

KNOWLEDGE, ATTITUDE AND PRACTICE OF DENGUE PREVENTION AMONG SUB URBAN COMMUNITY IN SEPANG, SELANGOR

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ABSTRACT

Background: Globally, dengue cases has increased 30-fold in the last 50 years. The increase of dengue incidence is also experienced by Malaysia. With regards to the magnitude of prevalence of dengue in Malaysia, the control of mosquito-borne viral infection is very challenging, whereby only interventions targeted on the environmental cleanliness, vector control and changing human behavior proving effective. This study aims to determine the knowledge, attitude and practice for dengue prevention, also to identify the association between knowledge and practice.

Materials and Methods: A cross-sectional study with simple random sampling was done in the semi-urban community of Sepang, Selangor (N=305) using a guided questionnaire consisting of questions on dengue knowledge, attitude, practice of prevention, barriers and sources of information. Data was analyzed using T test and ANOVA to determine the knowledge difference among sociodemographic characteristics and the association between knowledge and practice.

Result: Majority of the respondents (64%) are having moderate level of knowledge. A total of 98% of respondents know that empty stagnant water from old tires, trash cans, and flower pots can be breeding places for mosquitoes. However, only 27.5% know that Aedes mosquitoes bite during the day. We found a significant difference in knowledge scores between age group ($p=0.002$), marital status ($p=0.002$), income ($p=0.041$) and occupation ($p=0.011$). Regarding attitude, 98.4% agreed that dengue fever could be prevented and controlled, nevertheless, only 59% disagreed that fogging is the only control method against dengue fever. When comes to practice, 73% of respondents have limited practice towards dengue prevention. The most implemented practice was remove the stagnant water (59%). However, there is no association between knowledge and practice ($p>0.05$).

Conclusion: It could be inferred from this study that most of the residents have high level of knowledge on dengue, good attitude towards dengue and limited practice of dengue prevention. However we found no significant association between level of knowledge and dengue prevention practice.

Keywords: Dengue, Knowledge, Attitude, Practice, Sepang, Selangor, Malaysia

1.0 Introduction

Globally, dengue cases has increased 30-fold in the last 50 years. The increase of dengue incidence is also experienced by Malaysia. In the year 2000, the annual incidence rate of dengue in Malaysia is only 31.6 cases per 100,000 population, which rose to 361.1 cases per 100,000 population in 2014. In the same period of 2000 to 2014, the number of reported dengue cases dramatically increased from 7,103 to 108,698 cases per year. (Mudin, 2014) As of April 2016, Taman Warisan Indah is classified as a dengue cluster area. Comparatively, the District of Sepang contains 25 clusters, and the state of Selangor contains 884 clusters. Kota Warisan had been subjected to many dengue control activities in accordance with the national guideline which includes anti-dengue campaigns, gotong-royong and fogging. (Malaysian Remote Sensing Agency, 2016). Therefore, the objective of this study is to identify the level of dengue knowledge, attitude towards dengue fever and practice of dengue prevention among community of Taman Warisan Indah.

2.0 Materials and Methods

This is a cross sectional study design with the inclusion criteria of being Malaysian and age of 18 years and above. Respondents who were mentally retarded, physically disabled, deaf or mute and having language barrier were excluded from the sample. A total sample size of 305 is required to fulfill the objectives of our study at 95% confidence interval and inflated by 20% to explain non respondents and incomplete response.

A simple random sampling was implemented and data was collected using validated questionnaires, which covers knowledge, attitude, and practice of dengue prevention. Concerning to knowledge, 14 questions were given which covered the sign and symptoms, transmission, treatment and prevention. A correct answer was given 1 point and wrong answer was 0. Total marks ranges from 0-14. This was then classified into 3 levels of knowledge (high level, moderate level or low level). Based on previous study (Nahida, 2009), a Bloom's cut off point was used, (60%-80%):

Level of knowledge	Scores
High levels (80-100%)	12-14
Moderate level (60-79%)	09-11
Low level (less than 59%)	00-08

In regards to attitude on dengue fever, respondent was asked 6 questions with 3 positive and 3 negative statements. Those who agree to positive statement and disagree to negative statement are interpreted as having good attitude and vice versa. Separate question about their view on either the responsible of dengue prevention falls on the community alone, government alone or both were also asked. The frequency of the answers was calculated and assessed (Binsaeed et al., 2015).

While for practices on dengue prevention, a set of 10 questions on different methods of dengue prevention was asked to respondent. With the scale 0=Never, 1=Seldom, 2=Sometimes, 3=usually, 4=Always, this added up to total score of 0-40 points. Based on study done before (Labrague and Yboa, 2013), Bloom's cut off point was done as below:

Practice level	Score
Good Practice	32-40
Moderate Practice	25-32
Limited Practice	0-24

Analysis was done using SPSS version 23. Non-responses and irrelevant answers were treated as missing values and therefore excluded from the analyses. Values of $p \leq 0.05$ were considered significant. In addition to descriptive analyses, ANOVA and chi-square test was used to test the significance of differences and association.

3.0 Result

3.1 Knowledge on dengue

The study participants ($n=305$) consisted of 56.7% male and 43.3% female. The majority of the participants were aged between 30-39 years old (37.7%), Malay (98%), married (87.5%), received tertiary education (81.6%), works in the government sector (40.7%) and has monthly income of more than RM5000 (52.5%).

Table 3.1.1 Socio Demographic Data and Mean Knowledge Score.

Items	Characteristic	Frequency n (%)	Mean Knowledge Score	P value
Age	<20	6 (2.0)	7.17	0.002* (<20 vs 40-49 $p = 0.042$; 20-29 vs 40-49 $p = 0.019$; 20-29 vs 50-59 $p = 0.048$)
	20-29	23 (7.5)	8.04	
	30-39	115 (37.7)	9.17	
	40-49	97 (31.8)	9.34	
	50-59	39 (12.8)	9.38	
	60>	25 (8.2)	8.88	
Gender	Male	173 (56.7)	9.14	0.674
	Female	132 (43.3)	9.05	
Race	Malay	283 (92.8)	9.16	0.286
	Chinese	12 (3.9)	8.25	
	Indian	8 (2.6)	8.50	
	Others	2 (0.7)	8.50	

Marital status	Single	31 (10.2)	8.06	0.002* (single vs married p= 0.002)
	Married	267 (67.5)	9.21	
	Widowed/ Divorced	7 (2.3)	9.57	
Education level	Informal education	1 (0.3)	9.00	0.857
	Primary	6 (2.0)	9.50	
	Secondary	49 (16.1)	8.94	
	Tertiary	249 (81.6)	9.12	
Occupation	Government	124 (40.7)	9.41	0.011* (government vs unemployed=0.02)
	Private	88 (28.9)	9.10	
	Self-employed	27 (8.9)	8.52	
	Unemployed	36 (11.8)	8.39	
	Retiree	30 (9.8)	9.20	
Income	<RM 1000	54 (17.7)	8.46	0.041* (<1000 vs >5000 = 0.046)
	RM 1001-2000	10 (3.3)	9.60	
	RM 2001-3000	12 (3.9)	9.58	
	RM 3001-4000	69 (22.6)	9.12	
	>RM5000	160 (52.5)	9.24	

*p value significant at <0.05

There was a statistically significant difference between age groups ($p=0.002$). A post hoc test revealed that the knowledge score was statistically significant higher in age group 40-49 ($p=0.019$) and the age group of 50-59 ($p=0.048$) as compared to the age group of 20-29. Furthermore, being married has a significantly higher mean knowledge score than single ($p=0.002$). Those who work in the government sector has a significantly higher mean knowledge score than unemployed ($p=0.02$). Those who earn more than RM1000 per month has a significantly lower mean knowledge score than those who earn more than RM5000 ($p=0.041$).

Table 3.1.2 Respondent's Levels of Knowledge on Dengue Infection

Levels of Knowledge	Cut off point	Frequency	Percentage (%)
Low level	0-8	14	4.6
Moderate level	9-11	195	63.9
High level	12-14	96	31.5

A total 63.9% of the respondents have moderate level of knowledge on dengue, followed by 31.5% with high level and 4.6% has a low level of knowledge.

Table 3.1.3 Respondent's Knowledge on Dengue Infection

Items	Yes n (%)	No n (%)
The principal mosquito vector for dengue fever is Aedes aegypti.	272 (89.2%)*	33 (10.8%)
Dengue fever affects infants, young children and adults.	212 (69.5%)*	93 (30.5%)
Dengue patients have chills, headache, pain upon	274 (89.8%)*	31 (10.2%)

moving the eyes, and low backache.		
Rainy season is the only epidemic season for dengue infection.	66 (21.6%)	239 (78.4%)*
Mosquitoes transmitting dengue infection bite only during day time.	84 (27.5%)*	221 (72.5%)
The mosquito that transmits dengue infection lays its eggs in dirty sewage water.	90 (29.5%)	215 (70.5%)*
Empty stagnant water from old tires, trash cans, and flower pots can be breeding places for mosquitoes.	298 (97.7%)*	7 (2.3%)
Dengue viruses are transmitted to humans through bites of infective female Aedes mosquitoes.	251 (82.3%)*	54 (17.7%)
Only method of controlling dengue infection is to combat the vector mosquitoes.	184 (60.3%)	121 (39.7%)*
There is no specific treatment for dengue infection and the drug of choice is paracetamol.	113 (37.0%)*	192 (63.0%)
Abate sand can be beneficial in killing mosquito larvae.	257 (84.3%)*	48 (15.7%)
Abate sand, if put in the standing water, can help to prevent the mosquito breeding for 3 months.	189 (62.0%)*	116 (38.0%)
Stored water container/tanks for drinking water without being covered should be cleaned every 7 days.	251 (82.3%)*	54 (17.7%)
I am afraid of getting it if one of my family members has dengue fever.	240 (78.7%)*	65 (21.3%)

Note: * indicate correct answers

A total of 97.7% agreed that standing water from old tires, trash cans, and flower pots can be breeding places for mosquitoes, while only 27.5% says that Aedes mosquito bites during daytime.

3.2 Attitude towards dengue fever

Table 3.2.1 Respondent's Attitude towards Dengue Infection

Statements	N (%)		
	Agree	Disagree	Don't know
Believing that dengue fever could be prevented and controlled.	*300 (98.4)	2 (0.7)	3 (1.0)
Elimination of breeding sites is complicated and time consuming.	23 (7.5)	*264 (86.6)	18 (5.9)
Believing that fogging is the only control method against dengue fever.	110 (36.1)	*179 (58.7)	16 (5.2)
The possibility to recover from dengue fever infection.	*289 (94.8)	14 (4.6)	2 (0.7)
Healthy person cannot be infected by dengue fever.	33 (10.8)	*257 (84.3)	15 (4.9)
You have an important role in dengue fever prevention.	*290 (95.1)	12 (3.9)	3 (1.0)

Note: *Indicate good attitude

A total of 98.4% believe that dengue can be prevented and controlled, however only 58.7% disagreed that fogging is the only method to control dengue fever.

Table 3.2.2 Respondent's Attitude towards responsibility of dengue fever control

Responsibility on dengue fever control N (%)	
Government	1 (0.3)
Community	10 (3.3)
Government and community	294 (96.4)

3.3 Practice on dengue prevention

Table 3.3.1 Practice on Dengue Prevention

Extent of practice	Cut off point	N	%
Limited Practice	0-23	224	73.4
Moderate Practice	24-31	69	22.6
Extensive Practice	32-40	12	3.9

Table 3.3.2 Respondent's practice of dengue prevention

Practice	Always n (%)	Usually n (%)	Sometimes n (%)	Seldom n (%)	Not at all n (%)
Aerosol Insecticides	93 (30.5)	51 (16.7)	73 (23.9)	54 (17.7)	34 (11.1)
Professional Pest Control	10(3.3)	11(3.6)	23(7.5)	37(12.1)	224 (73.4)
Uses Window screens	23 (7.5)	18 (5.9)	21 (6.9)	22 (7.2)	221 (72.5)
Uses Fans	89 (29.2)	55 (18.0)	30 (9.8)	24 (7.9)	107 (35.1)
Bed nets	12 (3.9)	20 (6.6)	22 (7.2)	27 (8.9)	224 (73.4)
Eliminates standing water	180 (59.0)	54 (17.7)	24 (7.9)	31 (10.2)	16 (5.2)
Cuts down bushes	119 (39.0)	65 (21.3)	36 (11.8)	32 (10.5)	53 (17.4)
Mosquito coils	63 (20.7)	42 (13.8)	45 (14.8)	31 (10.2)	124 (40.7)
Covers water containers	175 (57.4)	58 (19.0)	19 (6.2)	15 (4.9)	38 (12.5)
Cleans water filled containers	179 (58.7)	67 (22.0)	27 (8.9)	14 (4.6)	18 (5.9)

The majority of the respondents perform limited practice of dengue prevention and control (73%). A total of 59% of the respondents always eliminate standing water, 57.4% clean water filled containers and cover water containers. Nevertheless, only 3.9% use bed nets, and 3.3% use professional pest control.

3.4 Association of knowledge on dengue and practice of dengue prevention

Table 3.4.1 Association between Levels of Knowledge and Practice score

Levels of knowledge	Mean of Practice score	p
Low Level	19.58	0.926
Moderate Level	19.78	
High Level	20.29	

There was no significant association between level of knowledge and mean practice scores (p=0.926).

3.5 Barriers on practicing dengue prevention and sources of knowledge

Table 3.5.1 Barriers on Practicing Dengue Fever Prevention

Items	N (%)		
	Agree	Disagree	Not sure
Thermal fogging (fumigation) and smoke ULV (fogging from vehicle) is harmful to health.	108 (35.4)	151 (49.5)	46 (15.1)
Abate in the water can be bad for health.	83 (27.2)	132 (43.3)	90 (29.5)
What the government does do not help in the fight against the epidemic.	51 (16.7)	232 (76.1)	22 (7.2)
I need a lot of money to implement dengue prevention at home.	31 (10.2)	255 (83.6)	19 (6.2)
I am very busy until I have no time to implement dengue prevention at home.	44 (14.4)	251 (82.3)	10 (3.3)
I or my family feels that fogging (fumigation) is dangerous and can stain the house and therefore during fogging activity, I do not like to open the doors and windows.	127 (41.6)	162 (53.1)	16 (5.2)
Afternoon / evening session is the time for prayer and meals. Hence if fogging (fumigation) is being carried out at that particular time, I find it very inconvenient when they order me/family to leave the house.	131 (43.0)	159 (49.8)	15 (4.9)
I have other reasons for not cooperating with implemented dengue prevention activities.	26 (8.5)	259 (84.9)	20 (6.6)

The main barriers of not practicing dengue prevention were the feeling that fogging (fumigation) is dangerous and can stain the house (41.6%), feels that it is very inconvenient when they order me/family to leave the house during fogging (43.0%). Moreover, 35.4% and 27.2 % said that thermal fogging and Abate are harmful to health respectively.

Table 3.5.2 Source of Knowledge on Dengue Fever

Source	Frequency	%
Television/Radio	276	90.5
Newspapers	206	67.5
Brochures	185	60.7
Health centre	118	38.7
Hospital	115	37.7
Health Worker	104	34.1
Neighbour	94	30.8
School	72	23.6
Internet	71	23.3

Majority of the respondents get the knowledge from television or radio (90.5%).

4.0 Discussion

The majority of the suburban community in Sepang, Selangor have a moderate and high level of dengue knowledge, in which it consistent with a previous study done in Negeri Sembilan stated that the knowledge among respondents was adequate (Leong, 2014). This is may be due to easy access to knowledge about dengue, whereby 90.5% of the respondents received information from the television or radio, and most of the resident have at least one television or radio at home. Despite of that, the lack of dengue cases in the area contributed to the lower perceived danger of dengue, reflected in the poor attitude towards dengue prevention practice, and poor prevention practice itself in the community.

In regards of knowledge items, the majority of the respondents know about the principal mosquito vector for dengue fever, it affects all age groups, and the symptoms of dengue. This is supported by another study also done in Malaysia, 97.0% of respondents knew *Aedes Aegypti* causes dengue fever, 95.7% knew dengue fever affects all age groups and 95.0% also knew about the symptoms of dengue syndrome (Al-Dubai et al., 2013). This is important as these knowledge are vital for dengue awareness and prevention. Alarmingly, only a fraction of our respondents knew that *Aedes* mosquito bites during the day, similar to a study in Central Nepal (Dhimal et al 2014) that found only a meager 7% respondents knew dengue mosquitoes most likely feed or bite during the day. Thus, more effort must be done in order to teach & reinforce the knowledge of dengue infection in the community.

We found several significant differences between sociodemographic data and knowledge score. Age group <20 was found to have a significantly lower knowledge score compared to 40-49, which may be due to more experience, and more exposure in the workplace, as the 18-20 age group is less likely to be working. However, this is not the case in Karachi, Pakistan, where no significant association was found between age and dengue knowledge (Itrat et al. 2008).

Several studies support the effect of higher income on knowledge scores (Itrat et al. 2008). Similarly, we found a significant difference between those who earned less than RM1000 has a significantly lower knowledge score compared to those who earned more than RM5000. We

conclude that people with higher income may have had a better education, as well as having more sources of information regarding dengue.

Regarding occupation, we found that government workers have a significantly higher knowledge scores compared to the unemployed. Another study done in Malaysia supports our finding of a significant association between occupation and dengue knowledge ($p=0.007$) (Naing et al. 2011). The difference may be due to people working especially in the government sector are more likely to be exposed to workplace health campaigns and has more information regarding dengue from colleagues, compared to people who are unemployed.

Regarding attitude, the majority of the community believed that people can recover from dengue fever infection, contrasted to a study in Saudi Arabia which showed that only 74.5% of respondent agree to it (Binsaeed et al. 2015). Besides, a minority of the community agreed that a healthy person cannot be infected with dengue fever which shows bad attitude. This is worse in Jamaica, with only 21.2% of the respondents thought they were at risk of contracting dengue fever (Faisal et al. 2010). A minority of the community agreed that elimination of dengue breeding site is complicated and time consuming, which was more prominent in the rural communities in Malaysia, where 32.7% believed that elimination of larvae breeding is a complete waste of time (Al-Dubai et al, 2013). The majority of our respondents agreed that the responsibility of dengue fever control applies to both the community and government which is in accordance with a study done in Kuala Lumpur and Selangor in which 74.3% believe that it is the responsibility of the public health staff and local government to curb the dengue epidemic (Al-Dubai et al., 2013).

Regarding practice, the majority of the respondents performed limited practice of dengue prevention and control. This is alarming, even though many respondents reported that there were no dengue cases for 4 years in the residential area. A few weeks after our study, there were 4 reported cases of dengue in Taman Warisan Indah, and the area had been classified as a dengue cluster area until April 2016, barring any other cases. Barely more than half of the respondents covers water containers and only about a third of the community uses aerosol insecticides spray. We found several barriers which contribute to this lack of practice, whereby many of the community do not know about Abate, many do not know that windows and doors should be opened during fogging, many feel that fogging is dangerous, and dengue prevention practice is inconvenient.

Based on the results, we found that residents with high level of knowledge achieved the highest mean of extent of practice score (20.29) followed by moderate level (19.78) and low level (19.58) but no significant association is found. This contradicts the result of a study done in Malaysia where a significant association between practice and knowledge was found as knowledgeable participants had higher mean practice scores in comparison to the non-knowledgeable participants ($p=0.030$) (Al-Dubai et al., 2013). This is attributable to the lack of dengue prevention practice in Taman Warisan Indah.

5.0 Conclusion and recommendation

It could be inferred from this investigation that most of the residents have moderate level of knowledge on dengue, good attitude towards dengue and limited practice of dengue

prevention. However we found out that there is no association between level of knowledge and dengue prevention practice.

We would like to recommend that an intervention being done to increase the level of dengue prevention practice from limited practice to good practice. Emphasize on the potential breeding sites at home and the usage of abate should be made. The residents should also be reminded to conduct dengue prevention practice every week.

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Declaration

We affirm that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and if relevant, registered) have been explained.

Authors contribution

Nur Ain bt Mahat, Muhammad Azfar bin Mahfidz, Azfar Hakim Bin Abdol Rashid, Akmal Norikhwani Bin Amrin, Omarulharis Bin Shahrudin, Nur Hafizah Binti Sazali, Adibah Bahirah Azzahra Binti Hamjah, Maryam Alini Binti Shukiman.

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