

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 Shamsudin¹, Salmiah Md Said², Titirahmawati², Ahmad Zaid Fattah², Arshil Moideen¹, Norliza Ahmad²
¹ Royal Medical Corps, Malaysian Armed Forces, ² Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Introduction

Dengue cases are reported at 400 million cases reported worldwide every year, with 70% burden being in Asia, and Malaysia is the 3rd highest country in the Western Pacific region.

Dengue severity, impact and gaps:

- Causing mortality: CFR 0.14% (2019) to 0.16% (2020) (Cogan, 2023)
- High-cost burden: global: US\$689.7 million; Malaysia US\$56 million (Shepard et al., 2016; Packierisamy et al., 2015)
- A long day of loss: 11.2 to 18.7 days, 16.2 hospitalised (Mia et al., 2016)
- Military camp as dengue hotspot: impair strength forces

The study objective is to analyse the effect of IMODE in improving dengue preventive practice, Knowledge, motivation and behavioural skills

Methods

Design: Two-Arm Cluster Randomised Control Trial

Duration: October 2022 – March 2023

Sample size: using Lemeshow et al. 1990, inflated with Hemming et al., 2011 for cluster. Results : 124 samples per arm, 284 total.

Questionnaire: validated during this study (Cronbach's alpha: 0.69 – 0.96)

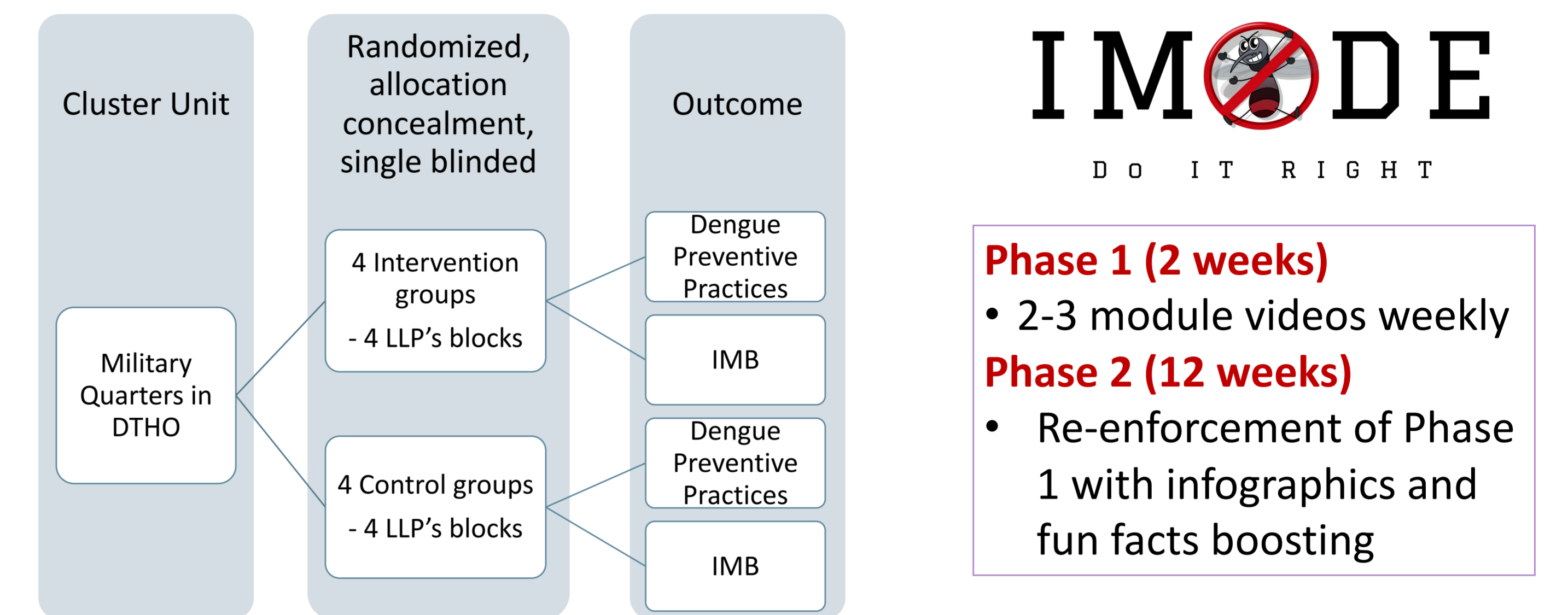


Figure 1. Two arm cluster randomized control trial diagram. *IMB: Information, motivation, behavioural skill

Results

Participation rate, attrition rate and missing data analysis

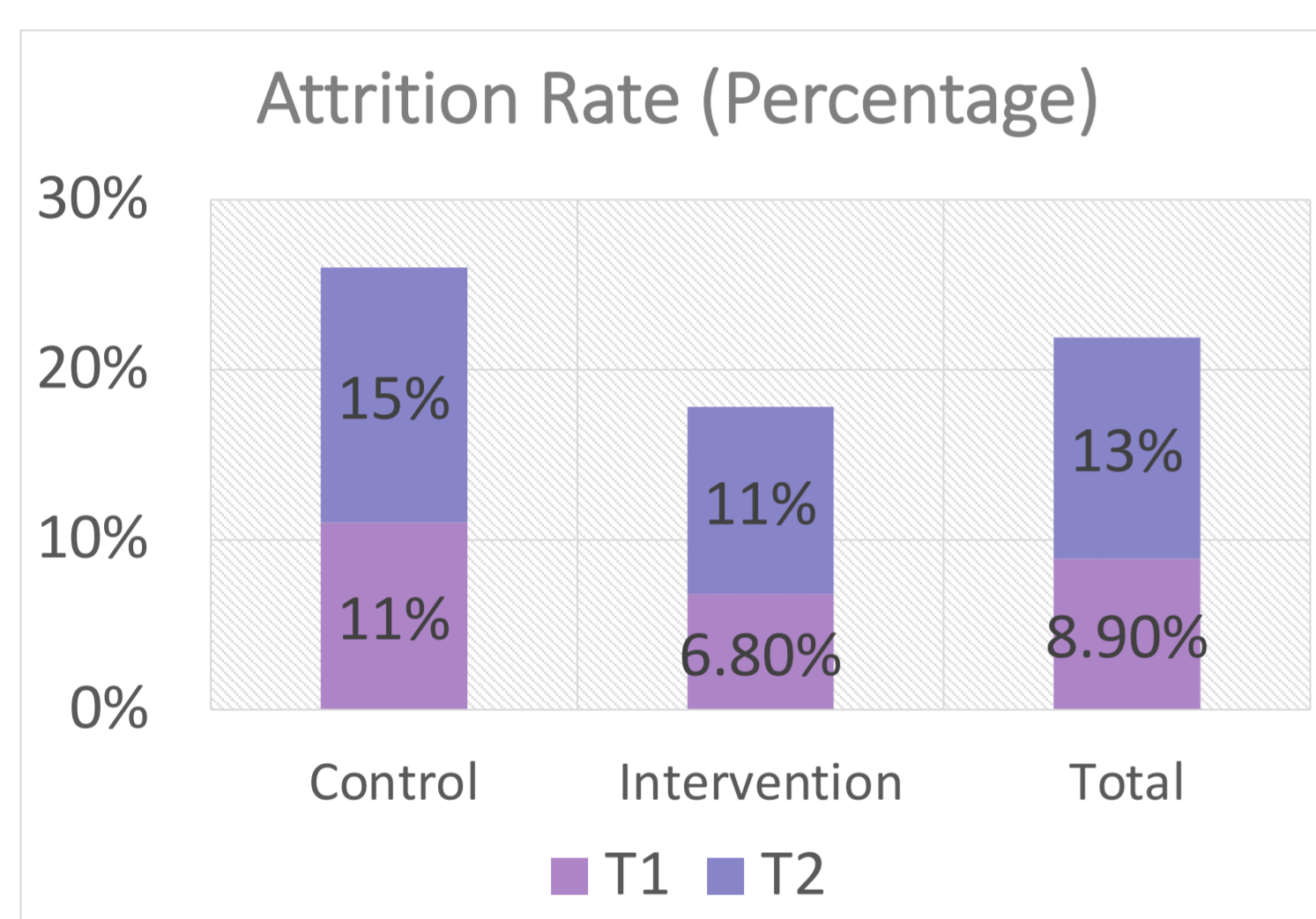
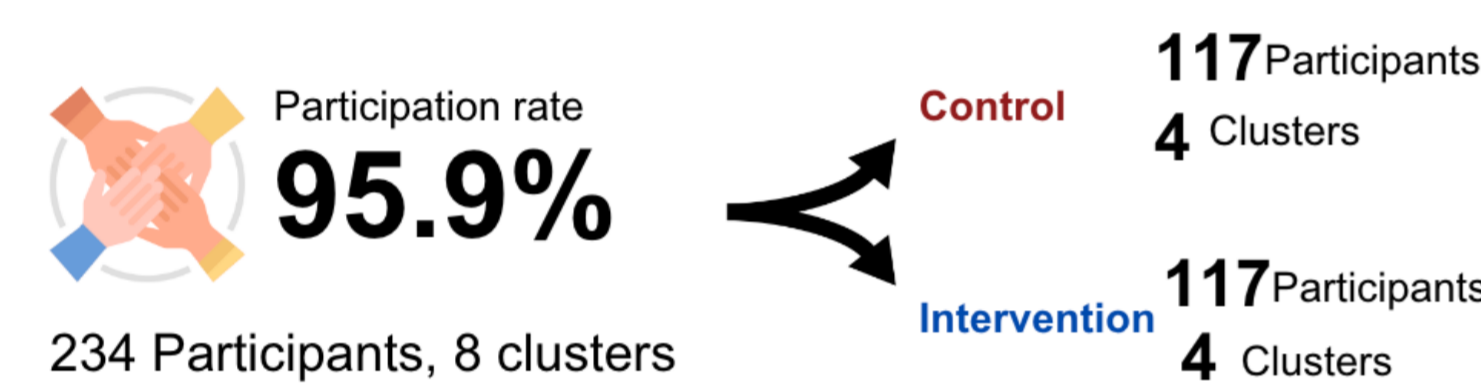


Figure 2. The attrition rate. T1: after 2 weeks, T2: after 3-months

- Missing data: missing complete at random (MCAR = 0.519)
- Intention-to-treat conducted with multiple imputations
- Sensitive analysis: significant difference in household income

Descriptive and baseline comparison

The mean age of all participants: 35 (SD 0.33). The majority were Malays (87.2%), male (83.3%), having secondary education (87.6%), having children (91.9%), household income of B40 (70.1%), and ranked corporal and below (55.6%). No significant differences were noted except for rank, income and number of children.

PAST DENGUE AND MEDICAL HISTORY

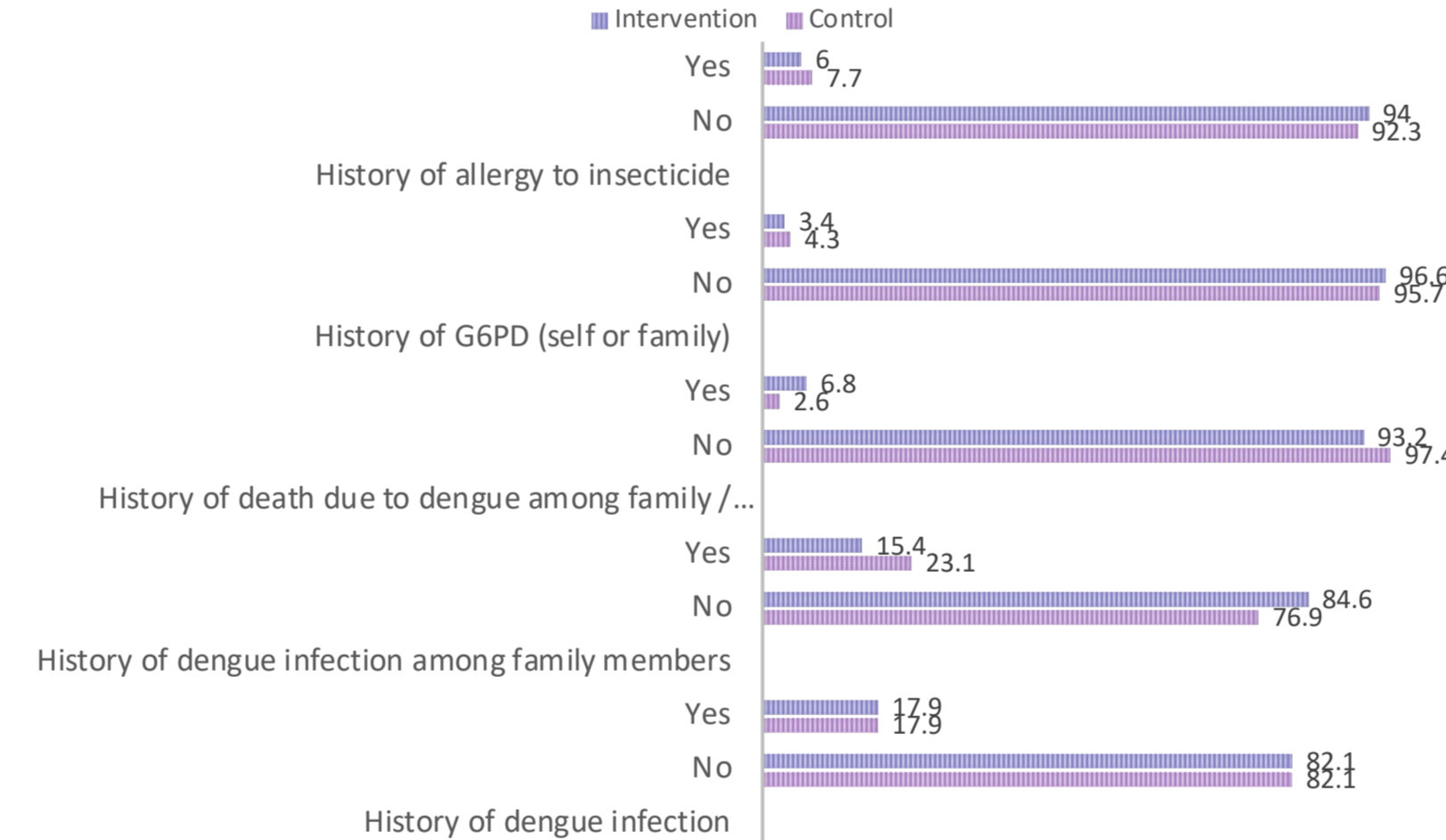


Figure 2. Medical and dengue past-history.

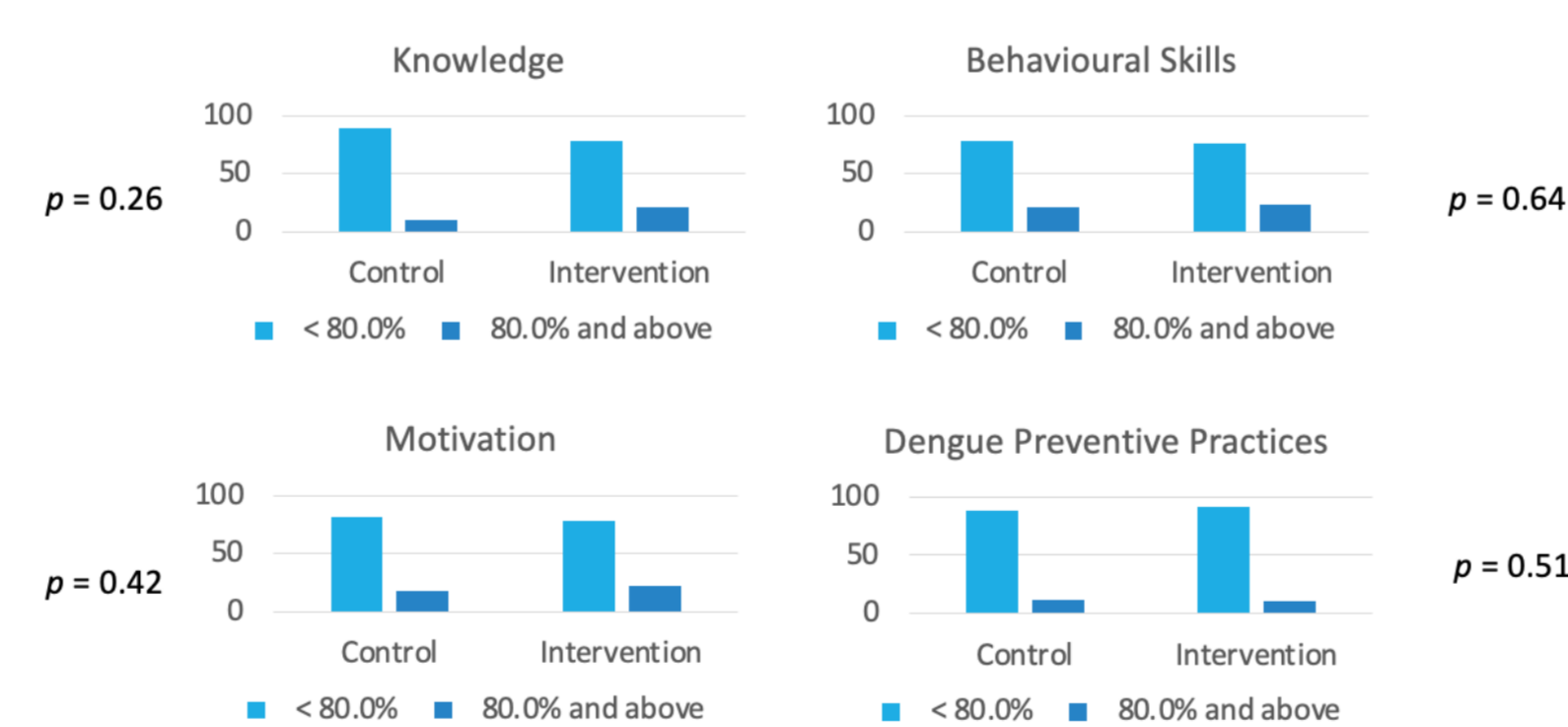


Figure 3. Baseline comparison on dengue preventive practices and IMB between groups

Effect of IMODE

The effect of IMODE is shown in Table 1.

Variable	Parameter	F	df	p value ^a
Knowledge	Group	49.677	1	< 0.001*
	Group x Time	54.606	2	< 0.001*
Motivation	Group	35.568	1	< 0.001*
	Group x Time	46.584	2	< 0.001*
Behavioural Skills	Group	24.017	1	< 0.001*
	Group x Time	10.817	2	0.004*
Dengue Preventive Practices	Group	6.625	1	0.01*
	Group x Time	4.806	2	0.09

Table 1. Effect of IMODE using General Estimating Equation (GEE); * significant set at p < 0.05 ; adjusted for rank, household income and number of children

Results in the intervention group compared to control:

- Significant increase in knowledge (OR 18.38, 95% CI 23.56, 48.37; p < 0.001)
- Significant increase in motivation (OR 10.33, 95% CI 7.27, 13.39; p < 0.001)
- Significant increase in behaviour skill (OR 8.58, 95% CI 3.32, 13.83, p = 0.001)
- No significant improvement in dengue preventive practices (OR 4.4, 95% CI -0.6, 9.48, p = 0.08)

Discussion

This is the first study to report dengue preventive practices using IMB theory. IMB theory was used to understand preventive behaviour in infectious disease such as sexual transmitted disease, COVID-19 and malaria (John et al., 2017; Tjahjadi et al., 2023; Balami et al., 2019). But more was needed to know if it has the effect to improve dengue preventive practices.

Although IMODE has successfully improved IMB, it was not significant in improving dengue preventive practices. Firstly, time constraint might be reason. Other studies conducted to improve dengue preventive practice took at least a year (Hanklang et al., 2018; Caprara et al., 2015) for a significant

Discussion (cont.)

improvement. Therefore, a longer duration of the intervention module could give a more favourable outcome in dengue practice.

Secondly, the involvement of stakeholders and more support is needed to ensure the field action plan is properly conducted within the community to ensure the effectiveness of the module.

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