

ORIGINAL ARTICLE

Knowledge, Attitude and Practice Towards Dengue Prevention Among Students at Tan Sri Mustaffa Babjee College, Universiti Putra Malaysia

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ABSTRACT

Introduction: The aim of this study was to assess the level of knowledge, attitude, and practice towards dengue prevention among students at Tan Sri Mustaffa Babjee College, Universiti Putra Malaysia. **Method:** An analytical cross-sectional survey was performed with 214 respondents from Tan Sri Mustaffa Babjee College residents using a simple random sampling method. A self-administered validated questionnaire was distributed to respondents through student email and Whatsapp phone application. The acquired data was then analyzed using Statistical Package for Social Sciences Software (SPSS) Version 27. **Results:** The majority of the students had moderate knowledge (17.14 ± 2.510), attitude (30.69 ± 4.065) and practice (7.97 ± 2.224) towards dengue prevention. The year of study was the only sociodemographic characteristic that had a significant association with knowledge ($\chi^2 = 18.288$, $P = 0.013$), attitude ($\chi^2 = 18.526$, $P = 0.010$) and practice ($\chi^2 = 19.194$, $P = 0.014$) of dengue prevention, while the factor of the study programme ($\chi^2 = 31.599$, $P = 0.002$) were found to have significantly associated with the level of knowledge. **Conclusion:** There was a significant association between dengue prevention knowledge and practice ($\chi^2 = 11.838$, $P = 0.019$), but no significant association between knowledge and attitude, as well as practice and attitude. College management should organize and regularly implement the dengue control activities that focus on both preventive action and expanding awareness of dengue prevention to ensure lifetime action and effective methods in controlling dengue.

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INTRODUCTION

Dengue is a contagious disease caused by the dengue virus (DENV). Given that there are currently four DENV serotypes (DEN-1,2,3,4), humans can contract dengue four times (1). Dengue is spread by female *Aedes aegypti* and *Aedes albopictus* mosquitoes (2). Dengue vectors can easily spread throughout tropical and sub-tropical locations, including Malaysia, particularly during the vector's breeding period, which coincides with the rainy season. As a result, rapid dengue transmission may occur when these vectors are present in excessive concentrations (3).

These mosquitos deposit their eggs in water-retaining containers such as buckets, animal dishes, flowerpots, bowls, and vases near standing water. They reside

indoors and outdoors near humans, and they bite humans at all hours especially during dawn and dusk. Mosquitoes can become infected if they bite a human who has been afflicted with the virus. The virus can then be passed on by the infected mosquito bite to another individual. Aside from mosquito bites, dengue can also be transmitted by blood transfusion, organ transplant, needle stick injuries, and prenatal transmission (4).

Currently, dengue has no specific treatment. The vaccine available called Dengvaxia is still in clinical trials before it can be declared as effective antiviral therapy and licensed vaccine (5). For the time being, patients will be advised to rest, hydrate well, and seek for medical practitioner consultation if they experience any dehydration-related symptoms such as decreased urination or dry mouths or/and lips (6). Additionally, depending on the symptoms and underlying problems, patients may require emergency care, an immediate referral, or in-hospital management. (1). Acetaminophen or paracetamol, as well as nonsteroidal anti-inflammatory medications (NSAIDs), are commonly used to treat fever,

muscular aches, and pains (6).

Malaysia has documented dengue disease since 1902. In the 1970s, the disease became a public health issue, with the first significant outbreak occurring in 1973 (7). The prevalence of dengue fever has grown to 361 cases per 100,000 people in 2014 from 32 cases per 100,000 people, 4 years back. Furthermore, the most current cumulative case count in Malaysia as of 7 May 2022, is 13651 instances. The figure increased by 40.5 percent over the same period in 2021, when 9715 instances were reported. The number of deaths from dengue complications has also increased, with 7 deaths compared to 5 deaths during the same period last year (8). This number is higher than in other Asian countries such as Cambodia, Vietnam, and the Philippines. As a result of this predicament, it is critical that Malaysians' understanding, attitude, and practice of dengue prevention are improved before an outbreak arises. People who are educated about dengue fever can put the disease's prevention methods into practice. As a result, it will contribute to the reduction of dengue fever cases.

MATERIALS AND METHODS

An analytical cross-sectional study was conducted among residential students of Tan Sri Mustaffa Babjee College, Universiti Putra Malaysia, Malaysia from 1st to 30th September 2022. The sample size was calculated using two proportion formula by Fleiss JL, 1981 with the reference proportion from Mayxay et al., (12). 214 respondents were recruited by using simple random sampling. By using a random number generator, the Tan Sri Mustaffa Babjee College residents who fulfil the predetermined criteria (male/female residents of the college and age between 19-30 years old) were selected as the respondent. A web-based validated questionnaire was distributed to all respondents through students' emails and social media platforms including Whatsapp. A concise account on the study topic, consent form and personal data protection statement were displayed in the questionnaire. Consents were obtained prior to respondents responding to the questionnaire. Data obtained were anonymized and stored in a computer with encryption to preserve confidentiality.

Tan Sri Mustaffa Babjee College was chosen for this study due to the occurrence of dengue outbreaks despite the vector control (fogging ULV sprays) as well as yearly dengue prevention and awareness program has been implemented in the college (11). Based on the reported cases received by the Tan Sri Mustaffa Babjee College's management from 2017 to 2021, it appears that there was a fluctuating pattern in the number of dengue cases. In 2017, there were a total of 71 cases reported, with the highest number of cases in May (20 cases) and June (12 cases). In 2018, only one case was reported in September. The year 2019 saw a total of four cases, with

October having the highest number of cases (2 cases). In 2020, three cases were reported, with August having the highest number of cases (1 case). In 2021, there were seven cases reported, with November having the highest number of cases (6 cases). Therefore, it is important to understand the underlying factors contributing to this pattern in order to effectively prevent and control dengue transmission in the college.

Consequently, research on the knowledge, attitude, and practice of dengue prevention among Tan Sri Mustaffa Babjee College students should be conducted to limit the scope of the problem and provide valuable information for the development of effective strategies to prevent and control dengue transmission. The rationale of this study is to gain a better understanding of how much the students know about dengue, how they perceive the disease, and how they practice prevention measures. The findings of this study may then be used to develop targeted interventions and educational programs to improve the knowledge and practices of the students, which will ultimately help reduce the incidence of dengue in the college community.

Study instrument

A structured and validated questionnaire in English language was used to assess the knowledge, attitude and practice towards dengue prevention (13). The self-administered questionnaire encompassed four sections with a total of 49 questions. Section A consisted of six closed-ended sociodemographic characteristics including age, gender, ethnicity, marital status, year of study and study program. Section B contained 24 questions pertaining to assessing respondents' knowledge. Alternatives of 'Yes', 'No', or 'Don't know' were applied for each question in Section B. Section C contained 8 questions addressing respondents' attitudes towards dengue prevention. The respondents' attitudes were evaluated using a five-point Likert-type scale. While Section D consisted of 11 questions pertaining to respondents' preventative practices to avoiding dengue. Alternatives of 'Yes', 'No', or 'Not Sure' were applied for each question in Section D.

Data analysis

The Statistical Package for the Social Science (SPSS) version 27.0 was used for data analysis. Data entered manually were thoroughly checked for preventing error. Descriptive analysis was performed to describe the sociodemographic characteristics, knowledge, attitude, and practice towards dengue prevention of the students. Chi square test was performed to determine association between sociodemographic characteristics and knowledge, attitude and practice, knowledge and attitude, attitude and practice, knowledge, and practice towards dengue prevention among students. Additionally, Bloom's cut off point was used to categorize the level for each category for questions in Section B, C and D. The cut off points for the knowledge

category in this study are as follows: scores between 19-24 are classified as high knowledge, scores between 14-18 are classified as moderate knowledge, and scores between 0-13 are classified as poor knowledge. For the attitude category, scores between 32-40 are classified as good attitude, scores between 24-31 are classified as moderate attitude, and scores between 8-23 are classified as poor attitude. Finally, for the practice category, scores between 9-11 are classified as good practice, scores between 7-8 are classified as moderate practice, and scores between 0-6 are classified as limited practice. Confidence interval selected was 95% and results were considered significant at $p < 0.05$.

Ethical consideration

This study was approved by the Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia (JKEUPM-2022-400).

RESULTS

Of 214 students who were selected, 100% completed and returned the questionnaire. The sociodemographic characteristics of the students collected consists of age, gender, ethnicity, marital status, years of study and study programme. The mean age was 21.79 (± 0.08) with minimum age of 20 and maximum of 25 years old. More than half of the students were female (72.9%), similar with other previous study (2,14-15) as there are three blocks for female residents while only one block for male residents in the study location. The majority of the students were Malay (71.5%) followed by Chinese (14.5%), Indian (9.3%) and Others (4.6%). In various studies on dengue knowledge, attitude and practice, Malay was consistently found to have the greatest number among other races (2,14,16-19). 24.3% of the respondents were Bachelor of Science Environmental and Occupational Health with Honours' students (KPP), followed by Doctor of Veterinary Medicine's students (VET) (19.6%), Bachelor of Biomedical Sciences with Honours's students (BMD) (15.0%), Doctor of Medicine's students (MD) (13.6%), Bachelor of Science Dietetic with Honours' students (DTK) (9.8%), Bachelor of Nursing with Honours' students (NUR) (9.8%) and Bachelor of Science Nutrition and Community Health with Honours' students (PKK) (7.9%). The respondents were all single, which differs from a prior research of university students who had a combination of single and married marital status (14,15). As for the Year of Study, Year 5 recorded the lowest number (5.6%), as only VET and MD programmes offer five academic years. Other programmes have a maximum of four-year study duration. The rest of the results are shown in Table I.

Overall, based on Table II, most of the students 131 (61.2%) have moderate knowledge with only 18 (8.4%) have poor knowledge and 65 (30.4%) have high knowledge. Almost half of the students 103 (48.1%) have a moderate attitude meanwhile, 99 (46.3%) have a

Table I: Sociodemographic characteristics (n=214)

Variable	n	%
Age		
20-21	91	42.5
22-23	105	49.1
24-25	18	8.4
Gender		
Male	58	27.1
Female	156	72.9
Ethnic		
Malay	153	71.5
Chinese	31	14.5
Indian	20	9.3
Bumiputera Sabah	8	3.7
Bumiputera Sarawak	2	0.9
Marital status		
Single	214	100
Married	0	0
Divorced	0	0
Years of study		
Year 1	23	10.7
Year 2	56	26.2
Year 3	66	30.8
Year 4	57	26.6
Year 5	12	5.6
Study Program		
MD	29	13.6
VET	42	19.6
BMD	32	15.0
KPP	52	24.3
DTK	21	9.8
PKK	17	7.9
NUR	21	9.8

MD: Doctor of Medicine
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Table II: Mean, standard deviation, frequency, and percentages for the level of knowledge, attitude and practice related to dengue prevention among students (n=214)

Variable	Mean (SD)	f	%
Level of knowledge			
High (19-24)	17.14 (± 2.510)	65	30.4
Moderate (14-18)		131	61.2
Poor (0-13)		18	8.4
Level of attitude			
Good (32-40)	30.69 (± 4.065)	99	46.3
Moderate (24-31)		103	48.1
Poor (8-23)		12	5.6
Level of practice			
Good (9-11)	7.97 (± 2.224)	70	32.7
Moderate (7-8)		95	44.4
Limited (0-6)		49	22.9

good attitude and 12 (5.6%) have a poor attitude towards dengue prevention. While for the level of practice, 95 (44.4%) of the students have moderate practice while 70 (32.7%) of them have good practice and 49 (22.9%) have limited practice towards dengue prevention.

The year of study ($\chi^2= 18.288, P = 0.013$) and study program ($\chi^2= 31.559, P = 0.002$) were associated with the level of knowledge of dengue. Based on Table III, it was also found that 17.4% of the 1st year students have poor knowledge while the 5th year student had none in that category. For study programme, 19.0% of the respondents with poor dengue knowledge were found to be among VET students.

There was a significant association between the year of study and the attitude towards dengue prevention ($\chi^2= 18.526, P = 0.010$) (14-15,21). Table IV shows 87% of Year 1 students had poor attitude compared to less than 5% or no poor attitude in other years of study. In terms of other socio-demographic characteristics (age, gender, ethnicity, study programme and marital status), there was no significant association between level of attitude with this characteristics.

There was a significant association between the year of study and the level of practice towards dengue

Table III: Association between sociodemographic characteristics and level of knowledge towards dengue

Variable	Knowledge			Test statistics	
	Good n (%)	Moderate n (%)	Poor n (%)	χ^2	p value
Age				7.509	0.111
20-21	21 (27.4)	59 (61.3)	11 (11.3)		
22-23	36 (32.8)	62 (55.7)	7 (11.5)		
24-25	8 (49.0)	9 (51.0)	0		
Gender				1.479	0.477
Male	16 (27.6)	35 (60.3)	7 (12.1)		
Female	49 (31.4)	96 (61.5)	11 (7.1)		
Ethnic				9.199	0.266
Malay	40 (26.1)	99 (64.7)	14 (9.2)		
Chinese	13 (41.9)	14 (45.2)	4 (12.9)		
Indian	9 (45.0)	11 (55.0)	0		
Bumiputera	0	2 (100.0)	0		
Sarawak					
Bumiputera	3 (37.5)	5 (62.5)	0		
Sabah					
Year of study				18.288	0.013*
Year 1	6 (26.1)	13 (56.5)	4 (17.4)		
Year 2	13 (23.2)	36 (64.3)	7 (12.5)		
Year 3	14 (21.2)	46 (69.7)	6 (9.1)		
Year 4	28 (49.1)	28 (49.1)	1 (1.8)		
Year 5	4 (33.3)	8 (66.7)	0		
Study Program				31.599	0.002*
KPP	15 (28.8)	35 (67.3)	2 (3.8)		
NUR	2 (9.5)	19 (90.5)	0		
DTK	6 (28.6)	12 (57.1)	3 (14.3)		
PKK	3 (17.6)	13 (76.5)	1 (5.9)		
VET	12 (28.6)	22 (52.4)	8 (19.0)		
MD	16 (55.2)	13 (44.8)	0		
BMD	11 (34.3)	17 (53.1)	4 (12.5)		

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Table IV: Association between sociodemographic characteristics and level of attitude towards dengue

Variable	Attitude			Test statistics	
	Good n (%)	Moderate n (%)	Poor n (%)	χ^2	p value
Age				8.133	0.087
20-21	58 (63.0)	32 (34.8)	2 (2.2)		
22-23	81 (77.1)	22 (21.0)	2 (1.9)		
24-25	9 (52.9)	6 (35.3)	2 (11.8)		
Gender				4.441	0.109
Male	37 (63.8)	21 (36.2)	0		
Female	112 (71.8)	38 (24.4)	6 (3.8)		
Ethnic				10.701	0.165
Malay	114 (74.5)	35 (22.9)	4 (2.6)		
Chinese	19 (61.3)	12 (38.7)	0		
Indian	10 (50.0)	8 (40.0)	2 (10.0)		
Bumiputera	0	2 (100.0)	0		
Sarawak					
Bumiputera	6(75.0)	2 (25.0)	0		
Sabah					
Year of study				18.526	0.010*
Year 1	15 (65.2)	6 (26.1)	2 (87)		
Year 2	37 (66.1)	17 (30.4)	2 (3.6)		
Year 3	45 (68.2)	21 (31.8)	0		
Year 4	45 (78.9)	10 (17.5)	2 (3.5)		
Year 5	7 (58.3)	5 (41.7)	0		
Study Program				15.078	0.237
KPP	40 (76.9)	11 (21.2)	1 (1.9)		
NUR	14 (66.7)	4 (19.0)	3 (14.3)		
DTK	14 (66.7)	7 (33.3)	0		
PKK	11 (64.7)	6 (35.3)	0		
VET	30 (71.4)	12 (28.6)	0		
MD	21 (72.4)	6 (20.7)	2 (6.9)		
BMD	19 (59.4)	13 (40.6)	0		

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prevention ($\chi^2= 19.194, P = 0.014$). Based on Table V, Year 1 recorded the highest percentage of limited practice (52.2%) with only 30.4% possessed good practice.

Table VI presents the association between knowledge, attitude and practice towards dengue prevention. There was a significant association between knowledge and practice towards dengue prevention ($\chi^2= 11.838, P = 0.019$). This association 35.8% of the students with high knowledge possessed good practice compared with 4.2% of those with poor knowledge.

DISCUSSION

Level of knowledge on dengue

Fever is one of the symptoms of dengue that all students were aware of, but 50% of them did not know that dengue also causes coughing and swollen glands. This is comparable to earlier studies (2,10,14) in which the majority of the students knew fever is one of the symptoms for dengue. Recognizing the dengue signs and symptoms is crucial for students to ensure they receive appropriate treatment (10). More than half of the students understand that Aedes is a type of mosquito that transmits dengue. Several other studies showed similar findings (2,7,14,19-21). The peak biting times were

Table V: Association between sociodemographic characteristics and level of practice towards dengue

Variable	Practice			Test statistics	
	Good n (%)	Moderate n (%)	Limited n (%)	χ^2	p value
Age				7.169	0.127
20-21	39 (42.9)	26 (28.6)	26(28.6)		
22-23	45 (42.9)	39 (37.1)	21 (20.0)		
24-25	11 (61.1)	5 (27.8)	2 (11.1)		
Gender				5.196	0.074
Male	25 (43.1)	14 (24.1)	19 (32.8)		
Female	70 (44.9)	56 (35.9)	30 (19.2)		
Ethnic				11.209	0.136
Malay	62 (40.5)	51 (33.3)	40 (26.1)		
Chinese	16 (51.6)	10 (32.3)	5 (16.1)		
Indian	13 (65.0)	3 (15.0)	4 (20.0)		
Bumiputera Sarawak	0	2 (100.0)	0		
Bumiputera Sabah	4 (50.0)	4 (50.0)	0		
Year of study				19.194	0.014*
Year 1	7 (30.4)	4 (17.4)	12 (52.2)		
Year 2	29 (51.8)	20 (35.7)	7 (12.5)		
Year 3	25 (37.9)	23 (34.8)	18 (27.3)		
Year 4	27 (47.4)	21 (36.8)	9 (15.8)		
Year 5	7 (58.3)	2 (16.7)	3 (25.0)		
Study Program				18.568	0.099
KPP	19 (36.5)	22 (42.3)	11 (21.2)		
NUR	13 (61.9)	4 (19.0)	4 (19.0)		
DTK	11 (52.4)	7 (33.3)	3 (14.3)		
PKK	8 (47.1)	5 (29.4)	4 (23.5)		
VET	13 (31.0)	14 (33.3)	15 (35.7)		
MD	19 (65.5)	8 (27.6)	2 (6.9)		
BMD	12 (37.5)	10 (31.3)	10 (31.3)		

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Table VI: Association between knowledge, attitude, and practice towards dengue prevention

Variable	Knowledge			Test statistic	
	High n (%)	Moderate n (%)	Poor n (%)	χ^2	p value
Practice				11.838	0.019*
Good	34 (35.8)	57 (60.0)	4 (4.2)		
Moderate	24 (34.3)	40 (57.1)	6 (8.6)		
Limited	7 (14.3)	34 (69.4)	8 (16.3)		
Attitude				2.098	0.718
Good	48 (32.2)	89 (59.1)	12 (8.1)		
Moderate	15 (25.4)	38 (64.4)	6 (10.2)		
Poor	2 (33.3)	4 (66.7)	0		
Variable	Practice			Test statistic	
	Good n (%)	Moderate n (%)	Limited n (%)	χ^2	p value
Attitude				6.866	0.143
Good	74 (49.7)	49 (32.9)	26 (17.4)		
Moderate	19 (32.2)	18 (30.5)	22 (37.3)		
Poor	2 (33.3)	3 (50.5)	1 (16.7)		

incorrectly identified by 50.9% of the students as being in the evening and at midnight. A limited understanding of mosquito biting times was also noted in the previous study among students (14) unlike other studies which show otherwise (2,10,19). This understanding is crucial

since most mosquito bite prevention techniques, such as mosquito coils and bed nets, are often used at night, when they are ineffective against Aedes mosquito bites (10). Coincide with other studies, only a small number of students acknowledged dengue has no specific treatment (14). The significance of the right response to this question is apparent since it will impact how the students respond to dengue. Students may not take dengue seriously if they believe there is a vaccine available. The result for a moderate level of dengue knowledge among students also coincides with study among university students in Malaysia (14) but contradicts with previous studies that resulted in high knowledge (2,10,15,19) and poor knowledge (20).

Level of attitude on dengue prevention

The majority of the students agreed that dengue can be prevented unlike a study that reported otherwise (14). Dengue may be avoided by employing proper preventative methods such as eliminating possible larval breeding areas and avoiding getting bitten by Aedes mosquitoes (14). 90.6% believed that the disposal of mosquito larvae is worth their time and not troublesome. This result was consistent with earlier studies (19,21) although it differed from (7) when the students thought mosquito larvae disposal was difficult. More than half of the students agreed that removing mosquito breeding grounds is a shared duty with health authorities, and they would support any campaigns or actions targeted at eradicating dengue which was found similar in past studies (2,7,10,15,19). This demonstrates that college students have been instilled with a sense of responsibility through health education.

More than 50% of students agreed fogging is enough to eradicate dengue. This finding was concurrent with previous studies (7,15,20) but there was a disagreement in one study among secondary school students (19). Fogging alone is insufficient to eradicate dengue as it only kills the adult mosquito when in contact with fog chemicals, but not the larvae. The most effective technique for preventing dengue illness is to continuously suppress dengue mosquito reproduction and to use personal protective measures, such as insect repellent and/or wearing long sleeves and long pants, especially during peak biting times (1). The result for the moderate level of attitude towards dengue was similar to a study conducted among undergraduate health science students at the Universiti of Science Malaysia (14) yet contradicted with previous studies that resulted in good attitude (10,15,19-20) and poor attitude (2).

Level of practice on dengue prevention

More than half of students (75.7%) covered the water container while 91.1% threw the stagnant water in a water container if it unused for more than 5 days, which was concurrent with previous studies (14-15,19-20). Female Aedes mosquitoes lay their eggs above the waterline on the inner, moist walls of vessels containing

water, hence it is crucial to close and remove any containers containing stagnant water. Besides, only 55 (25.7%) of the students have added a potent larvicide or known as 'abate' to the water containers. There were many similar findings from past studies (19-21) that rarely added 'abate' in any potentially containing water containers. 'Abate' is one of the recommended larvicides to kill mosquito larvae before they can grow into mosquito adults (22). There were only 146 (68.2%) students inspected for potential mosquito breeding places while 182 (85.0%) removed containers that can collect and allow water to stagnate, which was similar to as reported in the earlier studies (2,19). In contrast, the same practice was not discovered in a study conducted in a dengue hotspot in Malaysia (7). The result for good practice towards dengue prevention was similar with other studies (10,14) but deviate with previous studies that reported good practice (15,20) and limited practice (2,19).

Association between sociodemographic characteristics and level of knowledge towards dengue

According to Mohamad et al. (15), students from Faculty of Medical Science reportedly had a high level of knowledge about dengue than students from other faculties. Reflecting on the above finding, college management should prioritise VET students in planning dengue control programmes.

In contrast to earlier studies that found significant association between knowledge and ethnicity (16,18) as well as knowledge and marital status (23), this study found no significant association between level of knowledge and other socio-demographic characteristics (gender, study programme and marital status).

Association between sociodemographic characteristics and level of attitude towards dengue prevention

Contrary to other studies among university students, there was a significant association between the year of study and the attitude towards dengue prevention (14-15,21). Regarding other socio-demographic attributes such as age, gender, ethnicity, study programme, and marital status, no significant correlation was observed with attitude level. This contrasts with previous research that highlighted a significant link between attitude and ethnicity (18), as well as between practice and gender (2).

Association between sociodemographic characteristics and level of practice towards dengue prevention

Other studies did not correspond with the association between the year of study and the level of practice towards dengue prevention (14-15,21). In this study the Year I student recorded the highest percentage of limited practice (52.2%) with only 30.4% possessed good practice. This might be due to Year 1 students' lack of exposure and experience in controlling dengue disease in a college environment as they are unfamiliar with

the residential college environment. In contrast, Year 5, being the longest college residents had the highest percentage of good practice (58.3%). Hence, the dengue control activity such as search and destroy, should be made periodically to ensure that all the residents have good practice on dengue prevention.

For other socio-demographic characteristics (age, gender, ethnicity, study programme and marital status), this study found no significant association between level of practice unlike other previous study that found significant association between practice and ethnicity (18), practice and age (16,18,21,23,25) as well as practice and marital status (16,18,21). This possibly due to the students practicing the same prevention action recommended by the college management since the students were from the same college and were in a relatively close age range. Besides, a study by Leong (18) found the association between ethnicity and practice as the Malay culture of 'gotong-royong' contributes to the good practice among Malay ethnics.

Association between knowledge, attitude, and practice of dengue prevention

The association between knowledge, attitude and practice towards dengue prevention was consistent with several studies in Malaysia (2,14,16,19-21,23-26) but different with other studies that found there was no significant association between knowledge and practice (10,17-18,27). This study demonstrates that knowledge is one of the key important factors in improving practice. This information could help college management to plan an effective dengue control activity. For example, college' students should be taught about dengue and exposed to hands-on activities such as search and destroy dengue breeding places. This study also found no significant association between knowledge-attitude and attitude-practice, which was in-line with previous studies (18,20,28). Additionally, a prior study conducted in Malaysia demonstrated a significant association between knowledge-attitude (2,10,16,18-20,24) and attitude-practice (2,21,25-16).

Recommendations

Firstly, the college management should organize and regularly implement the dengue control activities that focus on both preventive action and expanding awareness of dengue prevention to ensure lifetime action and effective methods in controlling dengue. As for the recommendation for the association between the year of study and knowledge, as well as attitude and practice of dengue prevention among the 1st year students, this group must be given priority and extra attention when it comes to any initiatives promoting dengue awareness. The same approach should also be provided to Doctor of Veterinary Medicine students who were discovered to have low knowledge of dengue.

For future research, it is recommended to conduct

cohort study design to allow causation to be implied. Besides, by using the baseline data from this study, an experimental study can be conducted to compare the students' knowledge, attitude and practice of dengue prevention before and after the intervention to assess the effectiveness of the dengue control activities. Furthermore, to enable extrapolation of the findings to other settings, the study location can be widened across residential colleges in Universiti Putra Malaysia. Lastly, rather than using guided and self-administered questionnaires via online, it is preferable to conduct face-to-face interviews with qualified interviewers to avoid information bias among respondents.

Limitations

However, the results of this study should be regarded with caution as there are few limitations. First, the study design was cross-sectional study which does not enable causality to be implied. Besides, the obtained data were simply a snapshot of the estimated distribution at a certain time, as they were obtained during a brief period. A similar study conducted at a different time period may have different results. Furthermore, the data collection method could be one of the limitations. A guided and self-administrated questionnaire was used, which may also mean that there was a potential information bias since the students are inclined to give socially desirable answers. Lastly, the study location which was a college may restrict the findings to be applied to other contexts.

CONCLUSION

The findings of this study provided a baseline information regarding knowledge, attitude and practice towards dengue prevention among students at Tan Sri Mustaffa Babjee College, Universiti Putra Malaysia. Reflecting on the study which shown most students have moderate knowledge, attitude and practice about dengue prevention as well as a strong correlation between knowledge and practice.

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