge level in measles vaccination among parents despite possessing good routine measles vaccination practice[5]. Hence, future research may explore the perception and acceptance of SMV among parents during measles SIA.

Conducting district SIA during measles outbreak is resource-intensive. Financial and human resources are critically required in multiple areas such as: 1) SIA health promotion and health education; 2) vaccine storage, transportation and administration, and 3) employees' overtime payment. Hence, centralized SIA was employed over house-to-house as it reduced the number of employees, better vaccine cold chain management, and reduced the number of vaccine items. However, some parents were unable to go to the cSIA centre due to logistic reasons. Therefore, a mobile medical team was deployed from the cSIA centre to their houses for measles immunization.

The main limitation identified during conducting SIA is the possibility of children unregistered during cSIA survey. Although notice of reminder was placed at each house with absent occupants, they may not have complied with the request to seek SMV at the nearest clinic. Home visits by medical personnel also were unfruitful since they were constantly absent. Future SIA may employ local leaders or residents to gain this information, but this strategy may be time-consuming.

Conclusion

The SMV coverage during SIA in Seremban was low. The challenges and limitations identified may provide insights into future research and preventive strategies for maximizing SMV coverage during SIA.

Acknowledgements

We thanked Seremban District Health Office for contributing assistance during the study period.

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EPIDPP42/145 : Lymphatic Filariasis In Pahang, Malaysia : Distribution Of Cases And Strategy Towards Elimination

Nurul Nadjwa [1], Mohd Hafeez I [1], Tan San Kuei [1], Siti Nabihah [1], Nor Azimi Yunus[1], Suzana Mohd Hashim [1]
[1] Pahang State Health Department, Ministry of Health Malaysia
Corresponding author's email: drnurulnadjwa@moh.gov.my

Summary
Lymphatic filariasis (LF) is an important neglected parasitic disease according to the World Health Organization and Malaysia is one of the countries in which LF is an endemic disease. This study aims to show Pahang State Health Department efforts and strategies towards Lymphatic Filariasis Elimination Program (LFEP). Descriptive analysis using secondary data from year 2004-2022, were obtained from Vector Control Unit, Pahang State Health Department and Vekpro. Records in Vekpro from 2008 to 2016 showed Incidence rate (IR) less than 1.0 (per 100,000) post Mass Drug Administration (MDA) and introduction of MDA using Ivermectin medication in 2019 was successful in reducing the prevalence of LF. Despite all the challenges, efforts towards achieving filariasis elimination in Pahang is on the right track by 2025.

Keywords
Lymphatic Filariasis, Mass Drug Administration, Vekpro, strategies

Introduction
Lymphatic filariasis is caused by three species of parasitic worms, namely, *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*, which are transmitted by mosquitoes (1). Globally, over 120 million people were infected in 2000 and as of 2018, 51 million people were infected, a 74% declined since the start of WHO's Global Program to eliminate filariasis in 2000 (2). In response, WHO launched the Global Program to Eliminate Lymphatic Filariasis (GPELF) in 2000 with two main objectives, to interrupt the transmission of LF as well as to alleviate suffering and decrease the disability caused by LF (3). In Malaysia, LF is caused by *W.bancrofti* and *B.malay*i, and is transmitted by mosquitoes of the genus *Anopheles* and *Mansonia*. It occurs only in very small pockets in Malaysia:

Sabah, Sarawak, and several states of the Peninsular Malaysia including Terengganu, Kelantan, Pahang, Selangor, and Johor (4). MDA was introduced with DA medication in 2004 and then with IDA in 2019 with aims to reduce the parasite reservoir and prevent further transmission (5). In 2017, a three-drug regimen comprising ivermectin, diethylcarbamazine and Albendazole (IDA) was introduced by WHO as an alternative MDA regimen to accelerate the LF elimination program and Malaysia started this regime in 2019, as well as in Pahang, specifically in Rompin and Pekan district. Malaysia plan for elimination by year 2025.

Materials and Methods

This study was conducted using secondary data from Vector Control Unit, Pahang State Health Department, from year 2004 to 2022 by monitoring number of cases from all documents through Vekpro website and weekly epidemiology meeting review of cases in Pahang. Mapping to classify endemicity was done in 2002-2004. Detection of cases was done using Night blood survey (NBS) and Brugia Rapid Test Kit (BRT). Transmission Assessment Survey (TAS) has been done from 2012-2018 to determine whether a specific area has achieved the desired level of transmission interruption.

Results and Discussion

From the total of 74 Implementation Units (IU) in Pahang, 28 IU's were identified as red areas and the remaining 46 IU's as green or non-endemic areas (Figure 1). All 28 red IU's has undergone MDA 5 cycles from 2004-2008 using DA medication, as part of disease control and to reduce the prevalence of disease, which was successful as IR achieved less than 1.0 (per 100,000) post-MDA (Figure 2). The introduction of MDA using Ivermectin (IDA) medication in 2019 has been successful in reducing the IR of disease in Pahang. As for TAS in Pahang, all 28 red IU passed 3 cycles of TAS from 2012-2018, which shows antigenemia rate falls below the predefined threshold and indicates that the transmission of LF has been successfully interrupted, and MDA can be stopped in that area (Figure 3). Surveillance activities are still actively carried out in the state of Pahang despite having achieved the elimination status of filariasis after passing the third TAS in 2018 (Figure 2,3). This surveillance includes at-risk groups and localities in the state of Pahang. Figure 2 shows from year 2008 until 2022, there's a total of 323 positive Filariasis cases in Pahang, with 73.3% (237 cases) from *Brugia Malayi* species and remaining 26.7% (86 cases) parasite *Wuchereria Bancrofti*. Overall, detection of positive cases using NBS comprises of 57.9% (187 cases) while using BRT 30.7% (99 cases) and detection using both NBS+BRT 11.5% (37 cases). The majority of positive cases came from Pekan, Rompin and Lipis districts whereby local transmission was mostly from the 'Orang Asli' village and imported transmission from employers originated from India, specifically from Uttar Pradesh.

Figure 1: Pahang map according to endemicity after re-mapping in 2004

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Kes	10	9	9	33	8	1	12	9	2	44	22	52	72	12	28
NR	0.68	0.6	0.6	2.16	0.52	0.06	0.75	0.56	0.12	2.67	1.33	3.11	4.26	0.7	1.49

Figure 2: Number of Cases and Incidence rate of Filariasis in Pahang from 2008-2022

Figure 3: Pahang Lymphatic Filariasis Elimination Program Milestone

Conclusion

Efforts to combat filariasis have been ongoing in Pahang and MDA has been the cornerstone of these control efforts. Several challenges persist in the fight against Filariasis in Pahang, especially the impact of foreign workers from filariasis endemic countries that came to work in Pahang. Continued research improved and targeted surveillance, and also comprehensive control strategies are necessary to eliminate this debilitating disease. Despite all the challenges, efforts towards achieving filariasis elimination in Pahang is on the right track by 2025.

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EPIDPP43/36 : HIV Infection In Besut, Terengganu: Epidemiologic Transition, Mortality And Associated Risk Factors: A 17-Year Review (2005-2022)

Hafizuddin Awang[1], Mohd Fariz Zulrushdi[1], Sa'aidin Abdul Rahman[1], Noor Hadirah Zulkifli[1], Mahani Nordin[2], Mohd Anuar Abd Rahman[2], Kasemani Embong[2]

[1] *Besut District Health Department, 22200 Besut, Terengganu*

[2] *Terengganu State Health Department, Wisma Persekutuan, 20920 Kuala Terengganu, Terengganu*

Corresponding author's email: drhafizuddin@moh.gov.my

Summary

HIV infection and its mortality remains a public health threat despite the advancement of HIV treatment. This study aimed to determine the epidemiologic transition of HIV transmission; case fatality rate and determinants for HIV mortality in Besut. Data were collected from the National AIDS Registry for the period of

2005 until 2022. Descriptive and logistic regression were employed for data analysis. The case fatality rate for HIV in Besut is 25.3%. There is evidence of epidemiologic transition in HIV transmission in Besut. Heterosexuals, vertical transmission and tuberculosis co-infection were the significant determinants for HIV mortality in Besut.

Keywords
HIV, mortality, heterosexual, vertical, tuberculosis.

Introduction

Approximately 35 million people worldwide are infected with human immunodeficiency virus (HIV) in 2020 and it appears that the disease is identified as an important cause of death in the world (1). In Malaysia, the country's epidemic was mostly pushed by people who injected drugs (PWID) at an early stage, but this sample shifted towards increasing sexual transmission (2). HIV if left untreated would lead to high fatality rate. This study aimed to determine the epidemiologic transition of HIV transmission; case fatality rate and determinants for HIV mortality in Besut district, Terengganu.

Materials and Methods

A cross-sectional study based on retrospective record review from the National AIDS Registry for the year of 2005 until 2022, was conducted in Besut district, Terengganu. The inclusion criteria were patients who actively underwent HIV clinic follow-up at any of the eight health clinics in Besut, Terengganu or HIV patients who were admitted to Hospital Besut, Terengganu. Data were collected from National AIDS Registry. Descriptive statistics, simple and multiple logistic regression analysis were used for data analysis.

Results and Discussion

From year 2005 until 2022, there were 692 HIV patients diagnosed in Besut and the case fatality rate for HIV is 25.3%.

Figure 1 showed the epidemiologic transition of HIV transmission mode throughout 17 years from 2005 until 2022. The transmission mode has changed from IVDU into sexual transmission. Many people who inject drugs (PWID) are sexually active, so it is possible that high-seroprevalence HIV epidemics among PWID may initiate self-sustaining heterosexual transmission epidemics (3).

Multiple logistic regression revealed heterosexual relationship, vertical transmission and having tuberculosis co-infection as the significant determinants for HIV mortality as shown in Table 1.

Worse survival in heterosexuals than in men having sex with men (MSM) had been reported (4), as heterosexuals are more likely to be diagnosed at a later stage with late HAART initiation (5), which contributed to low survival (4).

In vertically transmitted HIV infection, those dying earlier during infancy are more likely due to infectious pulmonary disease, and those dying later are more likely to have cardiac disease and wasting syndrome (6).

Meta-analysis of cohort studies reported tuberculosis contributed significantly to mortality among people living with HIV (7). Tuberculosis may act as cofactor in the

progression of HIV infection by increasing the HIV viral load through inducing a faster HIV replication (8).

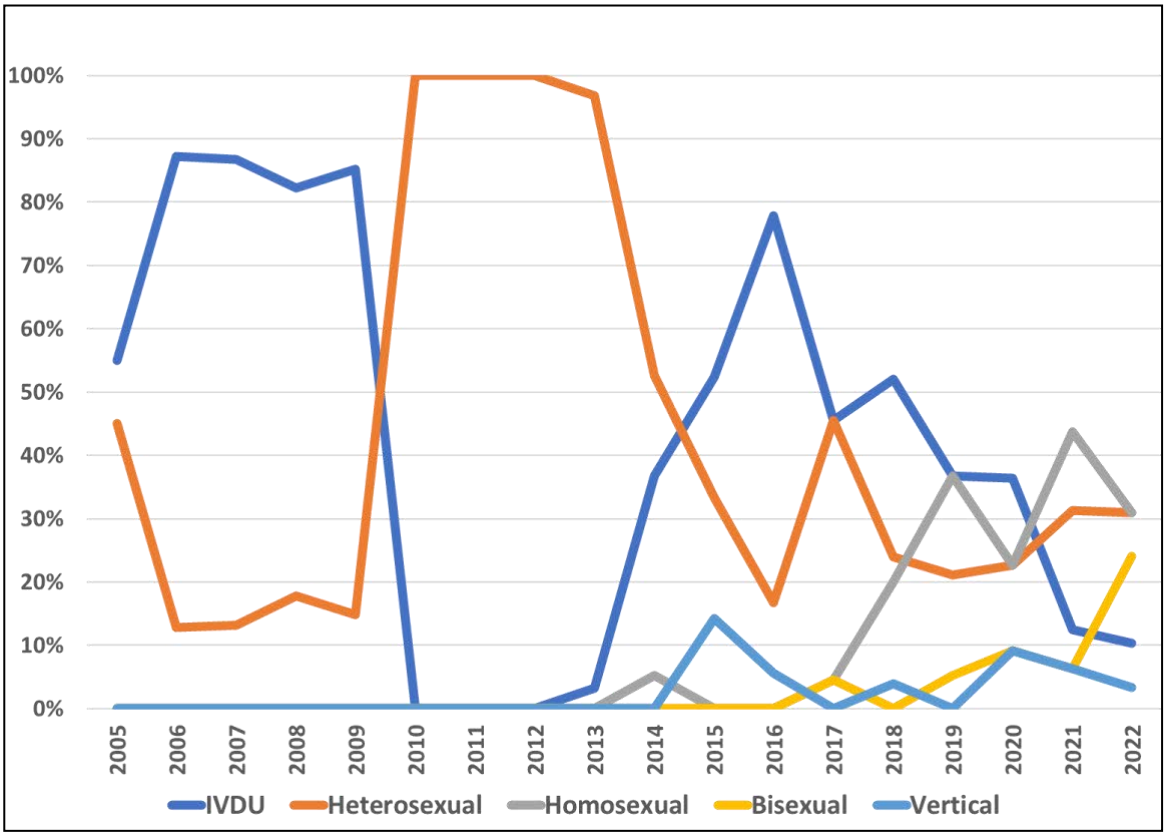

Figure 1: Epidemiologic transition of HIV transmission mode from 2005 until 2022

Table 1: Factors associated with HIV mortality in Besut by simple and multiple logistic regression (N=692)

Characteristics	Crude OR (95% CI)[a]	p-value[a]	Adj. OR (95% CI)[b]	p-value[b]
Age	0.99 (0.98,1.01)	0.829	-	-
Gender				
Female	1		1	
Male	0.66 (0.41, 1.07)	0.091	1.62 (0.92, 2.85)	0.093
Marital status				
Married	1		1	
Single	0.74 (0.46, 1.19)	0.229	1.49 (0.87, 2.55)	0.145
Divorced	1.16 (0.56, 2.39)	0.676	1.32 (0.61, 2.85)	0.474
Education				
Tertiary	1		1	
Primary	0.35 (0.14, 0.91)	0.359	0.37 (0.11, 1.22)	0.104
Secondary	1.47 (0.59, 3.61)	0.399	1.27 (0.41, 3.91)	0.667
Occupation				
Professional	1		-	-

Unemployed	1.94 (0.73, 5.16)	0.181	-	-
Non-professional	0.86 (0.23, 3.14)	0.828	-	-
Student	1.85 (0.45, 7.52)	0.386	-	-
Prison inmate	1.32 (0.42, 4.12)	0.626	-	-
Transmission mode				
IVDU	1		1	
Heterosexual	3.53 (2.41, 5.17)	<0.001	3.62 (2.32, 5.65)	<0.001*
Homosexual	2.01 (0.89, 4.53)	0.093	1.17 (0.43, 3.16)	0.756
Bisexual	0.00 (0.00, 0.00)	0.999	0.00 (0.00, 0.00)	0.999
Vertical	8.70 (2.37, 31.93)	0.001	8.55 (2.04, 35.78)	0.003*
Tuberculosis co-infection				
No	1		1	
Yes	3.29 (1.85, 5.84)	<0.001	3.30 (1.75, 6.19)	<0.001*
Hepatitis B/C co-infection				
No	1		-	
Yes	1.48 (0.26, 8.12)	0.651	-	-

[a]Simple logistic regression, [b]Multiple logistic regression

Conclusion

Around one-fourth of HIV patients in Besut succumbed to death. Besut's HIV epidemic has gradually shifted towards sexual transmission. Improved treatment is especially necessary in risky groups of population.

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EPIDPP44/129 : Diabetes Mellitus In Kedah: Factors Associated With Good Glycaemic Control

M. Husrul Ari H.[1], Sarmiza S.[1], M. Fadhil M.M.[1]
[1]Non-Communicable Disease Control Unit Department of Public Health, Kedah State Health Department, Kedah
Corresponding author's email: ncdjkn.kdh@moh.gov.my

Summary
Diabetes mellitus is a chronic disease that affects millions of people worldwide. Glycaemic control is essential for preventing diabetes-related complications and improving quality of life. However, many diabetic patients fail to achieve the recommended glycaemic targets. This study aimed to identify the factors associated with good glycaemic control among patients with type 2 diabetes mellitus in Kedah, Malaysia.

Keyword
Diabetes Mellitus, Glycaemic control, HbA1C, Factor associated, Non-communicable Diseases

Introduction
Diabetes mellitus is a chronic metabolic disorder that affects millions of people worldwide. It is characterized by high blood glucose levels due to insufficient insulin production or action. Among the states in Malaysia, Kedah had the highest prevalence of diabetes mellitus at 24.6%. Poor glycaemic control can lead to serious complications such as cardiovascular disease, kidney failure, blindness and amputation. Therefore, it is important to identify and address the factors that influence glycaemic control among diabetic patients. The aim of this article is to explore the factors associated with good glycaemic control among patients with type 2 diabetes mellitus in Kedah. The article will discuss the demographic and clinical characteristics, and how they relate to the glycaemic control.

Materials and methods
This is a cross-sectional study. The study population is the diabetic patient that have regular treatment at the government health clinic in Kedah. The sampling frame is the data from the National Diabetes Registry (NDR). Only active diabetes patients have been randomly selected from the database using a random sampling method. The sample size was calculated based on the Descriptive Study Using the Random Sampling method as described in the User Manual for Diabetic Clinical Audit at Health Facilities (MOH, 2008). Good glycaemic control is defined as HbA1C level of 6.5% and below.

The data were analysed using Statistical Package for the Social Sciences, SPSS (version 26.0) from International Business Machines, IBM. The bivariate analysis was conducted using simple logistic regression to determine the association

between the independent variables and the glycaemic control. The significance level in this study was set at $p<0.05$.

Result and Discussion

This study analysed the sociodemographic and clinical characteristics of 1945 diabetic patients in Kedah and their glycaemic control status. These findings are consistent with previous studies that reported majority of diabetic patients as shown in figure 1 had poor glycaemic control (Hassan et al., 2021; Saher et al., 2022).

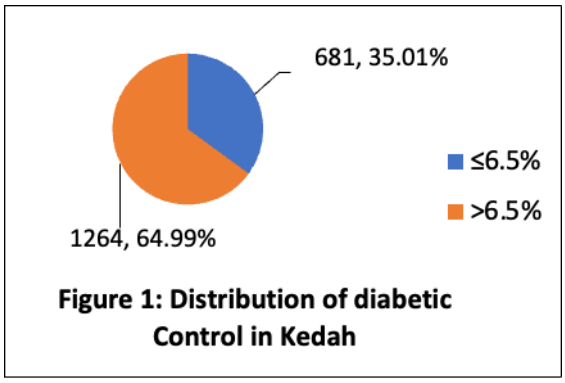

Figure 1: Distribution of diabetic Control in Kedah

In general, the findings of bivariate analysis suggest that age, Chinese and Indian ethnicity, and lipid profile are important factors that influence glycaemic control among diabetic patients in Kedah. After considering other factors, age, Chinese and Indian ethnicity, and triglycerides level remain significant.

The findings of this study are consistent with previous studies that reported similar associations of sociodemographic and clinical characteristics with glycaemic control among diabetic patients in Malaysia and other countries (Ghani et al., 2020; Hassan et al., 2021). The younger age group patient, Indian community and those with high triglycerides are those at risk of having poor glycaemic control.

However, some studies also reported other factors that affect glycaemic control, such as duration of diabetes, medication adherence, self-care behaviours, psychological factors and quality of care. All those factors are not analysed in this study due to limited data. Therefore, a comprehensive approach that considers all these factors is needed to improve glycaemic control among diabetic patients.

Conclusion

In conclusion, this study showed that age, ethnicity and triglyceride levels were important factors associated with glycaemic control among diabetic patients in Kedah. Older age group has higher odd of having better glycaemic control. Indian patients had the poorest glycaemic control, while lower triglyceride levels were linked to better glycaemic control.

Acknowledgement

We would like to thank everyone contribute in this study and Kedah State Health Department for the administrative support.

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EPIDPP45/137 : Submicroscopic Malaria Plasmodium Vivax Among Orang Asli Population In Pos Lenjang, Lipis, Pahang

Ahmad Rashidi bin Abdul Aziz [1]
[1] *Pahang State Health Department, Ministry of Health Malaysia*
Corresponding author's email: cdy_aziez@yahoo.com

Summary
Diagnosing asymptomatic malaria are challenging due to low level of parasitemia. Accurate diagnosis of malaria is important for realistic estimation of malaria burden and intervention plans. The study was carried out at 5 selected villages in Pos Lenjang, Lipis from July to October 2022 after 4 new relapsed Malaria P.Vivax cases were notified. The method of sampling was through Blood Film Malaria Parasites (BFMP) and Polymerase Chain Reaction (PCR) with a total sample size of 1192 population. The PCR tests noted a positive rate of 4.9% as compared to 0.87% tests seen via BFMP be positive. Results showed that BFMP tests are poorly sensitive in the detection of low levels of parasitemia as compared to PCR. This research findings conclude evidence of *Plasmodium* by PCR, among samples previously undetectable by routine BFMP examination, in the Orang Asli community who are clinically healthy.

INTRODUCTION
Malaysia is categorized by World Health Organization (WHO) as one of the countries that will achieve zero local human malaria transmission by 2025. However, targeting the human reservoir of infection, including those with an asymptomatic

infection and delayed rise of symptoms like in Relapse phase as seen in Plasmodium Vivax are required to achieve malaria elimination. Asymptomatic patients and delay clinical manifestation due to low/ subpatent level of parasites will be difficult for a practitioner to diagnose submicroscopic malaria. Accurate diagnosis of malaria is important for providing realistic estimates of malaria burden and preventing misinformed interventions.
There were episodes of P.Vivax outbreak that occurred from 2019 to 2021 consisted of 13 cases Orang Asli (aborigine) involving 5 out of 13 villages in Pos Lenjang, Kuala Lipis with a capacity of 2611 people. The study was carried out at Pos Lenjang after 4 new relapsed Malaria P.Vivax cases were notified in June 2022.

Methodology
Re-active case detection was conducted at Kg Lenjang Lipis from July to October 2022 at 5 selected villages in Pos Lenjang which were Kg Serdang, Kg Pagar, Kg Tungau and Kg Lenjang. Selected villages were chosen because they had previous Malaria cases from 2019 to 2021. Method of sampling was through Blood Film Malaria Parasites and PCR to identify sub-microscopic cases.

Results And Discussion
A total of 674 PCR tests was conducted at 5 villages at Pos Lenjang with a total PCR coverage of 56.5% but only 25% as compared to the whole population at Pos Lenjang. Based on the PCR tests noted 33 out of 674 was detected with a positive rate of 4.9%. Percentage of PCR positive was highest in Kg Lenjang or Kg Sg Jelai with 26.9% PCR positive followed by Kg Serdang (11.2%), Kg Pagar (2.3%) and Kg Tungau (1.8%).BFMP tests noted that 17 out of 1966 (0.87%) tests seen to be positive. Results showed that tests are poorly sensitive in detection of low levels of parasitemia as compared to PCR. Series of discussion at state level was conducted in July 2023 and decision was made to implement WHO intervention strategies Intervention in final phase of elimination and prevention of re-establishment, WHO Guideline for Malaria on 3rd June 2022 : Reactive strategy (response upon detection of cases) to start of Reactive Drug Administration (RDA). G6PD testing was also conducted prior to starting treatment among 599 out of 1192 population with 97 noted to have G6PD deficiency. RDA was conducted with aim to treat those living or near and those likely to have similar exposure based on time and place with cases without testing with a total of 71 given treatment at the field. Re-active case detection and treatment and test (RACDT) were administered to those living or near and those likely has similar exposure and treat positive cases with a total of 32 given treatment at hospital. The total number of patients given treatment via RDA and RACDT was 103 people. Among those excluded from radical treatment included those in the period of early pregnancy, age less than 6 months old, and weight less than 5 kg.
This research findings conclude evidence of *Plasmodium* by PCR, among samples previously undetectable by routine blood film microscopic examination, in community who are clinically healthy.

Conclusion
Continuous monitoring activity needed as Plasmodium Vivax cases seen submicroscopically or relapse will affect status of Malaria Elimination Assessment in

Malaysia. Strategies need to be drafted to increase coverage of testing and radical treatment among high risk group although this will require additional monetary allocation for logistics, medication, tests kit and malaria preventive activities and also need for other inter-sectoral involvement through resource sharing and to sustain and monitoring of activity.

EPIDPP46/144 : Accuracy Of Real-Time Polymerase Chain Reaction (Rt-PCR) As A Supplementary Test For Diagnosing Measles

Haziq Alias [1], Ahmad Iqmer Nashriq [1], Mimi Rodzaimah Abdul Karim [2], W Nur Afiza Wan Arifin [2],
[1] *University of Putra Malaysia*
[2] *National Public Health Laboratory, Ministry of Health Malaysia*
Corresponding author's email: haziqalias90@gmail.com

Summary
Real-time polymerase chain reaction (Rt-PCR) test is essential as a supplementary test secondary to the gold standard serology IgM detection in diagnosing measles cases. Diagnosing measles in a country with high vaccination coverage of measles-containing vaccine (MCV) such as Malaysia is difficult, especially among suspected measles cases with recent history of MCV immunization that might yield false positive serology IgM results. On the other hand, samples that are taken too early might yield false negative serology IgM results. This retrospective study used secondary data from laboratory measles surveillance to determine the effectiveness of Rt-PCR as a supplementary test to diagnose measles

Keywords
Measles Diagnostic Test, Effectiveness of Rt-PCR

Introduction
Measles is one of the most contagious diseases in the world that affects millions of people globally yearly. It is a vaccine-preventable disease. Malaysia had initiated the measles-containing vaccine immunization programme since the year 1982. Although high vaccination coverage of MCV (above 95%) has been achieved since 2010, Malaysia still has not reached the target for measles elimination status. Diagnosing measles in a country with high vaccination coverage of measles-containing vaccine (MCV) such as Malaysia is difficult, especially among suspected measles cases with recent history of MCV immunization that might yield false positive serology IgM results (1). On the other hand, samples that are taken too early (within 72 hours from rash onset) might yield false negative serology IgM results (2). In these cases, Real-time polymerase chain reaction (Rt-PCR) can be used as a supplementary test to confirm or exclude the diagnosis.

Materials and Methods
A retrospective cross-sectional study was conducted using secondary data retrieved from the measles laboratory surveillance system. Data were cross-checked with e-measles for accuracy. The sampling population included all reported suspected measles cases in Malaysia from January 2022 till January 2023 that had both

measles serology IgM and Rt-PCR samples. Reported suspected measles cases that did not have enough information for the study variables were excluded. Data were sorted using Microsoft Excel software version 2021, then exported and analysed using the 26th version of IBM SPSS. To determine the accuracy of Rt-PCR as a supplementary test for diagnosing measles, the result of IgM-, RtPCR+ reflected the false negative result of serology IgM for samples collected early (0-3 days from rash onset), and IgM+, RtPCR- as possible false positive result of serology IgM for samples with recent history of MCV immunization.

Results and Discussion

A total of 1317 records of reported suspected measles cases were included in the sampling frame. The positivity rate of IgM-,RtPCR+ were highest among those whose samples were collected early, 0-3 and 4-5 days from rash onset, 0.3% and 0.6% respectively. Whereas, the positivity rate of IgM+,RtPCR- was highest among those with recent history of MCV immunization, 54.7%. There was a significant association between dual positivity of serology IgM and Rt-PCR with recent MCV immunization and vaccination status of the suspected measles cases,(2=565.05, p<0.001) and (2=298.47, p<0.001). Multivariate analysis revealed that unvaccinated and incompletely vaccinated suspected measles cases were 8 times more likely to yield IgM+,RtPCR+ results (true measles infection) compared to those who had completed two doses of MCVs. On the other hand, unvaccinated individuals were five time less likely to yield IgM+,RtPCR- results compared to those who had received MCV immunization. This was consistent with the other finding of the study, that individuals with recent MCV immunization were 20 times more likely to yield IgM+,RtPCR results, which indicated that these results were false positive IgM evidenced by the negativity of the Rt-PCR.

Conclusion

Out of 5020 suspected measles cases samples, only 1852 Rt-PCR samples were taken as a supplementary test for the year 2022. The study had demonstrated the accuracy of Rt-PCR as a supplementary test to exclude false negative IgM results among samples that were taken too early from rash onset, and false positive IgM results among suspected cases with recent MCV. The Real-time Polymerase Chain Reaction (RT-PCR) test should be made compulsory for every suspected measles cases in Malaysia.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

EPIDPP47/128 : Effect of Digital Mobile of Information-Motivation-Behavioural Skills Dengue Intervention Module (IMODE) in Improving Dengue Preventive Practices Among Military Families: Cluster Randomised Control Trial

Nur Hidayah Shamsudin [1], Salmiah Md Said [2], Titirahmawati [2], Ahmad Zaid Fattah [2], Arshill Moideen [1], Norliza Ahmad [2]
[1] Royal Medical Corps, Malaysian Armed Forces
[2] Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
Corresponding author's email: lizaahmad@upm.edu.my

Summary
Dengue fever is a significant global health concern due to its widespread occurrence, increasing prevalence and potential for severe complications. This study aimed to analyse the effect of IMODE in improving dengue preventive practices among military families in a cluster randomised control trial using the Information-Motivation-Behavioural Skills theory. Generalised-Estimating-Equation (GEE) was used to determine the effect of IMODE intervention. Results showed that IMODE is effective in improving knowledge, motivation and dengue prevention behavioural skills but was not effective in improving dengue preventive practices.

Keywords
Dengue preventive practices, randomised control trial, Malaysian Armed Forces, Information-motivation-behavioural skills, dengue

Introduction
Dengue cases were reported at approximately 400 million cases worldwide, with 70% of the burden in Asia (1). It is a significant public health concern due to its increasing prevalence and severe complications (2). Situated in a dengue high-burden area, a few military camps have become dengue hotspots, exposing the personnel and its member to dengue infection and putting the military forces' strength at risk due to the need to be hospitalised and long absences (3). The objective of this study is to analyse the effect of digital IMODE in improving the knowledge, motivation, behavioural skills and dengue preventive practice among heads of households in military quarters in a camp in Kuala Lumpur.

Materials and Methods
This was a two-arm, single-blinded, cluster randomised control trial intervention conducted from October 2022 until March 2023 in one of the army camps in Kuala Lumpur, Malaysia. Four clusters for each parallel arm of the intervention and control groups with a ratio of 1:1. There were 234 participants recruited, with 117 for each intervention and control group. The intervention has 2 phases; the first phase is the main intervention given in 2 weeks, followed by the second phase of reminder in the subsequent 3 months. The intervention was conducted in digital information using a series of videos and infographics, and field activities. Data

were collected at baseline, immediate and 3 months post-intervention using a validated electronic questionnaire. Multiple imputations were conducted for missing data as missing data were categorised as missing data at random (MCAR). Final data were analysed with intention-to-treat analysis. The effect of the intervention was analysed using a generalised estimating equation (GEE) adjusted for household income, rank and number of children. A significant level was set at $p < 0.05$.

Results and Discussion

A total of 203 participants completed the study, with 99 participants in the control group and 104 participants in the intervention group, giving an attrition rate of 13.2% (31/234). At 3 months post-intervention, the intervention group showed significantly improved knowledge compared to the control group (OR 18.38, 95% CI 23.56, 48.37; $p < 0.001$) and significantly increased motivation compared to the control group (OR 10.33, 95% CI 7.27, 13.39, $p < 0.001$). The intervention also significantly improved dengue preventive behavioural skills compared to the control group (OR 8.58, 95% CI 3.32, 13.83, $p = 0.001$). The intervention, however, was not significant in improving dengue preventive practices (OR 4.4, 95% CI -0.6, 9.48, $p = 0.08$). This study found that the assessment made immediately after the intervention (2 weeks) and 3 months of follow-up may not be able to reflect the actual practice due to its short duration of the interval. The majority of successful intervention studies in dengue preventive practices were conducted in the range of 1 to 3 years (4,5). Hence, a longer duration of intervention may be needed.

Table 1. Descriptive and baseline comparison on the sociodemographic and medical history between intervention and control groups.

Variables	Control (n = 117)	Intervention (n=117)	Total (n= 234)	p-value
Age (mean ± SD)	33.6 ± 4.68	37.6 ± 4.53	35.6 ± 5.0	0.511
Gender				
Male	102 (87.2%)	93 (79.5%)	195 (83.3%)	0.114
Female	15 (12.8%)	24 (20.5%)	39 (16.7%)	
Ethnicity				
Malay	105 (89.7%)	104 (88.9%)	209 (89.3%)	
Non-Malay	12 (10.3%)	13 (11.1%)	25 (10.7%)	
Education Level				
Secondary	105(89.7%)	100(85.5%)	205(87.6%)	0.321
Tertiary	12(10.3%)	17(14.5%)	29(12.4%)	
Number of Children				
No child	14(12.0%)	5(4.3)	19(8.1%)	0.03*
Has children	103(88.0%)	112(95.7%)	215(91.9%)	
Household Income Category (RM)				

Below 4850	94 (80.3%)	70(59.8%)	164(70.1%)	<0.001*
4850 and above	23(19.7%)	47(40.2%)	70(29.9%)	
Rank				
Civilian member	1(0.9%)	3(2.6%)	4(1.7%)	<0.001*
Enlisted	89(76.1%)	41(35.0%)	130(55.6%)	
Senior enlisted	27(23.1%)	73(62.4%)	100(42.7%)	
History of dengue infection				
No	96(82.1%)	96 (82.1%)	192 (82.1%)	1.000
Yes	21(17.9%)	21(17.9%)	42 (17.9%)	
History of dengue infection among family members				
No	90 (76.9%)	99 (84.6%)	189 (80.8%)	0.135
Yes	27(23.1%)	18(15.4%)	45(19.2%)	
History of death due to dengue among family / neighborhood				
No	114 (97.4%)	109 (93.2%)	223 (95.3%)	0.123
Yes	3 (2.6%)	8 (6.8%)	11(4.7%)	
History of G6PD (self or family)				
No	112(95.7%)	113 (96.6%)	225 (96.2%)	0.734
Yes	5(4.3%)	4(3.4%)	9(3.8%)	
History of allergy to insecticide				
No	108(92.3%)	110 (94.0%)	218 (93.2%)	0.604
Yes	9(7.7%)	7(6.0%)	16(6.8%)	

Table 2. Intention to treat analysis showing the effectiveness of IMODE intervention to improve knowledge, motivation, behavioural skills and dengue preventive practices

Variable	f	df	p value[a]
Knowledge			
Group	82.185	1	< 0.001*

Time	13.683	2	0.001*
Group x Time	37.171	2	< 0.001*
Motivation			
Group	20.764	1	< 0.001*
Time	9.551	2	0.008*
Group x Time	20.136	2	< 0.001*
Behavioural Skills			
Group	14.557	1	< 0.001*
Time	14.244	2	< 0.001*
Group x Time	8.502	2	0.014*
Dengue Preventive Practices			
Group	7.264	1	0.007*
Time	6.370	2	0.04*
Group x Time	4.806	2	0.09

[a]Using GEE adjusted for household income, rank, number of children and score at baseline.
*Significant at $p \leq 0.05$

Conclusion

IMODE effectively improves the participants' knowledge, motivation and dengue preventive behavioural skills. IMODE, however, was not effective in improving dengue preventive practices among the participants.

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EPIDPP48/139 : Management of Acute Gastroenteritis (AGE) Outbreak in Tenom District Sabah 2023

Francesca Primus Chew[1], Mohamad Norhaizam Ahmad@Narawi[2], Amirul Ikhwan[1], Dadyhardafi bin Ramli[1], Johari bin Tasin[1]
[1]Tenom Health District Office, Tenom, Sabah, Malaysia
[2]Keningau Area Health Office, Keningau, Sabah, Malaysia
Corresponding author's email: francescachew@gmail.com

Summary
Gastroenteritis is a highly contagious disease. A surveillance system is important to detect an unusual event thus prompt control action is essential in an AGE outbreak. This report aims to describe in detail the AGE outbreak management in Tenom and to provide recommendations for the control and prevention of the unusual AGE event. Environmental sampling is equally essential in support of an outbreak investigation which can help determine etiological agents and appropriate control measures.

Keywords
Acute gastroenteritis, outbreak, measures, Tenom

Introduction
The occurrence of AGE cases in Malaysia is a trend that has existed for a long time and almost every day AGE cases have been reported throughout Malaysia. Public health efforts to control and prevent an outbreak have focused primarily on outbreak detection and control. The surveillance system was carried out in compliance with the "Event-based Surveillance Protocol" guidelines established by Malaysia[1]. The Tenom Health District Office has received a notification regarding an unusually surged increase of AGE incidents from a private clinic in the Tenom district on 05/01/2023. There are many individuals reported to attend private clinics to seek treatment suffering from acute symptoms of gastroenteritis such as abdominal discomfort, vomiting, nausea, and/or diarrhoea. These cases have involved a range of ages with different residential addresses.

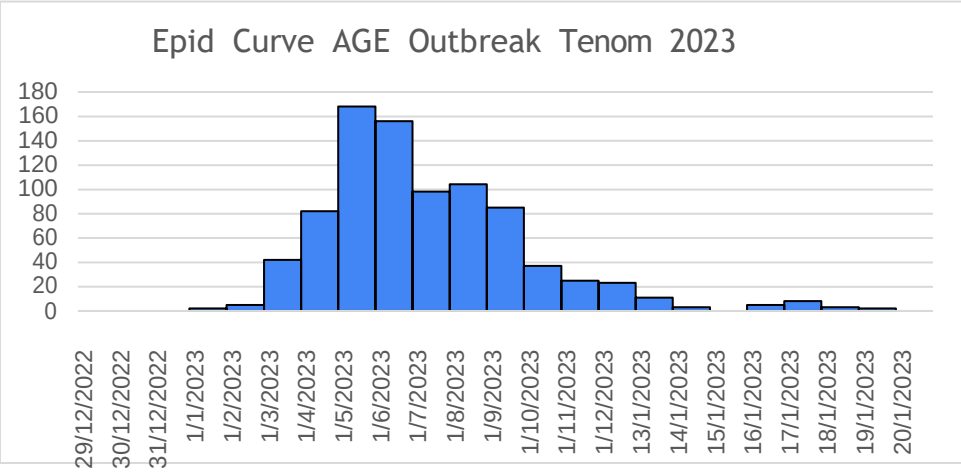
Material and Methods
This was a cohort study. A total of 865 cases were included in this study. The study's notification period was from 05/01/2023 to 20/01/2023, with a case definition of any person in the Tenom District who begins experiencing AGE symptoms on or after 01/01/2023, such as abdominal discomfort, vomiting, nausea, and/or diarrhoea. Case detection was done through active and passive case detection which involved all the health facilities in Tenom District. Clinical (stool samples) and non-clinical samples (food, water, and environmental samples) were taken for laboratory testing to confirm etiological agents. Treated water with in-situ testing was taken to ensure that the source of water supply was safe for consumers.

Samples of food and beverages were collected from the premises, including water vending machines that were highly accessible to the community. Investigation and control measures were conducted in accordance with Malaysia guidelines "Garis Panduan Pengurusan Wabak Keracunan Makanan Jilid 4"[2]. Data were analysed descriptively. Results and Discussion

The AGE outbreak in Tenom district reported a total of 865 cases. The AGE outbreak has occurred sporadically, involving 6 out of 7 sub-districts in Tenom. The age distribution was varied from all age ranges of 0-5 years to 81-85 years old. A total of 135 (22.9%) stool samples were taken from 590 cases that experienced symptoms of diarrhea. *Vibro cholerae* were ruled out in all the samples while 8 out of 70 stool samples (11.43%) were found to be positive for pathogenic microbes, 6 positive samples for *Shigella sonnei* and 2 positive samples for *Salmonella sp*. For non-clinical samples, 2 water samples from the water vending machine and 1 food sample were found to be positive for *E.coli*.

As for the environmental sampling, there was an incompliance of the routine water sample taken on 3/1/2023 which shows an incompliance of residual chlorine and pathogenic microbiology. The findings reported zero residual chlorine reading with the presence of *Total coliform* on the microbial test. These occurred at SRO Batu Tiningkang and SRO Kallang sampling points which were supplied by the Senagang water plant. The Senagang water plant's water distribution system involved 3 sub- districts in Tenom, contributing to most of the cases in this area. Reported feedback from the authority stated a leak in the drum chlorine pipeline caused the treated water that was channelled to have no residual chlorine.

The epidemiologic curve showed a continuous common source where cases were exposed to the same source of infection. The supply of contaminated water continuously (repeatedly) every day from the same source, causes a continuous onset and an increase in cases beyond the incubation period of the causative agent.



Graph 1: Epic Curve AGE Outbreak in Tenom District 2023

Conclusion
Based on the occurrence of the significant increase in AGE cases occurring sporadically, it is likely that the cause of the spread is through contaminated water sources. Appropriate preventive measures have been taken by the Tenom Health District Office to ensure that the AGE outbreak does not recur in the future.

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FAMILY HEALTH & HEALTH MANAGEMENT

FHSMPP01/33 : The Relationship Between Quality Of Life, Self-Esteem, And Family Environment With Resilience Among Orang Asli Youths In Gombak During COVID-19

Nurjuliana Noordin[1], Nik Nairan Abdullah[1], Raudah Mohd Yunus[1]
[1]Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM) Sungai Buloh Campus, Jalan Hospital, 47000 Sungai Buloh, Selangor, Malaysia.
Corresponding author's email: niknairan@gmail.com

Summary
Malaysian Orang Asli was devastated by COVID-19, forcing society to understand and assess indigenous resilience. This study aimed to examine the relationship between quality of life, self-esteem and family environment with resilience among Orang Asli youths in Gombak during COVID-19. Resilience was measured using the CD-RISC-25 Malay. The Pearson correlation test analysed the relationship between quality of life, self-esteem and family environment with resilience. All variables except religious and traditional practices domain under family environment were positively correlated with resilience. Culturally appropriate strategies can help Orang Asli youth become more resilient, improve their quality of life, build their self-esteem, and strengthen their families.

Keywords
Orang Asli, COVID-19, resilience, indigenous people, pandemic

Introduction
Coronavirus disease (COVID-19) threatens everyone, especially the poor, elderly, disabled, young, and indigenous, generating uncertainty, routine changes, financial concerns, and psychological and emotional effects on society (1). Due to physiological and behavioural changes, adolescents and young people are especially susceptible to the mental health effects of stress; however, resilience research in this age group is lacking (2). This pandemic presents challenges to society, particularly in understanding and assessing indigenous resilience, particularly among the Malaysian Orang Asli. Thus, our research aims to examine the relationship between quality of life, self-esteem and family environment with resilience among Orang Asli youths in Gombak during COVID-19.

Materials and methods

A cross-sectional study comprising Orang Asli communities was done in Gombak district, Selangor, between January and September 2022. A printed self-administered questionnaire as well as an online self-administered questionnaire using Google Forms were used to collect data from youths aged 18 to 24. Resilience was evaluated using the Conner-Davidson Resilience Scale-25 Malay (CD-RISC-25). While the WHOQOL-BREF questionnaire in Malaysian was used to measure quality of life (QOL), the Rosenberg Self-Esteem Scale (RSE) in Malay was used to measure self-esteem, and the Family Environmental Scale (FES) in Malay was used to measure family environment. The data was analysed using SPSS version 28.0. The Pearson correlation test was used to analyse the relationship between quality of life, self-esteem and family environment with resilience.

Result and discussion

The total number of participants in the study was 158. The quality of life and its domain, self-esteem, and family environment domains were significantly positively correlated with resilience (Table 1). However, the religious and traditional practice domain under the family environment did not show any correlation with the total score of resilience. Therefore, resilience can be enhanced by good quality of life, high self-esteem and a supportive family environment which did not include religious and traditional practices. The findings were comparable with a Saudi Arabian study that demonstrated that resilience during COVID-19 increases with good quality of life (3). Mentally resilient Orang Asli youths may view their adverse circumstance as opportunities for development and improvement. Positive thinking, which is influenced by resilience, can promote life satisfaction, an element of life quality. In a similar manner, this study also found a significant positive relationship between self-esteem and resilience. A study of Bosnian healthcare professionals during COVID-19 found that resilience and self-esteem were statistically significantly correlated (4). Orang Asli youths with high self-esteem are more optimistic, determined, and eager to succeed, which enables them to overcome obstacles and develop resilience. In addition, the family environment also positively correlated with resilience. This could be due to the fact that the majority of Orang Asli had strong connections of love, trust, and harmony with their extended families, communities, and one another. According to a Covid-19 study of Iranian families, less stress between mothers and children makes mothers more resilient, and less tension between children makes parents more resilient (5).

Table 1: The relationship between quality of life, self-esteem, and family environment with resilience of participants (N=158)

Variable	Mean (SD)	P-value	Correlate coefficient (r)
Resilience	69.28 (14.52)		1.00

QOL	3.95 (0.76)	<0.001*	0.399
General health	4.15 (0.69)	<0.001*	0.304
Physical health	59.10 (10.43)	<0.001*	0.344
Psychological	60.76 (16.83)	<0.001*	0.456
Social relationship	71.54 (13.72)	0.003*	0.236
Environment	68.39 (13.29)	<0.001*	0.448
Self-esteem	35.77 (4.94)	<0.001*	0.277
Family function			
Togetherness and harmony	18.13 (3.10)	0.007*	0.215
Expression	16.01 (3.75)	<0.001*	0.268
Relationship and family dynamic	18.83 (2.89)	<0.001*	0.424
Conflict	16.55 (3.84)	<0.001*	0.261
Religiosity and traditional practice	17.27 (3.18)	0.094	0.134

*Statistical significant at α=0.05

Conclusion

By developing culturally relevant approaches that avoid a one-size-fits-all approach and those that impose a western, biological programming framework on indigenous cultures, we can aid Orang Asli youths in becoming more resilient, improving their quality of life, boosting their self-esteem, and strengthening their families.

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FHSMPP02/72 : Direct Costs For COVID-19 Person Under Surveillance To A District Health Office - A Provider's Perspective

Intan Syafinaz Saimy[1], Noraziani Khamis[1], Nor Hayati Ibrahim[2], Nur Khairah Badaruddin[1], Faridah Kusnin[3], Nor Zam Azihan Mohd Hassan[4], Sukhvinder Singh Sandhu[3]

[1]*Institute for Health Management, National Institutes of Health, Ministry of Health Malaysia*
[2]*Medical Development Division, Ministry of Health Malaysia*
[3]*Selangor State Health Department, Ministry of Health Malaysia*
[4]*Institute for Health Systems Research, National Institutes of Health, Ministry of Health Malaysia*
Corresponding author's email: intan.syafinaz@moh.gov.my

Summary
This study aimed to estimate the costs of public health measures incurred by a district health office (DHO) specifically for the COVID-19 Person Under Surveillance (PUS) cases from the Ministry of Health Malaysia from a provider's perspective. A cross-sectional study was conducted in Klang DHO where PUSs were mapped based on activities and the cost of the resources needed to conduct the activity was estimated. The cost trend was consistent with the number of cases managed by the DHO. This direct cost for PUS incurred by a DHO is useful for managers planning their resources in infectious disease outbreaks.

Keywords
disease outbreak cost, Person Under Surveillance cost, district health office, Covid-19 cost, public health activities cost

Introduction
Sufficient public funding for all organizational levels that reach the ground will ensure a comprehensive response to a pandemic and this was made evident globally, especially during the recent COVID-19 pandemic. Hence knowing the costs incurred by any facility while managing a disease outbreak is quite pertinent for good outbreak management and preparedness (1). Thus, this study estimated the costs of public health measures incurred by a district health office (DHO) specifically for the COVID-19 Person Under Surveillance (PUS) cases from the Ministry of Health Malaysia, a provider's perspective.

Methodology
This was a cross-sectional study design that analyzed data from January until May 2020 in the Klang DHO. The source of data on COVID-19 related cases and activities was mainly from the health workers and administrative office. The detailed work process of the public health activities was documented in the earlier study (2) where the gathered activities were clustered according to the respective time phase of the Movement Control Order (MCO) and the data collection sheets were developed. All identified PUSs were listed and mapped based on activities and subsequently the cost of the resources needed to conduct the activity was

estimated. The cost data was grouped according to the different cost categories. Micro costing approach was adopted for the cost data using Microsoft Excel Version 2205. Each of the resources for each activity was quantified based on price in 2020 in Malaysian Ringgit (RM).

Results and Discussion

A total of 3376 PUSs were seen at Klang DHO where 388, 2299 and 689 cases were from Phase 1, 2 and 3 respectively. Across all three phases, under the Human Resource Category, the total cost for PUS was in the range of RM226,975.65 to 524,578.70. In Phase 1, the minimum cost was RM23,218.80 where it rose in trend in Phase 2 and decreased to RM44,760.90 in Phase 3 while the maximum cost showed the same pattern at RM87,241 in Phase 1 and RM78,928.40 in Phase 3. As for the cost of the Other Category which consists of costs for personal protective equipment, consumables together with other related items, the cost for PUS was RM9056.21 in Phase 1, increased in trend in Phase 2 at RM57,639.18 and similarly decreased in Phase 3 at RM12,682.59. The total cost for the Other Category in this study was RM79,377.98. Adding together the cost of the Human Resource and the Other Category, the cost per PUS for Phase 1 was in the range of RM83.18 to RM248.19, for Phase 2 was between RM94.23 to RM180.97 and for Phase 3 was around RM83.37 to RM 132.96.

Conclusion

The cost trend was consistent with the number of cases managed by DHO. Direct cost for PUS incurred by a DHO is useful for managers planning their resources for the prevention and control of infectious disease outbreaks. Total management costs may include the costs of Patient Under Investigation and from supporting activities.

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FHSMPP03/56 : Online Appointment At Public Primary Health Care (PHC) Facilities In Malaysia: A Perspective From The Demand-Side Strategy

Noor Haslinda I.[1], Wan Nur Nabilah S.[1], Rima Marhayu A.R.[1], Lee Wei Jia[2], Maheshwara Rao Appannan[2], Nasrul Muhaimin M.[1], Mastura I.[1] & Safiee I.[1]
[1]*Family Health Development Division, Ministry of Health Malaysia*
[2]*Digital Public Health Division, Ministry of Health Malaysia*
Corresponding author's email: haslinda_ismail@moh.gov.my

Summary
MySejahtera application was previously used in Malaysia to help with the management of COVID-19 pandemic. Opportunely, an online appointment module was launched in December 2022 to facilitate easy access to health services provision to primary healthcare (PHC) facilities. It is accessible to all MySejahtera users and their registered dependents, whereby appointments can be booked for services according to their preferred clinic and time slots. The services offered include Outpatient Treatment, Health Screening, Pre-Marital Screening, Pre-Employment/Education Medical Screening, Family Planning and Procedure.

Keywords
Primary health care, online appointment, mobile application, demand-side strategy, efficiency.

Introduction

Primary Health Care (PHC) is the thrust of the healthcare system. It is important to ensure that PHC is accessible and attractive to clients with the provision of quality healthcare services. Digitalisation has the potential as a demand-side strategy to improve health services utilisation by improving the community's health-seeking behaviour. As such, with an aim to empower and enable clients to select their desired clinic appointment time, the Ministry of Health Malaysia (MOH) has added an online appointment module to the MySejahtera application. The appointment slots are based on the availability of services according to the capacity of respective healthcare facilities. Data on the utilisation of appointment slots is updated and accessible via the Malaysian Health Data Warehouse (MyHDW). The objective of this paper is to determine the **socio-demographic** profile of clients assessing this online appointment system via this demand-side strategy in the PHC setting.

Materials and Methods

The analysis was done using secondary data retrieved from the daily appointment line listing provided by the system developer. Data for analysis includes all appointment slots booked by MySejahtera users for the offered services from 1st January 2023, until 31st March 2023. It covers Outpatient Treatment, The National Health Screening Initiative, PeKaB40 Health Screening, Pre-Marital Screening, Pre-Employment Health Screening, Quit Smoking Service, Family Planning Service, and Procedures. Only those who were registered with the correct Malaysian

Identification Card Number were included in the analysis. Those who cancelled their appointments were excluded from the analysis.

Results and Discussion

A total of 1,017 PHC facilities involved with more than eighty percent of public Health Clinics (*Klinik Kesihatan*) in Malaysia provided MySejahtera online appointment module. Almost three million appointment slots were made available for public booking, whereby only 8.4% of the slots were taken from 1st January 2023 until 31st March 2023. The highest number of available slots taken were for Outpatient Treatment services (14.5%). The majority of users were female (55.4%), aged between 19 and 39 years (55.6%), of Malay ethnicity (80.8%), and from urban areas (81.4%). About 90.5% of users booked for themselves. Most users were from Selangor (37.9%). IT-savvy users and urban residents were more attuned to using the application to book appointments. The top three services booked were outpatient treatment (60.3%), pre-marital screening (17.2%), and pre-employment/education medical screening (9.8%). Further analysis on appointment booking outcome status revealed that only 45.5% clients showed up during scheduled appointment day. Non-attendance could be overestimated as it may also represent those who default the appointments, and those whose arrivals were not properly recorded in the system by the clinics, especially in the early development phase. A significant number of Health Clinics in remote areas in Sabah and Sarawak were unable to utilize the online appointment system due to poor ICT infrastructure and internet access. Other types of PHC facilities namely Community Clinic, Rural Clinic, and Maternal and Child Health (MCH) Clinic were also observed using this appointment system but at a smaller percentage with limited services offered. Overall, the uptake of appointment slots was relatively low as this feature is still new at the point when this data was obtained. Various interventions such as promotional activities at all levels are needed to increase the public and providers' awareness for this new feature.

Table 1. Number of PHC facilities providing MySejahtera online appointment

Type of clinic	No. of clinic providing MySejahtera online appointment	Total no. of clinic	%
Health Clinic	883	1,076	82.1
Community Clinic	30	228	13.2
Rural Clinic	66	1727	3.8
Maternal & Child Health Clinic	38	83	45.8
Total	1,017	3,114	32.7

Table 2. Sociodemographic profile of users who booked appointment slot in the MySejahtera application from 1st January 2023, until 31st March 2023 (N=246,531)

Variables	Category	No. of users (n)	%
Gender	**Female**	136,545	55.4
	Male	109,986	44.6
Age group	**≤18 years**	23,813	9.7
	19-39 years	137,169	55.6
	40-59 years	60,428	24.5
	60 to 69 years	17,557	7.1
	≥70 years	7,564	3.1
Ethnicity	**Chinese**	23,715	9.6
	Indian	19,771	8.0
	Malay	199,283	80.8
	Others	3,762	1.5
Booked for	**Dependent**	23,370	9.5
	Self	223,161	90.5
Location	**Rural**	45,921	18.6
	Urban	200,610	81.4

Conclusion

Although it was recently launched in December 2022, the online appointment system showed a positive response and acceptability among MySejahtera application users, especially among those who reside in urban areas. Analytics from this platform can be combined with operational knowledge for efficient healthcare service delivery, aside from overcoming healthcare capacity-demand mismatches.

FHSMPP04/89 : Outlier Identification And Quality Of Care In Hospital Admissions: A Subspecialty-Level Analysis

Mohamad Helmi Bin Mohamad Yasim[1], Maznah Dahlui[1], Amirah Azzeri[1,2] Hafiz Jaafar[2]
[1]*Department of Research, Development and Innovation, University Malaya Medical Centre, Kuala Lumpur, Malaysia*
[2]*Public Health Unit, Department of Primary Health Care, Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia*
Corresponding author's email:helmi.yasim@ummc.edu.my

Summary
The average length of stay for patients with a specific diagnosis is usually common within each subspecialty. The diagnosis-related groups (DRG) classification enables the identification of outliers who may need special or additional clinical care with subsequent use of more resources. The outlier analysis can guide healthcare practitioners to plan better clinical care for patients with unique characteristics. Performing such analysis provides better patient outcome and allow the hospital to estimate utilised resources and make appropriate budgeting.

Keywords
DRG, outliers, evidence-based, healthcare delivery, university hospital

Introduction
Outliers are patients whose clinical characteristics or resource utilization are significantly different from the norm in their respective clinical subspecialty. These outliers on lengths of stay have an impact on the quality of care of patients and financial implications to hospital management. Short-stay outliers could mean sub-optimal care with risk of re-admission while long-stay outliers require more resources and expose the patients to more adverse events such as hospital-acquired infection.
Analysis of the outlier identification based on deviations from the median length of stay for specific diagnoses at various subspecialty wards was performed in a teaching hospital. By conducting this analysis, it provided a more detailed understanding of the impact of outliers in different clinical contexts. The findings can be used to inform the development of targeted interventions to manage outliers and improve clinical outcomes, and subsequent use of resources for appropriate hospital budgeting.

Materials and Methods
Analysis of the in-patient data of the University Malaya Medical Centre for 2020 was performed. Data were extracted from the electronic medical record, imputed, and coded into the case-mix system for DRG grouping.

The length of stay of all admissions for various subspecialties was sought. Outliers for each subspecialty were determined by using the definition of short-stay outliers (SSO) and long-stay outliers (LSO). An SSO is defined as patients staying less than 1/3 of the median length of stay while an LSO is defined as staying more than 1/3 of the median length of stay of each subspecialty.

Results and Discussion

Outliers were observed in 5566 (13%) of the 42,000 patients admitted in 2020 of which 44% and 56% of those were classified as short-stay and long-stay outliers, respectively. Majority of the cases identified as SSO were prepartum illnesses, while most cases for the LSO were cardiac catheterisation, vaginal birth, uncomplicated pneumonia and pertussis with an average LOS of 31 days. Outliers were observed among the patients who were older, had more severe illnesses, and required more intensive care services than the non-outlier patients. They were also more likely to develop adverse occurrences during hospitalisation. The majority of the cases identified as SSO and LSO were those admitted to the Medical followed by the Paediatric department.

As expected, patients identified as LSO had higher rates of adverse events during hospitalization compared to SSO and non-outliers. These are the patients who needed additional or special clinical care via targeted intervention for effective and quality care. The interventions include early identification of complications, closer monitoring and more intensive discharge planning. Older patients would tend to be LSO due to more severity of illness, higher risk for complications and are often coupled with co-morbidity. They need additional care and thus higher utilization of resources with an increased cost of care should be anticipated and budgeted accordingly.

Identifying outliers among patients admitted to the hospital signifies the importance of managing these cases appropriately. Implementing targeted interventions in hospitals can help to improve patient care and allocate resources efficiently. This analysis will help to contribute to improving management strategies in the hospital.

Conclusion

The analysis of the length of stay of hospital admission to determine outliers is important to properly plan clinical care for better patient outcomes and anticipate resource utilization for appropriate hospital budgeting.

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FHSMPP05/59 : Subsidised Psychiatry Treatment in Selangor Mental Sihat (SEHAT) programme

Muhammad Adil Zainal Abidin[1], Mohammad Farhan Rusli[1], Jamilah Hanum Abdul Khaiyom[2], Ahmad Nabil Md Rosli[3], Hijaz Ridzwan[3], Nor Faiza Mohd Tohit[1], Adha Radha Nasheha Mohamad Fuad[1], Afaf Qamelia Badrol Hisham[1], Iman Aisha Zamzuri[1], Siti Mariah Mahmud[4]

[1]Department of Community Medicine, Kulliyyah of Medicine, International Islamic University Malaysia

[2]Abdulhamid Abusulayman Kulliyyah of Islamic Revealed Knowledge and Human Sciences, International Islamic University Malaysia

[3]Department of Psychiatry, Kulliyyah of Medicine, International Islamic University Malaysia

[4] Pejabat Ahli Majlis Mesyuarat Kerajaan Negeri Selangor, Bangunan Sultan Salahuddin Abdul Aziz Shah

Corresponding author's email: adilza@iium.edu.my

Summary

With the COVID-19 pandemic hitting the nation in 2020, it can be seen that it has impacted negatively on public health, more so on mental health. The Selangor Mental Health (SEHAT) programme was introduced in 2021 and offered a holistic approach to mental health issues starting with advocacy, promotion, screening, and early intervention. SEHAT introduced a subsidised psychiatry treatment initiative in July 2022, providing substantial cost subsidisation of mental health treatment for lower socioeconomic groups. This landmark strategic purchasing initiative was pioneered by the Selangor state government together with the multidisciplinary expertise from International Islamic University Malaysia (IIUM).

Keywords

Mental health issues, mental health intervention, subsidised psychiatry, digital health, public mental health

Introduction

Mental illness has gained importance in public health over for past few years. It is estimated that half of the world's population lacks access to essential health services, including mental health services, for which effective care is limited (1). Several barriers to receiving care were noted to be a lack of knowledge about the illness, stigmas on help-seeking, or financial constraints (2, 3). With the introduction of the subsidised psychiatry initiative, it enables communities and individuals to receive better quality and affordable care for their mental health conditions, regardless of their age or socio-demographic characteristics. This goes in line with the WHO goal of ensuring universal health coverage, where no one is left behind (4). Hence, this study aims to provide and explore an alternative mental health care access pathway for individuals seeking psychiatric treatment in Selangor.

Materials and Methods

In the Selangor SELangkah application, there is a mental health module, the Mental SEHAT which provides validated questionnaires to screen for users' level of mental

health through DASS-21, PSS-10, PHQ-9 and GDS-15. Based on their scores, users will then be encouraged to follow the modules and watch more than 60 psychoeducational videos to have a better understanding of their situation. Meanwhile, the establishment of the SEHAT hotline for those who are anxious and in distress, helps them ~~to~~ reach trained counsellors via phone calls immediately. For those who have severe scores and wish to get subsidised treatment, the flow process provided by the SEHAT programme is accessible and convenient since users will have to answer screening questionnaires for screening purposes through the SELangkah apps to screen their eligibility. Once eligible, they will be immediately referred by the SelCare (a healthcare programme under the Selangor state) clinics. Each patient will be given an approximation of three to five appointment slots with the psychiatrist. A total of 14 psychiatrists from the Malaysian Psychiatric Association (MPA) are involved in this subsidisation programme. Few of many are cooperative and compliant with treatments and follow-ups, having Malaysian citizenship, and prioritising given for B40 group income.

Results and Discussion

As of 1st March 2023, a total of 157 users had already registered for this subsidised psychiatric intervention programme. 132 of them were screened and referred to psychiatrists for further intervention, whereas the remaining 25 are still waiting for their first appointment with SelCare clinics for subsequent screening to re-assess their eligibility for the subsidisation programme. Out of the 700 slots offered, 396 were utilised by the 132 registered users, covering their consultations and treatments. The majority of the patients were 18 to 30 years old (47.5%), female (54.5%) and Malay ethnicity (59%).

Conclusion

This subsidised psychiatry initiative proved to play a significant role in getting people with mental health issues access to the treatment they needed. Several strategies can be made and improved to increase awareness of users who are currently in need but are not receiving treatment, which might be due to some barriers they met while trying to seek treatment. Accessibility through mobile apps encouraged those with mental health problems to reach out for help.

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FHSMPP06/77 : HbA1c Variability And Its Associated Factors Among Type 2 Diabetes Patients In Malaysia Public Primary Care Clinics

Xin Rou Teh[1], Aslene Siu Tjing Yeoh[1], Azah Abd Samad[2], Mastura Ismail[3], Feisul Mustapha[4], Sheamini Sivasampu[1]
[1]*Institute for Clinical Research, National Institutes of Health, Shah Alam, Selangor, Malaysia*
[2]*Klinik Kesihatan Seksyen 7, Ministry of Health Malaysia, Shah Alam, Selangor, Malaysia*
[3]*Family Health Development Division, Ministry of Health Malaysia, Putrajaya, Malaysia*
[4]*Perak State Health Department, Ipoh, Perak, Malaysia*
Corresponding author's email: xinrou1801@gmail.com

Summary
Visit-to-visit HbA1c variability has been shown to be associated with higher mortality and diabetic complications. This study aims to identify the factors associated with HbA1c variability (in terms of coefficient of variation and standard deviation) among type 2 diabetes mellitus (DM) patients. A retrospective cohort was formed using data from primary care clinics electronic medical records. Amongst the Malays and Indians, the use of insulin, high triglyceride levels, young age and uncontrolled HbA1c were shown to be associated with high HbA1c variability in multiple logistic regressions for both HbA1c variability measures. HbA1c variability can be a valuable measure in diabetes management, as it does not require an additional cost and with can provide additional insight.

Keywords: HbA1c variability, diabetes mellitus, coefficient of variation, standard deviation, primary care

Introduction

Malaysia has a higher prevalence, 1 in 5 adults are living with DM in 2019 (1). Research has demonstrated that visit-to-visit HbA1c variability is associated with diabetic complications (2,3). However, there was a paucity of literature on the factors associated with HbA1c variability. This study aims to identify the factors associated with HbA1c variability in type 2 DM patients treated in Malaysian public primary care clinics.

Materials and Methods

A retrospective cohort of type 2 DM patients who had visited two of the public primary care clinics in Selangor was formed using data from electronic medical records. All type 2 DM patients age 18 years and above, with at least two years of follow-up and at least two HbA1c readings were included in the study. HbA1c variability were measured in terms of coefficient of variation (CV) and standard deviation (SD), using the below formula.

$CV = \frac{SD}{Mean} * 100$; $SD = \sqrt{\frac{\sum(x-mean)^2}{N}}$

HbA1c-CV and HbA1c-SD will be categorized into high and low variability using their medians as the cut-off points. Descriptive analysis and logistic regressions were performed to explore the significant factors. The associations between the

factors and HbA1c variability were reported using odds ratios (OR) and 95% confidence interval (CI), with significance level set at $p<0.05$.

Results and Discussion

We included 2532 type 2 DM patients, with mean age of 61.7 years, more females (55.8%) and of Chinese ethnicity (39%). The mean type 2 DM duration was 5.9 years. The mean BMI was 28.2 kg/m^2 and 45.8% of them were obese. In addition, only 30.7% of them had their HbA1c under control, which was <7%.

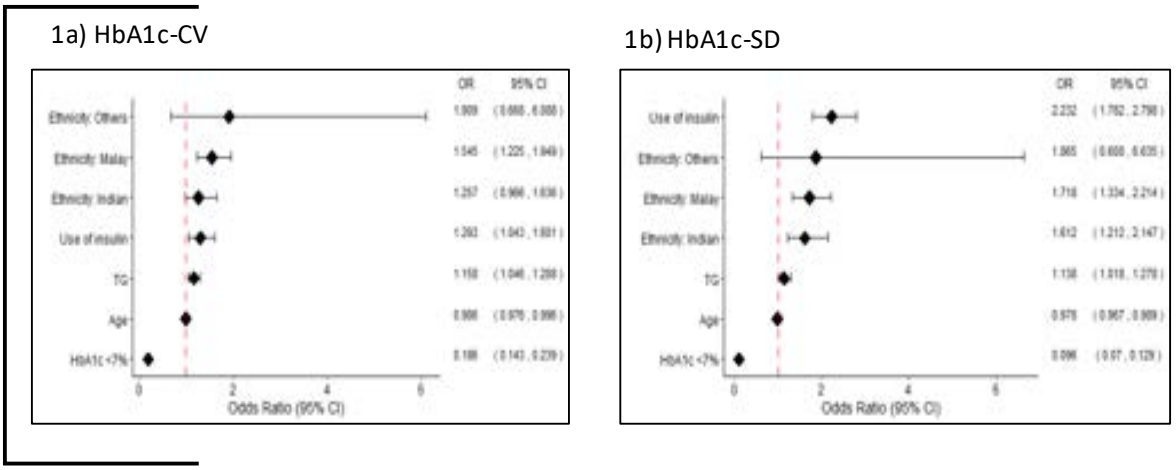
HbA1c-CV and HbA1c-SD were divided into high and low based on the cut-off point of 9.16 and 0.75, respectively. HbA1c-CV were higher among Malay, Indian, and others ethnicities, in comparison to Chinese. Moreover, individuals who used insulin and had higher triglyceride levels demonstrates positive associations with increased HbA1c-CV. In comparison, older patients and those who had good HbA1c control had lower HbA1c-CV. HbA1c-SD were shown to have similar results to HbA1c-CV.

This is the first study that explored the factors associated with HbA1c variability among type 2 DM patients in Malaysia primary care clinics using real world data. High HbA1c variability was found to be associated with younger age, which is a trend seen in previous studies (4). Previous studies also showed that Malays and Indians have worse mean HbA1c level or HbA1c control, when compared to Chinese (5). Insulin is known to cause hypoglycaemia and hence it explains the high HbA1c-SD. Besides, there was positive association between triglyceride level and HbA1c variability.

Conclusion

By identifying the factors associated with HbA1c variability, clinicians can either closely monitor the patients, prescribe drugs that will minimize variability, or educate patients on self-care activities that reduce the variation,

Figure 1 Forest plots of multiple logistic regression for HbA1c-CV and HbA1c-SD



**Complete case analyses were performed, with n=1938*

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FHSMPP07/37 : Slim Selangor: The Impact Of A Six-Week Weight Loss Program On Anthropometric Measures In Selangor Citizens

Sufian[1], Siti Mariah Mahmud[2], Jinat Ahmed[2], Mohammad Farhan Rusli[3]
[1] Trainer Consultant for Slim Selangor
[2] Selangor Public Health Advisory Council
[3] Kulliyyah of Medicine, International Islamic University Malaysia
Corresponding author's email: jinatahmed@hotmail.com

Summary

Amid increasing obesity rates in Malaysia, the six-week Slim Selangor program was initiated to promote healthier lifestyles among adults in Selangor. The program, consisting of both in-person and online coaching sessions, employed a proven weight-loss strategy endorsed by the Malaysian Ministry of Health. The program's impact was evaluated by comparing participants' health indicators before and after the intervention. Post-evaluations revealed significant improvements among participants, with 59.4% exhibiting reduced waist-hip ratios, 61.8% achieving weight loss, and 37.19% achieving a decrease in fat percentage. These results underscore the program's effectiveness, suggesting it can promote overall well-being and reduce obesity-related illness risk. This aligns with previous studies highlighting the efficacy of structured community-based interventions in achieving substantial weight loss and improving obesity-related conditions.

Keywords

Weight-loss, obesity, Selangor

Introduction

Malaysia, with a notably high obesity prevalence according to the 2019 National Health and Morbidity Survey, is projected to have 23.4% of its adult population classified as obese by 2030. This trend threatens public health and imposes a considerable economic strain on the healthcare system, excluding the indirect obesity-related costs expected to increase with the obesity rate. Consequently, managing obesity is a pressing health priority in Malaysia, especially among adults. To address this, the state government introduced Slim Selangor, a six-week program aimed at curbing obesity in Selangor. This program equips participants with crucial knowledge and skills to adopt a healthier lifestyle, aiming to establish sustainable healthy habits. Additionally, it encourages Selangor residents' active involvement in maintaining a healthy lifestyle. The program strives to enhance the community's overall health and fitness, thereby contributing significantly to combatting obesity.

Materials and Methods

The program featured Training with Trainers in 42 locations across Selangor, comprising six face-to-face sessions held over six weeks. An online platform was utilized for Training without Trainers, leveraging Gmail and live broadcasts on Google Meet. This approach aimed to enhance participants' understanding of exercise techniques while reducing coaching sessions and associated costs. The training included various components such as Home Workouts, Diet Classes, Slimming Training videos, Slimming Classes, Selangor Slim Module, and Diet Menu. Participants could conveniently follow the "just follow" approach of the Home Workout and Lean Training Videos, emulating a complete exercise class within an hour, while considering the recommended order for optimal results and injury prevention.

Participants in the program underwent initial evaluation at four different venues in Selangor to ensure eligibility. The criteria included being adults aged 18 to 50, residing in Selangor, having a high Body Mass Index (BMI), being physically capable, and having no chronic health conditions that could impede exercise or adherence to a healthy diet. After the program, a post-assessment measured changes in crucial health indicators such as waist-hip ratio, BMI, body weight, and body fat percentage.

Results and Discussion

Post-evaluations were conducted in four locations with a total of 207 attendees. It was observed that 123 out of 207 attendees (59.4%) experienced a significant decrease in waist-hip ratio. Four participants who had previously scored a 1 on their assessments achieved a score of 5 at the end of the program, indicating a lower risk of disease as their waist or abdominal size decreased compared to their hips. Additionally, 128 attendees out of 207 (61.8%) showed weight loss, with the highest weight loss of 7.1 kg achieved by four participants. Most participants achieved a weight loss of at least 3 kg, with only one participant achieving a weight loss of 0.3 kg. Finally, 77 attendees out of 207 (37.19%) achieved a decrease in fat percentage, with the highest recorded decrease being 12.5%.

In the group of 207 participants, 123 (59.4%) saw significant reductions in waist-to-hip ratios, lessening their risk for conditions like type 2 diabetes, stroke, and heart disease. Remarkably, the program score for four individuals went from 1 to 5,

signaling a lowered disease risk. About 61.8% of the participants experienced weight loss with the most significant drop being 7.1 kg, beneficially reducing obesity-related disease risks. Also, 37.19% showed a decrease in body fat percentage, up to a maximum of 12.5%, leading to improved body composition and a reduced risk for certain health conditions.

Slim Selangor Program aligns with numerous weight-loss studies and interventions. The (Institute for Public Health, 2015) has highlighted how structured initiatives can significantly reduce weight and improve obesity-related issues. Similarly, a (2014) review by Johns DJ et al. identified community-based efforts as effective in moderating weight loss. Globally, comparable programs like the Diabetes Prevention Program in the U.S (Knowler WC et al., 2002) have shown positive results, decreasing diabetes incidence by 58% over three years, demonstrating the potential effectiveness of programs like Slim Selangor.

Conclusion:

The success of the Slim Selangor 2022 in aiding participants to attain their weight loss goals is demonstrated by the noteworthy reduction in waist-hip ratio, weight loss, and decrease in fat percentage. The findings suggest a positive trend towards enhanced overall well-being and a reduction in susceptibility to specific illnesses. The efficacy of the program in attaining these outcomes underscores the significance of an efficacious weight loss program in mitigating the likelihood of ailments linked to obesity.

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FHSMPP08/80: Outsourcing Of Public Patients In Ministry Of Health Hospitals During The COVID-19 Pandemic

Gunenthira Rao Subbarao[1], Mohd Ridzwan Shaari[1], Fawzi Zaidan Ali[2], Khairol Idham Zulkifli[2]

[1]Public Health Medicine Specialist, Senior Principal Assistant Director, Medical Development Division, Ministry of Health Putrajaya

[2]Senior Principal Assistant Director, Medical Development Division, Ministry of Health Putrajaya

Corresponding author's email: gunenthira@moh.gov.my

Summary

In response to the COVID-19 pandemic, the Ministry of Health (MOH) has chosen to outsource certain medical services in the year 2020 - 2022. The objective of this

study is to evaluate the effectiveness of outsourcing in reducing the number of backlog cases in MOH hospitals. This is a cross-sectional study using a convenient sampling collected from MOH hospital. There was a reduction of 11.7% in backlog cases of which 56.2% were surgical-based and 43.8% non-surgical involving 49 MOH hospitals, and 113 private hospitals. Outsourcing can be used as one of the strategies to overcome challenges encountered by public hospitals.

Keywords
Outsourcing, Patient, Hospital, COVID-19, Pandemic

Introduction

Outsourcing is a strategy practised in the public hospital Ministry of Health Malaysia (MOH) to increase the effectiveness of services and reduce operating costs. Outsourcing is defined as a process of externalizing tasks and services performed in-house to outside vendors (1). Among the services that have been outsourced under MOH were cleaning, linen and laundry, clinical waste management, engineering maintenance, and many others (2). In the year 2020, the MOH decided to outsource certain medical services from the government to private facilities as a way to reduce the waiting time of patients for surgical and non-surgical procedures to overcome backlog cases and improve medical service delivery which was affected due to the COVID-19 pandemic. The objective of this study is to evaluate the effectiveness of outsourcing in reducing the number of backlog cases in MOH hospitals in response to COVID-19 in the year 2021.

Materials and Methods

This is a cross-sectional study using convenience sampling. Two main secondary data were collected monthly during the outsourcing process. First would be the number of cases successfully outsourced to private facilities from the monthly reporting of the state health department to the officer in charge of outsourcing in the Medical Development Division, MOH. While second data would be the number of backlog cases (elective cases awaiting procedure beyond the normal waiting time) collected from the respective unit in the medical service based on the information gathered from the respective Head of Services. Inclusion for backlog cases were elective cases namely surgical procedures, and investigations like CT scans, MRI while exclusion was a complicated surgical procedure that might need intensive care unit support, multidisciplinary approach care, or unplanned emergency cases.

Results and Discussion

The selection of cases from MOH hospitals that need to be outsourced was based on the concept of high volume, low risk, and elective cases. Thus, emergency, and high-risk cases that might require intensive care were not referred to the private facility as outsourcing cases. This whole outsourcing process used special funding from the Ministry of Finance (MOF) called *Kumpulan Wang Covid (KWC)* and *Akaun Amanah Bencana (AAB)* which are specially allocated to MOH during this pandemic. However, it is obligated to the government finance protocol. In total, there were 20,772 surgical and non-surgical cases were outsourced to private, of which 11,684(56.2%) were surgical-based and 9,088(43.8%) non-surgical. It involved all 14

State Health Departments in Malaysia, 49 MOH public hospitals, and 113 private hospitals. The total expenditure for this outsourcing practice was RM 174,299,895.98.

In terms of backlog cases, 8,725 patients were awaiting surgical procedures as the outsourcing process commenced in September. *Outsourcing activity was started in April, while backlog data collection was in September* 2021. Figure 1 below shows the reduction of backlog cases for the surgical procedure through the outsourcing process to a private facility. There was a reduction of 11.7% in backlog cases, a reduction from 8725 patients in September 2021 to 7812 in November 2021 before the outsourcing funding was fully utilized (3). The achievement surpassed the initial target set by the Medical Development Division which is a 10% reduction in backlog cases in MOH hospitals. More cases were unable to outsource further because of the limitation of private facilities' services and the limited budget allocation which is a disabling factor (4).

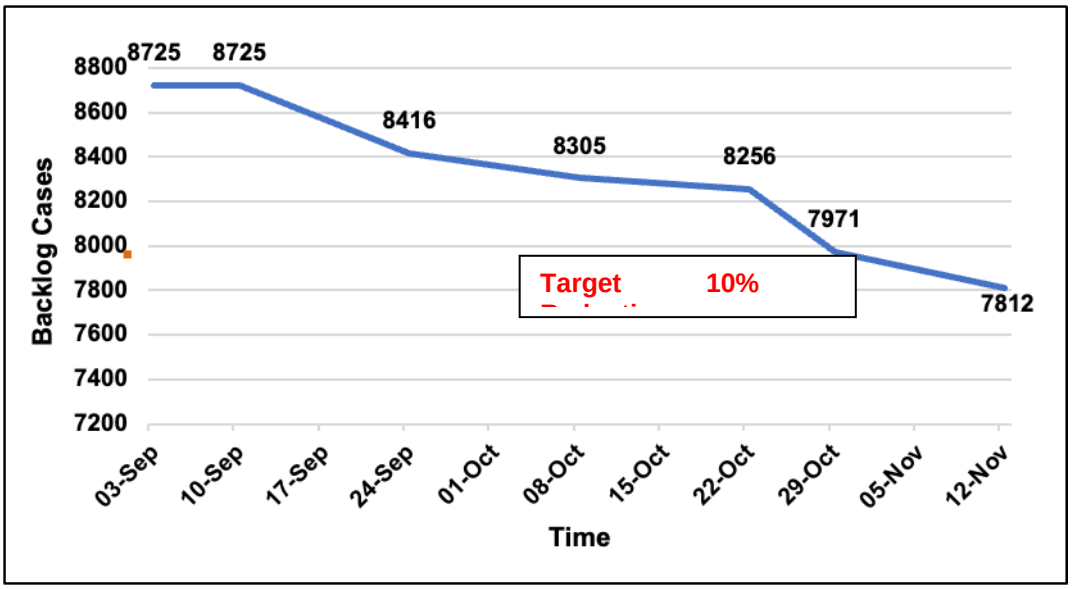

Figure 1: Backlog Cases Reduction Trending Through Outsourcing in Malaysia Public Hospitals Year 2021

The rapidly evolving COVID-19 pandemic required hospitals to have in place all essential preparedness and had to be synchronized with the country's overall plan for managing the pandemic. Thus, outsourcing is seen as one of the strategies to respond to the COVID-19 emergency (5).

Conclusion

Public hospitals of MOH have benefited from the outsourcing practice. It meets the objective as successfully reduced the backlog cases and at the same time improves the waiting time of patients for certain services. Outsourcing has reduced the backlog cases and surgical-based patients have benefited more. Overall, patients were satisfied with outsourcing as it fills the gaps in public hospital services which were overstretched in managing the pandemic. Outsourcing is seen as an advantage because it addresses the issue of human resource limitation, and overcomes the time and space limitations for procedures. However, it is dependent on the budget

allocated and the services provided by the private sector which can be the inhibiting factor. Future studies should undertake a cost-effectiveness analysis of outsourcing public cases to private ones.

Acknowledgment
The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article. They also acknowledge the Director General of Health, Deputy Director of Health (Medical), and Director of the Medical Development Division for the support and permission of publishing this study.

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FHSMPP09/92: Pooled Confirmatory Factorial Analysis On Authentic Leadership, Psychological Capital, Job Burnout And Organisational Commitment Based On Primary Healthcare Workers In Sarawak

Ainaa Anum Araffin Bakar[1], Noorzilawati Ishak[1]
[1] *Universiti Malaysia Sarawak*
Corresponding author's email: ainaaanum@gmail.com

Summary
In Structural Equation Modelling, the author steps in the analysis by performing the first step, called Confirmatory Factor Analysis (CFA). It can help researchers avoid erroneous estimations once they try to predict the relevance of a particular factor. It can also be utilised in various scientific areas. Four constructs, including authentic leadership, psychological capital, job burnout and organisational commitment, were assessed simultaneously in a pooled CFA for model fitness based on primary healthcare workers in Sarawak. The compensation of these factors can improve the model's capabilities.

Keywords
Pooled Confirmatory Factor Analysis, Organisational Commitment, Authentic Leadership. Psychological Capital, Job Burnout

Introduction

Committed healthcare workers in healthcare organisations are essential to delivering high-quality services. They bring value to the organisation through their determination, proactive support, high productivity, and quality awareness. Pooled Confirmatory Factor Analysis (Pooled CFA) is the first step of Structural Equation Modelling (SEM) that can identify the fitness of a complex measurement model based on four second-order constructs, including authentic leadership, psychological capital, job burnout and organisational commitment.

Materials and Methods

The study populations were assistant medical officers (AMOs) and nurses working in public health clinics with doctors in Sarawak, and 549 samples fulfilled the analysis requirements. Pooled Confirmatory Factor Analysis ascertains the researcher to develop the capability of the latent measurement model to be more effective and precise for drawing the conclusion besides avoiding the violation or regression assumption. Tools for measurement are all Likert Scales which are the Authentic Leadership Questionnaire (ALQ), Psychological Capital Scale (PsyCap), Oldenburg Burnout Inventory (OLBI) and Three-factor Organisational Commitment Scale (OCS).

Results and Discussion

Uni-dimensionality. The latest model demonstrated all factor loading of all items above 0.5 (Table 1) after deleting six items that are below 0.5 (OC17, JB2, JB4, JB10, JB12 and JB15), which indicated the uni-dimensionality of the new measurement model. (Figure 1). **Construct Validity.** Fitness Indexes acceptable fit (CMIN/DF = 2.588, RMSEA = 0.054, CFI =0.904, SRMR = 0.0617). (Figure 1)

Convergent Validity and Composite Reliability. The Average Variance Extracted (AVE) and composite reliability (CR) of all constructs exceeded their threshold values of 0.5 and 0.6, respectively. The convergent validity and composite reliability for all latent constructs in the model have been achieved.

Discriminant Validity. The Root of the average Variance of a component is higher than the average Variance of other components in Table 3. The criterion of discriminant validity is fulfilled.

Table 1 The Factor loading of each item in the new measurement model.

Construct	Sub-construct	Item	Factor Loading
Authentic Leadership	Self-awareness	AL1	0.865
		AL2	0.843
		AL3	0.883
		AL4	0.867
	Internalised Moral Perspectives	AL5	0.759
		AL6	0.917
		AL7	0.943
		AL8	0.922
	Balanced Processing	AL9	0.647
		AL10	0.844
		AL11	0.921
		AL12	0.924
	Rational Transparency	AL13	0.874
		AL14	0.936
		AL15	0.939

		AL16	0.915
		PC1	0.917
	Self-efficacy	PC2	0.950
		PC3	0.895
		PC4	0.838
		PC5	0.850
	Hope	PC6	0.942
Psychological Capital		PC7	0.916
		PC8	0.870
	Resilience	PC9	0.896
		PC10	0.890
		PC11	0.918
	Optimism	PC12	0.949
		JB3	0.643
		JB6	0.563
		JB7	0.806
	Disengagement	JB9	0.806
		JB11	0.647
Job Burnout		JB13	0.505
		JB1	0.649
		JB5	0.634
	Exhaustion	JB8	0.715
		JB14	0.661
		JB16	0.664
Organisational Commitment	**Affective commitment**	OC1	0.805
		OC2	0.613
		OC3	0.596
		OC4	0.572
		OC5	0.905
		OC6	0.703
		OC7	0.895
		OC8	0.880
	Continuance commitment	OC9	0.602
		OC10	0.604
		OC11	0.810
		OC12	0.821
		OC13	0.617
		OC14	0.748
		OC15	0.786
		OC16	0.785
	Normative commitment	OC18	0.807
		OC19	0.602
		OC20	0.857
		OC21	0.595
		OC22	0.818

Table 2. AVE and CR values for all constructs and sub construct

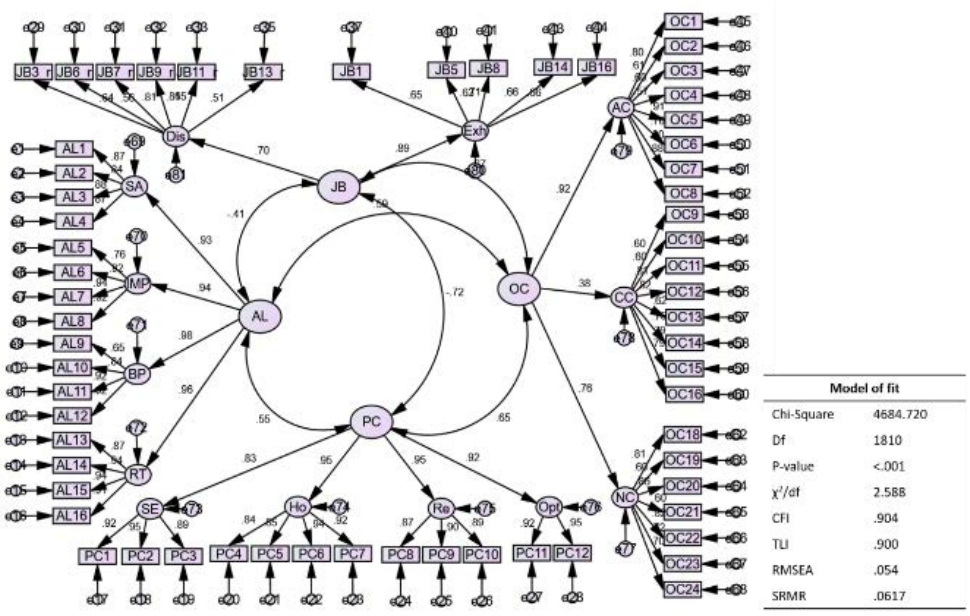
Construct	Sub-contruct	AVE	CR
Aunthentic leadership		**0.909**	**0.973**
	Self-awareness	0.748	0.899
	Internalised moral perspectives	0.789	0.922
	Balanced processing	0.708	0.888
	Rational transparency	0.840	0.956
Psychological capital		**0.719**	**0.880**
	Self efficacy	0.848	0.934
	Hope	0.788	0.946

	Resilience	0.748	0.925
	Optimism	0.872	0.922
Job burnout		**0.871**	**0.921**
	Disengagement	0.451	0.689
	Exhaustion	0.442	0.637
Organisational commitment		**0.522**	**0.631**
	Affective commitment	0.574	0.861
	Continuance commitment	0.529	0.826
	Normative commitment	0.539	0.816

Table 3. Discriminant Validity Index

No	Latent variable	Authentic Leadership	Psychological Capital	Job Burnout	Organisational Commitment
1	Authentic Leadership	**0.954**			
2	Psychological Capital	0.552	**0.848**		
3	Job Burnout	-0.409	-0.725	**0.933**	
4	Organisational Commitment	0.588	0.647	-0.669	**0.723**

Figure 1 The pooled CFA for the new measurement model.



The study focused on the validation and reliability of the measurement model. It analysed the components and indicators acknowledged as reliable by the construct validity and reliability tests. The low-value verification is associated with cultural interpretation problems that arise from adapting to the primary healthcare workers' context. Incorporating indicators belonging to another factor might contaminate the weak factor. Therefore, perform Exploratory SEM techniques to ensure whether the scale may have a unidimensional but multi-component construct can be considered. During model fitting, the chi-square/df was less than three. However, the p-value was significant. Some studies ignore the significance of the p-value if other Model fit values are good. AVE is higher than 0.5. According to Formell and Larcker (1981), 0.4 is acceptable, provided that CR is higher than 0.6 and the convergent validity of the construct is still adequate. Based on this paper, AVE for disengagement and exhaustion are below 0.5 (0.430 and 0.457, respectively). However, both CRs are higher than 0.6. Therefore, the convergent validity of all the constructs is acceptable. The current study is the first one that applied pooled CFA to test the conceptual framework on relationships between authentic leadership, psychological capital, job burnout and organisational commitment. The concept of Pooled-CFA is a method that enables scholars to carry out their investigations without spending much time identifying the various issues they might have to deal with the means of empirical study. The findings in the present study are beneficial for researchers to proceed with structural modelling to determine the relationships between authentic leadership, psychological capital, job burnout and organisational commitment. Therefore, the conceptual contribution of this study is that it extends the human resource management literature by validating the four constructs since such relationships have not been tested together in previous studies.

Conclusion

The model has met the requirements for validating and testing the hypotheses presented by the models after the original number of items was reduced to 60 from 68. The findings could be used to proceed with the second step of the Structural Model to study the hypothesis. Pooled CFA is a framework that helps select the best fit for the measurement model.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

FHSMPP10/124 : Exploring The Use Of Menstrual Cycle Applications Among Pharmacy Students

Syahiera Afieqah Rosman[1], Kamaliah Md Saman[1], Anna Liza Roslani[2], Aisyah Saad Abdul Rahim[1]
[1] *Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia*
[2] *KMI Kuantan Medical Centre, Jalan Tun Razak, Bandar Indera Mahkota, Kuantan, Pahang*
Corresponding author's email: aisyahsaad@gmail.com

Summary
Menstrual cycle apps enable women to predict their general health. Traditionally, women used to track their menstrual cycles manually; however, in this digital era, menstrual cycle apps on mobile devices are enormously popular. Period Tracker Period Calendar, Flo Menstrual & Period Tracker and Ovulation & Period Tracker are the top 3 apps in Google Play Store, with downloads that surpassed 10 million (1). While they can help assist women in tracking their periods and provide good personal care and symptom management capabilities, little is known about why and how women use the digital health data they generate (2). Thus, this novel study explored the use of menstrual cycle apps among undergraduate pharmacy students. Our initial results revealed that tracking menstrual cycles was the primary motivation for the majority of students using the apps.

Keywords
Menstrual apps, Menstruation, University student, Mobile health, Women's health

Introduction

Menstrual cycle apps can help women track their periods and predict their general health. Monitoring the menstrual cycle via mobile apps can improve awareness of their bodies, prepare their emotional moods and detect early physiological indicators, such as the emergence of cervical secretions a few days prior to ovulation. Therefore, the development of mobile applications like menstrual cycle apps can help women track their periods, as the apps provide good personal care and symptom management capabilities (1). Most studies focused on the perspectives towards the general population of women; none focused on a specific population, for example, female students in a particular educational institution (3). Therefore, this study aimed to explore the use of menstrual cycle apps amongst female pharmacy students at Universiti Teknologi MARA (UiTM) Puncak Alam.

Materials and Methods

A cross-sectional survey was conducted among female pharmacy students at the Faculty of Pharmacy, UiTM Puncak Alam, from March to May 2023. The development of the questionnaire involved three stages. Firstly, questions were adapted from previous studies (2,3). Secondly, the questionnaire was validated by expert panels consisting of academicians from UiTM Faculty of Pharmacy and an Obstetrics and Gynaecology (O&G) consultant. Lastly, the questionnaire was

piloted with 20 students, and their feedback was used to refine the final version of the questionnaire for data collection. The questionnaire was administered online through Google Forms; the survey link was shared via Whatsapp groups of each pharmacy student batch. A total of 227 respondents participated in the survey. This study has received ethical approval from UiTM Research Ethics Committee (REC(PH)/UG/063/2023). The preliminary work presented here concerned the demographics and results on the use of menstrual cycle apps among UiTM pharmacy students.

Results and Discussion

This research yielded valuable demographic information, as presented in Table 1. The majority of survey participation came from 3rd-year students, comprising 36.6% of the responses, followed by 4th-year students at 22.9%. The 1st and 2nd-year students accounted for 20.3% of the respondents. Out of 227 respondents, approximately 55.5% fell within the normal body mass index (BMI) indexes. We found that many students (63.9%) had chosen to install menstrual cycle apps on their smartphones. Nearly half of the students used the My Calendar app, followed by the Flo app (11%). The primary motivation behind using these apps is revealed in Table 2, which is to track their menstrual cycles. Students also used these apps to understand symptoms or physiological changes during menstruation, and to gain related health information. This tracking feature would enhance students' understanding of their bodies and menstrual cycles and aid them in identifying any changes that may require medical attention (3,4). Interestingly, a small number of students used the apps to predict ovulation and to come off contraception.

Table 1: Descriptive statistics of pharmacy students who responded to the survey (n=227), their body mass indexes and menstrual cycle apps used.

Variable	n (%)
Year of Study	
1st year	46 (20.3)
2nd year	46 (20.3)
3rd year	83 (36.6)
4th year	52 (22.9)
Body Mass Index (BMI)	
<18.5 (Underweight)	43 (18.9)
18.5 – 24.9 (Normal)	126 (55.5)
25.0 – 29.9 (Overweight)	43 (18.9)
>30.0 (Obesity)	15 (6.6)

Own any menstrual cycle apps?	
No	82 (36.1)
Yes	145 (63.9)
App used (n=145)	
Flo	27 (11.9)
My Calendar	70 (30.8)
Clue	2 (0.9)
Maia	2 (0.9)
Others	44 (19.4)

Table 2: Students' motivation for using menstrual cycle app (n=145)

Reasons for use	n (%)
I can know when my period is arriving and be prepared	144 (99.3)
I can understand any symptoms or changes during menstruation	71 (49.0)
I can gather information related to my health for self-tracking or informing my healthcare professional	75 (51.7)
I can know I am ovulating	50 (34.5)
I can predict when to come off contraception	5 (3.4)
Other	3 (2.1)

Conclusion

This study was conducted to explore the use of menstrual cycle apps among pharmacy students at the UiTM Faculty of Pharmacy. Our study found that the primary motivation for using menstrual cycle apps is to track their periods. A small number of undergraduates were using these apps to predict ovulation and come off contraception. My Calendar Period Tracker seemed to be the most preferred app for nearly half of the students. In conclusion, menstrual cycle apps can offer significant benefits to female students, serving as valuable assistants on their mobile phones for understanding their bodies and menstrual cycles while aiding in the early detection of any significant changes that need medical attention.

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FHSMPP11/146: Building Resilience: The Redesign Of Public Primary Health Care Clinic In A Post-COVID-19 Era

Norain Ahmad [1], Siti Noraida Jamal[1], Ali Munawar[1], Tanty Darwinna[1], Khairani Halid [1], *Rohaizan Abd Kadir Jailani[1] ,Enna Mohd Hanafiah[1], Rozita Halina[1]*
[1] Health Facility Planning, Planning Division, Ministry of Health Malaysia
Corresponding author's email: drnorain@moh.gov.my

Summary
The emergence of the COVID-19 pandemic has profoundly impacted healthcare service delivery, necessitating significant adaptations to the primary healthcare clinic design. This paper highlights the multifaceted effects of the COVID-19 pandemic on the function and design of primary healthcare clinics as well as the critical areas that have undergone substantial transformations to ensure patient and healthcare provider safety.

Keywords
COVID-19, design, health clinic, pandemic, primary care

Introduction
A primary healthcare clinic is a community-based health facility that offers basic medical services and promotes preventive care for patients and their families. Since the country's independence, primary health care in Malaysia has begun with the introduction of fundamental health services via Maternal and Child Health Clinics (MCH). Then, the services grew to encompass a greater scope of the community's requirements and needs. In order to provide essential services, the 8th Malaysian Plan (2001-2005) produced seven designs of primary health care clinics, namely health clinic types 1, 2, 3, 4, 5, 6, and 7(1), which serve as the foundation for current designs. However, following the COVID-19 pandemic that has ravaged the country, it has been discovered that existing health facilities confront numerous challenges in implementing prevention and control measures for infectious diseases due to space limitations. This review explains the adaptation of primary health care clinic design, to cater to the requirements of infectious disease prevention and control in primary health care clinics.

Materials and Methods
A workshop was held in October 2020 to engage stakeholders in a situational analysis of the current situation of COVID-19 and the condition of primary

healthcare clinics during the pandemic. Parties involved were from the Planning Division, Family Health Development Division, Dental Health Division, Engineering Services Division, and Public Works Department. The team conducted an evaluation of the current layout and suggested modifications to the standard plan for health clinics in order to comply with the demands of infectious disease control. Subsequently, a few meetings and a series of interactions were held with stakeholders to develop a new standard pre-approved plan (PAP) for primary healthcare clinics. At the end of 2021, the new PAP for health clinic types 2–6 was completed and ready to be implemented in future health clinic projects. Each design is reviewed by the Ministry of Health's panellist before being forwarded to the central agencies for final approval before implementation(1).

Results and Discussion

The existing layout of a primary health care clinic has a shared, internalised waiting area, which causes the mixing of infectious and non-infectious disease (non-ID) patients. Lack of a dedicated area for ID patients, forcing triage and treatment to take place in temporary tents. Furthermore, the lack of a drive-through pharmacy service led to the exposure of non-ID patients to infectious disease transmission while waiting for medication. Besides, open counters in registration, lab, and pharmacy facilities increase the risk of infection for healthcare personnel.

The ID elements that are incorporated into the new PAP for primary health care clinics are as follows: a) enhanced infection control by implementing standard operation procedures of hand hygiene and regular surface disinfection; b) providing spacious areas by reconfiguring spaces to ensure appropriate physical distancing; c) providing an isolation area for suspected infectious patients; d) ensuring ventilation systems comply with infection disease prevention policy (2, 3); e) flexible consultation rooms that can be used for virtual clinics or telehealth (4, 5); f) streamlined workflow with clearly defined pathways for staff and patients; g) provision for staff support spaces, which are specialised areas for rest and relaxation; and h) provision for donning and doffing area. The recommended layout of primary health care clinic design is shown in Figure 1.

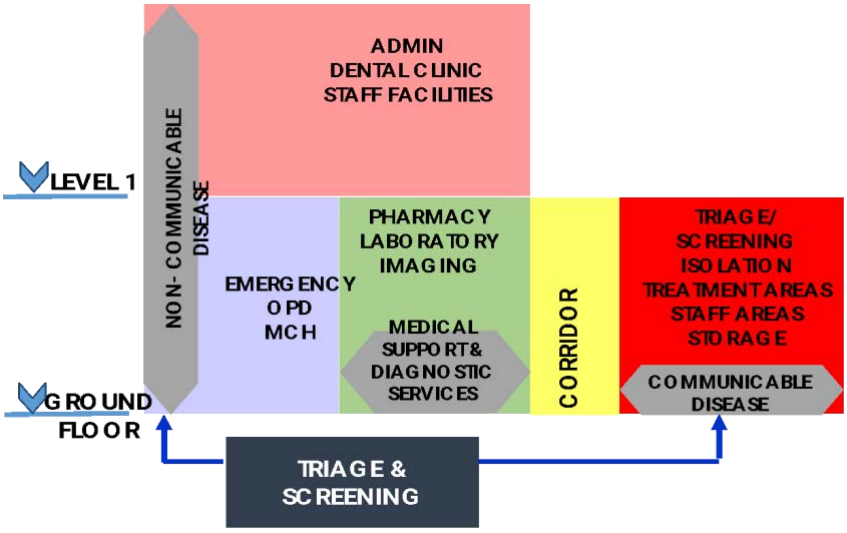

Figure 1. Sketch layout of new standard PAP for primary health care clinic (example of type 3 health clinic)

Conclusion

The post-COVID-19 era calls for the adaptation of health clinic design to prioritise infection control measures, virtual clinic, flexible spaces, and improved ventilation systems, ensuring safer and more efficient healthcare delivery while addressing future pandemics and public health emergencies. By addressing these key factors, health clinics are designed to be safer for both patients and staffs.

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FHSMPP12/69 : Factors Associated With Pre-Pregnancy Care Knowledge Among Undergraduate Students In Selangor

Nur Diyana Sakinah Muhamad Rusdi [1], Nik Nairan Abdullah [1], Mohd Shahril Ahmad Saman[1] Suzanna Binti Daud [2]

[1] *Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA*
[2] *Department of Obstetrics & Gynaecology, Faculty of Medicine, Universiti Teknologi MARA*
Corresponding author's email: niknairan@gmail.com

Summary
Pre-pregnancy care (PPC) is important to improve maternal and fetal outcome. This study aimed to determine the prevalence of poor PPC knowledge and its associated factors. A cross-sectional study using convenience sampling was conducted among 145 unmarried female students from Universiti Teknologi MARA, Shah Alam. A self-administered Malay-validated online questionnaire was used. Results from multiple logistic regression revealed that intention to get married in 5 years or less and low awareness on the availability of PPC services were significantly associated with poor knowledge. PPC health education needs to be targeted especially to the young reproductive age population to raise their awareness.

Keywords
Pre-pregnancy care, knowledge, awareness, perception, services

Introduction
Pre-pregnancy care (PPC) is an intervention that optimises women's health before conception with the goal to improve maternal and neonatal outcomes and reducing morbidity and mortality (1). There was a low prevalence of PPC service utilisation in Malaysia. The main reason was poor awareness of the PPC services. Many studies found that younger women were less likely to utilise PPC (2) and had poor knowledge (3). However, these studies were conducted among pregnant women who attended government clinics. PPC should also be emphasized in the young reproductive population. The youth are the future generation. If their awareness about PPC increases, there is a higher likelihood for them to use PPC services and help prepare for parenthood. This study was aimed at determining the prevalence of poor PPC knowledge and its associated factors among unmarried female undergraduate students.

Materials and Methods
This was a cross-sectional study using convenience sampling that involved 145 unmarried female students aged 18–25 years old from Universiti Teknologi MARA, Shah Alam, between October to December 2022. A self-administered Malay-validated online questionnaire (Talib et al., 2018) was used, and it consisted of independent variables, which were socio-demographic data, family history of unplanned pregnancy, intention to get married, perceptions of the risk of pregnancy, awareness on the availability of PPC services and the outcome was knowledge of PPC. Descriptive analysis, simple logistic regression followed by multiple logistic regression analysis were conducted using SPSS version 25.0.

Results and Discussion
The mean age of the study population was 21.7 (SD 1.6) years old. The prevalence of poor PPC knowledge was 17%. This finding showed discrepancies compared to another study that revealed married women who attended government clinics had a higher percentage of poor knowledge, which was 52% compared to ours (17% vs. 52%) (4). In our study, the prevalence of poor knowledge was low, probably

because some of the items in the questionnaire could be answered using logical thinking without true exposure to the PPC service. The questionnaire, however, was chosen because it has been validated in Malay. In addition, a study shows that higher education levels were significantly associated with good PPC knowledge (3) and this may explain our findings among undergraduate students with a higher level of education compared to the general population. In the multiple logistic regression analysis, the intention to get married in 5 years or less (adjusted odds ratio [AOR] = 2.66; 95% CI: 1.06, 6.69; P = 0.037) and low awareness on the availability of PPC services (AOR = 5.4; 95% CI: 1.87, 15.60; P = 0.002) were significantly associated with poor knowledge of PPC. Their low awareness of the existence of PPC services may be due to being young, single, unmarried and without pregnancy experience, hence no PPC exposure. Compared to students who had the intention to get married after 5 years, those who intended to get married in 5 years or less have 2.66 times the odds of poor PPC knowledge.There were limitations in this study. Firstly, sample size is small and non-probability sampling were used. Secondly, the number of Malay-validated questionnaires that measured knowledge on PPC were limited. Thirdly, our study population only confined to Malay and Bumiputra. It is recommended to develop a revised questionnaire tailored to a more suitable study population.

Table 1: Sociodemographic characteristics of the respondents (N=145)

		Total Freq, n (%)	Mean (SD)
Age			21.7 (1.61)
Ethnicity	Malay	130 (89.7%)	
	Bumiputra (Sabah/ Sarawak)	15 (10.3%)	
Income	≤ RM 4850	96 (66.2%)	
	> RM 4850	49 (33.8%)	
Chronic disease status	No	128 (88.3%)	
	Yes	17 (11.7%)	
Genetic disease status	No	132 (91.0%)	
	Yes	13 (9.0%)	

SD: Standard deviation

Table 2: Family history of unplanned pregnancy, intention to get married, perception of the risk of pregnancy, awareness on availability of PPC services and knowledge of PPC of the respondents (N=145)

Variables		Total Freq, n (%)
Family history of unplanned pregnancy in the family	No	123 (84.8%)
	Yes	22 (15.2%)

Intention to get married	≤ 5 years	49 (33.8%)
	> 5 years	96 (66.2%)
Perception of the risk of pregnancy	Negative	47 (32.4%)
	Positive	98 (67.6%)
Awareness on the availability of PPC services	No	72 (49.7%)
	Yes	73 (50.3%)
Knowledge of PPC	Poor	25 (17.2%)
	Good	120 (82.8%)

PPC: Pre-pregnancy care

Table 3: Factors associated with poor PPC knowledge, using simple and multiple logistic regression analysis (N=145)

Variables	Simple Logistic Regression		Multiple Logistic Regression		
	Crude OR (95%CI)	*p*-value	B	Adjusted OR (95%CI)	*p*-value
Age (year)	0.97 (0.74,1.26)	0.807	-	-	-
Ethnicity: Malay Bumiputra	0.315 (0.04, 2.52) 1	0.276	-	-	-
Income: ≤ RM 4850 > RM 4850	1.10 (0.44, 2.77) 1	0.835	-	-	-
Chronic disease: Yes No	0.27 (0.03, 2.14) 1	0.216	-	-	-
Genetic disease: Yes No	0.86 (1.80, 4.15) 1	0.853	-	-	-
Family history of unplanned pregnancy: Yes No	0.20 (0.03, 1.53) 1	0.121	-	-	-
Intention to get married: ≤ 5 year > 5 year	2.53 (1.05, 6.07) 1	0.038*	1.351	2.66 (1.06,6.69)	0.037*

Perception:					
Negative	0.78 (0.30, 2.02)	0.605	-	-	-
Positive	1				
Awareness:	1				
Yes	5.23 (1.84, 14.7)	0.002*	1.914	5.40 (1.87,15.6)	0.002*
No					

PPC: Pre-pregnancy care; OR: Odds ratio; CI: Confidence interval
*significant *p*-value <0.05

Conclusion

Our study found that intention to get married in 5 years or less and low awareness on the availability of PPC services were significantly associated with poor knowledge of PPC. Through PPC health education, awareness can be raised using a variety of channels, including digital health platforms.

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FHSMPP13/105 : Patient Satisfaction With Virtual Clinic Services In Melaka 2022-2023

J Mohd Ridzuan[1], Ruzita Mustaffa[1], Aniza Hamzah[1], Akmal Afif[1]
[1]Melaka State Health Department
Corresponding author's email: dr.ridzuan@moh.gov.my

Summary

Virtual clinic (VC) was one of the initiatives taken by the Ministry of Health aimed at mitigating the COVID-19 pandemic's effect. Patient satisfaction serves as a crucial indicator of quality healthcare delivery. This study aimed to evaluate patient satisfaction with the VC services in Melaka and identify the associated factors. It was found that 94% of the respondents were satisfied with the VC

services and that the satisfaction level was significantly higher in patients enrolled to the VC service based on a healthcare worker's suggestion (OR: 7.10 (95% CI: 1.42- 35.50); p=0.01) compared to those who enrolled on their own request.

Keywords
Virtual clinic, Primary healthcare, Satisfaction, Associated Factors, Melaka

Introduction
The COVID-19 pandemic has led to healthcare responses aimed at mitigating the effects. The implementation of virtual clinics (VC) was one of the initiatives taken by the Ministry of Health Malaysia (MOH) in overcoming barriers to optimal patient care when the healthcare system was overwhelmed by the pandemic. The Virtual Clinic program was introduced in 2019 at five primary health clinics across Malaysia. By 2022, there were 19 clinics implementing VC services in Melaka. Virtual clinics aimed to prevent disease transmission, reduce congestion, and minimize patient waiting time. Since the majority of patients had their first experience with VC during the pandemic, satisfaction was a major concern. The quality of the implementation of VC should be evaluated before further expansion to ensure the continuation of optimal health services. Therefore, our aim was to evaluate patient satisfaction with VC services in primary healthcare in Melaka and identify the factors associated with it.

Materials and Methods
This was a cross-sectional questionnaire-based study. The study included patients aged 18 years and above who attended the VC at Primary Healthcare clinics in Melaka. The calculated sample size was 290 patients. Systematic random sampling was used for patient selection. There were no incentives to participate, and the patients gave their consent before responding to the questions. Sociodemographic data included gender, age, education level and also the method of referral to the VC and how the patients knew about this service. The questionnaire used to assess the patients' VC experience contained 11 questions with 5 Likert scale answers (strongly agree, agree, neutral, disagree, strongly disagree). Data were presented as frequencies and percentages. Binary logistic regression was used to identify the associated factors with the patient's satisfaction and reported odds ratios. The outcome was patients' satisfaction towards the VC services. All data were analysed using SPSS version 22.0.

Results and Discussion
The study included 277 patients; 219 (79.06%) were females. The majority of participants were university graduates (46.21%). Referral to the virtual clinic was by healthcare worker (HCW) suggestion in most cases (80.14%) (Table 1). The patients got the info about the virtual clinic through HCW information (90.97%), friends/family (5.7%), social media (1.8%) and mass media (0.4%). These data suggest that raising patient awareness outside healthcare facilities is especially important. Most patients agreed and strongly agreed that they received clear instructions before referral to the VC (84.84%) while 35.74% strongly agreed that VC can replace the physical clinic. The majority of the respondents agreed that this service will reduce the risk of infection transmission (88.44%) and also reduce the

congestion in the clinic (88.09%). The VC also reassured and comfort the patients about their health conditions during the COVID-19 pandemic (agreed=26.71%, strongly agreed=60.29%) (Table 2). Ninety-four per cent of the respondents were satisfied with the VC services. Other previous studies reported a lower level of satisfaction among patients who used VC (2). Patients' satisfaction with VC services varied widely in different settings (2). This study found that age, gender and level of education did not associated with satisfaction, contrary to what was reported by other studies (1). Satisfaction was significantly higher in patients enrolled on the VC service by HCW suggestion (OR: 7.10 (95% CI: 1.42- 35.50); p=0.017) compared to those enrolled by their own request. This is probably due to an incomplete explanation given by the attended HCW as they might presumed that the patient already had all the information needed. Thorough information by HCW could improve satisfaction.

Table 1: Demographics of the respondents (n=277)

Variables	Frequency (%)
Gender	
Male	58 (20.94)
Female	219 (79.06)
Age	
18-29	70 (25.27)
30-39	110 (39.71)
40-49	49 (17.69)
50-59	25 (9.03)
60-69	17 (6.14)
>70	6 (2.17)
Level of education	
No formal education	10 (3.61)
Primary school	13 (4.69)
Secondary school	126 (45.49)
University education	128 (46.21)
VC referral by healthcare worker suggestion	
Yes	222 (80.14)
No (Patient's own request)	55 (19.86)

Table 2: Respondent's opinion about the virtual clinic in Melaka (n=277).

Question	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Did you received clear instruction before enrolment to Virtual Clinic?	7 (2.53)	5 (1.81)	30 (10.83)	91 (32.85)	144 (51.99)
Do you agree that the virtual clinic can replace the normal physical clinic?	22 (7.49)	16 (5.78)	51 (18.41)	89 (32.13)	99 (35.74)
Do you agree that Virtual Clinic can help to reduce the risk of infection transmission?	6 (2.17)	4 (1.44)	22 (7.94)	73 (26.35)	172 (62.09)
Do you agree that Virtual Clinic can reduce the congestion in clinic?	5 (1.81)	6 (2.17)	22 (7.94)	58 (20.94)	186 (67.15)
Did you feel reassured with your health during COVID-19 pandemic because of Virtual Clinic?	7(2.53)	2 (0.72)	27 (9.75)	74 (26.71)	167 (60.29)

Table 3: Associated factor for Virtual Clinic satisfaction by Multiple Logistic Regression analysis (n=277)

Variable	Adjusted OR	95% CI	P-Value
*VC referral by healthcare worker suggestion			
Yes	7.103	1.42, 35.50	0.017

*Adjusted for gender, age and level of education

Conclusions

The patients were generally satisfied with the VC services. Satisfaction was significantly higher in patients enrolled to the VC by HCW suggestion compared to those enrolled by their own request. Thorough information should be given to all patients, particularly to those who request the service of their own accord.

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FHSMPP14/110 : Management Of Suspected Acute Coronary Syndrome In Emergency Department Of A University Hospital

Nur Aimimastura Berahim[1], Maznah Dahlui[2], Hafiz Jaafar[2,3], Amirah Azzeri[2,3], Aidawati Bustam[4], Abdul Muhaimin Noor Azhar[4], Mas Ayu Said[1]
[1] Department of Social Preventive Medicine, Faculty of Medicine, University Malaya
[2] Department of Research, Development and Innovation, University Malaya Medical Centre
[3] Department of Primary Care, Faculty of Medicine and Health Sciences, University Sains Islam Malaysia
[4] Department of Emergency Medicine, University Malaya Medical Centre
Corresponding author's email: aimiwahab@gmail.com

Summary
This study aimed to investigate the number of suspected cases of acute coronary syndrome (ACS) and evaluate the management practices in an Emergency Department (ED). Data were collected from electronic medical records of 86 patients presenting to the ED with ACS-related diagnoses. The majority of cases were ACS, with unstable angina being the most prevalent. Male patients and those of Malay ethnicity comprised a significant proportion. The majority of the patients presented with chest pain and came as walk-in patients while ambulance utilisation was low. Most cases were triaged as yellow cases. The median length of stay (LOS) in the ED was 9.46 hours, longer for NSTEMI cases, complicated cases, and admitted patients with majority of patients admitted to the general ward. The study highlights the need for efficient triage, timely interventions, and appropriate disposition strategies to improve ACS management in the ED and reduce patient length of stay.

Keywords
emergency services, suspected acute coronary syndrome, management practice

Introduction
As a subset of ischaemic heart disease (IHD), ACS is ranked as the highest disease burden of all cardiovascular diseases, accounting for half (49.8%) of total cardiovascular deaths globally (1, 2). Mortality remains high in South Asia with the highest years of life lost, reflecting both larger population and early onset of IHD (2, 3). In Malaysia, IHD remains the principal cause of death with 17.0% of total medically certified deaths in 2020 (4). Time is often regarded as muscle in ACS management and the goal of the ED is to perform a rapid assessment, establish an early diagnosis, and initiate appropriate therapy promptly. Failure to definitively diagnose patients in the ED can lead to unnecessary admissions, increasing healthcare expenditure and treatment costs. Conversely, unintentionally discharging patients with acute myocardial infarction puts their safety at risk. Hence, this study aims to describe suspected cases of ACS and assess the management practices within the ED at a University Hospital.

Materials and Methods
This is a cross-sectional study, using data from electronic medical records of patients who presented to the ED between June and September 2022, with diagnoses related to ACS according to the ICD-10 codes. A total of 86 patients were included in the data analysis, encompassing sociodemographic information, clinical characteristics, ED management and outcomes.

Results and Discussion

The findings revealed that ACS accounted for 80.23% of all 86 suspected cases. Of all ACS cases, unstable angina was the most prevalent type (n=40, 58.0%), followed by non-ST elevation myocardial infarction (NSTEMI) (n=22, 31.88%) and ST-elevation myocardial infarction (STEMI) (n=7, 10.12%). These proportions help in understanding the distribution and relative frequency of different types of ACS presenting to ED. It's important to note that despite 17 cases (19.77%) not being diagnosed as ACS, with majority of them being discharged (n=14, 82.35%), they would still utilise similar resources as ACS cases, particularly during the initial assessment and investigations.

The majority of suspected ACS patients were male (n=59, 68.6%), with a higher proportion of Malay ethnicity (n=35, 40.70%). The mean (±SD) age of the patients was 59.87 years (± 14.06), and a significant majority (n=77, 89.53%) had pre-existing medical conditions. These gender, ethnicity, and age distributions in this facility were similar to the previous report by National Heart Association Malaysia (5).

The primary presenting symptom was chest pain (n=68, 79.07%), followed by shortness of breath (n=13, 15.12%). This is consistent with classic symptoms of ACS, however, healthcare providers should also have a high index of suspicions for cases presented with respiratory symptoms. Approximately 20 (23.26%) cases were classified as complicated ACS cases. This indicates that about a quarter of the cases may need higher resource utilisation while being treated. It is important to highlight that the utilisation of ambulances was relatively low (n=3, 3.49%) indicating potential gaps in timely emergency medical services. Initiation of treatment for suspected ACS cases may be delayed as it can be started during the ambulance transport itself should they use the ambulance services. Regarding ED management, 27 (31.40%) cases were triaged as red (highest priority), while 58 (67.44%) were categorised as yellow (urgent but non-emergency). The triage was based on patient symptoms and general conditions and helped guide resource allocation and ensure timely care. However, there was also a patient investigated for ACS treated in Green Zone which may have negative implications to patient.

The median (IQR) length of stay in the ED was 9.46 (5.0) hours, with significantly longer stays (median, Q1-Q3) observed for NSTEMI (9.68, 6.34-13.83) compared to other diagnoses (p-value <0.001), complicated cases (10.59, 6.18-14.12) compared to uncomplicated cases (7.75, 5.43-9.63) (p-value <0.05), and admitted patients (8.55, 6.55-11.92) compared to discharge (4.73, 3.10-8.03) and AOR discharge (7.65, 6.58-19.32) (p-value <0.001). These findings highlight the need to streamline processes, implement efficient workflows, and optimize resource utilisation to reduce ED overcrowding and enhance patient flow. The disposition outcome indicated that 66 (76.74%) patients were admitted, with 57 (86.15%) admitted to the general ward and 9 (13.85%) to the intensive care unit. A small proportion (n=1, 1.16%) of patients were directly sent to the cardiac catheterisation lab. These findings reflect the severity and resource requirements of ACS cases.

Conclusion

These findings offer valuable insights into the epidemiology, clinical presentation, management, and outcomes of suspected ACS cases in the ED, emphasizing the

necessity for efficient triage, timely interventions, and appropriate disposition strategies to optimize patient care and outcomes. Further research is needed to explore potential strategies for improving ACS management in the ED and reducing patient length of stay.

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FHSMPP15/113 : eHealth Literacy Of Pharmacy Students At A Malaysian Public University

Siti Nur Zawana Miscon, Aisyah Saad Abdul Rahim
Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia
Corresponding author's email: aisyahsaad@gmail.com

Summary

Healthcare professionals and the public are increasingly turning to the Internet as a source of health information due to its convenience and accessibility. As future pharmacists, pharmacy students must have high eHealth literacy and skills to look for, comprehend, evaluate and appraise health information available on electronic sources to deliver better pharmaceutical services for optimal patient outcomes. This study aimed to investigate the level of eHealth literacy amongst pharmacy students at a Malaysian public university. Our results found that more than half of the students (57.2%) demonstrated high eHealth literacy with an eHEALS score of 32 and above (out of 40). The majority of the students were also familiar with the available health resources. However, only 58.6% of respondents felt confident about using information from the Internet to make health-related decisions. This finding was consistent with the previous study (1). Pharmacy students would benefit from training programmes designed to improve their skills and confidence in appraising and curating health information for better patient outcomes.

Keywords
eHealth literacy, public health, health information, pharmacy students.

Introduction
Rapid growth and development of information technology has significantly impacted the healthcare system. In the digital era, the Internet has become one of the primary sources of health information (2). However, the credibility of the information obtained on the Internet may be an issue which could lead to false health information, resulting in poor health decisions and, thus, poor health outcomes. Good eHealth literacy will empower patients and healthcare practitioners, including pharmacists, to make decisions and engage in public health and wellness (1,3). Currently, there is only one study on the eHealth literacy of pharmacy students in Malaysia (1). Due to the dearth of studies, we aimed to investigate the level of eHealth literacy amongst pharmacy students at Universiti Teknologi MARA (UiTM) Puncak Alam using the validated eHealth Literacy Scale (eHEALS) instrument (4).

Materials and Methods
Participants were recruited using convenience sampling. The inclusion criteria of the study were pharmacy students at the Faculty of Pharmacy UiTM Puncak Alam. The exclusion criteria were lecturers, staff and students of UiTM Puncak Alam from other programmes and pharmacy students from other universities. This cross-sectional survey was conducted from March to May 2023 at UiTM Puncak Alam. It employed the questionnaire adapted from Blebil et al. (1). After obtaining ethical approval from UiTM Research Ethics Committee (REC(PH)/UG/072/2023), the questionnaire in Google Forms was distributed to all pharmacy students at the Faculty of Pharmacy. A total of 254 respondents completed the questionnaire. This work presents initial data on pharmacy students' demographics and eHEALS scores from Year 1 to Year 4.

Results and Discussion
Table 1 shows that 31.1% of the respondents were Year 3 students. Most students owned both smartphones and tablets (84.6%), which is 5.5-fold greater than having only smartphones. The majority of students agreed or strongly agreed that they know how (98.4%), what (94.9%) and where (93.3%) to find helpful online health resources and how to use online health information to help themselves (95.3%) (Table 2). However, only 58.6% of respondents felt confident about using information obtained from the Internet to make health-related decisions. Several students indicated that they lacked the skill to evaluate information (29.1%) and had difficulties differentiating the quality of health resources (33%). The median eHEALS score of the participants was 32 ± 2.0 (interquartile range, IQR).

The evaluation of eHealth literacy presented in Table 2 was consistent with the previous study (1). One-third of pharmacy students indicated they lacked sound judgement and confidence to make health decisions based on information from the Internet. More than half (57.2%) demonstrated high eHealth literacy levels with an

eHEALS score of 32 and above (out of 40). This result is higher than the previous study that reported a median eHEALS score of 31 ± 3.0 (IQR) for 65.3% of Malaysian pharmacy student respondents from private and public universities (1). The high level of eHealth literacy may be because younger generations are more familiar with technology and have greater access to online resources.

Table 1: Demographic characteristics of participants (n=254)

Characteristics	**n**	**%**
Year of study		
Year 1	67	26.4
Year 2	57	22.4
Year 3	79	31.1
Year 4	51	20.1
Which devices do you own?		
Smartphone	39	15.4
Smartphone and tablet	215	84.6

Table 2: eHealth Literacy Scale (eHEALS) (4)

eHEALS statement (n=254)	**n (%)**					**IQR**
	SD	**D**	**U**	**A**	**SA**	
I know how to find helpful health resources on the Internet	0 (0.0)	1 (0.4)	3 (1.2)	222 (87.4)	28 (11.0)	4.0 (0)
I know how to use the Internet to answer my health questions	0 (0.0)	1 (0.4)	21 (8.3)	190 (74.8)	42 (16.5)	4.0 (0)
I know what health resources are available on the Internet	0 (0.0)	0 (0.0)	13 (5.1)	220 (86.6)	21 (8.3)	4.0 (0.0)
I know where to find helpful health resources on the Internet	0 (0.0)	0 (0.0)	17 (6.7)	226 (89.0)	11 (4.3)	4.0 (0)
I know how to use the health information I find on the Internet to help me	0 (0.0)	0 (0.0)	12 (4.7)	227 (89.4)	15 (5.9)	4.0 (0)
I have the skills I need to evaluate the health resources I find on the Internet	0 (0.0)	12 (4.7)	62 (24.4)	169 (66.5)	11 (4.3)	4.0 (1)
I can tell high-quality from low-quality health resources on the	0 (0.0)	9 (3.5)	75 (29.5)	146 (57.5)	24 (9.4)	4.0 (1)

Internet						
I feel confident in using information from the Internet to make health decisions	0 (0.0)	14 (5.5)	91 (35.8)	137 (53.9)	12 (4.7)	4.0 (1)

Notes: SA=Strongly agree; A=Agree; U=Undecided; D=Disagree; SD=Strongly disagree. IQR=interquartile range

Conclusion

Our study found that pharmacy students at UiTM Faculty of Pharmacy demonstrated high eHealth literacy. However, they were still experiencing difficulties in evaluating and applying online health information. Training programmes for improving students' eHealth literacy, such as Internet usage skills, are therefore crucial. Ideally, the programmes should begin at the university to enhance student skills and confidence in the appraisal and curation of health information for better patient outcomes in the digital era.

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FHSMPP16/123 : Malaysia National Health Accounts (MNHA) Out-of-pocket (OOP) Health Expenditure Estimates Using Integrative Approach

Ellyana Mohamad Selamat[1], Premila Devi Jeganathan[1], Hishamuden Alias[1], Anegala Periana Kovindear[1]
[1]Malaysia National Health Account, Planning Division, Ministry of Health
Corresponding author's email: ellyana@moh.gov.my

Summary

Tracking out-of-pocket (OOP) health expenditure is essential to monitor and understand the financial burden placed on individuals and households in accessing

healthcare services. This study aimed to explore the methodology when generating timely annual reports on OOP health expenditure estimation using the nationally adapted Malaysia National Health Accounts (MNHA) framework. The integrative approach used in Malaysia when producing National Health Accounts (NHA) encompasses exploring and balancing expenditure flows from both sources' and providers' perspectives. The OOP health expenditure for year 2021 amounted to 31.5% of the total expenditure in health (TEH) is considered high when benchmarking against other high-income countries.

Keywords
Malaysia National Health Accounts, out-of-pocket (OOP), integrative approach

Introduction
OOP health expenses can create financial hardship by forcing people to choose between health expenses and other necessities. By tracking national out-of-pocket health expenditure, policymakers, researchers, and public health officials can gain insights into the affordability and accessibility of healthcare services within a country. OOP health expenditures are spending made by individuals for their own or another individual, who could be a family or a household member, for the purchases of health care services or products without the benefit of insurance or third-party reimbursement (1). MNHA under the Planning Division of the Ministry of Health (MOH) uses the integrative approach when estimating the national OOP health expenditure based on the standardised and internationally accepted NHA framework (2). This study was aimed to explore the methodology when generating timely annual reports on OOP health estimation using the nationally adapted MNHA framework.

Materials and Methods
The integrative approach takes into account several different health expenditure flows from various perspectives, including sources of financing (e.g., private health insurance schemes, MOH's user charges, Household Expenditure Survey) and providers' aspect (e.g., private hospital and clinic surveys) (2). Gross OOP expenditure encompasses reconciled data from multiple sources, which is further classified into Non-residual Items (NRI) and Residual Items (RI). Estimating OOP health expenditure becomes challenging when reimbursement occurs. Reimbursement can occur through multiple channels such as private insurance enterprises, private corporations, the Employees Provident Fund (EPF), the Social Security Organisation (SOCSO), and other agencies. This reimbursed expenses if reported as OOP pose a risk of overestimation. To mitigate this, the recommended best practice is to conduct third-party deduction (TPD) during analysis. Also, under the MNHA framework, the OOP spending is inclusive of spending for health-related functions such as education and training.

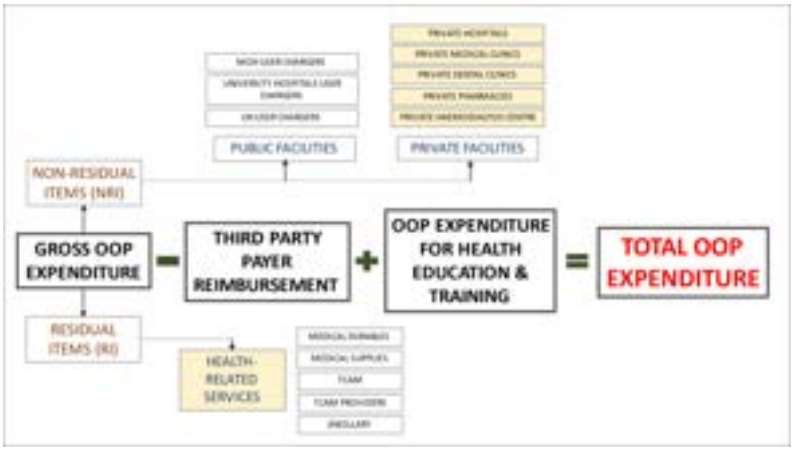

Figure 1: Integrative Approach Methodology under the MNHA framework

Results and Discussion

In 2021, the OOP health expenditure amounted to RM24,643 million, equivalent to 31.5% of the TEH. The OOP health expenditure from 2011 to 2021 had an increasing trend from RM11,466 million to RM24,643 million. When looking at the provider perspective, OOP expenditure was highest for private hospitals at RM11,423 million or 46.4% of total OOP expenditure. For function, outpatient services took up RM9,983 million or 40.5% of total OOP expenditure. MNHA's OOP estimation generated based on an integrative approach throughout the time series enables policymakers to identify the year-on-year growth and trends. This contributes to the development of evidence-based policy that will directly assist in monitoring the presence of catastrophic health expenditure in the country. Under the Universal Health Coverage (UHC) framework, countries aim to reduce OOP payments and increase the proportion of healthcare financing through prepayment mechanisms (3). This is to ensure that people have access to healthcare services when needed without experiencing financial hardship. Globally total health expenditure shows an increasing trend, giving rise to the need for comparable international data. The advantage of using a standardised method like NHA when producing OOP estimation is that it allows for the homogeneity of data produced and ensures better cross-country comparability. While there is no specific target percentage, many countries strive to keep the OOP health expenditure as low as possible, with benchmarking to high-income countries with well-established healthcare systems that have achieved relatively low OOP expenditure, often below 20% of total health expenditure (4). Producing good private spending data using standardized methods is crucial for facilitating country comparisons and enhancing benchmarking value. An integrative approach that combines source and provider data yields more reliable estimates, enables the inclusion of new relevant data, and allows for potential error adjustments.

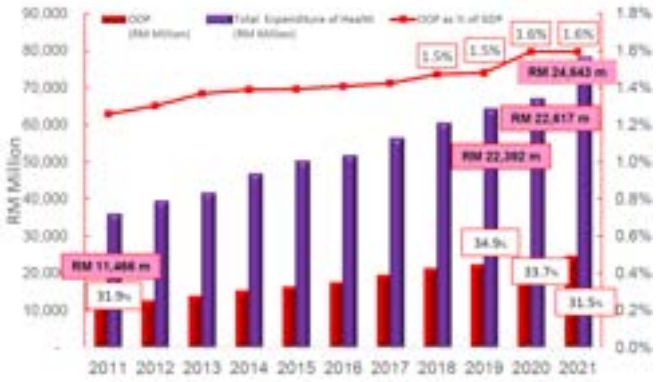

Figure 2: OOP health expenditure time series 2011-2021

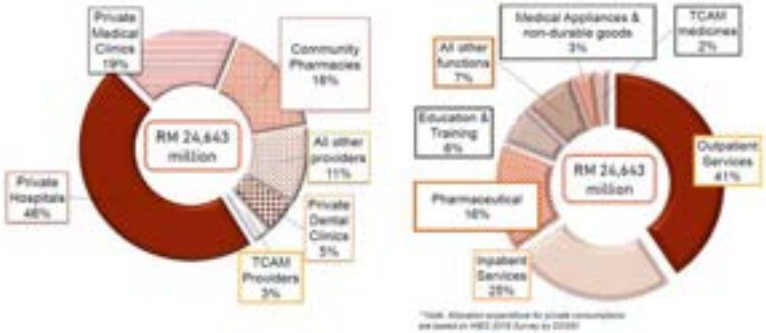

Figure 3: OOP expenditure for Providers (left) and Functions (right) of healthcare, 2021

Conclusion

Malaysia's OOP health expenditure is on rise, accounting for 31.5% of total expenditure in health (TEH), high compared to other high-income nations. Tracking OOP health expenditure provides evidence-based information for policymakers, aiding evaluation of affordability and accessibility of equitable health care services.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

FHSMPP17/114 : Gender Differences In Perceived Psychological Distress Of Infertility Among Malaysian Infertile Men And Women

Noor Izni Mohamed Shapie [1], Nik Daliana Nik Farid [2], Rafdzah Ahmad Zaki [2]
[1] *Miri Divisional Health Office, Ministry of Health Malaysia*
[2] *Department of Social and Preventive Medicine, Faculty of Medicine, Universiti of Malaya, Malaysia*
Corresponding author's email: drnoorizni@gmail.com

Summary
Infertility, a disease of the reproductive system, frequently results in negative consequences, psychological distress, debilities and impairment of quality of life. This study aimed to investigate the psychological distress of infertility among infertile men and women in Malaysia. The results proved that both genders, men and women experienced psychological distress with regard to infertility. Nevertheless, infertile women had a significantly higher level of stress, anxiety and depression as compared to infertile men. Therefore, early psychological intervention and management are needed to prevent further detrimental mental health issues. Public awareness is also warranted to curb the stigmatisation of infertility.

Keywords
Psychological distress, infertility, depression, anxiety, stress

Introduction
Infertility is a traumatic and stressful situation that affects both couples. According to the World Health Organization (WHO), more than 80 million people globally are facing difficulties in trying to conceive their offspring at some point in their life (1). The rates of infertility differ between countries, ranging from less than 5% to more than 30% and it is projected that one in ten couples will face infertility (1). Based on the available literature, it is a major life crisis with diversified consequences. It could cause harmful social repercussions and psychological distress on both the affected (2). In Malaysia, despite the escalating incidence of infertility, the study on the psychological distress of Malaysian infertile individuals is still scarce.

Materials and Methods
This was a cross-sectional study using universal sampling. The sample size to estimate the number of Malaysian infertile men and women needed was calculated using the "Power and Sample Size" (PS) software, Version 3.0.43. A two-proportions formula using ca ross-sectional study was used based on a previous local study (3). Respondents from the fertility clinic of the National Population and Family Development Board (LPPKN), Kuala Lumpur, Malaysia and not known to have psychiatric disorder or organic brain disease were recruited between February and April 2016. A total of 502 participants participated in the study. Data collection was carried out via self-administered validated assessment tool, Malay language DASS-21 (BM DASS-21) Questionnaire. Descriptive analysis and logistic regression analysis were employed. All data were analysed using SPSS version 20.0.

Results and Discussion

The study revealed the presence of a significant difference between gender in psychological distress. From the results, it was evident that both genders experienced depression, anxiety, and stress concerning infertility. Out of 502 participants, 35.8% women and 26.8% men had depression, 64.9% women and 50.2% men developed anxiety, and 38.7% women and 21.6% acquired stress. The foremost results of the Logistic Regression, the Crude Odd Ratio, showed that infertile women exhibited a significantly higher level of depression ($p<0.05$), anxiety ($p<0.05$), and stress ($p<0.05$) level compared to infertile men. However, after considering other factors (adjusted), women had a significantly higher level of stress ($p<0.001$) and anxiety ($p<0.05$) compared to men.

All infertile individuals will possibly face psychological ailments that progressively worsen as they cope with the ups and downs of 'emotional and physical roller coaster' of infertility and its treatment (4). This study proved the existence of a very significant association between gender and the outcomes of depression, anxiety, and stress, as infertile women were demonstrated to have a significantly higher level of the factors compared to infertile men. In other words, infertile women were more likely at risk of having severe or a higher level of psychological distress than infertile men. This is due to the socio-cultural expectation and pressure for married women to have their offspring (3,4). The unceasing requirement to undergo a series of invasive and complex fertility treatments often led the women to face the psychological problem (4). Scholars revealed that infertile men were agonised due to societal scrutiny, the pressure to have a child, and the issue of divorce; while women suffered most from the marital cacophony, mental collapse, high expectations of the family and society, as well as the husbands' strong desire for offspring (5).

Table 1: Sociodemographic characteristics of Malaysian infertile men and women

Characteristic	Count (n=402)	Percentage (%)
Age (33.28 ± 5.101)		
≤ 34 years	336	66.9
> 34 years	166	33.1
Gender		
Male	231	46.0
Female	271	54.0
Ethnicity		
Malay	387	77.1
Chinese	38	7.6

Indian	69	13.7
Others	8	1.6
Education Level		
Primary school	4	0.8
Secondary school	148	29.5
Pre-university	126	25.1
University	224	44.6

Table 2: Gender differences in psychological distress among infertile men and women

Outcomes	Gender		*p*-value	95% C.I
	Men n=231(46%)	Women n=271(54%)		
Depression	62 (26.8%)	97 (35.8%)	0.100	1.52 (0.92-2.52)
Anxiety	116 (50.2%)	176 (64.9%)	0.016	1.60 (1.09-2.33)
Stress	50 (21.6%)	105 (38.7%)	P<0.001	2.26 (1.51-3.38)

Table 3: The association of gender and depression, anxiety and stress (Adjusted Odd Ratio, AOR)

Gender	Depression				Anxiety				Stress			
	AOR	p-value	95% CI LL	95% CI UL	AOR	p-value	95% CI LL	95% CI UL	AOR	p-value	95% CI LL	95% CI UL
Male	*Ref*				*Ref*				*Ref*			
Female	1.52	0.100	0.92	2.52	1.84	0.001	1.28	2.63	2.29	<0.001	1.54	3.41

Conclusion

The study revealed that both genders experienced psychological distress with regards to infertility. However, infertile women in Malaysia demonstrate a significant susceptibility to psychological distress than men. As childbearing is

considered as a right of every human being, thus, infertility should be addressed promptly with appropriate psychological intervention and strategies.

Acknowledgement
I would like to thank the Director General of Health of Malaysia, University Malaya Ethics Committee, and National Population and Family Development Board (LPPKN), Ministry of Women, Family and Community Development, Malaysia for granting me the permission to undertake this study. This study was partially funded by Post Graduate Research Grant, University of Malaya (Grant Number PG220-2015B).

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FHSMPP18 / 161 : The Predictors Of Overweight And Obesity Among University Students In Serdang, Malaysia

Zaahirah Mohammad[1], Azline Abdilah[2], Norliza Ahmad[3], Halimatus Sakdiah Minhat[3]
[1] *Rembau Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia*
[2] *Kuala Pilah Health District, Negeri Sembilan State Health Department, Ministry of Health Malaysia*
[3] *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
Corresponding author's email: zaahirah1166@hotmail.com

Summary
Being overweight or obese has become an increasingly common health issue involving individuals of all ages, particularly teenagers and young adults, and has become a burden globally. Furthermore, both were shown to increase the risk of many non-communicable diseases in later life. This study aimed to determine

predictors of overweight and obesity among undergraduate students. The results showed that the predictors for overweight and obesity among university students residing in Serdang were the age of 24 years old and above, male gender, and Indian and Malay ethnicity. Hence, relevant health education interventions for weight reduction should include and focus on the targeted group.

Keywords
Overweight, obesity, non-communicable diseases, university students, Malaysia

Introduction

The prevalence of overweight and obesity has been increasing over the last 20 years and has become a public health concern worldwide. Being overweight and obese are predisposing factors for many non-communicable diseases in later life, such as type II Diabetes mellitus, cardiovascular diseases, hypertension and hypercholesterolemia, and certain types of cancer (1). Both conditions were previously perceived as diseases of a middle-aged group, but now the conditions have also affected an increasing percentage of young adults. Previous studies showed that young adults, particularly university students, seem to be prone to weight gain during their study years (2). Currently, there is a lack of studies conducted on young adults or university students in Malaysia, as most studies were conducted among the general adult population. Therefore, this study is proposed to examine the predictors associated with overweight and obesity among university students.

Materials and Methods

This was a cross-sectional study conducted among undergraduate students residing at the University of Putra Malaysia from September 2017 to July 2018. Three residential areas were randomly selected. The respondents from each residential area were selected by applying probability proportional sampling. Data for the study was collected using a validated and reliable self-administered questionnaire and anthropometric measurements (weight and height to calculate BMI). The data were analysed using IBM Statistical Package for Social Science (SPSS) version 23, and multiple logistic regression was used to determine the predictors. A value was set below 0.05. Independent variables in this study were age, gender, monthly household income, course, knowledge of physical activity and dietary intake, physical activity, dietary intake, smoking status, sleep duration, sleep quality, and stress.

Results and Discussion

A total of 494 respondents participated in this study. The response rate was 98.8%, and the prevalence of overweight and obesity was 38.1%. The predictors of overweight and obesity among the respondents were the age group of 24 years and above (AOR = 2.671), Malay ethnicity (AOR = 5.34), Indian ethnicity (AOR = 7.155), and male (AOR = 1.818). In this study, age 24 and above was a predictor, as the level of physical activity decreased with age, and it is believed that final-year students spent less time doing physical activities as they were more likely to devote more time to studying for final-year exams. The second predictor was male gender; this is similar to a few studies that were conducted among university students in 22 countries in 2014, which showed a significant association between

males and overweight and obesity (4). This might be due to the fact that females have better health-seeking behaviours than males; hence, they choose lower-calorie foods and are more likely to engage in weight loss programs. Nevertheless, the final predictor was ethnicity. From this study, Indians and Malays are 7 times and 5 times, respectively, more likely to be overweight or obese compared to other ethnicities. A 2014 study on the association between ethnicity and food intake showed that the types of dishes and ingredients, dietary taboos and restrictions, rituals, forms, and structure of meals all play major roles in determining what kind of food the family eats and eventually become part of their culture (5).

Table 1: Descriptive analysis of sociodemographic and BMI characteristics among respondents in the study (n=494)

Independent variables		Median (IQR)	Frequency, n	Percentage, %
Age (years)	**18-20**	21(1)	110	22.3
	21-23		337	68.2
	24 and above		47	9.5
Ethnicity	**Malay**		379	76.7
	Chinese		76	15.4
	Indian		14	2.8
	Others		25	51.1
Gender	**Male**		145	29.4
	Female		349	70.6
Monthly Household Income	**Less than RM2000**	3000(3200)	127	25.7
	RM2000-RM3999		167	33.8
	RM 4000 and more		200	40.5
BMI	**Underweight**	21.64(5.69)	59	11.9
	Normal weight		247	50
	Overweight		113	22.9
	Obese		75	15.2
Study Course	**Physical Education**		42	8.5
	Engineering		110	22.3
	Biology		36	7.3
	Business Administration		27	5.5
	Environmental Study		86	17.4
	Food Technology		92	18.6
	Science Computer		101	20.4

Table 2: Predictors of overweight and obesity among university students in Serdang

Variable	ß	SE	Wald	p - value	Adjusted Odds Ratio	95% CI

						Lower	Upper
Age Group							
18-20 years old					1.000		
21-23 years old	0.321	0.239	1.801	0.180	1.379	0.862	2.205
24 and above	0.983	0.369	7.109	0.040*	2.671	1.297	5.500
Ethnicity							
Others					1.000		
Malay	1.675	0.628	7.119	0.080*	5.34	1.56	18.283
Chinese	0.619	0.681	0.826	0.363	1.858	0.489	7.063
Indian	1.968	0.829	5.637	0.018*	7.155	1.41	36.311
Gender							
Female					1.000		
Male	-0.598	0.208	8.286	0.040*	1.818	1.210	2.732
Constant	-2.465						

*Significant value: p-value <0.05

Conclusion

The predictors associated with overweight and obesity among university students in Serdang were those aged 24 and above, male gender, and Indian and Malay ethnicity. Hence, programs and policies should be directed to these high-risk groups as identified in this study.

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FHSMPP19/138 : Challenges Of Community Participatory Approaches In Public Health Research To Uncover The Gendered Impacts Of COVID-19 On Essential Care Workers

Anis Farid[1], Shazana Agha[1], Abinaya Mohan[1]
[1] Women's Aid Organisation
Corresponding author's email: anis@wao.org.my

Summary
In undertaking a project to understand the gendered impact of COVID-19 on essential care workers, community participatory approaches remain invaluable in centring the lived experiences of those most impacted. To facilitate the involvement of essential care workers as interlocutors and community advocates, the project employed a participatory approach to involve community members as Research Associates who were trained to conduct focus group discussions. This extended abstract discusses some critical challenges encountered, including translating academic concepts into practical tools for easier access, as well as administering and fine-tuning modules.

Keywords
Community, participatory approaches, public health, COVID-19, carework

Introduction
The Endemicity, Care, and Gender: Towards Developing Resilience in Malaysia's Care Workforce and Infrastructure (RE: CARE) Project is working to uncover the gendered impacts of the COVID-19 pandemic on essential care workers by examining their paid and unpaid care work burden.
Care work has long been disproportionately shouldered by women, both professionally and at home. The situation was exacerbated by COVID-19, despite the move towards endemicity. Endemicity, though debated, is generally understood as the point where the disease is constantly present but no longer constitutes an active crisis (Samuel, 2022). Essential care workers, including healthcare workers, and their experience during the pandemic in Malaysia, remains understudied, a stubborn blind spot which must be addressed to develop policies which can better support Malaysia's essential care workforce and infrastructure. However, crucial to this goal, is the need for data collection practices to centre the experiences of those who were on the frontline.

Materials and Methods
To centre the experiences of essential care workers, it was necessary to employ a participatory approach, which is defined as the "co-construction of knowledge through partnerships between researchers and those affected by/involved in the phenomenon under study" (Wilkinson and Wilkinson, 2017).

By centring the perspectives of a diverse range of stakeholders directly impacted by care policies, we shape the research as a collaborative process through partnership(s), recognising and utilising the distinct strengths of the individuals involved. This approach shifts care workers' roles from a 'group under study' to one actively engaged in the process of developing resilient, inclusive policies. We were interested in the involvement of those from marginalised communities, such as hospital cleaners, careworkers in rural areas and migrant workers to name a few, as part of mutual knowledge-building processes. This participatory approach was employed in further refining both data collection tools developed and training manuals to equip Research Associates with the skills to implement the project.

Figure 1. Groups of those classified in the project as essential care workers

Results and Discussion

Individuals, from the selected essential care worker communities, partook as Research Associates. Their titles were chosen to reflect their crucial role in the research process, not merely as data collectors, but as individuals who were actively invited to contribute their perspectives throughout the processes.

The initial tools were developed by the research team, consisting of Women's Aid Organisation (WAO) and professors from the University of Alberta and Universiti Malaya, and were shared with the Research Associates, who represented the essential care worker community. Through collaborative discussions, these tools were refined. A few challenges were faced in this process.

One of the biggest challenges was attempting to disseminate academic concepts and knowledge in understandable ways. As rigorous research necessitates adherence to academic protocols, finding ways to administer data collection methods, such as focus group discussions, in ways that were practical to the essential care worker community required translating concepts not only from English to Bahasa Malaysia, but from academia to practice. Modifications that were made included ensuring that the Research Associates understood the intent of the questions, to allow freedom to express difficult concepts in ways more easily

understood to their community. Additionally, translation processes involved community translators to ensure translated materials were faithful to how the communities would speak. This resulted in guides created in Bahasa Malaysia, Bahasa Indonesia, and Tagalog.
Questions from the interview schedule were customised with feedback from Research Associates to reflect the experiences of particular communities. For example, with hospital cleaners, they recommended capturing the sanitisation SOP changes as a result of COVID-19 and how exactly to probe this, creating a data collection tool that better reflected the lived experiences of hospital cleaners.

Conclusion
The approach is unique because research occurs at an intersection between academia, civil society, and community—bringing different perspectives and understanding of care work and the shape it took during COVID-19 and into endemicity. In involving Research Associates who represent their community, the research is more sensitised.

Acknowledgments
This abstract is part of a research project funded by the Women RISE Initiative, supported by the International Development Research Centre (IDRC), the Canadian Institutes of Health Research (CIHR), the Social Sciences and Humanities Research Council of Canada, and the African Population and Health Research Center (APHRC). The RE:CARE Project team is helmed by Women's Aid Organisation (WAO), in collaboration with Professor Dr. Shanthi Thambiah, from Universiti Malaya, Gender Studies Unit, and Dr. Denise Spitzer, from the University of Alberta School of Public Health, with the support of the Ministry of Health Malaysia and TalentCorp Malaysia. The WAO is also supported by Yayasan Sime Darby (YSD).

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FHSMPP20/164 : The Effectiveness Of IFitER Program At Wellness Hub Alor Setar In 2022

NorejanNordin[1], Mahiran Abu Bakar [2], Anis Anina Samhan[1], Zaharawati Zakaria[1,]
[1] *KotaSetar District Health Office*
[2] *Kedah State Health Department*
Corresponding author's email: norejan@moh.gov.my

Summary

People with a BMI of 25 or higher are termed overweight, while those with a BMI of 30 or more are classified as obese; this results in abnormal or excessive fat storage, which poses health risks. The Malaysian Ministry of Health has launched the I Fit and Eat Right (IFitEr) Programme in every Wellness Hub, which is a Health Promotion Centre in every state in Malaysia, to assist persons who are overweight or obese. Furthermore, the programme supports community participation in weight-control initiatives and the maintenance of healthy lifestyles. Its application at the Wellness Hub Alor Setar 4 series demonstrates how effective this programme is.

Keywords
IFitErProgram, Wellness Hub AlorSetar, effectiveness, BMI.

Introduction
Being overweight or obese is widely recognized as one of the major chronic diseases in the world. According to the 2019 World Population Review Report, Malaysia has the highest obesity rate (15.6%) in Southeast Asia, followed by Brunei (14.1%), Thailand (10.0%), and Indonesia (6.9%). Statistics have also shown that 50.1% of Malaysian adults are overweight or obese (NHMS 2019). This is brought on by a sedentary lifestyle and poor eating habits. Being at home is not a justification for not leading a healthy lifestyle. Hence, IFitER Program was introduced by the Ministry of Health Malaysia (MOH) as an intervention module for weight reduction.

Materials and Methods
A retrospective study of the 4IFitEr series (2 series were carried out face to face over a period of 6 months and 2 virtual programs that were done in 3 months period) at Wellness Hub Alor Setar, Kedah in 2022. The percentages of weight loss, fitness improvements and the number of participants who remained throughout the intervention are all included in this study.

Results and Discussion
IFitEr Program series 1 and 4 were done face to face or in person together with the coach at Wellness Hub Alor Setar. Upon registration, all participants were requested to go through all the tests (weight, blood pressure, glucose, BMI, fitness, diet recall and routine activities) as their based line data. These data were taken every month as their progress monitoring. Besides that, the participants were also encouraged to have their own social support such as group or team support and counselling. Meanwhile IFitER program series 2 and 3 which were conducted through online were called MyVIFitEr or Malaysia Virtual IFitER. The participants of these programs were requested to measure and update their progress and activities on their own every week via the WhatsApp application which were closely monitored by the coach. The results of IFitER program showed (Table 1) that the first group had 22 participants, 95% had lost some weight, 86% had increase their fitness level and 95% of participants had remained until the end of the intervention. The second group were comprised of 28 participants, 65% of them lost some body weight, 26% had an average increase in fitness level and 96% of them stayed until the end of the intervention. Meanwhile the third group had 14

participants, 87% of them had lost some body weight, 71% had an increase in fitness level, and 92% completed the program. The last group had 21 participants, 63% had lost weight loss was, 37% increased their fitness level and 90% of managed to stay until the end of the intervention.

Table 1: Descriptive results of 4 series IFitEr Program at Wellness Hub AlorSetar in 2022

Observation factor	Series 1	Series 2	Series 3	Series 4
Number of participants	22	28	14	21
Weight loss (%)	95	65	87	63
Increased fitness level(%)	86	26	71	37
Participants remained until the end of the intervention(%)	95	96	92	90

Conclusion

Obesity or overweight poses a greater health danger if not overcome properly. IFitEr program either virtual or physical/face-to-face proved effective in assisting its participants to lose some weight which indirectly improve their health status and reduce the risk of morbidity and mortality.

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FHSMPP21/148 : Maternal And Child Factors As Determinants For Stunting Among Under Five Children In Kuantan, Pahang

Noraini Musa[1], Nor Azam Kamaruzaman[1], Hafizah Pasi[2], Iskandar Firzada Osman[3]
[1]Department of Family Medicine, Kulliyyah of Medicine, IIUM Kuantan, Pahang
[2]Department of Community Medicine, IIUM Kuantan, Pahang
[3]Klinik Kesihatan Jaya Gading, Kuantan, Pahang
Corresponding author's email: drhafizah@iium.edu.my

Summary

Worldwide, there were an estimated 144 million children with stunting, the commonest form of childhood malnutrition. The current knowledge gap about the leading causes of stunting can be filled by identifying the maternal and child factors as determinants of this public health problem. This study showed significant associations between lower birth weight, delivery week, and maternal height with an increased likelihood of stunting.

Keywords
Stunting, determinant, under-five children, Kuantan

Introduction
Stunting is the most prevalent form of malnutrition among the infant and young children population, both globally and locally. It refers to low height-for-age children and is primarily caused by chronic undernutrition. Preventing and early identification of stunting is critical before their growth status deteriorates further. The present data showed that 20% of Malaysian children were at risk for stunting. To characterize the stunting problem and understand why the prevalence is still high in local settings, it is crucial to identify the maternal and child factors with the potential to be the determinants of this public health problem. This study aimed to determine the association of stunting with maternal and child factors among children aged 6 to 59 months old and their caregivers in Kuantan, Pahang.

Materials and Methods
This was a case-control study involving 160 children aged 6 months-59 months old who attended seven health clinics in Kuantan from August to October 2021. With a ratio of 1 case: 3 control, 40 children with stunting were selected as cases and 120 non-stunted children as controls. Data were collected using an interviewer-guided questionnaire consisting of a sociodemographic profile, maternal characteristics, and child's birth and growth history. Data were entered and analysed using IBM SPSS version 26.0 (IBM Corp 2019). Simple Logistic Regression analyses were applied and all significant variables with p value less than 0.05 were then selected for the Multiple Logistic Regression analyses to find the actual association with stunting while adjusting for cofounders.

Results and Discussion
A total of 160 children (40 cases and 120 controls) participated in this study. Malay ethnicity comprised 91.9% of the total participants. The mean age in months for cases (27.2 ±14.1) was higher than controls (22.4 (±10.5). Additionally, female gender, siblings $\leq$ 2, and term pregnancy were notably higher in both groups. 99.4% of participants had received vaccination up to their age. The mean delivery week was found to be lower in cases than in controls [37.5 (±1.4) and 38.3 (±1.6)] similar to the mean birth weight which was lower in cases than in controls [2.6 ±(0.5)kg and 3.0 ±(0.5)kg]. Analysis has significantly found that: with an increase of one week in delivery week, there is a significant 40.0% reduction in the risk of becoming stunted (OR: 0.6 [95% CI 0.4-0.9], p-value: 0.035), and with an increase of one kilogram in birth weight, there is a significant 80.0% reduction in the risk of become stunted (OR: 0.2 [95% CI 0.1-0.7], p-value: 0.009) among the children.

For the maternal characteristics, the mean maternal height for cases (151.0 ±5.1cm) was lower than controls (155.4 ±6.0cm), while for maternal occupation and education level: housewives and secondary or higher education levels were higher in both groups. The mean household income for cases was noted to be lower than controls, RM 2567.5(±1843.3) and RM 3813.6(±2604.7) respectively. Almost all of the caregivers have treated water as a water source (98.8%) and a fridge for food storage (98.1%) at their homes. This study has significantly found that with an increase of one centimetre in maternal height, there is a significant 11.0% reduction in the risk of becoming stunted (OR: 0.89 [95% CI 0.82-0.98], p-value: 0.016) among the caregivers. Other factors were found not to be significantly associated with stunting after adjusting for other cofounders.
These findings concurred with other studies which had shown that lower birth weight, shorter delivery weeks, and lower maternal height as strong determinants of child stunting.

Table 1: Maternal and child factors with significant association with the stunting status of children among respondents

Variables	**Stunting**					
	Yes, n=40 (mean ± SD)	**No, n=120 (mean ± SD)**	**Crude OR (95% CI)**	***p-value***	**Adjusted OR (95% CI)**	***p-value***
Delivery week (week)	37.5 ± 1.4	38.3 ± 1.6	0.7 (0.6-0.9)	0.006	0.6 (0.4-0.9)	0.035*
Birth weight (kg)	2.6 ± 0.5	3.0 ± 0.5	0.2 (0.1-0.5)	<0.001	0.2 (0.1-0.7)	0.009*
Maternal height (cm)	151.0 ± 5.1	155.4 ± 5.9	0.9 (0.8-0.9)	<0.001	0.89 (0.82-0.98)	0.016*

*Significant at p<0.005
SD= standard deviation OR= odds ratio CI= confidence interval

Conclusion

Strategies to prevent childhood stunting must include improvement in maternal nutritional status and provision of early intervention from the antenatal period to prevent low birth weight as well as optimizing the delivery weeks. This study may offer an opportunity to review the current strategies, target the significant determinants which had been identified, and empower the community and healthcare providers for early identification and intervention to break the vicious cycle of stunting.

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FHSMPP22/21: The Effectiveness Of Segak-JomFit Kedah Trim & Fit (SJTF) Programme In Sik District, Kedah: A Pilot Intervention Study

Nora Saliza M.S[1]., Hadzri Z[1]., Noorul Emilin A.K.[1]
[1]*Pejabat Kesihatan Daerah Sik, Kedah*
Corresponding author's email: drnorasaliza@moh.gov.my

Summary
A pilot intervention study, the SJTF programme was conducted in 10 secondary schools in Sik District, Kedah between August and October 2022. The study's aim was intended to measure the effectiveness of this intervention program by determining the percentage of participants able to lose at least 5% of their initial body weight following a 3-months programme. Data from the SJTF programme were analysed via a descriptive analysis and pre and post-intervention comparisons were made. The findings showed that 71.0% achieved a significant weight reduction and 19.4% of the participants were able to lose at least 5% of their initial body weight. This study found that the SJTF Intervention Program may have a positive outcome in reducing obesity among adolescents.

Keywords
obesity, schoolchildren, weight intervention, collaboration

Introduction
The school health data for Sik District, Kedah showed an increasing prevalence rate for overweight and obese groups among school students from 0.6% in 2020 to 7.63% in 2022. Sik District, being the largest district and located in remote areas in Kedah with the least population density, has a higher prevalence and greater odds of obesity (Johnson and Johnson, 2015). Due to the worrying prevalence, the Sik District Education Office (DEO) and Sik District Health Office (DHO) in 2022 began a collaborative project for the SJTF Intervention Program against overweight and obesity among school students. The initial aim was to create awareness about obesity and empower participants with knowledge and skills in achieving an ideal

body weight. This project was the first intervention programme on weight management among school students that has been conducted in Kedah. The objective of this study was to measure the effectiveness of the intervention program by determining the percentage of participants able to lose at least 5% of their initial body weight following a 3-months programme.

Materials and Methods

The SJTF Intervention Program was carried out as a collaborative work between Sik District Education Office (DEO) and Sik District Health Office (DHO). A cross-sectional study involving 31 participants (aged 13–17 years old) from 10 secondary schools was conducted between August and October 2022. The participants were students with obesity problems, who did not have chronic health problems and who were committed to the programme. The intervention activities included a focus group discussion, health talks, food preparation, and exercise demonstrations, along with the participant checklist. Anthropometric measurements which included the weight (kilogram), height (meter) and BMI (kilogram/meter2) measurements were carried out monthly by trained staff nurses using the Seca 803 Digital Body Weight Scale, which was calibrated regularly according to schedule. A descriptive analysis was conducted, and the body mass index (BMI) pre and post-intervention were measured and tested via the Wilcoxon Signed Rank Test.

Results and Discussion

Table 1 shows that the majority of participants in the SJTF intervention program were aged 13–15 years old (58%). 74.2% of participants were male and mostly were from the Malay ethnicity (96.8%). Table 2 shows that 71.0% of participants achieved a weight reduction from their initial body weight, with 19.4% of participants able to achieve the program's objective of losing at least 5% of their initial body weight following 3-months of intervention. However, 3.2% had static body weight and 25.8% had increased body weight. Table 3 shows that among those who lost body weight, a significant difference was observed between the measured median BMI during pre-intervention and post-intervention BMI (median: 37.2; interquartile range: 10.8) versus 35.9 (10.7); p-value = 0.001).

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able 1: Demographic characteristics of SJTF intervention program participants

Variables	SJTF participants (n=31)	
	Frequency (n)	Percentage (%)
Age (years)		
13-15	18	58.0
16-17	13	42.0
Gender		
Male	23	74.2
Female	8	25.8

Ethnicity		
Malay	30	96.8
Chinese	0	0.0
Indian	0	0.0
Others	1	3.2

Table 2: Body weight status after SJTF intervention program

Variables	**3 months after SJTF**	
	Frequency (n=31)	**Percentage (%)**
Decreased body weight (total)	22	71.0
Decreased weight <5%	16	51.6
Decreased body weight ≥5%	6	19.4
Static body weight	1	3.2
Increased body weight	8	25.8

Table 3: The body weight status after SJTF intervention program and the pre and post BMI differences

Category	**n**	**%**	**BMI (Median (IQR))**		***p-value**
			Pre-intervention	**Post-intervention**	
Decreased body weight	22	71.0	37.2 (10.8)	35.9 (10.7)	<0.001
Static or increased body weight	9	29.0	37.0 (7.8)	37.9 (7.6)	0.012

**p-value based on Wilcoxon Signed Rank Test*

This pilot study, a three-month intervention to a voluntary group of obese and committed adolescents showed a positive outcome in reducing their weight. As this pilot project was only done for a short period of time, the percentage of reduction of at least 5% was small. According to Ahern et al. (2017), a 52-weeks intervention programme produced greater weight loss and other clinical benefits than a 12-week programme which is more cost-effective in the long term.

It was noted that nine adolescents had static and increased body weight because the intervention programme did not measure the actual knowledge, attitude and practice of the adolescents towards effectively reducing their weight. Besides that, the commitment to lose weight is undoubtedly influenced by family. The choice of cooking methods, the quality of food, and the quantity of food provided at home also play a role. At school, teachers can help monitor students' activities and caloric intake, but at home, students and their parents shoulder the responsibility. Thus, parental awareness and support are equally important to ensure the success of the SJTF intervention program. When a family intervention component is included in school-based programmes, PA and nutritional behaviour reinforcement at home are more likely to be successful (Brown and Summerbell, 2009). However, parental involvement in this pilot program was relatively limited.

Conclusion

This study found that the SJTF Intervention Program may have positive outcomes in reducing obesity among adolescents. The initiatives to combat obesity should start at a young age for generational impact. Collaboration between the Sik District Health Office and the Sik District Education Office to organise the SEGAK-JomFitKedah Trim & Fit intervention program has provided a good platform to overcome obesity among schoolchildren.

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FHSMPP23 84: Health Literacy Among Local Communities In A Protected Area Of Pahang National Park. Barriers And Strategies

Nor Aziah Abd Kadir[1,2], Amirah Azzeri[1*], Mohd Iqbal Mohd Noor[2,4], Mohd Hafiz Jaafar[1], Ratha Krishnan Suppiah[2], Zurina Kefeli[3]

[1]Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia (USIM), 71800, Nilai, Negeri Sembilan, Malaysia

[2]Faculty of Business and Management, Universiti Teknologi MARA (UiTM) Cawangan Pahang Kampus Raub, 27600 Raub, Pahang, Malaysia

[3]Faculty of Economics and Muamalat, Universiti Sains Islam Malaysia (USIM), Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan Malaysia

[4]Institute for Biodiversity and Sustainable Development (IBSD), Universiti Teknologi MARA 40450 Shah Alam Selangor Darul Ehsan Malaysia.

Corresponding author's email: amirah.azzeri@usim.edu.my

Summary

Health literacy plays a crucial role in empowering individuals' healthy decision-making. However, protected area communities face unique challenges that hinder their health literacy levels. This study explores the barriers and strategies to improve health literacy among communities in protected areas through a focus group discussion. The result highlighted barriers like education, infrastructure, and finances. Strategies to enhance health literacy are also proposed to be implemented through community-based intervention programs. By addressing

these barriers and strategies, policymakers and health providers can promote health literacy and improve community health outcomes.

Keywords
barriers, health literacy, protected areas, strategies

Introduction

Health literacy is an individual's ability to access, comprehend, evaluate, and apply health-related information daily (Schillinger, 2020). It is increasingly recognized as one of the most crucial social determinants. However, previous research shows that the level of health literacy among populations still needs to be higher and more adequate (Jaafar et al., 2021). This study examines the local community in protected regions impacted by conservation legislation. Protected areas are usually far from the main roads. Thus, the neighbourhood struggles to access schools and other institutions. Massive development in protected areas is prohibited since it could damage ecosystems and environmental sustainability. People battle to increase network, health, and other access. These conditions restrict their socioeconomic status. Living in a protected area limits their health knowledge. This study examines ways to promote health literacy in Pahang National Park (PNP) protected area.

Materials and Method

We conducted a focus group discussion (FGD) among stakeholders representing the institutional actors in the case study area. Therefore, in this study, the actors are a representative from

i. Pusat Kesihatan Daerah (PKD), Kuala Tahan
ii. Jabatan Kemajuan Orang Asli (JAKOA)
iii. Department of Wildlife and National Park (PERHILITAN)
iv. District Education Office, Jerantut
v. Jerantut District and Land Office
vi. Non-Government Organization
vii. Tok Empat and Tok Batin of the local villages

The actors gave formal permission to record the FGD. A semi-structured interview guide was developed by researchers and reviewed by two experts.
The audio was transcribed verbatim. Researchers verified all transcripts for completeness, accuracy, and anonymity. Participants were not allowed to correct transcripts. Chat function text was analysed in Word files. Then, thematic analysis coded participants' answers. S1–S10 indicates 10 FGD individuals' responses.

Result and Discussion

From the FGD, the themes for barriers and strategies to improve HL are as follows.

i. Education barrier

Education is a crucial barrier as it influences the level of health conditions in the community. A lower educational background may reduce their understanding of health information.
S1: 'The villages rarely undergo health screening because they have no symptoms. They will go when they want to apply for a job'.
To educate the community, health awareness should be instilled at school (Vamos et al., 2020). Health campaigns should be done regularly in outreach community programs for long-term strategies.

ii. Infrastructure barrier
The infrastructure, such as road systems and internet coverage, must be in better condition to access health information.
S8: 'Road condition is terrible. That is why the ambulance cannot reach us and doctors occasionally visit us'.
In the long term, local authorities should upgrade the facilities. Karim (2020) mentioned that the rural community is significant with low health literacy as they have limited access to infrastructure.

iii. Financial barrier
The PNP community relies on agriculture, fishery, and forest goods for income. They live in poverty on unreliable income. The PNP floods during monsoon season, stopping all economic activities. Due to unpredictable revenue, the local community needs help receiving improved healthcare and health information.
S10: 'The villagers are receiving unstable and limited income. They usually have problems getting to the hospital for treatment. They rather buy medicine (paracetamol) at the grocery store or consume traditional plants'.
Modern agriculture programs should be promoted among the locals. Financial barriers will specifically show the difficulty of people to afford essential treatment or any other form of healthcare. This limited access to healthcare can negatively affect health outcomes and contribute to health disparities (Onsay,2022).

Conclusion
HL barriers pose significantly affect individuals' health. These barriers are limited education, infrastructure, finances, and policy. A comprehensive strategy is essential to improve HL among the communities. By addressing these barriers and strategies, individuals can make better health decisions and improve health outcomes.

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FHSMPP24/91 : The Level Of Digital Health Literacy And Its Associated Factors Among Elderly In Three Villages At Jempol, Negeri Sembilan, 2023

Muhammad Azri Bin Mansor [2], Fatimah Binti Ahmad Fauzi[1], Muhammad Jufri Firdaus Bin Mahathir [2], Tharma Seellan A/L Muniandy [2], Kamilia Binti Zainal Maaruf [2], Farah Husna Binti Muliadi [2], Nurul Iman Sofea Binti Suhaimi [2], Iwana Izah Binti Mohd Deen [2], Khirthanaa A/P Suparmaniam [2], Shanna Lyn Carino [2], Ang Lin, Lai Yico [2]
[1] *Department of Community Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
[2] *Fourth Year Medical student, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia*
Corresponding author's email: fatimah_fauzi@upm.edu.my

Summary
Digital Health Literacy (DHL) is essential to improve the access and utilisation of healthcare services, patient interaction and self-care management for better outcome of healthcare services. The purpose of this study was to determine the level of digital health literacy among the elderly in Jempol and its associated factors. The level of digital health literacy among the elderly was considerably low with a median of 12 (Interquartile range:18), which was significantly associated with sociodemographic factors (age, monthly household income, ethnicity, current occupational status, marital status, education level) and internet usage behaviour (duration of internet usage, the time spent using the internet per day, number of devices used, frequency of internet usage).

Keywords
Digital health literacy, health literacy, elderly, sociodemographic, Internet usage

Introduction
In today's digitalization era, the need for DHL has become crucial and is becoming a trend worldwide as it is essential to improve the access and utilisation of healthcare services, patient interaction, and self-care. It is the "ability to seek,

find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem" (4). Previous local study on health literacy showed that the prevalence of limited health literacy level was highest among the elderly (1) and the DHL among primary care patients in Malaysia was also low (2). Low DHL could result in health inequities, where certain individuals can fully utilize patient engagement technologies while others are unable to do so. The purpose of this study is to determine the level of digital health literacy and its associated factors among the elderly in Jempol, Negeri Sembilan.

Materials and Methods

A cross-sectional study was conducted among 281 elderly aged 60 and above in Kampung Jempol, Kampung Serting Ilir and Kampung Mahsan, Jempol, Negeri Sembilan, Malaysia from 13 March 2023 until 14 April 2023. A convenient sampling method was used due and data was collected via face-to-face interview. The eHealth Literacy Scale (eHEALS) was adapted (4) and translated into Malay language. The study instrument was pretested and showed good reliability (Cronbach's alpha: .88). Data was analysed using IBM SPSS version 28.

Results and Discussion

The median score of DHL was 12 (Interquartile range:18). Majority of the respondents were using smartphones (66.5%) and digital devices like laptops, tablets, and desktops (13.6%) for internet usage, though 19.9% of them were still using regular cell phones. The main purpose of internet usage was mostly for communication (54.1%), news (40.6%), and health information (39.1%). Bivariate analysis showed a significant association between sociodemographic (lower age, Malay ethnicity, married, higher education level, higher monthly household income, currently working) and internet usage behaviour (higher number of devices, duration of Internet usage, frequency per week, time spent per day using Internet) with a higher level of DHL among elderly. The low prevalence of DHL among this study's respondents is lower compared to a previous study in a developing country (3). This can be contributed to the rural demographic backgrounds like lower education level, lower household income, unemployed, and internet usage behaviour that is still limited.

Table 1: Association between Sociodemographic Factors and Internet Usage Behaviour with DHL among Elderly using Spearman's rank Correlation (N=281)

Factors	Correlation coefficient (r)	*p*-value
Sociodemographic Factors		
Age (years)	-0.346	<0.001*
Monthly household income (RM)	0.440	<0.001*
Internet Usage Behaviour		

Duration of internet usage (years)	0.738	<0.001*
Time spent using the internet per day (hours)	0.703	<0.001*

(*)-*p*<0.05 is significant

Table 2: Association between Sociodemographic Factors and Internet Usage Behaviour with DHL among Elderly using Mann-Whitney U and Kruskal Wallis test (N=281)

Factors	**U[a]/H(df)[b]**	***p*-value**
Sociodemographic Factors		
Gender	8716.500[a]	0.092
Ethnicity	18.749 (2)[b]	<0.001*
Marital status	20.103 (2)[b]	<0.001*
Highest education level	81.396 (4)[b]	<0.001*
Current occupational status	8.459 (2)[b]	0.015*
Internet Usage Behaviour		
Number of devices used	71.922 (2)[b]	<0.001*
Frequency of internet usage per week	130.929 (2)[b]	<0.001*
Frequency of receiving guidance	135.326 (3)[b]	<0.001*
Seeking health information	1347.000[a]	<0.001*

([a])-Mann-Whitney U test. ([b])-Kruskal-Wallis test. (*)-*p*<0.05 is significant

Conclusion

There is a significant association between all the factors studied and DHL among the elderly in this study except gender. This gives new insight into DHL among the elderly in rural areas that can be used in future intervention programmes of improvements. Health authorities should include the elderly population in digital health strategies for better health access, in line with the development of the digital age.

Acknowledgements

This study was conducted as part of the requirement of the Community Medicine Posting program among 4th-year Medical students (Group D), Universiti Putra Malaysia.

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FHSMPP25/109 : Exploring The Social Networks Of Elderly Population In Kuching North City: Implications For Quality Of Life

Zulaikha Abdul Razak[1], Lee Yew Fong[2]
[1] *Faculty Of Medicine and Health Sciences, UNIMAS*
[2] *Sarawak General Hospital*
Corresponding author's email: kuuzue@gmail.com

Summary
The global elderly population is projected to increase fourfold by 2050, impacting their well-being, support, and experiences. Social networks significantly affect older adults' well-being, physical and mental health, and holistic life quality. A study was conducted on 32 elderly individuals' social circles in Kuching North City, Sarawak, encompassing their relatives, spouses, acquaintances, and friends. Elderly individuals' social networks were reliant on their family members. Enhancing social connections, promoting communal engagement, fostering interprofessional collaboration, and bolstering participation in community activities improved holistic well-being. Health and well-being initiatives should integrate social networks, intergenerational activities, community-based support systems, technological inclusion, and age-friendly legislation.

Keywords
Elderly, Social network analysis, Quality of life, Urban area, Sarawak

Introduction
The projected increase in the global older adult population by 2050, attributed to reduced fertility rates, enhanced healthcare, and advancement in medical

technology, will have significant implications for their experiences, health, and support systems (1). Given its status as the largest state in Malaysia, Sarawak presents a significant demographic profile that warrants a thorough comprehension of its elderly population's attributes. Social networks influence older individuals' lives, affecting their well-being, physical and mental health, and holistic quality of life (2). Social network analysis (3) identified influential individuals in elderly social networks and comprehended the exchange dynamic of information, resources, and support (2). Analysing influential individuals in networks yields valuable insights for developing interventions, policies, and programmes that prioritise social connectedness, bolster support systems, and improve holistic well-being.

Materials and Methods

This cross-sectional survey analysed 32 elderly individuals residing in Kuching North City, Sarawak. The inclusion criteria comprised participants' willingness to participate, a minimum age of 60 years, residency of at least one year in the study area, ability to answer survey questions and the non-existence of cognitive or depressive disorders. The instruments for evaluating cognitive functioning were the Abbreviated Mental Test Score (AMTS) and social network questionnaire (4). SNA examined the participants' social networks (5). Descriptive analyses were conducted employing SPSS, and social network analysis was facilitated by NodeXL Pro software. The study adhered to ethical considerations and safeguarded participant rights.

Results and Discussion

The participant's mean age was 67.16 years, with 65.6% female and 34.2% male. The Malay ethnicity constituted the majority of participants (90.6%), followed by the Bidayuh group (6.3%) and a group classified as "other" (9.4%). Regarding education, 37.5% of respondents completed primary and secondary education, respectively, whereas 18.8% attained tertiary education. Most participants (87.5%) resided in their own homes, whereas some (12.5%) cohabited with their children. Table 1 indicates that relatives had the highest centrality (31 connections), suggesting a significant familial relationship prevalence in the subjects' social networks, followed by spouses and acquaintances (15 and 14 connections, respectively). The centrality degree was lowest among the neighbours. Additionally, relatives exhibited the highest values for betweenness centrality, closeness centrality, and eigenvector centrality, signifying their influential role as network connectors. Spouses, acquaintances, and neighbours also augmented the network, albeit to a lesser degree. The sociogram in Figure 1 displays centrality measures of various roles in the social network. Relatives exhibited high interconnectivity levels and served as intermediaries among diverse groups. The spouses' central location indicates their proximity to other network members. Neighbours offered social support and assistance, whereas friends possessed access to influential individuals. The study underscored the significance of family members, specifically relatives and spouses, in elderly individuals' social networks. Friends' and neighbours' contribution was comparatively minor. Augmenting these relationships may ameliorate the elderly individuals' social support, well-being, and holistic quality of life.

Figure 1. Older Adults' Role-based Networks in Kuching North City, Sarawak.

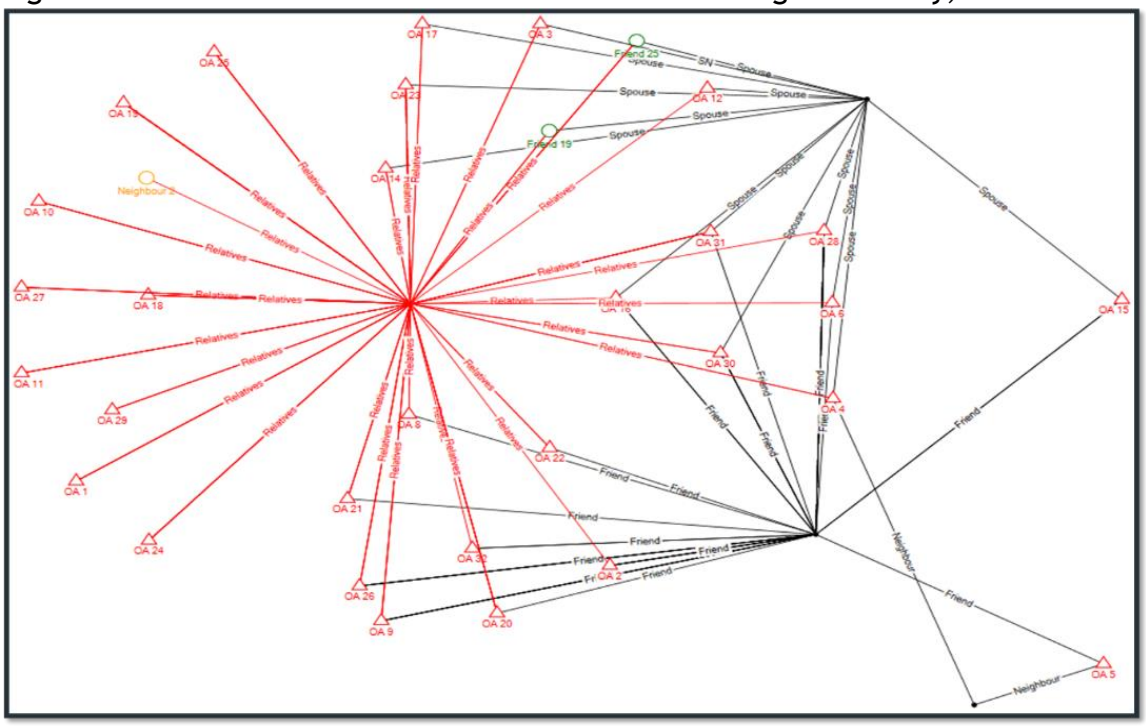

Table 1. Older Adults' Role-based Networks in Kuching North City, Sarawak (N=32)

Roles	Degree	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality
Relatives	31	465.080	0.837	0.232
Spouse	15	93.431	0.480	0.126
Friends	14	63.844	0.468	0.122
Neighbour	2	2.645	0.356	0.011

Conclusion

The sociogram analysis indicated that the senior adults' social networks were varied, with family members exerting the most significant influence. Strategies for enhancing well-being encompass enhancing familial bonds, facilitating social interactions, strengthening marital relationships, promoting community engagement, and fostering interprofessional collaboration. Health and well-being programmes should integrate social networks, intergenerational activities, community-based support systems, technology integration, and age-friendly policies. Further research may explore the social network's influences on health outcomes and ascertain efficacious interventions. This study's limited sample size restricted its generalisability and applicability to diverse populations or varying geographical and cultural contexts.

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FHSMPP26 / 157 : Correlation Of Deprescribing With Specific-Necessity And Concern, General Overuse And Harm And Level Of Medication Adherence Among Elderly At The Geriatric Clinic Of A Public Hospital In Malaysia

Kamaliah Md Saman[1], Safirah Masturina Zulkipli[1], Nur Athiqah Nazira Rosli[1], Ungku Ameen Ungku Mohd Zam[2], Hakima Makhtar[2], Mathumalar Loganathan[1]
[1] *Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Selangor Branch, 42300 Bandar Puncak Alam, Selangor, Malaysia*
[2] *Geriatric Clinic, Hospital Tengku Ampuan Rahimah, 41200 Klang, Selangor, Malaysia*
Corresponding author's email: kamaliah@uitm.edu.my

Summary
Deprescribing although beneficial for the elderly was not commonly practised due to the challenges involved. This study among geriatrics at a hospital clinic, aimed to explore the prevalence, types and reasons for deprescribing and its correlation with patients' specific and general beliefs. The study revealed that stopping medication and decrease in doses were the most common types. The major reasons were "risk outweighs benefit", and "adverse effects". No significant correlation existed between deprescribing and patients' beliefs except a weak correlation with "general overuse" (p=0.037). This study established that prescribers should priorly base deprescribing on clinical judgement over patients' beliefs.

Keywords
Deprescribing, specific-necessity, specific-concern, general-overuse, general-harm

Introduction
Deprescribing is defined as the process of withdrawal of unnecessary drugs, supervised by a healthcare professional (1). The elderly are prone to polypharmacy due to multiple diseases. Globally, 10% of drugs used by the elderly have the potential to cause more harm than benefits (2). Time-consuming nature, low confidence in deprescribing knowledge, insufficient patient details, and avoiding

negative relationships were among the challenges faced by the physicians (3). Even though studies showed that deprescribing is safe, yet deprescribing is minimal because prescribers and patients often find it complicated to decrease or discontinue medications. We hypothesised that patients' beliefs can affect deprescribing and hence medication default. Hence we conducted this study with the aim to explore the prevalence, types and reasons for deprescribing and its correlation with patients' beliefs in the specific necessity and specific concern, general overuse and general harm and their medication adherence level.

Materials and Methods

This was a cross-sectional study involving purposive sampling of 45 geriatric respondents who attended the geriatric clinic of a government tertiary hospital between October to December 2020. The patients were required to answer the Belief in Medication Questionnaire (BMQ) developed by Horne et al., in 1999 which contained 18 items and the validated Medication Safety Alert Tool for the Elderly (MeSATE) which contained 17 items and four domains; disease, socioeconomic, treatment and psychosocial, for measuring medication adherence (MA) risk levels. The inclusion criteria were elderly patients aged 65 years and above, taking at least five medications for their chronic diseases and consented to participate in this study. Patients who do not understand the Malay or English language were diagnosed with advanced dementia, Alzheimer's disease, major depression, psychosis and were terminally ill/comatose were excluded. We subjected the data collected for descriptive (demographics and prevalence), and correlative analysis using statistical software; SPSS version 25.

Results and Discussion

Table 1: Demographics of respondents (n = 45)

Variables		Frequency (%)
Gender	**Male**	21(46.7)
	Female	24 (53.3)
Age group (years old) (Mean ± SD) = (74.58 ± 7.34)	**60-69**	11 (24.4)
	70-79	21 (46.7)
	80-89	11 (24.4)
	90-99	2 (4.4)
Race	**Malay**	19 (42.2)
	Chinese	9 (20.0)
	Indian	17 (37.8)
Marital Status	**Not married**	1 (2.2)
	Married	43(95.6)
	Divorced/Widowed	1 (2.2)
Source of income	**Family support**	26 (57.8)
	Pension	6 (13.3)
	Allowance	5 (11.1)
	Insurance	4 (8.9)
	Others	4 (8.9)

Education level	**None**	2 (4.4)
	Primary	14 (31.1)
	Secondary	20 (44.4)
	Tertiary	9 (20.0)
No of current medication	**Less than 5**	4 (8.9)
	5 or more	41 (91.1)

Table 2 Deprescribing prevalence, types and reasons

	Variables	Frequency (%)
Deprescribing status	**Yes**	29 (64.4)
	No	16 (35.6)
Type of deprescribing	**Stop medication**	19 (46.3)
	Decrease dose	18 (43.9)
	Change to another medication	4 (9.8)
Reasons for deprescribing	**Medication risk outweighs the potential benefit**	16 (31.4)
	Potentially inappropriate medication (PIM)	4 (7.8)
	Medication is not necessary	18 (15.7)
	Medication is ineffective	1 (2.0)
	Medication is burdensome and difficult to adhere to	3 (5.9)
	Medication does not align with patient wishes	3 (5.9)
	Medication contributes to adverse effects	16 (31.4)

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Table 3 Correlation of deprescribing with belief on medicine and medication non-adherence level

Variable	Pearson Correlation coefficient, r (p value)
Specific-necessity	0.180 (p = 0.237)
Specific-concern	0.082 (p = 0.594)
General-overuse	0.311 (p = 0.037)
General-harm	0.046 (p = 0.766)
Non-adherence level	
Pearson Chi Square (X2)(df)	0.257 (1) (p = 0.427)

Table 1 showed that stopping medication and decrease in doses were the most common types of deprescribing. The major reasons were “risk outweighs benefit”, and “adverse effects”. Table 2 showed that more than half of the respondents (64.4%) were deprescribed their medication. Table 3 showed the Pearson Chi-Square Test result shows no correlation between deprescribing with medication adherence level (p = 0.427). Patient’s belief in specific necessity (p = 0.237, specific concern (p = 0.594) and general harm (p = 0.766), were significantly

correlated with deprescribing status. Only specific overuse showed a weak correlation (p = 0.037) with deprescribing status.

Conclusion

This study established that prescribers should priorly base deprescribing on clinical judgement and meanwhile not disregard patients beliefs and preference.

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FHSMPP27/75 : Emergency Department Congestion: Factors Contributing To Congestion And Solution To Resolve The Situation

Nor Asiah Muhamad[1,ǂ,*], Nur Hasnah Ma'amor[1,ǂ], Fatin Norhasny Leman[1], 'Izzah 'Athirah Rosli[1], Nor Hidayah Jamalluddin[1], Tengku Puteri Nadiah Tengku Bahrudin Shah[1], Nurul Syazwani Misnan[1], Nik Athirah Farhana Nik Azhan[1], Chan Huan Keat[2], Muhammad Radzi Abu Hassan[2]

[1]Sector for Evidence-based Healthcare, National Institutes of Health, Ministry of Health, Malaysia

[2] Office of Director General of Health, Ministry of Health, Malaysia

[ǂ]share equal amount of work

Corresponding author: norasiahdr@gmail.com

Summary

Emergency Department (ED) crowding is a sentinel indicator of health system functioning. While often dismissed as a mere inconvenience for patients, the impact of ED crowding on avoidable patient morbidity and mortality is well documented but remains largely underappreciated. Therefore, a systematic review was conducted to identify relevant studies on EDs congestion. Electronic databases yielded various causes for EDs congestion and solution. The key to a sustainable solution is to realign healthcare financing to allow hospitals to keep inpatient capacity below a critical threshold of 90%; beyond that, hospital throughput dynamics will inevitably lead to ED crowding.

Keywords

congestion; emergency department; hospital; systematic review; solution

Introduction

Emergency Departments or EDs offer vital services involving emergency, urgent cases, and disaster management globally that required immediate support via a rapid diagnosis and the administration of a medical or surgical treatment in a very

short period (1). ED play a significant role in an acute healthcare system (2) including providing rapid care for life-threatening illnesses and injuries (3). EDs are one of the most crowded hospital departments that received patients with numerous medical conditions, including high-risk patients, are admitted (1).
It is certain and established that overcrowding represents one of the main problems that has been affecting global health and the functioning of the healthcare system in the last decades, especially ED (4). Since 1980, overcrowding has been identified as one of the main factors limiting correct, timely, and efficient hospital care (4). Overcrowding in EDs refers to the situation that contributed to the malfunction of the ED to offer the medical service which can appear due to the imbalance between the constant increase in the healthcare demand for example the number of patients awaiting visit, receiving treatment and others (5). This problem is widespread worldwide and leads to a negative impact to health services (1). In light of the need of finding solutions that can put an end to hospital overcrowding, this review aims, through a review of the literature, to summarize the triggering factors, as well as the possible solutions that can be proposed. The objective of this review was to provide an update on the comprehensive synthesis of the causes and solutions to EDs overcrowding.

Materials and Methods

We conducted a systematic review through electronic PubMed, ISI Web of Science, Science Direct, Scopus, Cochrane Library and Google Scholar. The keywords used: Overcrowding; ED; Length of Stay; Waiting time; inpatient boarding, Triage, Hospital Emergency Services, ED Patient Flow, Ambulance diversion, Emergency Outpatient Unit and Patient Safety. Inclusion criteria were: (1) studies with quantitative details and information on the relationship between the causes that lead to overcrowding in ED and the consequences that this phenomenon entails; (2) studies describing possible strategies already adopted or adoptable in the future to address the effect that overcrowding has on the ED were considered. Exclusion criteria were studies not in English and not directly pertinent to the query string or studies not containing sufficient information on the relationship between overcrowding and EDs. The full text of relevant studies was retrieved and assessed. Each reference of the included studies was cross-checked to identify further studies. A complete consensus was achieved through discussion for the studies included in this review.

Results

A total of 131 studies was included in this review. Overall, 22 countries and one multiple or mixed countries included in this review with many studies were reported from the USA (46 articles or 35.1%), followed by Australia and Canada (14 articles or 10.7%) as well as Multiple countries (10 articles or 7.6%). The multiple countries articles are the countries that include more than one country in the published article for example Van Der Linden MC, 2017 conducted the study in Pakistan & Netherlands and Kingswell C, 2017 articles performed in Canada, the United States, and Australia. Other countries also reported factors and solutions to ED crowding that are also included in this review as shown in Table 1.

Table 1: List of countries that reported the factors and solutions to ED crowding included in this review

No	Country	No of articles included	Percentage (%)
1	Australia	14	10.7
2	Belgium	1	1.3
3	Canada	14	10.7
4	Mix/multiple country	10	7.6
5	China	2	1.5
6	England	2	1.5
7	Greece	1	1.3
8	India	1	1.3
9	Iran	2	1.5
10	Ireland	6	4.7
11	Israel	2	1.5
12	Japan	1	1.3
13	Korea	2	1.5
14	Netherlands	4	3.2
15	New Zealand	1	1.3
16	Saudi Arabia	5	3.8
17	Spain	1	1.3
18	South Africa	1	1.3
19	Sweden	2	1.5
20	Switzerland	3	2.3
21	Taiwan	3	2.3
22	United Kingdom	2	1.5
23	United State	46	35.1
	Total	131	100

The factors contribute to ED crowding have broadly categorised into patient, hospital, others, and system effects as stated at Table 2. Whereas the solution of ED crowding is also being investigated and reviewed which it had broadly categorised into patient, hospital, system, and others as stated at Table 3.

Table 2: Main causes of overcrowding

Factor	Causes

Input (Patient): due to the volume of patients arriving and waiting to be seen	**Presentations with more urgent and complex care needs** Long waiting time or delay for hospital admission/triage Complexity of disease and age of the patients Emergencies No access to a primary care doctor Poor and uninsured, medical/health insurance Limited access to diagnostic services in primary care or community Inappropriate use of emergency services Unnecessary visits, "Frequent flyer" patients and non-urgent visits Self-referral process and the number of escorts accompanying a patient Habit/preference Referral by a health care provider Refused to visit Primary care/clinic
Throughput (Hospital): due to the time to process and/or treat patients'	Insufficient place/ bed/ stretchers (leads to the factor of ED crowding. Delay on service/treatment/lab/discharge. Bed availability (both in the ED and in the hospital) Shortage of staff, hospital resources and equipment ED as 'holding unit/ long stay at ED High number of patients Consultation Case-mix report Waiting or unavailable specialist Repeated diagnostic Complicated study case Closing the waiting room Cancellation of outpatient and surgical elective cases Increase of demand Size of ED/hospital The use of advanced machine Discharge time from ED or transfer Non-medical or injured for non-emergent care factors for admission in ED Block access Seasonal/ Outbreaks Experience staff

Output (Discharge): due to the volume of patients leaving the ED	Inefficient planning of discharging patients Unfamiliarity with the regulations governing inter-hospital transfers.
Others	Spiritual/cultural value/language Change of hospital system

Table 3: Solution of ED crowding

Factors	Solution
Patient/Input	Home care Better organised and active discharge planning Educate patients about their children's disease Better financial
Hospital/Throughput	Strengthening of the primary healthcare Availability of bed Increase hospital service (lab and others) Internal transportation service Adoption or revision of a triage scale/room Additional of staff Better management/access The presence of physicians or specialist in ED Multidisciplinary Implement a program to decrease the ED crowding Reduce or variable time on treatment/waiting/admission. Better privacy and security within the departments Communication Training Expanding clinic hours Consider using the waiting room Reduce time of ward admission Policy Increased the speed of test request Early or improving discharge of inpatients from ED or transfer to another institution Refer patients away from ED Redesign ED Create protocol/guideline/plan Targeting specific patient Telemedicine Improving hospital operational efficiency Time of discharge Improve collaboration between specialties/clinics

	New technology
Discharged/Output	Increased hospital service system Introduction to the 4h system Computerized short messaging service to inform care providers of patient delay Simulation platform that runs in ED Software or computer simulation for better ED service
Others	Review the demands of EDs Adequate funding and resources for EDs Prevention of illness Educate caregiver Augmented continuity of care

Discussion

Considering the growing importance of overcrowding in EDs and its potential effects on the wellness of patients and employees, the need to develop strategies to deal with or mitigate the problem has become evident. As has been described, the causes leading to overcrowding in EDs are multiple, starting with input causes and ending with output causes (6). Only knowledge and awareness of the issue can lead us to put in place the most appropriate strategies to be able to counteract the problem and bring it under control. This review presents a summary of the main indicators of overcrowding although there is currently no gold standard.

Conclusions

In this regard, numerous strategies have been collected and proposed in order to be implemented both at the ED level and at the hospital level. The goal should be to carry out an approach that takes into consideration not just the ED but also the hospital, the health care system in general and the country.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

FHSMPP28/76 : Immunisation Outreach Programme 2022 In Kepong Health Office

Florence[1], Kavita Jetly[1,2] , Sharanjit[1], A. Akashah[1]
[1]*Kepong Health Office, Ministry of Health Malaysia*
[2]*Institute of Health Management, National Institutes of Health*
Corresponding author's email: dr.sharanjit@moh.gov.my

Summary
Immunisation, a strategy of the World Health Organization (WHO) is to reduce the mortality rate of children aged 5 years old and below. The immunisation coverage has been low for several years in the Kepong Health Office (KHO) or Pejabat Kesihatan Kepong (PKK) localities thereby the initiative of conducting an Immunisation Outreach Programme was undertaken to determine the contributing factors with the main focus being the Measles, Mumps and Rubella (MMR) vaccination. Door to door approach was used involving all maternal and child-health care (MCHC) staff of PKK. Most of the children under government follow-up were found to be immunised.

Keywords
Outreach, Immunisation, Kepong, MMR, vaccine

Introduction
According to the WHO, immunisation is a process whereby a person is made immune or resistant to an infectious disease, typically with the administration of a vaccine. The immunisation coverage in Kepong has been inconsistent over the past 5 years in reference to national set targets. The objective of this study was to identify the prevalence of incomplete/non-immunised children by age group, health facilities, types of missed vaccines and contributing factors for incomplete/non-immunisation in Kepong.
We also aimed to increase the immunisation rate coverage in Kepong with the main focus being MMR immunisation in line with the Measles Elimination Program that started in Malaysia in 2004 through our Immunisation Outreach Programme.

Materials and Methods
A cross-sectional study was conducted from January to December 2022 in the Kepong Health Office. Incomplete or non-immunised children aged 6 years and below were conveniently sampled regardless of their nationality status or immunisation status. Parents who were uncooperative and children with contraindications for vaccinations were excluded. The nurses of all 7 Maternal and Child Healthcare clinics (MCHC) visited residential areas with high defaulter rates and measles outbreak localities in Kepong. Door-to-door visits were conducted and the Child Healthcare Immunisation Record books were checked for vaccination records and immunisation status in accordance to the National Immunisation Programme schedule. Vaccines were administered on
the spot for children found to have had missed/incomplete vaccinations with parental consent and having no contraindications for immunisation.

Results and Discussion

A total of 31 localities with 18515 homes were visited. A total of 3080 children were screened during the outreach programme of which 62 (2%) were found to have missed/incomplete vaccinations. Majority (91.9%) were given vaccines on the spot during the programme and the remaining (8.1%) were given appointments at health clinics as the children were either not well or not at home during the visit. The age group with highest prevalence of incomplete/non immunisation were those 1 to 2 years of age (40%) followed by 3 to 4 years of age (29%) and this coincidentally reflected those children whom were born during the COVID-19 pandemic. The vaccine with the highest incidence of incomplete immunisation was the HEXAXIM booster (28.9%) followed by MMR (17.8%). Nearly half (41.9%) of those incomplete/unvaccinated children had follow-up within the 7 MCHC in Kepong whereas 37% had follow up at private healthcare facilities. The most common factors for incomplete/unvaccinated children were financial constraints (32.3%) and missed appointments (14.5%). The rate of missed or incomplete immunisation in Kepong was relatively low (2%). Nevertheless, 1 in 3 of incomplete/non-immunised children had follow-up appointments at private healthcare facilities. Continuous strategies are needed to maintain the rate of immunisation, especially for those with follow-up in the private healthcare sector to achieve herd immunity.
The limitations of this door-to-door approach were 40% of the homes visited were locked on the day of the visit, 10% were unoccupied and 3% refused to cooperate. Nevertheless, despite these limitations, we managed to cover more than the estimated calculated sample size of children aged 6 years and below.
In comparison to the previous years, 2022 saw a notable improvement in the coverage of the MMR immunisations as well as the Pentavalent/Hexaxim vaccinations. This outreach programme conducted also strengthened private healthcare facility collaboration and increased public awareness of the importance of immunisation through health education by our staff as well as the distribution of pamphlets.

Conclusion

The outreach programme revealed that most of the children under government facilities follow-up were fully immunised. The programme was also effective in identifying the number of incomplete or non-immunised children and helped to increase community awareness on the importance of immunisation under the KHO coverage areas.

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FHSMPP29/135 : High Acceptability And Uptake In A COVID-19 Self-Testing Pilot In Manufacturing Industries In Kedah, Malaysia

Muhammad Radzi Abu Hassan [1], Sunita Binti Abdul Rahman [2], Huan Keat Chan [1], Nurul Farhana Zulkifli [3], Xiaohui Sem [3], Elena Marbán-Castro [3], Suziana Redzuan [4], Eliana Ahmad [4], Alias Abdul Aziz [5], Muhammad Suhail Abdul Wali [5], Nurhanani Ayub [1], Mohd Sharif Bin Mohd Ali [2], Lai Choon Ng [6], Paula Del Rey-Puech[3], Elena Ivanova[3], Olga Denisiuk[3], Norizan Binti Ahmad [2], Othman Bin Warijo [2], Sonjelle Shilton [3]
[1] Ministry of Health Malaysia
[2] Kedah State Health Department
[3] FIND
[4] Kuala Muda District Health Office
[5] Kulim District Health Office
[6] Federation of Malaysian Manufacturers Kedah/Perlis Branch
Corresponding author's email: drsunita@moh.gov.my

Summary
COVID-19 self-testing is essential for enabling individuals to self-care, screen and isolate timely. This study assessed the feasibility of an iterative and adaptive COVID-19 self-test delivery model to the community via workplaces. A total of 1,777 employees from four manufacturing industries enrolled (60% of staff). Thirty-eight percent of participants reported to have used a self-test. A total of 378 COVID-19 positive cases were detected (91% among household members). There was a strong acceptability to join the pilot and self-test uptake. Workplace-based programmes can improve testing access in the community and mitigate future pandemics.

Keywords
COVID-19, self-testing, self-care, secondary distribution, households

Introduction
Different public health strategies are needed to mitigate the COVID-19 pandemic (1). Self-testing is essential for enabling individuals to self-care, and to screen and isolate in a timely manner (2). As of 19 July 2022, Malaysia registered 142 COVID-19 self-tests for use (3). Achieving widespread COVID-19 testing in the community may present challenges. During the pandemic, households in the Kedah state were hotspots for transmission. This study focuses on five of the areas of feasibility studies, proposed by Bowen et al.: acceptability, demand, implementation, practicality, and adaptation (4). The implementation of a COVID-19 self-testing distribution model to reach multigenerational families in the community through the active workforce might be feasible and acceptable to guarantee safe spaces.

Materials and Methods
Together with the Ministry of Health (MoH), Kedah State Health Department, Kuala Muda and Kulim District Health Offices, the Federation of Malaysian Manufacturers

(Kedah/Perlis Branch), and four manufacturing industrial companies, a mixed-methods implementation pilot study was conducted between November 2022 and May 2023 to study the feasibility of this distribution model. Participants were instructed to take the COVID-19 nasal self-tests home for themselves and their household members, following national guidelines. At enrolment and end of the study, participants completed an online socio-demographic, knowledge, and satisfaction survey. . Data was cleaned and analysed using SPSS Statistics V21.0. Qualitative data was collected through semi-structured interviews (SSI) and focus group discussions (FGD), following an interview guide. Notes were taken, translated, and transcribed into an Excel tool for in-depth exploration, coding and interpretation of results.

Results and Discussion

A total of 1,777 participants (60% of total staff) from four companies enrolled in the pilot. Enrolment rates varied per site from 53% to 85%. The enrolment survey was completed by 1,772 participants (99%). Most of them were female (58%), Malaysian (97%), had secondary education (51%) and were employed full time (98%). Almost 80% of participants had received the COVID-19 booster dose. Regarding COVID-19 diagnosis, 56% of participants, and 67% of their household members, had COVID-19 before the study.

From the 681 participants (38%) who responded to the survey at the end of the study, 400 participants used 1,299 COVID-19 self-tests. Thirty-four participants, and 344 household members, were reported to have self-tested positive during the pilot. Since enrolment, participants had high willingness to self-test for COVID-19 (77%), thus, there was only a slight increase compared to end-of-study levels (80%). Approximately 40% of participants at both timepoints knew how to use the nasal swab in correctly.

A total of 44 SSI, and 4 FGD with 14 participants, were performed. It was noted that participants trusted COVID-19 self-tests, and most of them accepted the use of the nasal swab. For example, one participant declared that *"nasal tests were more accurate, and they were more confident with the result"* (female, 50, senior executive). Some participants stated that they used MySejahtera to report their positive self-tests results. The main reason participants did not report their self-test result via MySejahtera was that they tested negative. The elements of the self-test model that were valued the most among participants were: free self-tests for them and their household members, care packages, and continuous support provided during implementation.

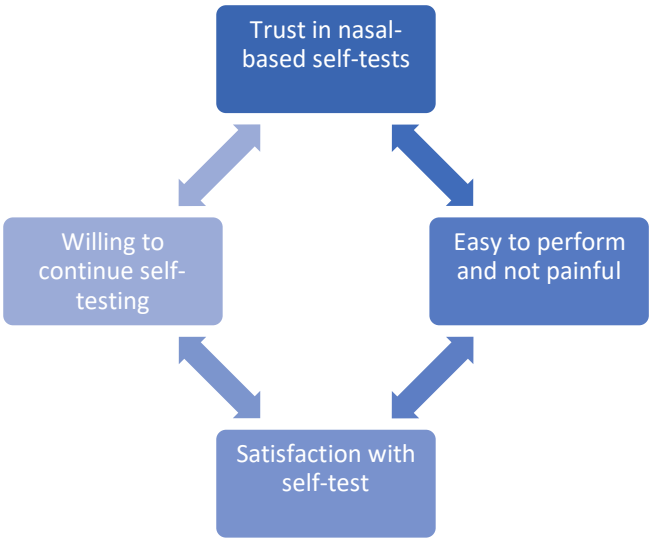

Figure 1. Key highlights from qualitative interviewing

Conclusions

The acceptability and uptake of COVID-19 self-tests were high and secondary distribution led to the detection of more than 300 COVID-19 cases in the community. Therefore, workplace-based self-testing programs have the potential to enhance access to testing in the community and contribute to the mitigation of future pandemics.

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FHSMPP30/140 : Exploratory Factor Analysis of a Patient-Reported Outcome Measure: A Newly Developed Medication Adherence Measurement Tool For The Elderly In Malaysia

Kamaliah Md Saman[1], Tan Cha Sin[2], Lin Shu Ning[3], Noor Azwin Bukhori[2], Mathumalar Loganathan[1], Khairil Anuar Md Isa[4]
[1] *Faculty of Pharmacy, Universiti Teknologi MARA (UiTM), Puncak Alam, Selangor, Malaysia*
[2] *Poliklinik Bandar Maharani, Jalan Salleh, Muar, Johor, Malaysia*
[3] *Hospital Tengku Ampuan Rahimah, Klang, Selangor, Malaysia*
[4] *Faculty of Health Sciences, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia*
Corresponding author's email: kamaliah@uitm.edu.my

Summary
Measurement of medication default (MD) is vital for elderly with polypharmacy but the availability of measure remain scarce. This cross-sectional study aimed to validate our patient-reported outcome measure named Medication Alert Tool For The Elderly (MeSATE). Data was obtained using MeSATE questionnaire from 391 randomly selected elderly from nursing homes and outpatient clinics of a government hospital and a health centre. The study further conducted the Exploratory Factor Analysis (EFA) procedure. The findings revealed a four-factor structure with the remaining 14 items with acceptable Cronbach Alpha values, retained and deemed valid and reliable to measure MD construct among the elderly.

Keywords
medication default, measure, exploratory factor analysis, validity, reliability

Introduction
Adherence to medication regimens is crucial for effective treatment of chronic diseases in the elderly with polypharmacy, which is often low. Poor medication adherence or medication default (MD) poses a serious and expensive challenge to patients and healthcare systems in terms of association with unfavourable outcomes such as disease progression, risk of hospitalization, cardiovascular complications and death. Medication adherence (MA) is a multifactorial construct that incorporates various factors including socioeconomic, health-system related, condition-related, patient-related, social support, therapy-related and psychosocial. Despite all the previous studies on measurement tools of MA and their psychometric properties, there is still a scarcity of research on the validity and reliability of MA/MD factors among the elderly. This study aimed to establish a reliable measure for MD named Medication Safety Alert Tool For The Elderly (MeSATE), a patient-reported outcome measure that we developed, by conducting a detailed validation of factors through Exploratory Factor Analysis (EFA) procedure.

Materials and Methods
This cross-sectional study was conducted among the randomly selected elderly residents of nursing care homes and outpatients of a government hospital and a health centre in 2019 - 2021. Data was obtained using the MeSATE questionnaire,

developed from literature review, validated by experts and pilot-tested prior to the study. Trained personnel conducted the interview and filled out the questionnaire comprising 17 items (Q1 - Q17). A total of 391 respondents participated in the study. EFA using Principal Component Analysis (PCA) with Varimax Rotation to determine the factors' structure and internal reliability test by determining the value of Cronbach's Alpha for each factor was performed using IBM-SPSS version 25.0. The assumptions required to continue with EFA were significant (P-Value < 0.05) Barletts' Test of Sphericity and measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO) of more than 0.6 (1). This study has received ethical approval from MOH and UiTM [NMRR-19-2970-47740 (IIR) and UiTM 600-TNCPI(5/1/6].

Results and Discussion

The results in Table 1 shows that Bartletts' Test of Sphericity is significant (P-Value < .05) and the measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO) (.684) is acceptable for the data reduction technique.

Table 1: KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**0.684**
Barlett's Test of Sphericity	**Approximate Chi-Square**	**1209.60**
	Df	**136**
	Sig	**< .001**

In PCA, six components surfaced based on the Eigenvalue greater than 1.0 as in the scree plot (Figure 1) and the total variance explained for measuring the MA/MD construct is 58.2% which is acceptable (2).

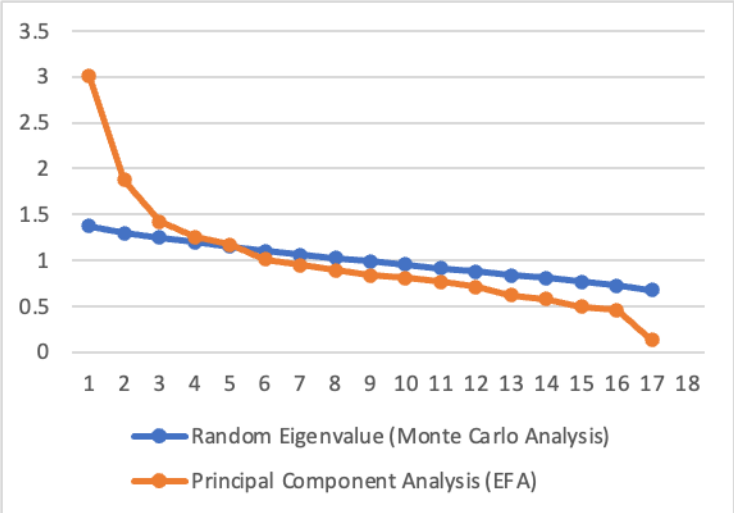

Figure 1: Combined Graph: EFA And Parallel Analysis (Monte Carlo Simulation)

To prevent the tendency to overestimate the number of factors to be retained, the Monte Carlo simulation technique by applying parallel analysis was done with a computer program called ViSta-PARAN (3). Based on the interpretation of Figure 1, where four factors emerged (4 dots before the point where 2 points from the 2

analyses were superimposed), we went on to proceed with the Varimax rotation of the four identified components fixing the factors as four in the SPSS analysis. We obtained the distribution of items with factor loadings of more than 0.4 (2) into their respective factors as in Table 2. Q1, Q7 and Q8 with factor loadings of less than 0.4 were deleted (2). The Cronbach's Alpha for each factor was found to be more than 0.6 as shown, which is acceptable (4) and therefore has attained acceptable internal reliability. Hence the 14 items will have to be retained and deemed suitable to assess the MD construct. The four factors of MA/MD identified in this study are disease, socioeconomic, treatment and psychosocial.

Table 2: The Four Factors and their items Rotated Component Matrix

Items/Factors	1	2	3	4
Q1				
Q2			0.824	
Q3			0.813	
Q4				0.828
Q5	0.456			
Q6	0.603			
Q7				
Q8				
Q9		0.660		
Q10		0.612		
Q11		0.598		
Q12		0.519		
Q13				0.757
Q14	0.583			
Q15		0.481		
Q16	0.754			
Q17	0.772			
Cronbach's Alpha	0.682	0.615	0.690	0.631

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
a. Rotation converged in 5 iterations

Conclusion

This study established the validity and reliability of MeSATE for measuring MD construct in Malaysian healthcare institutions. This will contribute to improved measurement in correlating the MA risk levels with the appropriate action and follow-up that needs to be taken for the betterment of care for the elderly.

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FHSMPP31/151 : Mobile Health Services For The First People In Pahang. Challenges And Hopes.

Zafrin Jamaludin[1], Raja Nurul Najwa Raja Ismail[1], Nazirah Jusoh[1], Mohd Hafeez Intiaz Hussein[1], Aznita Iryany Mohd Noor[1], Zulaiha Abdul Jalil[1], Azlan Abu Bakar[1], Roslina Che Cob[1], Mohd Nazri Awang[1], Suzana Mohd Hashim[1], Nor Azimi Yunus[1]
[1]Pahang State Health Department, Ministry of Health Malaysia
Corresponding author's email: drzafrin@moh.gov.my

Summary
Mobile health services for Orang Asli in Malaysia is a part of multiple strategies implemented by the Ministry of Health Malaysia since 2012 to ensure universal healthcare access, especially for the vulnerable population like Orang Asli. Currently, there are sixteen mobile health clinics with the median number of cases attended at 34,508 per annum in Pahang. Subsequently, the healthcare services provided via the mobile teams along with other related contributing factors, have observed a notably dropped in the rate of under-five mortality among Orang Asli in Pahang. Despite tremendous improvements in access to care, obstacles still exist including cultural barriers, limited infrastructure, and inadequate manpower.

Keywords
Mobile Clinics, Orang Asli, Mobile Health Service, Mortality Rate, Pahang

Introduction
Orang Asli are indigenous people commonly understood as the first people or the original inhabitants of Malaysia. As of 2021, Orang Asli in Peninsular Malaysia accounted for 0.7% (209,575) of Malaysia's population (1). In the face of modernisation, they encounter various challenges including limited access to healthcare and education, poverty, and discrimination (2). Mobile health services serve a vital role in closing the gap for healthcare inequalities among Orang Asli. The Ministry of Health Malaysia has introduced mobile health clinics to provide better and systematic primary health care services for Orang Asli. This study

describes mobile health services for Orang Asli in the state of Pahang including the demographics of the clients in 348 villages, services provided, number of mobile clinics available and clinic workloads. It also demonstrates the trend of the under-five mortality rate among Orang Asli in the state of Pahang over the past 10 years.

Materials and Methods

Data from nine district health offices in Pahang that provide services of mobile health clinics were collected and analysed in the form of secondary data. Descriptive analysis of demographics of the clients, services provided, numbers of mobile clinics available and clinic workloads were quantified from 2018 to 2022, yearly. This study also tabulates the trend of under-five mortality rate per 1,000 live births among Orang Asli in the state of Pahang for the 10 years duration. Data were analysed using Excel software for reporting.

Results and Discussion

Pahang is the largest state in Peninsular Malaysia that has the highest number of Orang Asli at 78,615 (3). There are 16 mobile health clinics in the state of Pahang that provide mobile health services specifically for Orang Asli. Apart from mobile clinics, Pahang is also equipped with static clinic facilities that consist of 93 health clinics, 231 rural health clinics, 3 mother and child health clinics and 9 community clinics located all over Pahang. Of the 16 mobile health clinics that reported on the number of visits, the median number of annual visits was 1082 with an interquartile range of 818 to 1564. Female patients make up a slight majority with an average of 59% female patients. The majority of the services provided are outpatient care and mother and child health. The median number of cases attended by mobile health clinics annually was 34,508 with an interquartile range of 30967 to 37227 cases. From the year of 2011 until 2021, there was an increment of the under-five mortality rate among Orang Asli populations in the state of Pahang followed by a significant reduction of the trend after the year 2014. From the data analysed, mobile health clinics are seen as an important service to ensure that the vulnerable populations of Orang Asli have equal access to better health services as other Malaysian. Mobile clinics are well-positioned to advance these objectives as healthcare leaders and policymakers become aware of the significance of social determinants of health and the connections between the community and the clinical setting[4]. Looking at the rate of under-five mortality among Orang Asli in Pahang, it is notable that the rate dropped especially after 2014. This drop might be contributed by the services offered via mobile teams for the Orang Asli by the Ministry of Health Malaysia since 2012.

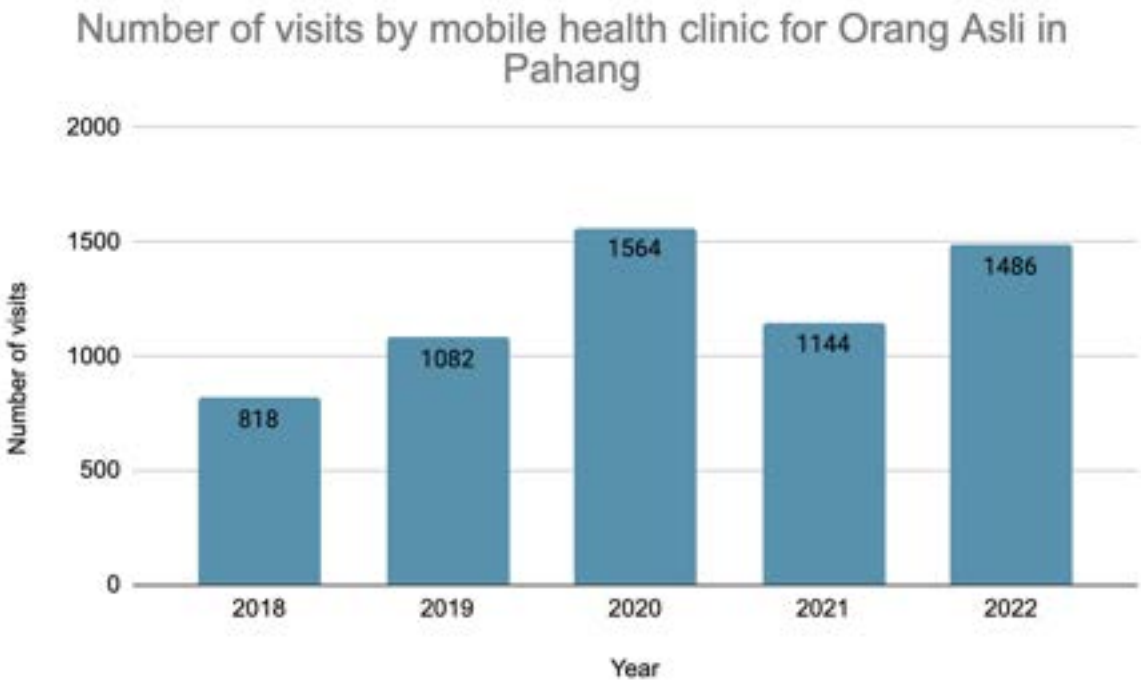

Figure 1 : Number of visits by mobile health clinic for Orang Asli in Pahang

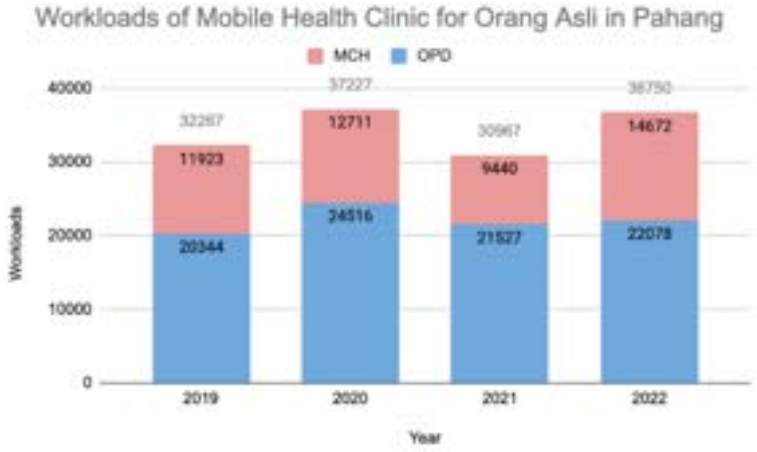

Figure 2: Workloads of mobile health clinic for Orang Asli in Pahang

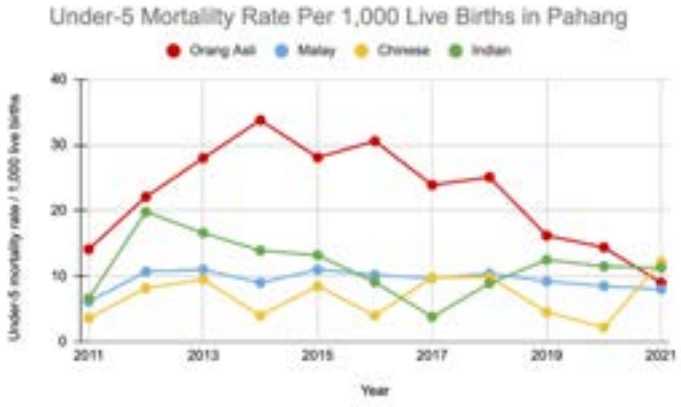

Figure 3 : Under-5 mortality rate per 1,000 live births in Pahang

Conclusion

Mobile health clinics for Orang Asli in Pahang play a significant role in addressing healthcare disparities, improving health outcomes, and reducing the rate of mortality. Despite various challenges to expand services, continuous efforts are deemed important to ensure the accessibility of healthcare services for Orang Asli in Pahang.

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FHSMPP32/163 : "If Only I Knew": A Case Study Of The Lived Experience Of A Pregnant Teenager

Anisah Baharom [1], Nor Afiah Mohd Zulkefli [1], Firdaus Mukhtar [2]
[1] *Department of Community Health, Faculty of medicine and Health Sciences, Universiti Putra Malaysia*
[2] *School of Graduate Studies, Universiti Putra Malaysia*
Corresponding author's email: b_anisah@upm.edu.my

Summary

During the adolescent's transition period, several influencing factors affect the choices they make which in turn affects their actions and ultimately the consequences. This study aimed to explore the lived experience of a pregnant teenager to understand how she became involved in sexual risk behaviour. A qualitative case study was carried out which involved an in-depth interview with a pregnant teenager in a shelter home. The main research question was "What was the lived experience of the teenager in relation to her pregnancy?" The thematic analysis found the journey started with "Chaos in my family", followed by "Decisions and consequences", and finally "Reflections". This study showed that poor family relationship results in externalizing behaviour such as risky sexual behaviour. Choices that teenagers make are influenced by external factors rather than mature thinking.

Keywords
Adolescence, risky behaviour, teenage pregnancy, transition period, sexual behaviour, parental guidance

Introduction

Adolescence is a transition period to adulthood which involves changes in various aspects of their development such as physical, social, cognitive, and mental (1). During this process, several influencing factors affect the choices they make which in turn affects their actions and ultimately the consequences (1). Exploring how a teenager became involved in high-risk behaviour such as unprotected sex can provide insight into the teenager's lived experiences. Teenagers are vulnerable to unintended pregnancy as they are exposed to influences such as social media, peer circles, and sexual grooming (2). The purpose of this study was to explore the lived experience of a pregnant teenager from before she became pregnant until the time that she was involved in unprotected sex.

Materials and Methods

This was a qualitative case study which involved purposive sampling of a pregnant teenager in a shelter home. Data was gathered by in-depth interview which was audio recorded with the guardian's and teenager's written and verbal consent. The audio was transcribed. The interview guide was designed to solicit answers regarding the lived experience of the teenager in relation to the pregnancy, the influencing factors in her experience, the choices she had to make and the aftermath. Data collection and analyses occurred concurrently. Steps were taken to ensure the trustworthiness of the data. Analysis was carried out by thematic analysis.

Results and Discussion

The teenager was a 16 years old girl, who was at 30 weeks of her pregnancy. The themes which emerged were "Chaos in my family", "Decisions and consequences", and "Reflections". The family environment was filled with high levels of stress. There was constant yelling and anger outbursts in the family. Her parents often inflict physical abuse on her and her siblings during their anger outbursts. Household chaos has been associated with behavioural problems and involvement in risky behaviours among adolescents. The instability and unpredictable home environment result in a loss of sense of belonging and connectedness among family members (3).

As a result of her chaotic family environment, she found solace in being with her friends and making further friends through social media. Her friendship with an adult male on social media developed from being a friend to being a confidante, and eventually, they had an intimate relationship. She experienced sexual grooming before she was involved in unprotected sex. Though intimate relationship during adolescence is said to prepare them for future adult relationships leading to marriage, unprotected sex can lead to unintended pregnancy and possible complications including morbidity and mortality (4).

In her reflections on what happened to her, she regretted her decision to trust and be intimately involved with a "stranger". She wished she had more love and care from her parents. If only she knew how to nurture the love of her parents and to communicate more effectively with her parents, she would not have been involved in an intimate relationship with a "stranger". Communication between parents and family members is an important influence on externalizing behaviour (5). Poor communication affects not only connectedness among family members but also results in dissatisfaction and the development of behaviour problems.

Conclusion

Teenagers in their transition stages need effective communication with parents and positive parental guidance to prevent them from high-risk sexual behaviour. Choices that teenagers make depend on influencing factors rather than mature thinking.

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FHSMPP33/131 : A Systematic Review On Patients Classification System (Specific To Diagnosis-Related Group) For Health Care Services Worldwide.

Adzly Hairee Sahabudin[1], Amirah Azzeri[1,2,] Mohd Hafiz Jaafar[1,2] and Maznah Dahlui [2,3]

[1]Faculty of Medicine & Health Science, Universiti Sains Islam Malaysia (USIM), Persiaran Ilmu, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia;
[2]Department of Research Development and Innovation, University of Malaya Medical Centre (UMMC), Lembah Pantai, 59100 Kuala Lumpur, Malaysia;
[3]Centre of Population Health, Department of Social and Preventive Medicine, Faculty of Medicine, Universiti Malaya.
Corresponding author's email: adzlyhairee92@raudah.usim.edu.my

Summary

In the 1990s, high-income countries began adopting diagnosis-related group (DRG)-based payments to accelerate progress towards universal health coverage. New variations of the original DRG system were created to address its limitation. A

systematic review was done to determine the patients classification system used worldwide for healthcare services The articles chosen are from credible databases such as Scopus and Science Direct and contain keywords such as Diagnosis-Related Group (DRG), Prospective Payment System and Casemix. The similarity found is that most of the classification system used is based on the ICD-10 and is modified based on their usage and objectives.

Keywords
Data Pooling, DRGs, Healthcare System, Prisma, Systematic Review.

Introduction
In most high-income countries in the 1990s, diagnosis-related group (DRG)-based payments have steadily taken the lead in paying hospitals for acute inpatient care (1). The main goal for this implementation is for achieving a faster move toward universal health coverage (1). Based on the original DRG system, new systems were then created to address specific limitations in the original DRGs (2). Some of the new DRG systems that was created in the United States are Medicare DRGs, Refined DRGs (RDRGs), All Patient DRGs (AP-DRGs), Severity DRGs (SDRGs) and All Patient Refined DRGs (APR-DRGs) (2). Other countries have also implemented or adopted DRG systems for their own healthcare system. In Australia, they have implemented the original DRG as the basis of their Australian Refined Diagnosis Related Groups (AR-DRG) (3). In Korea, the K-DRG was created based on the U.S. Refined DRGs (4).

Materials and Method
A systematic literature review has been done to identify the types of DRGs available based on countries and the strengths and weaknesses of each DRG system to determine the best method to apply the DRG system for the emergency department in Malaysia. The database that has been used to find the papers are Science Direct, Scopus, Semantic Scholar, Academia and Korean Science. Several keywords were chosen to find the papers such as: diagnosis-related group, prospective payment system, case-mix, payments systems, efficiency and K-DRG.

Results and Discussion
It can be seen that each DRG system has its own strengths and weaknesses. For Australia, the AR-DRG is created to focus more on inpatient care in public hospitals. However, its drawback is its DRG classifications, as Australia has a relatively small national population. In Korea, several groups in Refined DRGs could not be distinguished in K-DRGs due to a lack of medical data, and due to the procedures, that were not used in Korea (4). It was later then revised in 2003 by modifying the complexity adjustment method of the Australian Refined Diagnosis-Related Group (AR-DRG) (5). From this it can be said that each country's DRG system has its advantages and disadvantages focused on some variables for each has its own socio-political factors, the quality and depth of the coded data available to characterize the mix of cases in a healthcare system, the size of the underlying population, and the intended scope and use of the classification (3). Some countries however do not implement the DRG system in their healthcare due to lack of funding to apply the DRG system or preferring to use other methods. One of the said countries is Japan. In 1998 Japan implemented the DRG system on a

trial basis, the result shows it did not achieve a reduction in the average length of stay. Due to this, the Japanese Medical Association (JMA) believe that implementing the DRG system could potentially lead to healthcare system distortions like ineffective inpatient care management, a rise in readmissions, and overuse of outpatient care.

Table 1: Strength and weaknesses for each DRG by country.

Country	DRG System Available	Strengths	Weaknesses
United States of America	**1) Medicare DRG**	Covers a broad range of patients in an acute care hospital, Incentivises efficiency.	Only for Medicare covered patients.
	2) APR-DRG	Covers non-Medicare covered patients, predictability with financial planning and budgeting.	Limited data availability for some patients, more complex than Medicare DRG.
Australia	**AR-DRG**	Focus more on inpatient care	Lack of DRG classifications
South Korea	**K-DRG**	Focus on diseases and procedures available in South Korea	Less number of groups available
Thailand	**TDRG**	Incorporates the complexity of multi-payer system of Thai UHC	Still under improvement by expanding the DRG.

Conclusion

When creating a new DRG system for their healthcare system, several factors such as the socio-political factors, the country's health insurance schemes and the country's healthcare abilities and funding should be considered. The implementation shows that it can improve overall healthcare and can improve data collection for future advances.

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ENVIRONMENTAL AND OCCUPATIONAL HEALTH

OHEHPP01/09 : Understanding The Epidemiology Of Healthcare Workers Infected With Tuberculosis (TB) Disease In Kedah: Multiple Case Studies From 2017 To 2021.

Nur `Atiqah Mohamad `Azli [1], Muhammad Shauqi Abdul Kadir [2], S Maria Awaluddin[3], Harisah Mad Salim [1], Maznieda Mahjom [3]

[1] Occupational Health and Safety Unit, Hospital Kuala Nerang, 06300 Kuala Nerang, Kedah, Malaysia.

[2] Director Office, Hospital Kuala Nerang, 06300 Kuala Nerang, Kedah, Malaysia.

[3] Centre for Occupational Health Research Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia, Bandar Setia Alam, Selangor, Malaysia.

Corresponding author's email: dratiqahazli@moh.gov.my

Summary

There is scarce information on the epidemiology of TB among HCWs in Malaysia, particularly in Kedah state regarding the source and risk of TB infection at the workplace. Secondary data analysis was conducted on HCWs data who were infected with TB disease in Kedah from 2017 to 2021. A total of 36 cases out of 61 (59.0%) were classified as probable occupational diseases. Four themes were generated from this study to describe the risk of TB infection such as the risk of infection based on individual characteristics, risk of infection at the administrative level, risk of infection at the engineering level and risk of infection at personal protective equipment (PPE) practice. This study concluded that HCWs were at risk of being infected and contracting TB disease at the workplace which required prompt and specific intervention.

Keywords

Tuberculosis, healthcare workers, epidemiology, secondary data, case-study

Introduction

Tuberculosis (TB) has been recognized as an occupational disease among healthcare workers (HCWs) (1). The incidence of TB among HCWs also was higher than in the general population (2). There is scarce information on the epidemiology of TB among HCWs in Malaysia, particularly in Kedah state regarding the source and risk of TB infection at the workplace. This study aims to summarize the epidemiology of HCWs who were infected with tuberculosis disease in Kedah between 2017-2021.

Materials and Methods

This was a cross-sectional study involving secondary data from the Kedah State Health Department on TB cases among HCWs from 2017 to 2021. Data were extracted from the original national TB investigation report form for each TB case in Kedah. The qualitative approach of a multiple case study design was utilized incorporating content analysis and thematic analysis. The data anonymity was maintained throughout the analysis and the presentation of the result. The findings were tabulated in a frequency table for descriptive analysis. A table of theme and sub-themes were generated as the output from the thematic analysis. Missing data at certain variables remained missing and excluded in the denominator.

Results and Discussion

A total of 74 cases of TB among HCWs was documented from 2017 to 2021 and the final investigation report was available for only 53 cases. 36 cases out of 61 (59.0%) were classified as probable occupational diseases while 13 cases had missing data on that variable (Table 1). The top-3 occupational categories among HCWs with TB disease were nurse, medical officer and health attendant 28, 11 and 9 cases, respectively. A total of 48/74 cases (64.9%) were pulmonary TB, followed by 22 cases (29.7%) of extrapulmonary TB. There were four themes generated from this study as tabulated in Table 2. It described the risk of infection based on the individual characteristic, risk of infection at the administrative level, risk of infection at the engineering level and risk of infection at personal protective equipment (PPE) practice. Among the risk of infection from the individual characteristics, HCWs who had co-morbidities and were at increasing age were at risk of TB infection due to a lower immunity status as found in previous studies (2,3). In addition, the usage of PPE among HCWs can prevent direct transmission however, the adherence level was inadequate as reported in the previous study (4).

Table 1: Characteristics of TB disease among HCWs in Kedah; 2017 to 2022 via content analysis

Variables	N (%)
Gender (n=74)	
Male	21 (28.4)
Female	53 (71.6)
Ethnicity (n=74)	
Malay	66 (89.2)

Chinese	4 (5.4)
Indian	4 (5.4)
Occupational categories (n=73)	
Nurse	28 (38.4)
Medical officer	11 (15.1)
Health attendant	9 (12.3)
Administrative assistant	4 (5.5)
Assistant medical officer	4 (5.5)
Medical laboratory technologist	3 (4.1)
Public health assistant	3 (4.1)
House officer	2 (2.7)
Dental staff assistant	2 (2.7)
Pharmacist	1 (1.4)
Dental officer	1 (1.4)
Physiotherapist	1 (1.4)
Occupational therapist	1 (1.4)
General worker	1 (1.4)
Radiographer	1 (1.4)
Driver	1 (1.4)
Type of occupational disease (n=61)	
Probable occupational disease	36 (59.0)
Non-work related	13 (21.3)
Undetermined	12 (19.7)
Place of exposure (n=53)	
Health clinic	9 (17.0)
Medical ward	9 (17.0)
Emergency department	4 (7.5)
Chest ward	2 (3.8)
Medical laboratory	2 (3.8)
Multidiscipline ward	2 (3.8)
Eye clinic	1 (1.9)
Obstetrics & gynaecology	1 (1.9)

Office	1 (1.9)
Paediatric ward	1 (1.9)
Undetermined	21 (39.6)
Types of TB (n= 74)	
Pulmonary TB	48 (64.9)
Extrapulmonary TB	22(29.7)
TB (unsure of the specific diagnosis)	4(5.4)
History of contact with TB patient (n=53)	
Yes	32 (60.4)
Not sure	13 (24.5)
No	8 (15.1)

Table 2: Thematic analysis findings for the risk of TB infection among HCWs in Kedah

Themes	Sub-themes
Risk of infection based on individual characteristics	Close contact with a confirmed TB patient from family Close contact with a confirmed TB patient from a colleague Close contact with a confirmed TB patient at the workplace Close contact with unsure TB status of a patient History of working in a medical ward History of working in an emergency department Being a senior HCW Untreated latent TB infection Individuals with low immunity (e.g.: diabetes mellitus, retroviral) History of previous TB disease History of exposure in crowd place in a community Undetermined risk of exposure
Risk of infection at the administrative level	Long duration working in high-risk workplace Missed preplacement screening Misinterpret negative findings during TB surveillance/screening Patients with TB like-symptoms were not properly isolated
Risk of infection at the engineering level	No proper TB isolation room in a medical ward Inadequate ventilation in patients' examining room
Risk of infection at the level of PPE practice	Not adhering to PPE guidelines all the time

Conclusion

HCWs are at risk of being infected and contracting TB disease at the workplace. The prompt action of early identification and treatment can prevent complications besides strengthening the control measures and individual self-awareness toward TB disease.

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OHEHPP02/39 : Technostress Among Healthcare Workers (HCWs) At The State Hospitals In Klang Valley And East Malaysia

Nur Hasnah Ma'amor [1], Nor Asiah Muhamad[1], Fatin Norhasny Leman[1], 'Izzah 'Athirah Rosli [1], Nor Hidayah Jamalluddin[1], Mohammad Zabri Johari[2], Norliza Chemi[3], Mohd Fadzli Mohamad Isa[4], Norni Abdullah[5]

[1] Sector for Evidence-based Healthcare, National Institutes of Health, Ministry of Health, Malaysia

[2] Institute for Health Behavioural Research, National Institutes of Health, Ministry of Health, Malaysia

[3] Department of Psychiatric and Mental Health, Kajang Hospital, Ministry of Health, Malaysia

[4] Department of Psychiatry and Mental Health, Kuala Lumpur Hospital, Ministry of Health, Malaysia

[5] Department of Psychiatry and Mental Health, Tengku Ampuan Rahimah Hospital, Ministry of Health, Malaysia

Corresponding author's email: nurhasnah.m@moh.gov.my

Summary

Technostress is a as psychological state associated by increased use of advanced computer technologies which involves workers in all fields. This study aimed is to determine the association between technostress among HCWs in Klang Valley and East Malaysia. Data for the mean and standard deviation (SD) score based on the Technostress scale or Techno–stress creators' questions that consist of 6 categories was calculated using SPSS version 22.0. Overall, HCWs was observed with medium level of technostress. This finding suggests an early sign of the technostress among HCWs which might lead to the mental health issues such as depression, anxiety, and others. The intervention is needed to decrease the technostress level and help the HCWs to provide better or effective health services to the public.

Keywords

technostress, healthcare workers, information technology, Malaysia

Introduction

Technostress is defined as mental stress related to technology use with excessive physiological and emotional arousal (1). Currently, there has been an accelerated development and adaptation on the use of health information technology. There are varying degrees of evidence about the impact of health information technology on patient health. Since the COVID-19 pandemic, most work process has adapted the use of information and communication technologies (ICTs) such as telemedicine. This may lead to increase use of online working environments in health sector among HCWs. Therefore, this study aim to determine the prevalence of technostress among HCW in Klang Valley and East Malaysia.

Materials and Methods

A cross sectional study was conducted using proportionate quota sampling. Data was collected from HCWs who are currently working in State Hospital around Klang Valley (Hospital Tengku Ampuan Rahimah Klang, Kajang and Kuala Lumpur) and East Malaysia (Hospital Umum Sarawak and Queen Elizabeth, Sabah). They were eligible for this study if they are in service at the index hospital for a minimum of two years. Respondents answered the questionnaire via online survey. Data for the mean score based on the Technostress scale or Techno–stress creators' questionnaire that been developed and validated by Tarafdar et al. (2007) (2) was used in this study. This questionnaire consists of 6 domains: (1) Techno-overload, (2) Techno-invasion, (3) Techno-complexity, (4) Techno-insecurity, (5) Techno-uncertainty and (6) Total of technostress scale. Mean score was calculated to determine the level of technostress which was categorized into three levels (low: 1.00 – 2.33, medium: 2.34 – 3.66 and high: 3.67 – 5.00). Data on sociodemographic characteristics was also analysed using SPSS version 22.0.

Results and Discussion

A total of 582 HCWs were included in the study of which 339 (58.2%) respondents were from Klang Valley while 243 (41.8%) from East Malaysia. Most of the respondents who participated in this study were female (450 or 77.5%), Malay (291 or 50.0%), paramedic (295 or 50.7%), and monthly household income less than RM4,850.00 (262 or 45.0%). Detailed on the sociodemographic data for the state hospital in Klang Valley and East Malaysia is depicted in **Table 1**.

Total of technostress scale for both HCWs in Klang valley and East Malaysia revealed most of the respondents had medium level of technostress,418 (71.8%) followed by low, 92 (15.8%) and high level of technostress, 72 (12.4%). When a separate analysis for Klang Valley and East Malaysia was performed, similar findings were also seen. The detail finding on the technostress level among HCWs at the state hospitals in Klang Valley and East Malaysia is shown in **Table 2.**

This study could not identify any association between level of technostress in Hospital in Klang Valley and East Malaysia ($p = 0.061$).

Table 1: Sociodemographic data among HCWs at the state hospitals in Klang Valley and East Malaysia

Hospital	Klang Valley, n (%)	East Malaysia, n (%)	Total, n (%)
Respondent	339 (58.2)	243 (41.8)	582 (100.0)
Sex			
Male	81 (24.0%)	50 (20.6%)	132 (22.5%)
Female	257 (76.0%)	193 (79.4%)	450 (77.5%)
Ethnicity			
Malay	242 (71.4)	49 (20.2)	291 (50.0)
Chinese	26 (7.7)	32 (13.2)	58 (10.0)
India	51 (15.0)	9 (3.7)	60 (10.3)
Bumiputra Sabah & Sarawak	15 (4.4)	141 (58.0)	156 (26.8)
Others	5 (1.5)	12 (4.9)	17 (2.9)
Profession			
Doctor	149 (44.0)	56 (23.0)	205 (35.3)
Paramedic	132 (38.9)	163 (67.1)	295 (50.7)
Technical staff	26 (7.7)	15 (6.2)	41 (7.0)
Administration staff	29 (8.6)	9 (3.7)	38 (6.5)
Pharmacist	3 (0.9)	0 (0.0)	3 (0.5)
Monthly household			
B40 (<RM4,850)	137 (40.4)	125 (51.4)	262 (45.0)
M40 (RM4,851 – RM 10,970)	156 (46.0)	95 (39.1)	251 (43.1)
T20 (10,971 and above)	46 (13.6)	23 (9.5)	69 (11.9)

Table 2: Prevalence of the technostress level among HCWs at the state hospitals in Klang Valley and East Malaysia

Techno-stress creators	Technostress level	Klang Valley, n (%)	East Malaysia, n (%)	Overall, n (%)
Techno-overload	**Low**	55 (16.2)	35 (14.4)	90 (15.5)
	Medium	158 (46.6)	120 (49.4)	278 (47.8)

	High	126 (37.2)	88 (36.2)	214 (36.8)
Techno-invasion	**Low**	72 (21.2)	44 (18.1)	116 (19.9)
	Medium	129 (38.1)	85 (35.0)	214 (36.8)
	High	138 (40.7)	114 (46.9)	252 (43.3)
Techno-complexity	**Low**	97 (28.6)	63 (25.9)	160 (27.5)
	Medium	177 (52.2)	129 (53.1)	306 (52.6)
	High	65 (19.2)	51 (21.0)	116 (19.9)
Techno-insecurity	**Low**	176 (51.9)	118 (48.6)	294 (50.5)
	Medium	148 (43.7)	110 (45.3)	258 (44.3)
	High	15 (4.4)	15 (6.2)	30 (5.2)
Techno-uncertainty	**Low**	92 (27.1)	38 (15.6)	130 (22.3)
	Medium	170 (50.1)	139 (57.2)	309 (53.1)
	High	77 (22.7)	66 (27.2)	143 (24.6)
Total	**Low**	60 (17.7)	32 (13.2)	92 (15.8)
	Medium	242 (71.4)	176 (72.4)	418 (71.8)
	High	60 (17.7)	35 (14.4)	72 (12.4)

Overall, this study identified the prevalence of technostress level among HCWs who worked at the state hospital in Klang Valley and East Malaysia is at medium level. This result is almost similar as the finding that been reported previously in Egyptian (3). The technostress among HCWs is reported to be significantly higher than other occupations. It is possibly due to the higher job requirements, including clinical practice and teaching among HCWs (4). On a separate note, technostress is described by scientists as the dark side of technology use (5) which effect all the occupations including the HCWs. This include the used of the telemedicine and online meetings which is reported to have an increase to ten folds during the COVID-19 pandemic (2).

Finding of this study may suggest the early signs of the burnout which is significantly predicted the inflammatory cytokines for example TNF-a, IL6, and CoQ10 (6, 7, 8). These cytokines precipitate with the behavioral manifestations, such as fatigue, diminished appetite, and depression (9).

Conclusion

HCWs reported with moderate-to-high level of technostress which might lead to the burnout. The support from the hospital and psychological are needed to overcome this problem.

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OHEHPP03/30 : Burnout And Cortisol Levels Among Laboratory Personnel From Selected Facilities In Klang Valley During COVID-19 Pandemic

Maznieda Mahjom[1], Rohaida Ismail[2], Noor Syaqilah Shawaluddin[1], Lim Kuang Kuay[1], Tuan Mohd Amin Tuan Lah[1], Nadia Mohamad[2], Raheel Nazakat[2], Rosmanajihah Mat Lazim[1], Mizanurfakhri Ghazali[1], Masita Arip[3]
[1]Centre of Occupational Health Research, Institute for Public Health, National Institutes of Health, Ministry of Health Malaysia
[2]Environmental Health Research Centre, Institute of Medical Research, National Institutes of Health, Ministry of Health Malaysia
[3]Allergy and Immunology Research Centre, Institute of Medical Research, National Institutes of Health, Ministry of Health Malaysia
Corresponding author's email: drmaznieda@moh.gov.my

Summary
The sudden rise of COVID-19 cases during the early phase of each pandemic wave requires extended working hours for the laboratory personnel for sample testing. This study aimed to determine the prevalence of burnout and cortisol levels among laboratory personnel. Burnout and cortisol levels were measured using the Copenhagen Burnout Inventory (CBI) and by collection of saliva samples. The results indicated that less than half of the laboratory personnel experiencing overall burnout had low cortisol levels during the COVID-19 pandemic. Establishing mental health programs in the workplace is crucial to enable early intervention in facing possible burnout during the pandemic in the organization.

Keywords
COVID-19, laboratory personnel, burnout, cortisol, mental health

Introduction
Coronavirus Disease 2019 (COVID-19) leaves a prolonged devastating crisis in the healthcare sector which demands continuity for the care of COVID-19 patients. Due to the daily increment of COVID-19 cases and close contact, many samples must be

tested, adding to the burden, workload and stress on laboratory personnel. Furthermore, working in a new setting, fear of possible infection, and being away from family and friends may compromise their mental health. Long-term exposure to stressor that leads to burnout is associated with low level of cortisol (1). Therefore, it is imperative for this study to determine the prevalence of burnout and cortisol levels among laboratory personnel at selected facilities in Klang Valley during the COVID-19 pandemic.

Materials and Methods

It is a cross-sectional study involving 372 laboratory personnel from three selected facilities in Klang Valley. The respondents were recruited between October 2021 and December 2021 and required to complete an online questionnaire and 5 ml saliva samples were collected for analysis. The level of burnout was assessed using the Copenhagen Burnout Inventory (CBI), which includes three sub-dimensions of personal-, work- and client-related burnout. The cut-off score of 50% and above indicated possible burnout. Meanwhile, salivary cortisol was measured using a competitive enzyme immunoassay kit (Salimetrics, State College, PA, USA). The salivary cortisol levels lower than the normal range in adults (0.094 to 1.551 µg/dl) suggest that persons may have burnout. The data were analysed using SPSS version 26.

Results and Discussion

A total of 37.4%, 19.1% and 7.5% laboratory personnel recorded personal-, work- and client-related burnout, respectively with 15.1% of them developing overall burnout. The prevalence recorded were lower compared to a study that was conducted during the second wave of the COVID-19 in Canada which showed a total of 72.3% medical laboratory technologists (MLTs) experienced burnout (2). Similarly, a study in Malaysia from April to May 2020 reported that more than half of medical laboratory HCWs had experienced personal and work-related burnout (3). This study was conducted during the late phase of the COVID-19 pandemic when the daily cases reported were fewer than in the early phase of the pandemic, thus, this could affect the prevalence of burnout. The findings from this study also showed that 37.5% of the respondents with overall burnout had low level of cortisol. There is a significant relationship ($p<0.05$) between burnout status and the level of cortisol. A study by Lennartsson et al. (2015) showed salivary cortisol responses were low among patients with severe burnout (1). Several studies also reported low salivary cortisol among nurses and teachers who suffered from burnout (4). High cortisol level was due to exposure to stressors which alters the body by activating the hypothalamic-pituitary-adrenal axis (HPA), then leads to enhanced production of cortisol, one of the most significant steroid hormones secreted by the adrenal cortex (5). However, long-term exposure to stressors impaired the production of a sufficient amount of cortisol due to fatigue and exhaustion, a sign of burnout (1).

Table 1: Socio-demographic of the laboratory personnel (N=372)

Variables	Total	
	n	%
Gender		
Male	77	20.7
Female	295	79.3
Ethnicity		
Malay	303	81.5
Chinese	12	3.2
Indians	28	7.5
Others	29	7.8
Age (years) (mean= 33.26, SD= ±8.185)		
Below 30	148	39.8
30-40	159	42.7
Above 40	65	17.5
Handling COVID-19 samples		
Yes	206	55.4
No	166	44.6

Table 2: Burnout status among laboratory personnel (N=372)

Burnout status	Personal-related burnout n (%)	Work-related burnout n (%)	Client-related burnout n (%)	Overall Burnout n (%)
Non-burnout (<50)	233 (62.6)	301 (80.9)	344 (92.5)	316 (84.9)
Burnout (50-100)	139 (37.4)	71 (19.1)	28 (7.5)	56 (15.1)

Table 3: Associations between salivary cortisol and overall burnout among laboratory personnel (N=372)

Cortisol level	Burnout status, n (%)		p-value
	Burnout	Non-burnout	
Low	21 (37.5)	71 (22.5)	<0.016
Normal	35 (62.5)	245 (77.5)	
Total	56 (100.0)	316 (100.0)	

Conclusion

A quarter of burnout laboratory personnel recorded low level of cortisol. Thus, mental health programs need to be addressed at each facility by regularly screening laboratory personnel and designing an intervention program. It is also

vital to improve coping skills by increasing the awareness of good coping skill techniques.

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OHEHPP04/93 : The Trend Of Publication For Voice Disorders Among Teachers

Patrick Peng Wee Yao [1], Moy Foong Ming [1], Victor Hoe Chee Wai [1]
[1] *Department of Social & Preventive Medicine, Faculty of Medicine, University of Malaya*
Corresponding author's email: pengwy86@gmail.com

Summary
Teachers are prone to having voice disorders because their profession uses voice as a primary tool. This study aims to understand the research trend of voice disorders among teachers through bibliometric analysis from 2000 to 2022. The year, the number of publications, Web of Science (WoS) categories, journals, countries and author keywords were analysed. The findings suggest increasing research interest in voice disorders among teachers post-Covid-19. The United States (US), Brazil, and Europe are leading in voice research. The Journal of Voice is the prominent journal in voice research, and voice disorders in teachers are seen as a complex and multidisciplinary field.

Keywords
voice disorders, teachers, bibliometric analysis, VOSviewer, visualisation

Introduction

Teaching is a profession that uses voice as a primary tool, which puts a heavy demand on the teacher's voice. When a teacher abuses or uses their voice excessively at work, it can lead to voice disorders (1). A voice disorder can often lead to adverse outcomes. School teachers who suffer from voice disorder will have a reduced quality of life and increased absenteeism at work (2). The study of voice disorders among teachers is not new or emerging; hence, a bibliometric analysis is required to understand the research trends better. This study provides a bibliometric analysis of Voice disorders among teachers to explore the publication trend in terms of the number of publications, Web of Science(WoS) categories, most active journals, most active countries/territories, and author keywords.

Materials and Methods

A dataset of documents from the WoS database core collection, specifically The Science Citation Index Expanded (SCIE), Social Sciences Citation Index (SSCI) citation and Arts and Humanities Citation Index (AHCI) from 2000 – 2022, was extracted. This study included only journal articles and excluded other document types. Only articles published in the English language were included. The search strategy, including keywords and the search string, is presented in Figure 1. After the search, 379 eligible articles were collected, and the search results were saved with "Full Record and Cited References"; the data was saved on 19 May 2023. Author keywords co-occurrence analysis and citation analysis with countries were conducted and visualised using VOSviewer(version 1.6.19). Descriptive analysis was performed using Microsoft Excel.

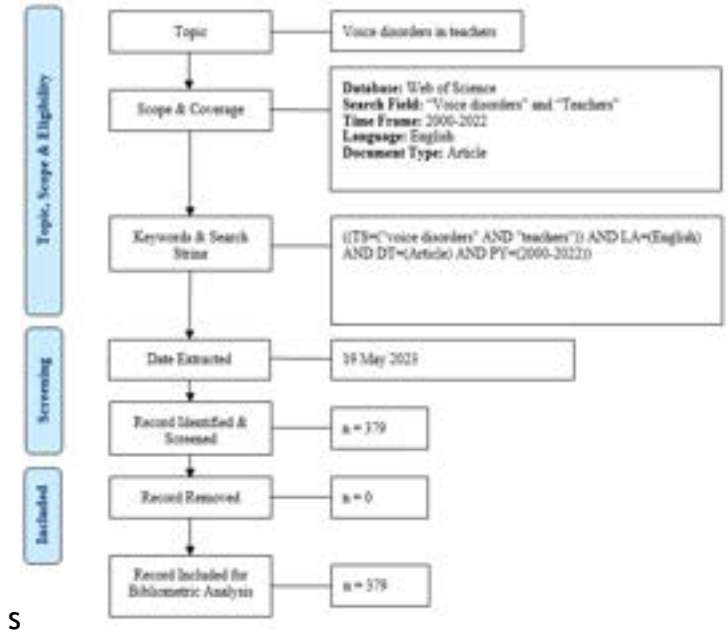

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Figure 1: Flow diagram of the search strategy

Results and Discussion

From 2000 to 2006, fewer than ten articles per year were published on voice disorders in teachers. However, from 2007 to 2011, the number of papers increased

more than two-fold. This trend of increase in articles from 2007-2011 demonstrates that research on voice disorders in teachers has attracted the attention of more scholars worldwide. In the subsequent years, the number of articles steadily increased and started to show a decline in 2018 before showing an upward trend during the COVID-19 pandemic; this might be attributed to a change in teaching mode to online instead of face-to-face in the education sector and working from home (3).

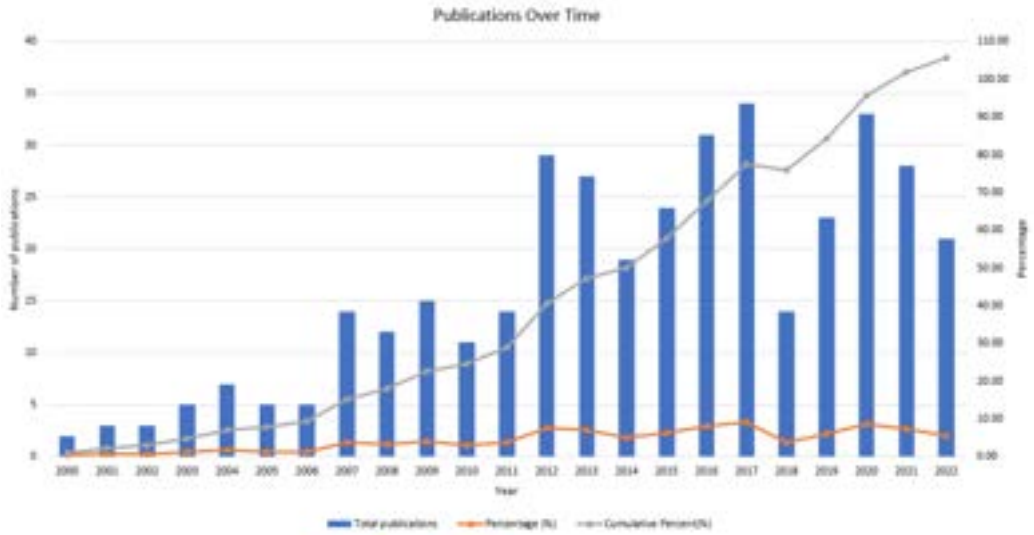

Figure 2: Publications over time

The most active country was the US, followed by Brazil and Europe. US and Europe are the major research countries as they are developed nations. Brazil, which ranked second highest in articles published, can be due to the culture of Brazil, where music and dance are part of their culture. The predominant categories for research on voice disorders were Audiology,Speech-Language Pathology, and Otorhinolaryngology (72.82%). This is followed by Rehabilitation (15.04%), Linguistics (10.03%) and Public Environmental Occupational Health(6.86%). This can be due to multidisciplinary clinics that evaluate voice and swallowing disorders with both an otolaryngologist and speech-language pathologists present have been widely regarded as the gold standard of practice. More than half of the total articles were published in the Journal of Voice because it is widely regarded as the premier journal for voice. Keyword co-occurrence analysis revealed that there are five clusters in voice disorders among teachers:1) Voice measures, 2) Occupational Health, 3) Professional voice users, 4) Epidemiology and 5) Dysphonia.

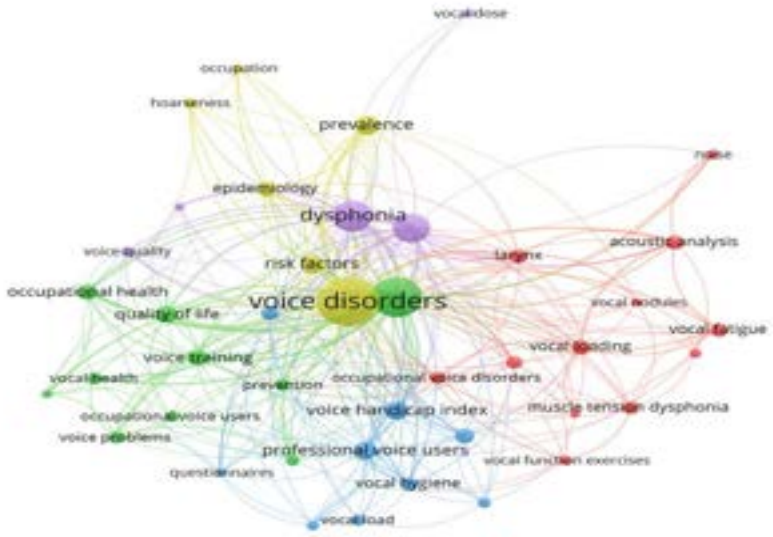

Figure 3: Co-occurrence clustering view of author keywords

Conclusion

Voice disorders in teachers are seen as complex and multidisciplinary, where mostly otolaryngologists and speech therapists are involved. Occupational health has a role, but the numbers are currently small. Voice disorders research is still few in Malaysia, and more focus should be given to voice disorders.

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OHEHPP05/117 : The Nexus Between Work Environmental Factors And Employees' Mental Health Well-Being During COVID-19 Pandemic: A Systematic Review

David Chan Chee Hoong [1], Halim Ismail [1], Hanis Ahmad [1], Hafiz Baharudin [1], Naiemy Reffin [1], Nor Azila Aris [1], Huam Zhe Shen [1]
[1] Department of Public Health Medicine, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia
Corresponding Author email: davidcch10@gmail.com

Summary
The COVID-19 pandemic has created exceedingly challenging circumstances, and the workforce acclimate to drastic job and social changes. Pandemic events emotionally affect an individual's endurance characteristics and mental well-being. The review's primary goal is to map out the impact of different work environmental stressors on employees' mental health and well-being during COVID-19. This study depicts several work environmental stressors that impact employees' mental health and well-being during COVID-19. The study depicts that these health consequences can be effectively avoided with appropriate measures on workplace environment issues and improving employee engagement.

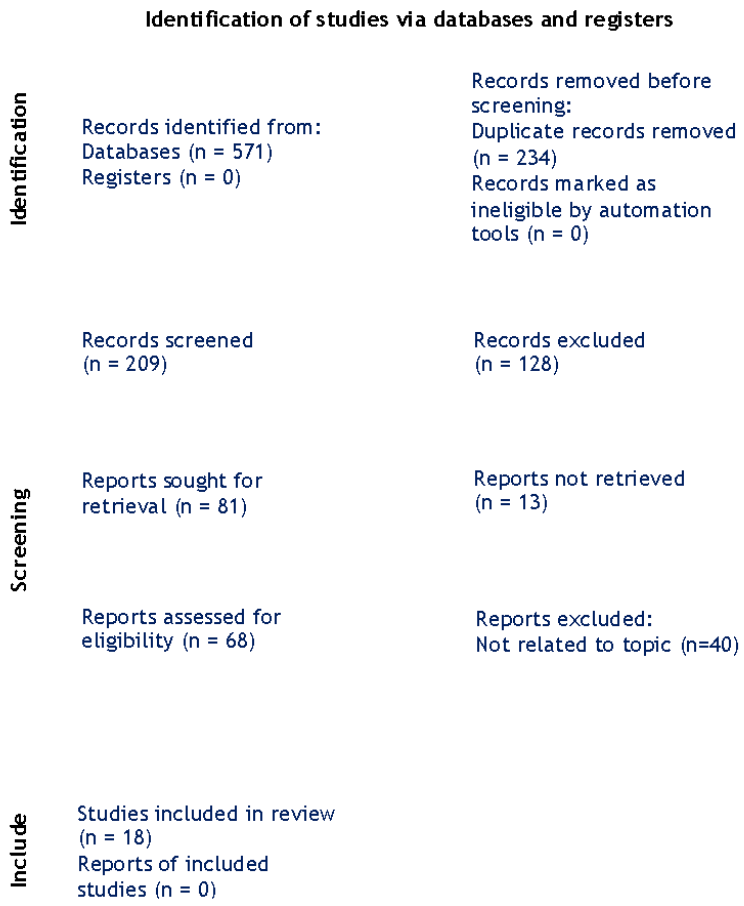
Keywords
Work Environmental, Mental health, Well-being, COVID-19, Workplace stressors.

Introduction
The world has been changing at an astounding rate since the appearance of the COVID-19 illness triggered a significant and unanticipated alteration in how individuals arrange themselves as social living creatures (1). Workplaces can influence people's psychological health by causing or alleviating mental anguish. Job involvement relates to work effectiveness and the quality of existence, often impacted by the variables linked to mental trauma induced by COVID-19 in the workplace (2). It was found that the outbreak's sense of anxiety in the workplace directly impacted employee contentment with the business and employment position. This, in turn, impacted the employee's everyday performance and dedication, resulting in physical and mental destructive effects that have been observed as emotional anguish (3). The primary goal of this review is to map out the impact of different work environmental stressors on employees' mental health and well-being during the COVID-19 pandemic.

Materials and Methods
Specific search strings were developed using Boolean operators by combining various keywords. The systematic literature (SR) search was conducted from 2019 to 2022, using the search strings primarily in databases that include PubMed, Web of Science, Cochrane and Psych Info. All experimental, theoretical, or review papers published in English that explored issues beyond the phrase search were considered. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (**PRISMA**) guidelines were followed to identify the papers, and only 18 articles were deemed acceptable for the present report's data extraction and

analysis. The research confirms that several work environmental stressors impact employees' mental health and well-being during COVID-19. The Mixed methods assessment tool (MMAT) was used for the quality assessment of the articles identified and proposed for qualitative and quantitative studies.

Figure 1: PRISMA Flow Diagram



Results and Discussion

The work environmental stressors are a primary indicator of employee dissatisfaction, dedication, work performance, psychological well-being, prosocial behaviour, and determination to stay. In addition to economic damage and employment uncertainty, COVID-19 damages a person's emotional stability. Three characteristics of occupational stressors during the COVID-19 pandemic: conventional work stressors, unpredictable and highly demanding job stress, and unfair labour stressors. Interaction, organisational climate, policies, job involvement, and psychological aspects substantially impacted workers' mental health during the COVID-19 pandemic (4). The longevity of the outbreak has a curvilinear influence on the tiredness of employees. Healthcare workers with COVID-19 victims had substantially more significant levels of exhaustion, stress, secondary trauma, fear, and despair (3).

With the current appearance of COVID-19, organisations face a massive challenge of unprecedented proportions, requiring them to dive into and effectively manage an extraordinary landscape while modifying their employees' working in disruptive technological, physiological, and socioeconomic dimensions. This leads to the involvement of uncertainty and role stress which may continue for an undetermined period (2, 3). Recent studies show that worker stress might be caused by anxiety about arriving at the office, defective equipment, and irregular workload (5).

Vigorous activity, food consumption, interactions with colleagues and dependent children, interruptions while functioning, modified working time, workstation establishment, and contentment with workplace interior environmental variables were all connected with reduced overall physical and cognitive well-being during remote working (6). For instance, work participation, co-workers' cohesiveness, and job stress were linked to emotional tiredness and depersonalisation, whereas others were linked to professional performance and significantly affected worker burnout.

Conclusion

The study depicts that these health consequences can be effectively avoided with appropriate measures on workplace environment issues and improving employee engagement. Further, integrating the services like task-sharing, staff education, monitoring mechanisms, and referrals can help heal the mental health challenges encountered during the pandemic.

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OHEHPP06 / 100 : Continuing Professional Development; Primary Report Years Of MyCPD

Hazirah A[1], Farah Hazwani AR[1], Ilya Hani AR[1], Sabrizan O[1].
[1] *Medical Professional Development Section, Medical Development Division, Ministry of Health Malaysia*
Corresponding author's email: hazirahazhar@moh.gov.my

Summary
Online monitoring of continuing professional development (MyCPD) is an essential online account for healthcare professionals (HCP) in Malaysia, enabling them to record their learning activities for competency development and healthcare delivery. This report aims to demonstrate HCP compliance with the points needed. Data values such as user credit points, type of healthcare professional, and user sector can be seen accordingly in the system. Enough required points are a way to reflect HCP practice to support the delivery of quality healthcare (2)(3).

Keywords
Online monitoring of continuing professional development (MyCPD), Credit points, Users, Healthcare Professional.

Introduction
A competent healthcare provider must have continuous education. World Health Organization first introduced the regional guidelines for continuing professional development (CPD) activities in 2010; similarly, CPD in Malaysia was initiated by the Ninth Malaysia Plans in 2007. Finally, the Ministry of Health launched MyCPD in 2017 to monitor new learning from HCP. Certain healthcare professions, such as medical practitioners, nursing, and medical assistant, have made it mandatory. For the past 5 years, all data has been recorded into the system but no report has been published to show the progress. This report aims to demonstrate HCP compliance with the MyCPD points needed based on the healthcare professions.

Materials and Methods
This was a cross-sectional study using secondary data collected from MyCPD. All data was gathered from 2018 to 2022 according to registration made by the user in Malaysia and was divided in the system based on the users, points, and HCP list. Three major HCP lists were identified and studied: medical practitioner, registered nurse, and medical assistant. Comparisons were made between these three schemes to determine the user points earned per year in order to achieve the minimum points required. Descriptive analysis was performed using Microsoft Excel.

Results and Discussion
In Malaysia, the points needed per healthcare profession are determined by its own regulatory body, with medical practitioners and registered nurses requiring 20 points (4)(5), and medical assistants requiring 40 points (5). Over the years, almost 80% of HCP users were able to gain the point required (Table 1). It shows that healthcare professionals in Malaysia can comply with the point of necessity and

understand the need to support good clinical practice (2). As MyCPD is not the sole administrator of the CPD collection system, the value shown in the system may not all HCP in Malaysia. Further studies, such as questionnaires or surveys should be done to see more results of MyCPD accomplishment.

Table 1. Comparison of points within 3 healthcare professions for 5 years

Year	Category	Total User	Users with more than 20 points	Users with less than 20 points	Percentage
2018	**Doctor**	27474	22984	4490	83.66%
	Staff Nurse	76433	63005	13428	82.43%
	Medical Assistant	19229	18201	1028	94.65%
2019	**Doctor**	31337	27899	3438	89.03%
	Staff Nurse	78311	67164	11147	85.77%
	Medical Assistant	21017	18201	2816	86.60%
2020	**Doctor**	35707	20982	14725	58.76%
	Staff Nurse	81948	52510	29438	64.08%
	Medical Assistant	23180	19545	3635	84.32%
2021	**Doctor**	38946	34357	4589	88.22%
	Staff Nurse	87062	65598	21464	75.35%
	Medical Assistant	24400	9992	14408	40.95%
2022	**Doctor**	44191	36688	7503	83.02%
	Staff Nurse	91588	70629	20959	77.12%
	Medical Assistant	25314	21892	3422	86.48%

Conclusion

The data collected over the years indicates that approximately 80% of healthcare professionals in Malaysia have successfully obtained the required points. It highlights their capability to meet the point requirements as well as their grasp of the necessity of supporting good quality healthcare service.

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OHEHPP07/132 : The Association Between Daily Temperature With Non-Accidental Mortality In Penang, Malaysia: A-Time Series Study

Hadita Sapari [1], Mohamad Rodi Isa[1], Rohaida Ismail[2], Wan Rozita Wan Mahiyuddin[2] and Mohamad Ikhsan Selamat[1]
[1]*Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA, Malaysia*
[2]*Environmental Health Research Centre, Institute for Medical Research, National Institutes of Health, Ministry of Health Malaysia*
Correspondence: mohamadikhsan@uitm.edu.my

Summary
Extreme temperature is one of the major public health concerns due to significant health impacts to human. Penang is among the states in Malaysia that demonstrated moderate to very-high heat index and intensified by the effects of urban heat islands. This study aimed to provide an overview of a time-series analysis of Penang by examining the relationship between daily temperature with non-accidental mortality from 1st January 2011 to 31st December 2020, using Distributed Lag Non-Linear Models (DLNM) with generalized linear model (GLM) Poisson regression. Identified Minimum Mortality Temperature (MMT) value was 29°C with a non-linear (U-shaped) temperature-mortality relationship. Extremely hot temperature significantly increases natural mortality with immediate (lag0) and acute effects (up to 3 days). Those with pre-existing respiratory diseases are at higher risk of mortality following exposure to extreme temperatures. Understanding the interaction between temperature with mortality is important in determining public health responses, especially with future projections of rising temperatures.

Keywords
Extreme temperature, heat, mortality, Poisson regression

Introduction
Living with an ideal ambient temperature is vital for human physiological responses to function optimally. An increase in ambient temperature, above a city-specific threshold, will increase mortality. Understanding the relationship between temperature and non-accidental mortality in different geographical areas is important in order to develop effective public health policies and protect the populations. Existing epidemiological research that examined the relationship between daily ambient temperature and mortality was concentrated in developed

countries (1). Even though the developing countries are consisting of more vulnerable populations, lacking in infrastructure, and have limited access to healthcare services (2,3), there was a scarcity of research reports in these, countries including Malaysia. Furthermore, Malaysia is having an increment in mean annual temperature between 2.7°C-4.0° over the past 10 years (4), besides experiencing natural phenomena such as El Nino. Hence, this study is intended to examine the relationship between daily temperature and non-accidental causes of mortality in Penang, which was identified to have a moderate to very-high heat exposure index in Peninsular Malaysia (5).

Material and Methods

Daily mortality data for Penang state were obtained from the Department of Statistics Malaysia from 1 January 2011 to 31 December 2020 using the International Classification of Diseases, Tenth Revision (ICD-10). The ICD-10 was subdivided into natural-cause mortality (A00-R99) and cause-specific mortality: cardiovascular mortality (I00-I99) and respiratory mortality (J00-J99). Meteorological data were obtained from the Department of Meteorology Malaysia for the same period of mortality data. Penang's data on daily temperature and relative humidity were collected at the Butterworth and Bayan Lepas meteorological station. To investigate possible confounders, air pollutants data within the study period were collected from the Department of Environment, namely ozone, particulate matter (PM10), sulphur dioxide, nitrogen oxide and carbon monoxide. Descriptive analysis was analysed using SPSS Version 26.0. A time series model was used to examine the effects of daily mean temperature while controlling for relative humidity, day of the week, long-term trend and air pollutants. Subsequently, we used Distributed Lag Non-Linear model (DLNMs) combined with Generalized Linear Model (GLM) Poisson regression to examine the relationship between daily temperature and relative risk of mortality along with lag day.

Results and discussion

A total of 54,431 non-accidental mortality were recorded in Penang over 10 years period, with a mean age of mortality at 65(SD:17). More than half of the mortality occurred among males (59.26%), aged more than 65 years old (54.5%), and Malaysian citizenship (95.5%). A U-shaped relationship between daily mean temperature and natural mortality with a minimum mortality temperature (MMT) of 29°C (90th percentile) was observed.

Compared to the 90th percentile, the relative risk of natural mortality associated with extremely hot temperature (99th percentile, 30°C) over lags 0-21 days was 1.11 (95% CI:1.012, 1.217). On the other hand, compared to the 10th percentile, the relative risk of natural mortality associated with extremely cold temperatures (1st percentile, 25°C) over lags 0-21 days was not significant, RR= [1.075 (95% CI: 0.894,1.291) Exposure to high temperature yielded immediate effects (0-3 days), while exposure to cold temperature yielded delayed effects (6 days). Mortality due to respiratory diseases showed a significant association with temperature at both lower and high temperatures.

Conclusion

Hot extreme temperatures significantly increase the risk of natural mortality, especially for those with pre-existing respiratory disease. This suggests that

heatwaves could have an adverse effect on public health, leading to a high number of non-accidental mortality. Therefore, these findings would help relevant stakeholders and policymakers in developing effective public health policies and adaptation measures towards extreme temperatures as well as improve the healthcare system response in future extreme temperature events.

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OHEHPP08/141 : Fostering Resilient Mental Well-Being: 'MyHappy Performance' Intervention For Healthcare Workers With Depression In Kuala Muda District Health Office

Noor Atika A.[1,2], Muhammad Hasif M.A.[2], Mahiroh A.J[1], Nurul Shafiqah A.G[1], Mohamad Shafuden O.[1], Masniza Izani M.S.[1], Hasniza H.[1], Shairah Aimi K.[1], Suziana R.[1]

[1]*Kuala Muda District Health Office, Sungai Petani, Kedah.*
[2]*Public Health Development Unit, Kedah State Health Department, Alor Setar, Kedah.*
Corresponding author's email: haseefali90@gmail.com

Summary

Mental health risks for healthcare workers (HCWs) post-pandemic call for addressing depression prevalence and interventions. A three-phase study involving 539 participants revealed a 5.8% depression prevalence. "MyHappy Performance", a mindfulness-based intervention module, incorporating art therapy and physical activities, yielded positive outcomes for 22 participants, reducing depression scores ($p<0.005$) and enhancing readiness for change ($p<0.0001$). Regular mental health screening and implementation of the developed module show promise for HCWs' mental well-being.

Keywords

Mental Health, Intervention, Depression, Healthcare workers, resilient

Introduction

Mental health issues have become a pressing global public health concern. In Malaysia, the burden of mental disorders significantly affects the nation's productivity (1). The COVID-19 pandemic has further intensified mental health challenges among healthcare workers (HCWs). Previous studies demonstrate the elevated prevalence of mental health problems, such as depression, anxiety, and stress, among HCWs, surpassing rates observed in the general population (2,3). The Kuala Muda District, characterised by its dense population and involvement in managing COVID-19 cases, presents unique challenges for HCWs. As Malaysia transitions to an endemic phase, assessing the mental health status of HCWs in this district and providing suitable interventions are of utmost importance. This project aims to analyse the mental health landscape, develop intervention modules, and deliver targeted interventions among HCWs with depression. By conducting mental health screenings and implementing group interventions, the program seeks to address the specific needs of HCWs and promote resilience.

Materials and Method

This program has been carried out in three (3) Phases. Phase I is a cross-sectional study involving secondary data analysis of yearly mental health screening using Patient Health Questionnaire-9 (PHQ-9) among HCWs in Kuala Muda District, while Phase II was the construction of modules through literature review and expert opinion for the preparation of group intervention modules. Phase III involved an intervention study to evaluate the effectiveness of the module on the level of depression and the level of readiness to change using the PHQ-9 and the University of Rhode Island Change Assessment Scale (URICA) questionnaire. Depression was defined as a PHQ-9 score ≥10. Data were analysed using SPSS-IBM (version 22.0) (IBM Corporation, New York, USA). Pre and post-intervention score was analysed using Wilcoxon signed-rank test, with a p-value of less than 0.05 was considered statistically significant.

Results and discussion

A total of 539 health workers have answered the mental health screening. The prevalence of depression was 5.8%. A group intervention module using the Mindfulness-Based Intervention (MBI) concept with a combination of art therapy and physical activity was built (Table 1). Next, a total of 22 HCWs with moderate depression underwent intervention. There was a decrease in the median depression scale score from 12[11,12.25] to 6[2.75, 10.25] ($z= -2.823$, p-value< 0.005) and an increase in the median for the willingness to change scale which was 9.0[8.38,9.83] to 10.1[9.18,10.6] ($z=-3.832$, p-value <0.0001). This study highlights the higher prevalence of depression among HCWs compared to the general population (4). It emphasises the urgency of implementing a mental health policy in the workplace to support the well-being of health personnel. The findings also underscore the dynamic nature of mental health and the need for periodic assessments and early interventions. The study suggests audience-appropriate and sustainable interventions, considering cultural norms and beliefs (5). A pilot intervention module, "MyHappy Performance," is proposed as a guide for interventions and future randomised controlled trials are recommended for stronger conclusions on its effectiveness.

Table 1: Module slots and number of hours assigned to each intervention

Slot	Intervention Type	Number of Hours
Anger Management	Psychoeducation Group Counseling	1 hour
Light Exercise & Meditation	MBI, Physical Activity	1 hour
Expressive Art Therapy	Expressive Art Therapy	2 hours
Massage Therapy	Physical Activity	1 hour
Communication Skills	Psychoeducation Group Counseling	1 hour
Smart Team	Psychoeducation Group Counselling	1 hour
Mood Enhancement	MBI	1 hour
Group Presentation	Psychoeducation Group counselling	2 hours

Conclusion =

In conclusion, this study highlights higher depression prevalence among HCWs compared to the general population. The "MyHappy Performance" intervention module showed promising results, reducing depression scores, and increasing willingness to change, indicating its potential in fostering resilience. Further research and controlled trials are needed to validate its effectiveness.

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OHEHPP09/125 : Effect Of Information-Motivation-Behavioral Skills-Based M-Health Education On Increasing Adherence To Pulheems Examination Among Military Personnel In Klang Valley

Nik Qistina Nik Abd Rahim [1,2],Nor Afiah Mohd Zulkefli [1],Norliza Ahmad [1],Lim Poh Ying[1]
[1] Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
[2] Military Medicine Department, Hospital Angkatan Tentera Tuanku Mizan
Corresponding author's email: norafiah@upm.edu.my

Summary
This study aims to evaluate the effectiveness of Information-Motivation-Behavioural Skills-based mobile-health education intervention on increasing PULHEEMS (military's periodic health examination) adherence at one- and three-months post-intervention among military personnel in Klang Valley. A quasi-experimental study was conducted among 420 military personnel in Klang Valley. PULHEEMS adherence (primary outcome) was collected at three months post-intervention, while total knowledge, motivation and self-efficacy scores (secondary outcomes) were collected at baseline, one- and three months post-intervention. Multivariable analysis was done to determine the effects. There were significant differences between the intervention and control group on both outcomes at three months post-intervention ($p<0.001$).

Introduction
The high prevalence of non-adherence to PULHEEMS examination, as the compulsory periodic health examination for all military personnel in Malaysia, was alarming (1). PULHEEMS stands for physical capacity, upper limb, locomotion, hearing, eye-left, eye-right, mental capacity and stability assessment. The objective of the examination is to ensure every military personnel is mentally fit and healthy to carry and uphold the vision of the Malaysian Army by determining their medical status. Non-adherence to PULHEEMS examination affected the deployability issues (1), late detection of non-communicable diseases and higher health costs (2). Mobile health (m-health) is the fastest and most promising approach to assist health examination adherence, as well as to assist the medical practitioner in managing health services (3). Thus, this study aims to evaluate the effectiveness of Information-Motivation-Behavioural Skills (IMB) based m-health education intervention on increasing PULHEEMS adherence at one- and three-months post-intervention among military personnel in Klang Valley.

Materials and Methods

This quasi-experimental study with a pre-post-test design with comparison was conducted among 420 military personnel who have met the inclusion and exclusion criteria in Klang Valley. The intervention program was completed in four months. The study instruments were the self-administered m-health validated questionnaires, the Military Lifetime Health Record (MLHR) system and the m-health education intervention. The intervention was validated and pretested on 44randomly selected military personnel with the same sociodemographic characteristics as the study participants. PULHEEMS adherence (the primary outcome) was collected at three months post-intervention, while total knowledge, motivation and self-efficacy scores (the secondary outcomes) were collected at baseline, one- and three-months post-intervention. Statistical Package of Social Sciences System version 26 was used to analyse the data. Chi-square and Mann-Whitney U tests were conducted between comparison groups for the primary and secondary outcomes. Generalized Estimating Equation (GEE) was performed for within groups comparisons. Multivariable analysis was done using Multiple Logistic Regression and GEE to determine the effects of the intervention on primary and secondary outcomes, adjusted for covariates. A significance level of 0.05 with 95% confidence was used to reject null hypotheses.

Result and Discussion

The response rate was 100%. Results showed no significant difference for primary and secondary outcomes at baseline. There were significant differences between the intervention and control group on both outcomes at three months post-intervention ($p<0.001$), although both groups had increased in proportions (93% and 63% respectively). This could be due to the feeling of being observed, as it is one of the components for a person to reflect on the situation (4). The intervention was able to improve total knowledge scores (B=0.181, 95% CI: 0.111, 0.252, $p<0.001$), motivation score (B=0.128, 95% CI: 0.059, 0.197, $p<0.001$) and self-efficacy score (B=0.175, 95% CI: 0.085, 0.266, $p<0.001$) at three months post-intervention after adjusted with covariates (Table 1). The participants who received the intervention were 36 times more likely to adhere to PULHEEMS examination (AOR=36.44, 95% CI: 18.02-73.70) (Table 2). Although the confidence interval is wide, which might be due to the modest sample size, it still has good enough evidence of the intervention's effectiveness. Total knowledge and self-efficacy scores were the predictors for PULHEEMS adherence in this study (AOR=1.05. 95% CI: 1.00-1.09; AOR=1.06. 95% CI: 1.02-1.10). Self-efficacy was improved when participants had more information related to the examination; meanwhile, a multidimensional approach is required to raise motivation, given that complex reasons are involved as to why people are not motivated to undergo health examination (5). This study proved that the IMB model is a solid theoretical framework for developing behavioural interventions, even though evidence for the sustainability of the behaviour change remains necessary. Applying the model is shown to be essential for mobile health research.

Conclusion

The IMB-based education effectively increased PULHEEMS adherence by improving total knowledge, motivation and self-efficacy scores. It could be embedded in the routine health programs at military units' tactical level and into the teaching curriculums of military training centres at the operational level. The strategic level leaders could apply the m-health module by integrating them into the current MLHR system. Randomised trial incorporating a longer duration of motivational approach is suggested after a qualitative study to explore further on sociocultural contexts of PULHEEMS non-adherence.

Acknowledgements
Deepest gratitude to all lecturers in the Department of Community Health, Universiti Putra Malaysia, who supported this study.

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OHEHPP10/121 : Prevalence Of Non-Communicable Disease Risk Factors Among Healthcare Workers In The KOSPEN WOW Program In Kedah

Rosidah Omar[1], Lau Shu Yee[1], Muhamad Fadhil Mohamad Marzuki[2], Liyanatul Najwa Zakaria[3], Norizan Ahmad[4]
[1]*Occupational and Environmental Health Unit, Kedah State Health Department.*
[2]*Non-Communicable Disease Unit, Kedah State Health Department*
[3]*Primer Unit, Kedah State Health Department.*
[4]*Public Health Division, Kedah State Health Department*
**Corresponding author: drlau.shuyee@moh.gov.my*

Summary
Non-communicable diseases (NCDs) are one of the major health problems. KOSPEN WOW (Healthy Community Builds the Nation Wellness of Workers) was initiated by

the Ministry of Health Malaysia to reduce the occurrence of NCDs as well as related risk factors and to increase the healthy behaviours of targeted workers at the workplace. This study aims to determine the prevalence of NCD risk factors among healthcare workers (HCWs) in health facilities that implemented the KOSPEN WOW Programme in Kedah

Keyword
KOSPEN WOW; non-communicable diseases; occupational health; wellness; health promotion

Introduction
The Non-Communicable Diseases Progress Report by WHO reported that NCDs kill 41 million people each year (1). Meanwhile, National Health and Morbidity Survey (NHMS) in Malaysia reported prevalence of diabetes mellitus increased from 11.2% in 2011 to 18.3% in 2019 (2). The survey also highlighted the prevalence of hypertension was 30% and obesity was 50%. Recognizing the impact of NCD on workers, the Ministry of Health Malaysia introduced the KOSPEN WOW program (Healthy Community Builds the Nation –Wellness of Workers) to reduce the occurrence of NCDs as well as related risk factors and to increase healthy behaviours of targeted workers at the workplace (3). This initiative includes a health screening program, hence this study aims to determine the prevalence of NCD Risk factors among HCWs in health facilities that implemented the KOSPEN WOW Programme.

Materials and Methods
This is a retrospective descriptive study of cumulative reporting of NCD risk factors among HCWs from the KOSPEN WOW Ministry of health facilities in the Kedah State Health Department. Secondary data was obtained from the National KOSPEN WOW Programme database from the year 2020 to 2022. In this study, three main measures of NCD risk factors were reported among HCWs which include raised random capillary blood glucose, raised blood pressure, and body mass index (BMI) ≥ 25 kg/m2.

Results and Discussion
The result shows a rising trend of overweight and obesity from 45.4% in 2020 to 48.6% in 2022 (Figure 1). The study also found a rising trend of raised capillary blood sugar from 15.5% in 2020 to 19.4% in 2022. Being overweight and obese is strongly associated with the risk of developing non-communicable diseases such as hypertension, diabetes mellitus, stroke, cardiovascular diseases, dyslipidemia, and some cancers. Besides, being overweight and obese have been proven to be associated with work absenteeism and reduced work productivity as compared to those with an ideal weight (4).

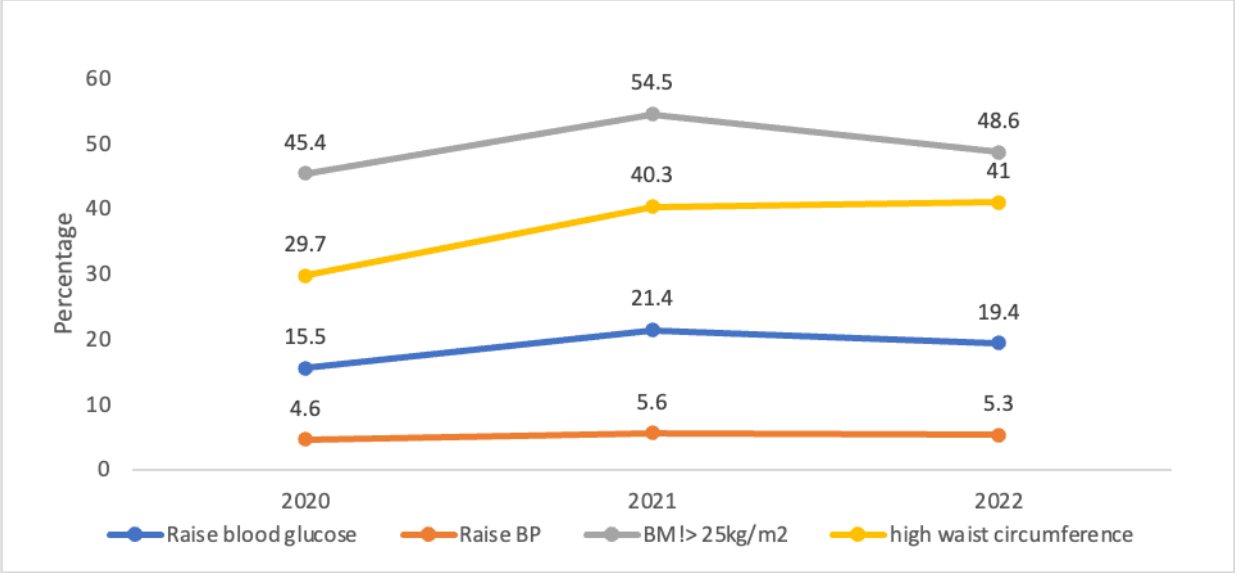

Figure 1: Prevalence of raised random capillary blood glucose levels, raised blood pressure, BMI ≥25 kg/m2, and high waist circumference among HCWS in MOH facilities from the year 2020 to 2022.

Based on previous studies, unhealthy dietary practices and physical inactivity have been recognised as key risk factors in rising NCDs for developing countries (5). Hence, to encourage physical activities among workers, we should create healthy workplaces such as wellness hubs, schedule physical activities such as 10 000 steps per day, and participate in sport event physically or virtually. Meanwhile, to promote healthy eating some interventions can be implemented such as healthy food, calorie tag during departmental meetings, the use of a food diary and using mobile applications to record calorie intake.

Conclusion

This study described NCD risk factors among HCWs in Kedah. Obesity, and raised blood sugar are the major problems identified. KOSPEN WOW is a good platform for early screening of NCD risk factors and the program should be sustained. Workplace place interventions to reduce the NCD risk factors are vital to ensure the wellness of the workers.

Acknowledgements

We would like to thank everyone contribute in this study and the Kedah State Health Department for the administrative support.

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OHEHPP11/122 : Willingness To Pay (WTP) For Saliva Test Kits Among Healthcare Workers In Kedah

Rosidah Omar[1], Lau Shu Yee[1]
[1]Occupational and Environmental Health Unit, Kedah State Health Department
Corresponding author email: drlau.shuyee@moh.gov.my

Summary
A saliva test kit is an important screening tool for early identification of Covid-19 infection. However, the willingness to pay (WTP) for the testing kit remains unclear. The objectives of this study are to identify the factors influencing willingness to pay and financing mechanism preference for the saliva test kit.

Keywords
Willingness to Pay, saliva test kit, COVID-19, self-test, healthcare worker

Introduction
The Coronavirus disease 2019 (COVID-19) pandemic has caused significant morbidity and mortality in the world. Other than vaccination, early identification and rapid isolation remain key strategies to curb the pandemic. A saliva test kit is an important screening tool for early identification. However, the willingness to pay (WTP) for the testing kit remains unclear. The objectives of this study are to identify the willingness to pay for the saliva test kit and to identify the factors influencing willingness to pay and financing mechanism preference for the saliva test kit

Materials and Methods
This is a cross-sectional study and was conducted among HCW in Kedah in 2021. The study used convenience sampling and the sample size was 621 HCWs. A questionnaire was adopted based on previous studies assessing willingness to pay and was distributed via online medium using Google Forms (1,2). The study variables include sociodemographic characteristics, willingness to pay for saliva test kits, and financing mechanism preference. Payment scale and open-ended method were used to collect the value for WTP.

Results and discussion
The study found WTP for the saliva test kit was RM6.75 or USD 1.59 which is lower as compared to the selling price of RM19 at the time of the study. The WTP was also lower than the previous study conducted in Kenya which reported a mean WTP

for saliva test kit value of USD 5.59 (3). The study found four factors influencing on the WTP for saliva test kits including females, tertiary education, professional groups, and household income >RM5000. Females had higher WTP as compared to males could be due to they are more health conscious and have higher health literacy (4). Professional groups were willing to pay more for saliva test kit could be due to they had higher education and monthly income (1,5). As for the financing mechanism preference, the majority of the respondents believed that individuals did not need to pay out of pocket for the saliva test (60.2%). Instead, respondents prefer employers (64.1%), government (67.4%) and health insurance (70.4%) to pay fully for the saliva test kit (Table 1)

Table 1: Financing mechanism preference for the saliva test kit

Variables		Frequency	Percentage
Individuals need to pay out of pocket for saliva test	No	374	60.2
	Yes, pay for a portion	142	22.8
	Yes, pay fully	105	16.9
Employers need to pay for saliva test	No	95	15.3
	Yes, pay for a portion	127	20.5
	Yes, pay fully	399	64.2
Governments need to pay for saliva test	No	69	11.1
	Yes, pay for a portion	134	21.6
	Yes, pay fully	418	67.3
Health insurance needs to pay for saliva test	No	103	16.6
	Yes, pay for a portion	80	12.9
	Yes, pay fully	438	70.5

Conclusion

The study reported WTP for saliva test kits among HCWs in Kedah was RM6.75 or USD 1.59. Factors influencing WTP include female, tertiary education, professional group, and household income. The majority of the respondents were not willing to pay out of pocket for the saliva test kit and stated it's the government, employers, and insurance companies' responsibility. The study results helped decision-maker to decide on a policy of saliva testing among HCWs and facilitate government to set appropriate market prices to ensure the affordability and accessibility of the saliva test kit

Acknowledgment
The authors would like to thank everyone who contribute to this study and the Kedah State Health Department for the administrative support.

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OHEHPP12/149 : Risk Factors Of Hearing Loss Among Vector Control Workers In Kedah

Rosidah Omar[1], Lau Shu Yee[1], Shareh Azizan Shareh Ali[2], Ezy Eriyani Mohd Hadzari[3], Alias Abdul Aziz[4]
[1] Occupational and Environmental Health Unit, Kedah State Health Department.
[2] Kota Setar District Health Office, Kedah State Health Department
[3] Baling District Health Office, Kedah State Health Department
[4] Kulim District Health Office, Kedah State Health Department
Corresponding author: drlau.shuyee@moh.gov.my

Summary
Noise-induced hearing loss is the leading occupational disease in Malaysia. The study aims to determine the prevalence of hearing loss among vector control workers in Kedah and the associated factors. We used secondary data from the medical surveillance of vector control workers by the Occupational and Environmental Health Unit in the Kedah State Health Department. The prevalence of hearing loss among vector control workers in Kedah was 58.8% and age >40 years were five times more likely to get hearing loss as compared to age <40 years (OR 5.694, 95% CI 1.907, 16.996).

Keywords: noise-induced hearing loss, vector control worker, hearing loss, safety

Introduction
Noise-induced hearing loss (NIHL) is hearing loss due to excessive noise and is the leading occupational disease in Malaysia. Hearing loss is defined as a partial or total inability to hear marked by a hearing threshold worse than 25 dB at any

audiometric test frequency (1). Vector control workers are at risk of developing hearing loss due to exposure to noise from fogging machines and exposure to chemicals that may be deleterious to their hearing such as organophosphate and diesel(2). Research on hearing loss in Malaysia has been limited, hence this study is to determine the risk factors of hearing loss among vector control workers in Kedah.

Materials and Methods

This was a cross-sectional study using secondary data from medical surveillance of vector control workers by the Occupational and Environmental Health Unit in the Kedah State Health Department. We use purposive sampling and include 97 vector control workers from three districts of Kota Setar, Baling, and Kulim. Descriptive analysis and multiple logistic regression were conducted to identify the factors for the hearing loss using STATA version 14.0

Results and Discussion

The mean age of workers was 37.3 (±7.5) years and the mean length of services was 10.6 (±6.3) years. Majority of the workers was male 92.8%, non-smoking 59.8%, and no comorbid 72.2%. A total of 32% reported had previous occupational noise exposure and 80.4% exposed to current occupational noise. Meanwhile 21.7% reported not compliance to PPE of hearing protection. Prevalence of hearing loss among vector control workers in Kedah was 58.8%. The percentage is higher than a previous systematic review which reported the prevalence between 7-21% of hearing loss among workers (3). Following logistic regression, age more than 40 years was five times more likely to get hearing loss as compared to age less than 40 years (OR 5.694, 95% CI 1.907, 16.996) (Table 1). The older age-group may have been exposed to excessive noise for a far longer period than the younger age-group (2). Figure 1 shows threshold audiogram for both ears according to age.

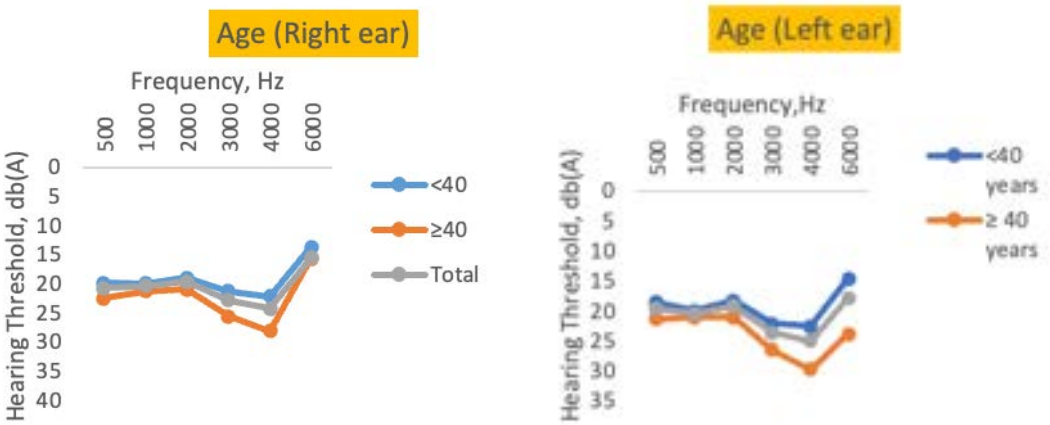

Figure 1: Threshold audiogram for both ears according to age.

Table 1: Multivariate Logistic Regression of Associated Factors of Hearing Loss among Vector Control Workers

Variable	B-coef	SE	Adjusted OR	95% CI	P value

Age <40 years			1.0 (reference)		
Age >40 years	1.739	3.177	5.694	1.907, 16.996	0.002
Female			1.0 (reference)		
Male	1.072	2.693	2.922	0.479, 17.794	0.245
Non Smoking			1.0 (reference)		
Smoking	0.797	1.062	2.219	0.868, 5.670	0.096
No Comorbid			1.0 (reference)		
Comorbid	-0.203	0.429	.816	0.291, 2.288	0.699
Current noise exposure No			1.0 (reference)		
Yes	-0.657	0.354	0.517	0.135, 1.980	0.336
Hearing Protection Yes			1.0 (reference)		
No	-0.599	0.348	0.548	0.158, 1.903	0.344
_cons		.462	.465	0.066, 3.265	0.442

Conclusion

Our study found prevalence of 58.8% vector control workers had hearing loss and age more than 40 years was a significant contributing factors. Strengthening of hearing conservation program include noise risk assessment, yearly audiometry, training, PPE of hearing protection and record keeping are vital to prevent noise induce hearing loss.

Acknowledgements

We would like to thank everyone contribute in this study and the Kedah State Health Department for the administrative support.

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Malaysian Journal of Public Health Medicine, Vol. 23 (Suppl (1) 2023
11th National Public Health Conference & 1st Global Public Health Conference:
Building a Resilient Public Health System for a Better Future | 25th - 27th July 2023 | Resorts World Langkawi, Kedah

OHEHPP13/150 : Recreational Marine Water Samples And Its Relationship With Acute Gastroenteritis (Age) Case Reporting In Port Dickson District, Negeri Sembilan, Malaysia

Ammar Amsyar Abdul Haddi[1], Esther Rishma Sundram[1], Shahdatul Dewi Nur Khairitza Taib[1], Muhammad Afdal Fitri Rahim[1], Qaiyum Omar[1], Zuraida Mohamed[2]
[1]*Port Dickson District Health Office, Ministry of Health*
[2]*Negeri Sembilan State Health Department*
Corresponding author's email: ammar353548@yahoo.com

Summary
Recreational beaches are frequently used by human for water activity therefore always have the risk of human exposure. This study aimed to explore the relationship between recreational marine water parameters and the case of Acute Gastroenteritis (AGE) reported in the local district of Port Dickson. Analysis showed that AGE incidence only negatively correlated with marine water pH level. Although analysis showed that the correlation between AGE case reporting and the marine water's faecal coliform and enterococci levels were not statistically significant, it does not take into account other pathogens that were not being analysed, which may warrant further exploration.

Keywords
Marine water, Acute gastroenteritis

Introduction

Recreational marine water sample surveillance activity is routinely done by coastal districts and a few markers such as faecal coliform and enterococci spp. levels were routinely measured to represent the magnitude of enteric bacteria pollution in marine water. Whereby Acute Gastroenteritis (AGE) is an illness characterized by gastrointestinal symptoms such as diarrhoea, vomiting and abdominal pain which is mainly caused by infection of the enteric pathogen to the gastrointestinal system. Due to both surveillance systems being related to enteric pathogens and their associated illness, there is a need for us to unravel the potential relationship between marine water sample parameters and local district Acute Gastroenteritis (AGE) data surveillance. This study aimed to explore the relationship between marine water sample parameters and Acute Gastroenteritis (AGE) surveillance data in Port Dickson district.

Method and Material

This is a cross-sectional analysis. Marine water samples' data surveillance was obtained from the environmental health unit, Port Dickson Health District. Marine water sampling was done at 2 main beaches in Port Dickson namely beach "A" and beach "B". Water sampling procedure was done in 3 spots located around 20 meters from the monsoon drain outlet near the beach. Sampling was done monthly throughout the year 2022-2023 and parameters such as enterococci, faecal coliform, pH and turbidity level were recorded. Whereas, AGE case reported was obtained via AGE surveillance data. Specifically, data was collected via weekly case reporting from the hospital and all health clinics in Port Dickson district throughout the year 2022-2023 which were recorded by the communicable disease

control unit, Port Dickson Health District. Pearson correlation and t-test were used for statistical data analysis

Results and discussion

Marine water samples throughout the year 2022-2023 showed that faecal coliform levels were above permissible level (>1000 count/100ml) in February, March, July and August for both beaches, whereas Enterococci level was above permissible level (>230 count/100ml) in February, August and October (1). AGE case reported that week was significantly correlated with the mean pH level in the marine water sample (beach B) in a negative linear relationship ($p=0.034$, $r=-0.53$). The mean pH level between beach A and beach B was significantly correlated in a positive manner ($p<0.001$, $r=0.78$). Faecal coliform levels in marine water samples between beach A and beach B were also significantly and positively correlated ($p<0.001$, $r=0.8$), and a positive linear relationship was also detected in marine water Enterococci level between beach A and beach B ($p=0.004$, $r=0.68$). Although a correlation was reported between AGE and other recreational water body enterococcus level in other studies (2,3), no correlation was detected between AGE cases reported and the mean faecal coliform level or mean Enterococci level in our marine water samples. Enterococci and faecal coliform levels were also not correlated with marine water's pH level nor marine water's turbidity level. The rainy season was associated with lower faecal coliform level in beach B ($p=0.035$). On top of that, having AGE cases reported above action level in the month before was associated with higher marine water enterococci levels in the following month ($p=0.038$). Since this analysis did not include other enteric pathogens such as viruses and other bacterial species that may be associated with AGE (4), more information is needed to fill the gap in establishing the relationship between these data.

Conclusion: Result show that AGE cases reported in Port Dickson district were not associated with marine water Enterococci or faecal coliform level but otherwise it did correlate negatively with marine water pH level.

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OHEHPP14/142 : Gaming Addiction And Its Association With Depression, Anxiety And Loneliness Among University Students In Malaysia

Mona Lisa Md Rasip[1], Nor Asiah Muhamad[2], Sharifah Zawani Syed Ahmad Yunus[3], Norliza Chemi[4], Norni Abdullah[5], Nur Hasnah Maamor[2], Izzah Athirah Rosli[2], Fatin Norhasny Leman[2], Mohd Fadzli Mohamad Isa[6]

[1]Occupational Safety and Health Unit, National Institutes of Health, Ministry of Health
[2]Sector for Evidence Based Healthcare, National Institutes of Health, Ministry of Health
[3]Communication and Dissemination Unit, National Institutes of Health, Ministry of Health
[4]Department of Psychiatry, Kajang Hospital, Ministry of Health
[5]Department of Psychiatry, Tengku Ampuan Rahimah Hospital, Ministry of Health
[6]Department of Psychiatry, Kuala Lumpur Hospital, Ministry of Health
Corresponding author's email: monalisamph18@gmail.com

Summary
Gaming addiction is considered as a behavioural mental health problem that may negatively impact an individual's daily functions. This study aimed to identify the association between depressions, anxiety and loneliness with gaming addiction among university students in Malaysia. A cross-sectional study was conducted using a two-stage stratified cluster sampling design. The findings showed that depression, anxiety and loneliness were found to be associated with gaming addiction among the university students in Malaysia. The evidence from this study may help to understand how gaming addiction may hinder youths' social development and the need to provide some guidance for mental health education practice in the future.

Keywords
gaming, behavioral addiction, depression, anxiety, loneliness

Introduction
Gaming addiction is defined as compulsive or excessive use of online or offline gaming that has negative impact on a person's physical, psychological, and social functions (1). It is recognised as one of behavioural mental health disorders. The Internet Users Survey reported in 2020 by Malaysian Communications and Multimedia Commission (MCMC) showed that 46% of the users were in their twenties and 43% of them used internet for gaming purposes (2). Social, media and psychological factors including depression, anxiety and loneliness contentment play major roles in gaming addiction (3). It was believed that to overcome the feeling of distress and loneliness, people spend time playing games, especially through online, and at some point, they feel more comfortable in their virtual life until it becomes an addiction (4). Therefore, this study aimed to identify the association

between depressions, anxiety and loneliness with gaming addiction among public university students in Malaysia.

Materials and Methods

A cross-sectional study was conducted between January and December 2022 in public universities in Malaysia, using a two-stage stratified cluster sampling design which is by faculty and student year. We identified 20 public university in Malaysia. The first stage of sampling was the selection of faculties and the second stage was the selection of student year. All students in the selected year were recruited to participate in this study. Four validated assessment scales were used to collect information on gaming addiction, depression, anxiety and loneliness. A statistical software tool, SPSS version 22 was used to conduct data analysis. Descriptive analysis was used for frequency of sociodemographic characteristics and proportions of gaming addiction, severity of depression, anxiety and loneliness among the students. Chi-square test was conducted to observe the association between the variables. Further analysis using multiple logistic regression was performed for any significant univariate associations.

Results and Discussion

A total of 4,098 students were included in the analysis. Of these, 598 had gaming addiction **(Table 1)**. Male were two times more likely to be addicted as compared to female (OR 2.30, 95%CI 1.84-2.89; p <0.001). Spending less than three hours on the Internet was less likely to be addicted as compared to those spending more than 10 hours (OR 0.65, 95% CI 0.50-0.84; p <0.001). Students who had social media were more likely to be addicted as compared to those who had no social media (OR 2.60, 95% CI 1.66-4.08; p <0.001). Students with depression were five times more likely to be addicted as compared to those without depression (OR 5.38, 95% CI 4.41-6.57; p <0.001). Students with anxiety were four times more likely to be addicted as compared to those without anxiety (OR 4.60, 95% CI 3.79-5.58; p <0.001). Students who were lonely were three times more likely to be addicted with gaming as compared to those who were not lonely (OR 3.59, 95% CI 2.51-5.13; p <0.001). From the results obtained, depression, anxiety and loneliness were found to be associated with gaming addiction among the university students in Malaysia. A previous study had demonstrated that video game addicts suffered poorer mental health and cognitive functioning with increased emotional difficulties, such as enhanced depression and anxiety, as well as more social isolation (5). The study further stated that adolescents and young adults were more vulnerable to Internet-related addiction because of their psychological and developmental characteristics and the easy access to the Internet with a portable device, hence the positive expectation of gaming.

Table 1. Distribution of gaming addiction among public university in Malaysia. (N=4,098)

Variables	N	Gaming addiction, n (%)	
		Normal	Addicted

Overall	4,098	3,500 (85.4)	598 (14.6)
Sex			
Male	1,462	1,169 (33.4)	293 (49.0)
Female	2,636	2,331 (66.6)	305 (51.0)
Ethnic groups			
Malay	2,889	2,470 (70.6)	419 (70.1)
Chinese	409	347 (9.9)	62 (10.4)
Indian	192	161 (4.6)	31 (5.2)
Bumiputera Sabah & Sarawak	536	461 (13.2)	75 (12.5)
Others	72	61 (1.7)	11 (1.8)
Duration of exposure on Internet			
<3	145	128 (3.7)	17 (2.8)
3-6	1,631	1,446 (41.3)	185 (30.9)
7-10	1,526	1,315 (37.6)	211 (35.3)
>10	796	611 (17.5)	185 (30.9)
Reason using Internet			
Searching information	3,810	3,274 (93.5)	536 (89.6)
Shopping	2,432	2,067 (59.1)	365 (61.0)
Attend workshop/seminar	2,349	2,013 (57.5)	336 (56.2)
Play games	2,084	1,660 (47.4)	424 (70.9)
Video call	2,318	1,981 (56.6)	337 (56.4)
Social media	3,875	3,326 (95.0)	549 (91.8)
Others	2,703	2,307 (65.9)	396 (66.2)
Depression			
No	2,368	2,222 (63.5)	146 (24.4)
Yes	1,730	1,278 (36.5)	452 (75.6)
Anxiety			
No	2,362	2,201 (62.9)	161 (26.9)
Yes	1,736	1,299 (37.1)	437 (73.1)
Loneliness			
No	657	623 (17.8)	34 (5.7)
Yes	3,441	2,877 (82.2)	564 (94.3)

Conclusion

This study showed that depression, addiction and loneliness is one of mental health problem among university students in Malaysia. The findings may provide evidence on the status of mental health problems and behavioural addictions among university students and help to understand how gaming addiction may hinder youths' social development. Hence, the need to provide some guidance for mental health education practice in the future is important.

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