

EFFECT OF INFORMATION-MOTIVATION-BEHAVIOURAL SKILLS-BASED M-HEALTH EDUCATION ON INCREASING ADHERENCE TO PULHEEMS EXAMINATION AMONG MILITARY PERSONNEL IN KLANG VALLEY



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INTRODUCTION

The high prevalence of non-adherence to PULHEEMS examination, as the compulsory periodic health examination for all military personnel in Malaysia, was alarming. 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, late detection of non-communicable diseases and higher health costs. 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. 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 44 randomly 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. 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. 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

Table 1: Effects of intervention on total knowledge, motivation and self-efficacy scores between and within groups over time (N=420)

Factors	Total Knowledge Scores		Motivation Score		Self-efficacy Score	
	Adjusted B ^a	p-value	Adjusted B ^a	p-value	Adjusted B ^a	p-value
Intercept	3.122	<0.001*	3.693	<0.001	3.263	<0.001
Trial group						
Control	Ref		Ref		Ref	
Intervention	-0.041	0.185	-0.004	0.905	0.007	0.853
Timepoint						
Baseline	Ref		Ref		Ref	
1-month	0.022	0.352	0.036	0.100	0.073	0.009*
3-month	-0.047	0.085	-0.046	0.095	-0.057	0.112
Trial group X timepoint						
Control x Baseline	Ref		Ref		Ref	
Intervention x 1-month	0.075	0.018*	0.042	0.165	-0.009	0.813
Intervention x 3-month	0.181	<0.001*	0.128	<0.001*	0.175	<0.001*

^a Generalized Estimating Equation, B = Beta Coefficient, *Significant at $p \leq 0.05$

Table 2: Effects of Intervention on PULHEEMS adherence among military personnel in Klang Valley (N=420)

Factors	AOR ^a	95%CI		p-value
		Lower	Upper	
Trial group				
Intervention	36.438	18.015	73.703	<0.001*
Control	Ref			
Total knowledge Scores	1.046	1.001	1.094	0.046*
Motivation Score	1.015	0.984	1.048	0.353
Self-efficacy Score	1.060	1.018	1.103	0.004*

^a Multiple Logistic Regression, AOR = Adjusted Odd Ratio, CI = Confidence Interval, * Significant at $p \leq 0.05$

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.

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