Knowledge, Attitude and Practices of Dengue Patient Admitted to Hospital Tuanku Ja'afar, Seremban, Malaysia

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ABSTRACT

Dengue fever is a major public health problem in Malaysia. This study describes the knowledge, attitude and practice of dengue patients admitted to Hospital Tuanku Ja'afar, Seremban, Malaysia. A descriptive, community-based, cross-sectional study was conducted with 231 participants admitted to Hospital Tuanku Ja'afar with a diagnosis of dengue fever. The questionnaire included questions on demographic data, knowledge, attitudes, and practices regarding dengue fever. The age group was divided into two groups, which were respondents less than 40 years old and respondents of 40 years old or more. Most of the respondents were married (55.0%), Malays (66.7%), and acknowledged that Aedes aegypti mosquito is a vector of dengue fever (93.5 %). There was a significant association (p= 0.045) between knowledge score and socioeconomic factors like 40 years or more, higher educational level, higher family income, lower number of dengue experiences, moderate density of plants and low density of mosquitoes. Participants generally have a good attitude towards dengue fever, with an average score of above 8. Most of the participants (85.7%) are afraid of dengue (agree or strongly agree). There were no significant association between attitude (p = 2.224) and practices (p = 2. 079) score with age. In light of these findings, it is important for public health initiatives to address knowledge and enhance awareness, such as organising promotional health campaigns. This would be helpful in increasing the practices in preventing dengue fever.

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INTRODUCTION

The trend of dengue incidence in Malaysia has continued to increase. [1] Dengue incidence has been increasing in recent years, with 130,101 cases (dengue fever 129,578 cases; dengue hemorrhagic fever 523 cases) reported in 2019, which is the highest since 2012. Dengue is associated with substantial societal and economic burdens. It was estimated that the total annual cost of dengue prevention and illness in Malaysia in 2009/2010 is at $175.7 million. However, the true cost of the disease in the country is unknown because surveillance is mostly passive with sentinel surveillance restricted to urban areas [7].

The presenting features of dengue may range from asymptomatic fever to dreaded complications such as hemorrhagic fever and shock. [1, 2] The common symptoms of dengue are acute-onset high fever, muscle and joint pain, myalgia, cutaneous rash, hemorrhagic episodes, and circulatory shock.[2] Dengue is associated with substantial societal and economic burdens. [1] It was estimated that the total annual cost of dengue prevention and illness in Malaysia in 2009/2010 was at $175.7 million. [1] Therefore, it is important to promote the prevention of dengue fever.

Despite the close monitoring to conduct prevention and control activities, the number of dengue cases continues to increase due to multiple factors. Five major factors that influence the transmission of dengue disease are the dengue virus, the human as the host, the environmental conditions such as cleanliness, the vectors, and their behavior, and climate change. Due to these multiple factors that influence the transmission of the dengue virus the control of mosquito-borne viral infection is very challenging and different from managing other infectious diseases. Hence, the Ministry of Health Malaysia has implemented the integrated strategy for dengue prevention and control program in the National Dengue Strategic Plan (NDSP) since 2011. There are seven strategies included in the NDSP which are strengthening the dengue surveillance, practicing integrated vector management, emphasizing dengue case management, social and community mobilization towards the prevention activity, ensuring a rapid response in managing the dengue outbreak, and developing new innovative methods through dengue research. Most of the factors that contribute to the occurrence of dengue cases are difficult to be controlled and these leave with only manipulation and intervention with the environment, vector control, and changing human behavior for the prevention and control of dengue. [3]

Dengue is an acute viral illness caused by RNA virus of the family Flaviviridae and spread by Aedes mosquitoes. Currently in Malaysia, the dengue infection is more predominantly in urban areas where 61.8% of the country population lives. As compared to 1980 where it is only 34%, the rate of dengue transmission has been raised over the decades. This coupled with rural-urban migration and pockets of illegal settlements, indiscriminate solid-waste disposal and a tropical rainfall, provide fertile grounds for Aedes breeding and the rise of dengue transmission in the country. [1]

Dengue fever is now one of the major public health problems in Malaysian healthcare. Since the year 2000, DEN-3 has re-emerged with an increasing number of such

serotypes, together with DEN-2. The case-fatality for dengue hemorrhagic fever was especially high, however this was partly contributed by under-reporting of dengue hemorrhagic fever, where the initial notification as dengue fever was not rectified when these cases subsequently were diagnosed as dengue hemorrhagic fever.

Therefore, prevention and control of DF and DHF was further strengthened with the enactment of the Destruction of Disease-Bearing Insects Act 1975 which was amended in 2001 for heavier penalties. This research was done to figure out about the Malaysian public's knowledge, attitudes, and practices they do to prevent dengue. The objective is to find out if the public has the correct way of prevention, and whether the preventive methods are effective in decreasing dengue transmission.

A study done by Selvarajoo et. al. [4] in 2020 showed that in the cut-off point of 80%, only 50.7% of participants have substantial knowledge about dengue fever. As for attitude, only 46.8% of the participants possess an appropriate attitude towards dengue prevention. Other than that, 49.8% of participants have satisfactory practices against dengue fever. The studies showed that almost half of the population does not have adequate knowledge, attitude, and practices (KAP) in the context of dengue fever. A meta-analysis done by Guad et. al. [5] shows that some areas in Malaysia, especially Negeri Sembilan, which is where our project is held, have poor KAP against dengue fever amongst respondents.

The study by Selvarajoo et. al. [4] also showed that 75.0% of the participants with positive dengue IgG, which means that the participant previously had or is having dengue fever, possessed poor KAP toward dengue disease. This result is also supported by a study showing participants from non-dengue hotspot areas showed a higher KAP compared to dengue hotspot areas. [6]

From previous research, we found out that KAP about dengue is still unsatisfactory in Malaysia, and KAP is closely related to the number of cases of dengue fever. Therefore, it is important to assess KAP as well as increase the awareness about dengue fever among Malaysians. This is especially important to those who had admitted to hospital due to dengue fever to prevent them from getting infected by other strains as repeated infection poses a higher risk in patient's health.

METHODS

Study setting and population

This cross-sectional study was conducted from 1 Sept 2023 to 30 Sept 2023. Objective of the study was to determine knowledge, attitude, and practices of dengue patients admitted to Hospital Tuanku Ja'afar. Subjects selected for this study were dengue patients admitted to Hospital Tuanku Ja'afar from the study period of 1 Sept 2023 to 30 Sept 2023. No placebo or treatment was applied to subjects. The sample size required for this study was estimated to be 223 respondents. This calculation, using Slovin's Formula, was based on previous study (Al Dubai et al, 2013), including a 2% of error

tolerance. The actual respondents collected was 231 respondents with a drop-out rate of 0%. Patient with dengue combo test positive, 13 years or above, conscious and oriented were eligible to enter the study. Patient with fever without positive dengue combo test result were excluded in this study.

Outcome expected in this study was to determine the knowledge, attitude, and practices of dengue prevention of dengue patients admitted to Hospital Tuanku Ja'afar. This was measured through a questionnaire given to the participants.

Ethical considerations

Study was conducted in compliance with ethical principles outlined in the Declaration of Helsinki and Malaysian Good Clinical Practice Guideline. Approval of the study was obtained from National Medical Research Register Malaysia (NMRR ID-23-01646-NFF, RSCH ID-23-01909-710) on 24 July 2023, IRB/IEC International Medical University (IMU) Joint-Committee on Research and Ethics (IMU JC) on 15 June 2023 and Hospital Tuanku Jaafar Clinical Research Centre (HTJ – CRC).

All participants in this study had the right to withdraw from the research anytime. All data, identity and confidentiality of the subject was kept private. Subjects was ensured to understand the purpose and risk of participating research, and data were collected after consent form signature under witness. Consent was taken from their parent/ guardian for participants from 13 to 17 years old to ensure the parent/ guardian are informed and aware of the participation of participants under their guardianship in this study.

Study instruments

We adapted part of our study instrument from a previous study by Sami Abdo Radman Al-Dubai, conducted on factors affecting dengue fever knowledge, attitudes, and practices among selected urban, semi-urban, and rural communities in Malaysia.[7] The questionnaire was validated by carrying out a pilot test on 30 respondents to verify that the questions were clear and easily understood. No further changes were made to the questionnaire.

The questionnaire consisted of four parts. Questions on these four parts were summed, and the total score of each part was obtained. The first part consisted of items regarding demographic data, such as age, gender, educational level, marital status, ethnicity, and employment status. The second part included questions on awareness of dengue fever and sources of information about dengue fever. Knowledge about dengue fever was assessed by 15 questions. Response options included 'yes' or 'no' and it included questions on dengue fever transmission, vector, clinical manifestations, and the management and control of dengue fever. The third part assessed attitudes towards dengue fever prevention with 6 questions. The response option included strongly agree (4), agree (3), neither agree or disagree (2), disagree (1), or strongly disagree (0). The

last part assessed the practices of dengue fever preventions with 14 questions with a response option including 'yes' or 'no'.

Statistical analysis

The Statistical Package for Social Sciences (SPSS®) (version 28.01. 0, IBM, Armonk, NY) was used to analyze data in this study. The study included descriptive and bivariate analysis. Questions on knowledge, attitudes, and practices were summed, and the total score of each part
was obtained. For each knowledge item, a true answer was coded '1' and the false answer was coded '0', and the total scores ranged from 0 to 15. A score of 12 and above was considered good knowledge. For the 'attitude' domain, 'strongly agree', 'agree', 'neither agree nor disagree', 'disagree' and 'strongly disagree' are assigned points of 4, 3, 2, 1 and 0, respectively. The scores for questions 1- 4 in 'attitude' domain are negatively worded items and will be reversely coded to produce the same direction of scoring. The total scores ranged from 0 to 24. A score of 12 and above is considered good knowledge. Practice items were coded '1' if the answer was 'yes' and '0' if the answer was 'no'. The total scores ranged from 0 to 14. A score of 10 and above was considered as good practice.

Descriptive statistics, which included central tendency, distribution, variability was conducted to obtain frequencies and percentages. For inferential statistics, the association of independent variables such as demographic characteristics with KAP levels were determined using the Chi-square test. One-way ANOVA and Kruskal-Wallis ANOVA were used for analysis between different groups of subjects to determine whether they are statistically significantly different from each other. Normality test was done for each variable to determine which test was appropriate. A value of $P < 0.05$ was considered statistically significant. T-tests were used to identify any statistically significant associations between explanatory independent and outcome variables.

RESULTS

Socio-demographic characteristics of respondents

Data of 231 respondents were included in the analysis. More than half of respondents were male (60.2%). Most of the subjects were Malays (66.7%) and married (55.0%). Most of the participants were from urban areas (77.1%) while only a small number of participants were from rural areas (22.9%). Forty- nine percent of the respondents had moderate and dense amounts of plants in their houses, twenty-six percent of respondents had low number of plants in their house and twenty-five-point one percent of respondents did not have plants in their house. Majority of the respondents had moderate number of mosquitoes around their housing areas (39.0%). The majority of the participants did not have any past medical history (78.4%); while 4.3% had Diabetes Mellitus, 5.6% had hypertension and 1.3% had dyslipidaemia. Most of the participants

had at least secondary education and more (83.5%), while 12.6% had primary education and 3.9% did not have any formal education. With all the total respondents, 38.5% were skilled workers, 27.3% were non-skilled workers and 34.2% were unemployed. The majority of participants had a total family monthly income of ≤ RM4849 or B40 (76.2%), 19.9% was M40 or RM4850-10959, and 3.9% was T20 or ≥ RM10960. (USD 1= MYR 4.71) (Table 1).

Table 1. Socio-demographic characteristics of respondents (N=231)

Characteristic	*n (%)*
Age	
Less than 40 years old	169 (73.2)
40 or more than 40 years old	62 (26.8)
Gender	
Male	139 (60.2)
Female	92 (39.8)
Ethnicity	
Malay	154 (66.7)
Chinese	30 (13.0)
Indian	31 (13.4)
Others	16 (6.9)
Marital status	
Married	127 (55.0)
Not married	104 (45.0)
Education level	
No formal education	9 (3.9)
Primary education	29 (12.6)
Secondary education and more	193 (83.5)
Occupation	
Skilled worker	89 (38.5)

Non-skilled worker	63 (27.3)
Unemployed	79 (34.2)
Total family monthly income (MYR)	
B40 (≤ RM4849)	176 (76.2)
M40 (RM4850-10959)	46 (19.9)
T20 (≥ RM10960)	9 (3.9)
Medical history	
No medical history	181 (78.4)
Diabetes Mellitus	10 (4.3)
Hypertension	13 (5.6)
Dyslipidaemia	3 (1.3)
Diabetes appears in more than one category	8 (3.5)
Hypertension, Dyslipidaemia	4 (1.7)
Diabetes Mellitus, Hypertension, Dyslipidaemia	4 (1.7)
Others	8 (3.5)
Number of dengue	
1	193 (83.5)
2	33 (14.3)
More than 2	5 (2.2)
Housing and surrounding	
Living area	
Rural	53 (22.9)
Urban	178 (77.1)
Density of plants	
None	58 (25.1)
Low	60 (26.0)

Moderate	87 (37.7)
Dense	26 (11.3)
Density of mosquito	
None	39 (16.9)
Low	67 (29.0)
Moderate	90 (39.0)
Severe	35 (15.2)

MYR, Malaysia Ringgit

Knowledge of dengue fever

Table 2 shows knowledge of dengue fever among participants. Majority of participants (93.5%) acknowledged that Aedes aegypti mosquito is vector of dengue fever. 93.9% of participants know that stagnant water is the main source for mosquito breeding, and majority of participants (93.9%) understands that control of dengue is to limit breeding of mosquito, and majority of respondents (80.1%) agreed that Abate can be beneficial in killing mosquito larvae. 95.7% of participants acknowledge that dengue fever can affect all age group. Majority of participants understands (87.4) the clinical presentation of dengue fever. Most of participants (84.8%) know that there is no vaccine for dengue fever. Most of the items were answered correctly but there are three items answered incorrectly by most of the participants which are “dengue epidemics does not start during hot weather”, “dengue is a flu-like illness” and “dengue can be transmitted by direct blood contact” (Table 2).

Table 2. Knowledge of dengue fever; number and percentage of respondents who answered the items correctly (N= 231)

Statement	Correct answer	n (%)
Dengue fever is caused by the mosquito Aedes aegypti	Yes	216 (93.5)
Life cycle of the Aedes mosquito is one week	Yes	160 (69.3)
Stagnant water is the main source for mosquito breeding	Yes	217 (93.9)
Dengue fever affects all age group	Yes	221 (95.7)
Dengue epidemics start during hot weather	No	115 (49.8)
Dengue is a flu-like illness	Yes	79 (34.2)
Chills and high fever, intense headache, muscle and joint pains are the most common presentation of dengue fever	Yes	202 (87.4)
Dengue can be transmitted by direct blood contact	Yes	68 (29.4)
Transmission cycle is “Man-Mosquito-Man”	Yes	143 (61.9)
Mosquitoes transmitting dengue infection bites only early in the morning	No	153 (66.2)
Control of dengue is by combating the breeding of mosquitoes	Yes	217 (93.9)
Abate can be beneficial in killing mosquitoes’ larvae	Yes	185 (80.1)
There is a vaccine for dengue	No	196 (84.8)
Paracetamol (Panadol) is the drug of choice for dengue treatment	No	125 (54.1)
Do I have to worry if one of my family members was diagnosed to have dengue a year ago?	Yes	146 (63.2)

Attitudes towards dengue fever prevention

With all the respondents, 12.1% strongly agreed that fogging by the municipal council was essential enough for prevention of dengue. Only 8.2% of the participants believed that it was the responsibility of the public health staff and local government in the prevention of dengue. 1.3% of the respondents strongly agreed that elimination of larvae breeding was a complete waste of time and 2.6% of the respondents also agreed that it was not necessary to seek immediate treatment for dengue fever as there was no cure for it. The majority of the participants strongly agreed that the public had the most important role in dengue control (36.4%). Majority of the participants were afraid of dengue (32.0%) (Table 3).

Table 3. Attitudes towards dengue fever prevention (N=231)

Statement	Strongly agree n (%)	Agree n (%)	Neither agree nor disagree n (%)	Disagree n (%)	Strongly disagree n (%)
Fogging by the municipal council is essential enough for prevention of dengue.	28 (12.1)	45 (19.5)	54 (23.4)	56 (24.2)	48 (20.8)
It is responsibility of the public health staff and local government in the prevention of dengue.	19 (8.2)	88 (38.1)	22 (9.5)	58 (25.1)	44 (19.0)
Elimination of larvae breeding is a complete waste of time.	3 (1.3)	22 (9.5)	22 (9.5)	102 (44.2)	82 (35.5)
It is not necessary to seek immediate treatment for dengue fever as there is no cure for it.	6 (2.6)	21 (9.1)	17 (7.4)	83 (35.9)	104 (45.0)
The public has the most important role in dengue control.	84 (36.4)	112 (48.5)	11 (4.8)	8 (3.5)	16 (6.9)
I am afraid of dengue.	74 (32.0)	124 (53.7)	18 (7.8)	5 (2.2)	10 (4.3)

Practice regarding dengue fever prevention

Table 4 shows practices of participants in preventing dengue fever outbreaks. Majority of respondents do practice of covering water jars or tanks (88.3%), change stored water (87.9%), examine for mosquito larvae in containers (81.8%), dispose garbage properly (91.3%), and practice to clean up surrounding house area (87.0%). Using mosquito repellent on body is least practiced by participants (47.2%) among all items (Table 4).

Table 4. Practice regarding dengue fever prevention (N=231)

Practice	Yes n (%)
Cover water jars or water tanks	204 (88.3)
Change stored water in flower vases, refrigerator tray or pails	203 (87.9)
Examine for mosquito larvae in containers for storing water	189 (81.8)
Proper disposal of items that can collect rainwater (e.g.: cans, tyres, garbage)	211 (91.3)
Clean up surrounding house area	201 (87.0)
Participate in community 'clean out surroundings" activities	155 (67.1)
Sleep in mosquito net or have mosquito screen on windows	160 (69.3)
Using mosquito repellent on body	109 (47.2)
Wear long-sleeved shirts and pants to avoid mosquito bites	181 (78.4)
Wear bright colour clothes to avoid mosquito bites	153 (66.2)
High fogging frequency of housing area	127 (55.0)
Use mosquito coil, electrical mosquito mat, liquid vapouriser	143 (61.9)
Using insecticidal spray	165 (71.4)
Using temephos (e.g.: *Abate*) for elimination of mosquito larvae	125 (54.1)

Association of knowledge, attitudes, and practices with socio-demographic variables

This study showed that there was no significant association between attitude and practice score and socio-demographic variables, as the p-value were 2.22 and 2.08 respectively ($p>0.05$ was not significant). Regarding knowledge ($p=0.045$), participants who were less than 40 years old had higher knowledge score (10.5±1.9) as compared to participants who were 40 or older than 40 years old (10.8±1.4). Male had higher knowledge score (10.5±1.9) compared to female (10.7±1.5). Participants with secondary education and more had higher knowledge scores (10.7±1.6) compared to those who only had primary education (9.9±2.2). Participants who had one dengue experience tended to have higher knowledge score (10.7±1.7) compared to participants who had more than two dengue experiences (9.8±2.5). Participants from rural areas had knowledge score (10.8±1.7) in comparison to participants from urban areas (10.5±1.7). Participants who had moderate number of plants in their houses had highest knowledge score (11.0±1.6) as compared to participants who had low (10.7±1.4) and dense (10.1±1.6) number of plants in their houses. Participants who had low number of mosquitoes in around their housing areas tended to have higher knowledge score (10.8±1.3) (Table 5).

Table 5. Associations between knowledge, attitudes, and practices with socio-demographic variables.

	Knowledge Mean (SD)	Attitude Mean (SD)	Practice Mean (SD)
Age			
Less than 40 years old	10.5 (1.9)	11.9 (2.4)	9.7 (3.4)
40 or more than 40 years old	10.8 (1.4)	11.3 (2.5)	10.3 (3.2)
Gender			
Male	10.5 (1.9)	12.1 (2.4)	10.1 (3.3)
Female	10.7 (1.5)	11.2 (2.4)	9.6 (3.3)
Ethnicity			
Malay	10.7 (1.4)	11.6 (2.4)	10.4 (3.1)
Chinese	10.6 (1.8)	12.1 (2.5)	8.6 (3.2)
Indian	10.4 (2.1)	12.0 (2.3)	9.3 (3.7)
Others	9.4 (2.9)	12.3 (2.4)	8.2 (3.9)

Marital status			
Married	10.6 (1.5)	11.3 (2.4)	10.1 (3.3)
Not married	10.6 (2.0)	12.3 (2.3)	9.7 (3.3)
Education level			
No formal education	10.7 (2.3)	10.2 (2.4)	6.3 (3.9)
Primary education	9.9 (2.2)	11.2 (2.3)	8.4 (4.1)
Secondary education and more	10.7 (1.6)	11.9 (2.4)	10.3 (3.0)
Occupation			
Skilled worker	10.6 (1.9)	11.7 (2.4)	10.5 (3.1)
Non-skilled worker	10.6 (1.7)	11.6 (2.3)	9.8 (3.6)
Unemployed	10.6 (1.6)	11.9 (2.5)	9.3 (3.4)
Total family monthly income (MYR)			
B40 (≤ RM4849)	10.5 (1.8)	11.9 (2.4)	10.2 (3.1)
M40 (RM4850-10959)	10.8 (1.4)	11.5 (2.1)	9.1 (3.8)
T20 (≥ RM10960)	11.2 (1.2)	10.2 (2.9)	8.1 (3.7)
Medical history			
No medical history	10.6 (1.7)	11.9 (2.3)	9.9 (3.3)
Diabetes Mellitus	9.3 (2.5)	11.9 (2.9)	8.3 (5.5)
Hypertension	11.6 (1.4)	10.6 (2.9)	10.9 (2.5)
Dyslipidaemia	10.3 (1.5)	10.7 (3.2)	10.7 (2.1)
Diabetes appears in more than one category	10.4 (2.0)	11.5 (1.8)	8.2 (3.7)
Hypertension, Dyslipidaemia	10.0 (1.8)	9.0 (2.2)	7.8 (3.3)
Diabetes Mellitus, Hypertension, Dyslipidaemia	9.8 (1.5)	11.3 (3.3)	11.0 (1.8)
Others	11.5 (1.2)	11.6 (1.8)	12.1 (2.1)

Number of dengue			
1	10.7 (1.7)	11.7 (2.4)	9.7 (3.3)
2	10.1 (1.6)	11.9 (2.3)	10.7 (3.1)
More than 2	9.8 (2.5)	11.4 (3.8)	11.4 (5.8)
Living area			
Rural	10.8 (1.7)	11.9 (2.3)	10.0 (3.8)
Urban	10.5 (1.7)	11.7 (2.5)	9.9 (3.2)
Density of plants			
None	10.1 (2.2)	12.3 (2.4)	9.9 (3.5)
Low	10.7 (1.4)	11.6 (2.2)	10.1 (3.0)
Moderate	11.0 (1.6)	11.7 (2.5)	9.9 (3.3)
Dense	10.1 (1.6)	11.3 (2.7)	9.1 (3.8)
Density of mosquito			
None	9.9 (2.5)	12.4 (2.1)	9.6 (3.7)
Low	10.8 (1.3)	11.6 (2.5)	10.2 (3.3)
Moderate	10.7 (1.5)	12.1 (2.3)	9.8 (3.3)
Severe	10.7 (1.8)	10.4 (2.5)	9.7 (3.3)

p-value is significant (<0.05); MYR, Malaysia Ringgit

Association of knowledge with both attitudes and practices

Knowledge score was categorized into two groups (knowledgeable and non-knowledgeable) according to the value adapted from previous study (Al Dubai et al) [7]. Participants scored 12 or more on knowledge were classified as good knowledge. To assess the relation between knowledge and both attitudes and practices, mean scores of attitudes and practice were compared across knowledgeable and non-knowledgeable groups. A significant association between practice and knowledge was found as the participant scored good knowledge had higher mean practice (10.85 ± 3.048) in comparison to the non-knowledgeable participants (9.68 ± 3.361) (p=0.023). Mean attitude score of the knowledgeable participants was higher than that of the non-knowledgeable participants, but this difference was not significant (p=0.420) (Table 6).

Table 6. Association of knowledge, and both attitudes and practices

	Attitude (Mean ± SD)	Practices (Mean ± SD)
Good knowledge	11.82 (2.742)	10.85 (3.048)
Poor knowledge	11.73 (2.353)	9.68 (3.361)
p-value	0.420	0.023

Associations between age with knowledge, attitude, and practices

This study found significant association between knowledge score and age, but no significant association between attitude and practices score with age (Table 7).

Table 7. Associations between age with knowledge, attitude, and practices

	Age (p-value)
Knowledge	0.045
Attitude	2.224
Practices	2.079

DISCUSSION

This study describes the knowledge, attitude, and practice of dengue patients admitted to Hospital Tuanku Ja'afar, Seremban, Malaysia. The questionnaire is in a self-reported manner.

The majority of the participants (93.5%) are aware of the cause of dengue fever, which is the mosquito Aedes aegypti, which is most consistent with the previous study in Malaysia (Al-Dubai et al, 2013). Most participants also showed a good understanding of the main source of mosquito breeding and the importance of combating it.
However, the participants showed poorer knowledge of the transmission of dengue infection. This can be observed that although 93.5% of participants acknowledged that mosquito is the cause of dengue, only 61.9% of them believed that dengue infection can be transmitted through mosquito bites. This finding is similar to Al- Dubai et al's study (2013), which observed that although 97.7% of participants understand that mosquito is the cause of dengue infection, only 72% of them believed that the disease could be spread by mosquito bites.
In this study, the majority of the participants (84.8%) believed that there was no vaccine for dengue. This is the less inconsistent finding with the study conducted by Al- Dubai et al (2013), where only 43.3% of participants think there was no vaccine for dengue.

In summary, factors associated with good knowledge are ≥ 40 years old, female, higher educational level, higher family income, lower number of dengue experiences, moderate density of plants, and low density of mosquitoes. This may be due to higher socioeconomic status and education that improve public awareness regarding dengue fever, which in turn reduces the episodes of the disease. There are no significant differences between different occupations. This result is tally with the results obtained from Al- Dubai et. al. Marital status shows no differences in knowledge regarding dengue fever, which is different from the results obtained from both Al-Dubai et. al which shows that participants that are single have higher knowledge and Selvarajoo et.al. which shows that married participants are associated with higher knowledge. This could be due to the different geographical settings of the participants in the studies.

Overall, in terms of knowledge, it is concerning that the majority of the participants (83.1%) were non-knowledgeable, with a score less than 12, and there is a significant association between knowledge score and sociodemographic variables. This finding shows the importance of correct knowledge and information should be provided to the public.

Participants generally have a good attitude towards dengue fever, with an average score of above 8. Most of the participants (85.7%) are afraid of dengue (agree or strongly agree). This result is different from the study done by Al-Dubai et.al which shows that only 4% of participants were afraid of dengue fever. This could possibly be due to the difference in participants in both studies. This study features participants who have already been diagnosed with dengue fever and admitted to the hospital while the participants in Al-Dubai et.al's study are from the general communities. Most of the participants (84.9%) have the opinion that the public has the most important role in

combating dengue fever. This finding is similar to the study done by Selvarajoo et.al. but not to the study of Al-Dubai et.al. This could be due to the year of study being done, where the study by Selvarajoo et.al. was done in 2020, which has a closer period of time compared to our study while Al-Dubai et.al. conducted the study in 2013. The public has increased awareness regarding their role in mitigating dengue fever. However, there are still 11.6% of participants who think that it is not necessary to seek immediate treatment for dengue fever as there is no cure for it.

This study shows that the most practiced preventive measures of dengue used by the participants were proper disposal of items, covering water jars or tanks, changing stored water, cleaning up surrounding house areas, and examining for mosquito larvae in containers. These findings are consistent with Al- Dubai et al's study (2013). This study also found that only 47.2% of participants use mosquito repellent to prevent mosquito bites and it is inconsistent with Al- Dubai et al's study (2013), where the majority of the participants (88.7%) use mosquito repellent. Besides, this study also found that more than half of the participants (54.1%) used temephos in the prevention of dengue, and this was far more compared to the finding observed in Al- Dubai et al's study (2013).

This study showed no significant association between practices of dengue prevention and sociodemographic variables. This is in contrast with Al- Dubai et al's study (2013), where there is a significant association between practice level with both age group and geographical area.

This study shows better attitudes (mean score: 11.82) and more preventive measures are practiced (mean score: 10.85) in participants who are knowledgeable compared to those who are non-knowledgeable. This could be due to better education regarding the importance and ways of preventing dengue fever.

The results of this study were discussed bearing in mind that there are certain limitations. There were variations in the outcomes of our research compared to the findings in existing literature, potentially arising from differences in the methodologies employed across the studies. This includes the differences in data analysis, scoring system, or cut-off point of the "poor" and "good" KAP and the demographic background of the participants.

According to the study, the participants have sufficient knowledge regarding dengue fever with some gaps in the knowledge. It is recommended to have more aggressive health promotion campaigns and seminars regarding dengue fever. This can further raise awareness and improve the public's knowledge of this topic. Education regarding symptoms of dengue fever, especially the warning signs, for instance, the bleeding tendency is important so that they can recognise and differentiate it from other conditions such as common flu. Complications of dengue fever should be emphasized so that they understand the importance of seeking treatment from healthcare professionals. Besides, it is recommended for the dengue vaccine to be made well-known as a method to prevent dengue fever and incorporate it into the public. This study shows most of the participants have good practices against dengue fever.

Education about the practices to mitigate dengue fever, besides the practice of community house cleanup activities and fogging, should be continued so that the number of dengue fever cases can be further reduced.

In conclusion, as a result of this study indicated that the majority of participants demonstrated awareness of the cause of dengue and the main source of mosquito breeding, however, it is concerning that a large proportion of participants exhibited non-knowledgeable attitudes, emphasising the critical need for accurate information dissemination to the public. Participants generally exhibited a positive attitude towards dengue infection, and the variances in attitude compared to previous studies may be attributed to differences in the context of participants and the year of study. Preventive practices were generally in line with the previous study, and in contrast to the previous study, there were no significant associations found between sociodemographic variables and dengue prevention practices. In light of these findings, it is important for public health initiatives to address knowledge and enhance awareness regarding dengue fever.

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LIST OF ABBREVIATIONS

HTJ	Hospital Tuanku Jaafar
IMU-JC	International National University, Joint Committee on Research & Ethics
SOMRAC	School of Medicine Research Allocation Committee
MREC	Medical Research and Ethics Committee
NMRR	National Medical Research Register
HTJ CRC	Hospital Tuanku Jaafar, Clinical Research Centre

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