Household-based Survey of Knowledge, Attitude and Practice towards Dengue Infections among Local City Communities in Shah Alam, Selangor, Malaysia

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***Abstract:** Dengue infection is the most rapidly spreading mosquito-borne viral disease in the world. Selangor indicated the highest number of dengue cases in Malaysia. Being the capital of the state, this study aims to investigate the awareness on the importance of eliminating mosquitoes breeding habitats in and near the household's area among communities in Section 13, Shah Alam. The cross-sectional survey was conducted among randomly selected 250 respondents, who fulfilled the inclusion criteria. The survey was adopted from a structured questionnaire. The data were analyzed using SPSS version 21.0. Among the 250 respondents, around 36.8% had previous history of dengue infection. The results showed that there is no significant difference in total score of knowledge (K), attitude (A) and practice (P) to those who are infected and not infected by dengue previously. It also found that there is negative correlation observed between the total score of knowledge (p=0.000), (r= -0.984) and attitude (p=0.013), (r=-0.259) with the infected person. This study has discovered that there are similar levels of KAP among the infected and non-infected person in the community of Section 13, Shah Alam showing that the efforts of Ministry of Health Malaysia in disseminating information to gain their knowledge, in a hope better attitude and practice, already been achieved in that particular area. Moreover, if the level of the knowledge and attitude of the community increase, the percentage of the infected person can be decreased. In conclusion, continuous practice and daily routine should be conducted in eliminating Aedes mosquito breeding sites.*

***Keywords:** knowledge; attitude; practice; dengue; community; Selangor*

1. INTRODUCTION:

Dengue is a mosquito-borne disease transmitted to humans by *Aedes aqgypti* and *Aedes albopictus.* Dengue virus (DENV) is the most prevalent mosquito borne viral infection that causes the highest rate of mortality among the members of *Flavivirus* genus. Dengue infection varies from asymptomatic infections to life-threatening dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS) (Gubler, 1998; Gubler, Ooi, Vasudevan, & Farrar, 2014; Guzman, 2003; Halstead et al., 2002).

Dengue fever is a major health problem that is endlessly occurring. Nowadays, dengue fever have becomes more severe disease that is continuously occurring and rapidly spreading DENV infections in several parts of the world. Dengue fever is prevalent in 112 countries across the world. Approximately in every year the

incidence are 50 million of cases, which among that, 500,000 of DHF cases and 22,000 of children death have been recorded (Guo et al., 2017).

Malaysia has been experiencing remarkable dengue outbreaks and ranks in the top ten countries with the highest dengue infection and death in the world. In 2016, a total of 101,357 dengue cases and 237 deaths have been reported in Malaysia. Most of the cases emerged in Selangor with 48,491 dengue cases, or 51.3% of the total dengue cases reported in Malaysia (Ahmad et al., 2018).Therefore, dengue fever becomes worst over the time and increasingly widespread especially in Selangor.

Currently, there is no specific drug or effective treatment to combat dengue fever. One of the alternatives is to avoid the spreading of the disease and eliminating *Aedes* mosquito breeding habitats (Othman et al., 2017). The prevention knowledge, attitude and practices should be enhanced among citizens as a part of the awareness strategy to reduce and control dengue outbreaks in Malaysia. However, it should start near the household areas specifically with the involvement of the local community (Alyousefi et al., 2016; Syed, 2010).

Thus, our present study aims to enhance the awareness about the importance of eliminating mosquitoes breeding habitats in and near the household's area in Selangor specifically in Seksyen 13, Shah Alam. Moreover, the strategy is to assess the level of knowledge, attitude and practices between the infected and non-infected respondents in order to strengthen and improve their attitude and practices in combating dengue vector. The correlation between the knowledge, attitude and practice were evaluated to identify the connection between those factors in eliminating the vector in and near the household's area. The excellent of knowledge on dengue would be interpreted into good practices of preventions studies (Hiremath, Chakrabarty, & Sequira, 2019; Thompson & Caltabiano, 2010).

2. Materials and Methods

A cross-sectional study design was took place in Seksyen 13, Shah Alam, Selangor, chosen for its high density of population in that area. The study was conducted from September until December 2019. The self-administered questionnaire were randomly distributed using random purposive samplings method among communities who lived in Section 13, Shah Alam, fulfilled the inclusion criteria and willing to participate in this study were chosen as the respondents. The sample size of 250 respondents was calculated using automated Raosoft calculator which the confidence level was decreased by using 90% distribution with 5% margins of error (Alhomoud, Basil, & Bondarev, 2016).

The survey was adopted from previous study (Ghani et al., 2019). In addition, questionnaires in this study consisted of 43 structured questions and divided into four sections which are socio-demographic including age, gender, marital status, education, occupation and previously experience on dengue infection, other sections; knowledge describe the symptoms of the infection and transmission of the vector; attitude assess the respondents' attitudes towards the prevention and control; and practices evaluate the daily habit of the community in combating the vector.

The data from survey questionnaires were sorted and coded in SPSS version 21.0 and were computed to meet the expressed objectives. Data screening was carried out to make sure the data were entered correctly since the tendency to get errors in data entry was common. In addition, the purpose of data screening was to make sure that there is no missing variable as well as no irrelevant data were entered (Field, 2013). Descriptive statistics (frequency, percentage, mean and standard deviations) have been

used to summarize and define the socio-demographic information of the study population. Parametric test was used to analyse the data which are T-Test and Pearson Correlation Test (Field, 2013; Liang, Fu, & Wang, 2019).

The parametric T-test was used to assess whether there is a significant difference in the means of two groups to compare the means of total knowledge, attitude and practice score among infected and non-infected groups. This is because each group normally distributed. However, p-value of more than 0.05 (p>0.005) was considered as no significant difference in this test. The statistical T-test is used to compare between the score of knowledge, attitude and practice regarding dengue infections among the respondents (Field, 2013; Hopkins, Dettori, & Chapman, 2018; Liang et al., 2019).

Pearson correlation was used to define the relationships between the knowledge, attitude and practices versus the non-infected and infected person among the study population. The r-value determined the strength of the correlation. While p <0.05 showed significant value (Hopkins et al., 2018; Liang et al., 2019).

In order to assess the level of knowledge, attitude and practices among the non-infected and infected dengue community, a scoring method was applied for each category. A positive and correct answer was given 1 mark while a negative and wrong answer was not given any mark. The total score of correct responses were then determined for each domain. The score for all responses from a respondent was totalled up to get the total score for the respondent's knowledge, attitude and practice towards dengue individually (Alyousefi et al., 2016; Ghani et al., 2019; Krishnamoorthy et al., 2018).

Informed consent letter was given to the respondents to sign before the survey was conducted and answered by the respondents. Ethical approval was obtained from Research and Ethic Committee, Management and Science University (MSU), code ethics (MSU-RMC-02/FR01/07/L1/023).

3. Results

Dengue Status Distribution

The dengue status distribution of the respondents is shown in Table 1. Out of the 250 respondents,158 of them had not been infected by dengue fever (N=158, 63.2%) whereas (n=92, 36.8%) had previously history of dengue infection. More than 50% of the respondents who previously had history of dengue infection in between age of 21 – 30 years old, meanwhile, only 2.4% between age of 51-60 years old had infected by dengue previously. Based on the accommodation, there is similar percentage of respondents lived in high-density building such as apartments and condominiums and landed housing area such as D'Kayangan who had been infected with dengue previously.

Socio-demographic Distribution

The survey questionnaire on the knowledge, attitude and practice of dengue among the community in Section 13, Shah Alam was completed by 250 respondents. The socio-demographic distribution of the respondents is shown in Table 2. Out of the 250 respondents, 149 of them were female (59.6%). Majority of the respondents were Malay (n=80, 72.7%), while the rest of them were Chinese (n=29, 11.6%) and Indian (n=179, 71.6%). Most of the respondents had bachelor education level (n=133, 53.2%). The working respondents were employed by the own business (n=37, 14.8%),

unemployed (n=7, 2.8%), private sectors (n=72, 28.8%), government sectors (n=21, 8.4%) and majority of the respondents are students. More than 75% of the respondents accommodated in high-density housing such as apartments and condominium and only 25% were lived in landed house. More than half of the respondents are single (N=175, 70.0%), while married (n=74, 29.6%).

Level of Knowledge, Attitude and Practice towards Dengue Infection among Local City Communities in Section 13, Shah Alam

Parametric t-test was used to determine if there is any significant difference in the means of two groups to compared means of total score of knowledge, attitude and practice between groups of infected and non-infected (N=250) as depicted in Table 3. The results showed that there is no significant difference for the mean of total score of knowledge (p=0.755), attitude (p=0.785) and practice (p=0.452) to those who are previously infected and not infected by dengue among communities in Section 13, Shah Alam.

Correlation between Level of Knowledge, Attitude and Practice versus Dengue Infection among Local City Communities in Section 13, Shah Alam

Table 4 shows the correlation between the level of knowledge, attitude and practice with the dengue infection among the local city communities in Section 13, Shah Alam. It also found that there were negative correlation observed between the total score of knowledge (p=0.000), (r= - 0.984) and attitude (p=0.013), (r= - 0.259) with the infected person among communities in Section 13, Shah Alam.

4. Discussion

Out of the 250 respondents, 36.8% had previous history of dengue infection. Based on the age, more than 50% of the respondents who has previously history of dengue infection at the age of 21 to 30 years old which showed they are an active people who will go out in the morning and come back at late evening. Besides that, the similar percentage of respondents who got infected by dengue previously not affected by the place of their accommodation either in high-density building or landed housing area. Most of the respondents were female because it was primarily women who were eligible during the interviewed session. It was difficult to interview a male respondent since most of them at work. Therefore, they are not at home during the interview. For some who were at home, they asked their wives to give answers, saying that women know much about their households and their family's health. They were the ones responsible for taking care of their families and doing the daily routines or household chores every day. The majority of the population were those who work and have a family between the ages of 30 and 60, while some of the respondents were students between the ages of 15 and 29. The rest of the respondents were older people or pensioners in the age range of retirees which are between 56 to 60 years old. More than half of the respondents lived in high-density accommodation such as apartments and condominiums since the population study is known as high density population in Shah Alam (Ahmad et al., 2018). Majority of the respondents were Malay which characterises majority of the populations in Section 13, Shah Alam (Ahmad et al., 2018). Most females and majority of males worked with the government or private sector, or had their own company. Most of the residents had a Bachelor's degree in education level. Those with a higher education degree should also have a higher level

of dengue understanding, attitude and practice (Amanah, Abdullah, & Abdul Ghafar, 2018; Diaz-Quijano et al., 2018).

In this study, the level of knowledge, attitude and practices towards dengue infections among local city community in Section 13, Shah Alam was evaluated to determine the awareness of the community. Result in Table 1 showed that the level of knowledge, attitude and practice among the infected and non-infected person were similar. This shows that the community already aware on the effects of dengue virus infection. Nowadays, dengue plays as a major public health problem in Malaysia. Thus, it becomes worst over the time. The efforts by the Ministry of Health Malaysia in disseminating information such as the dengue fever campaign and anti-dengue message in order to gained their knowledge, in a hope better attitude and practice already been achieved. Besides that, it may be because the respondents who lived in Section 13, Shah Alam have received a lot of information from various sources like television, brochure and radio about dengue infections. Television, radio and internet are the common source of information on dengue in the study's population area. Besides that, the power of social media is boundless, and the information continues to spread very fast across this medium. Younger generation is very prone to social media. As a result, using social media as a medium that can provide dengue information may encourage dengue fever awareness, as well as help communities enhance their knowledge, attitudes and practices on dengue prevention. Moreover, most of the respondents are categorized as middle age (less than 40) and youth (less than 30), hence, the effective disseminated information can be achieved especially through social media (Hiremath et al., 2019; Lwin et al., 2015; Othman et al., 2017). This finding is contradict with the study by Al-Zurfi et al., (2016), where they found that their respondents who are secondary school students from Alam Shah Science School, Cheras, Malaysia, were found to have good knowledge and good attitude towards dengue fever but poor in their practices. They concluded that health education programme is needed to inculcate the better preventive practice among the public.

Previous study on the the study of knowledge, attitude and practice among selected urban, semi-urban and rural communities in Malaysia found that attitude towards dengue fever is associated with the level of education and employment status while practice was associated with knowledge, age, marital status and geographic area (Al-Dubai, Ganasegeran, Rahman A, Alshagga & Saif-Ali, 2013). Besides that, the study of knowledge, attitude and practice regarding dengue fever among patients in Hospital Taiping shown that there is no significant relationship between knowledge, attitude and practice score to socio-demographic factors but good practice is a consequence from the good knowledge (AlHoot et al., 2017).

Other than media communication, another factor such as the vector itself is a must to be take care of. Through preventing mosquitoes from biting, it is possible to avoid dengue fever because they are the vectors that transmit dengue virus to human (Rather et al., 2017; Singh & Robinson, 2017). This suggests that providing health education about the disease is necessary to ensure that Selangor residents can have better understand the dengue fever phenomenon, gain more knowledge about dengue transmission and provide more positive attitudes towards dengue outbreaks. Meanwhile, this research has shown that their risk of dengue fever infection is lower if the respondents have a better knowledge, attitude and practice of dengue fever. Despite the fact that majority of the respondents already have higher knowledge, attitude and practice towards dengue infection, the vector must be control in order to reduce the population of the female *Aedes* mosquitoes. Environment itself plays as an

important role, for instance, female A*edes* mosquito requires a small amount of water in order to produce her breeding sites (Achee et al., 2015; Singh & Robinson, 2017). Artificial accumulation of water, such as empty tins, broken bottles, coconut shells, flowers and unused tires, in and around human households should be discarded. This result was supported by a previous study which found that the urban community in Kuala Lumpur also had a good attitude towards dengue infections and respondents who had previously history of dengue fever or had family members with dengue fever showed better knowledge, attitude and practice compared to those who does not had a previous history of dengue fever. Besides that, community with better information and attitude levels were more likely to take additional precautions to prevent dengue infections (Alyousefi et al., 2016; Ghani et al., 2019; Wan Rozita, 2006; Wong, Shakir, Atefi, & AbuBakar, 2015).

From the correlation analysis it was found that the knowledge and attitude showed negative correlations and significance difference towards infected person among study population. Based on the comparison between knowledge and attitude versus infected person of dengue in the study population, it was found that if the level of the knowledge and attitude of the community increase, the percentage of the infected person can be decreased. Hence, the Ministry of Health Malaysia should increase the awareness and disseminating information regarding dengue infection among communities in order to increase their knowledge hence indirectly lead to better attitude and practice. This finding indicated that someone who thought more about dengue had a better attitude and practice towards dengue, for instance, someone who notice that dengue can bites human during day time which are from 7.00 and 5.00 pm, they will close the windows and stay in house during day time (Rather et al., 2017; Singh & Robinson, 2017). On the other hand, someone who had no knowledge on dengue infection has a lower attitude to prevent dengue. In addition, another study was conducted in Selangor among communities living in hotspot and non-hotspot areas, the study found that the risk from being infected by dengue infection would be lower if the person had a better knowledge and attitude (Ghani et al., 2019). Furthermore, since there is no specific treatment and effective antiviral to combat dengue fever, the sole control measure is by preventing the transmission of the disease by eliminating the breeding sites of female *Aedes* mosquitoes near and in household areas. The authorities should create and spread the awareness among communities regarding dengue in order to increase their knowledge, attitude and practice.

The results of this study could not be generalized to the whole population in Shah Alam because it involved a small sample size. In addition, the study was conducted in urban area which focused only in Section 13, Shah Alam may limit the findings to be generalised to others settings. On the other hand, convenience sampling was used instead of random sampling due to time and cost limitations.

5. Conclusion

In recapitulation, community living in Section 13, Shah Alam has a similar knowledge, attitude and practice towards dengue infections which cause them to have a better awareness, making them more aware of dengue outbreaks and helping them to cooperate efficiently in controlling the personal hygiene of their surrounding environment. In addition, it was proved that there was negative correlation between knowledge and attitude versus infected person among community. Effort such as educational program regarding dengue infections brochure and pamphlet on dengue

would help to increase the level of knowledge, attitude and practice regarding dengue infections. Hence, mass media sources should be continuously disseminating information and promoting regarding dengue infections such as newspaper, social media, television and radio.

As for the linked and comparable research to be carried out in the future, a larger population scale is required to acquire more reliable results and lower the standard deviation. In addition, larger sample size could represent the actual population in the study area. Furthermore, future studies may be carried out in whole Shah Alam versus rural areas in order to study more regarding *Aedes* mosquitoes which are *Aedes aegypti* and *Aedes albopictus.* Besides that, future study may also be done by comparing landed houses and high raised building areas in larger amount of the population.

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Conflicts of Interest

There are no conflicts of interest.

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Table Legends

Table 1: Respondents who had history of dengue infection previously (N=250)

Parameters	Frequency	Percentage (%)
Have you infected by dengue fever before		
Yes	158	63.2
No	92	36.8

Table 2: Frequency of socio-demographic characteristic distribution (N=250)

Characteristics		Frequency	Percentage (%)
Gender	Male	101	40.4
	Female	149	59.6
Age (year)			
	10-20	34	13.6
	21-30	136	54.4
	31-40	47	18.8
	41-50	27	10.8
	51-60	6	2.4

Race

	Malay	179	71.6
	Chinese	29	11.6
	Indian	38	15.2
	Others	4	1.6

Accommodation

	Menara U	31	12.4
	Menara U2	35	14.0
	Brunsfield	21	8.4
	Persanda apartment	25	10.0
	Prima U	33	13.2
	D'kayangan	28	11.2
	Arte subang west	16	6.4
	Others	61	24.4

Educational level

	UPSR/PMR/SPM	37	14.8
	Diploma	73	29.2
	Bachelor	133	53.2
	Master/PhD	7	2.8

Marital status

	Single	175	70.0
	Married	74	29.6
	Divorce	1	0.4

Education status

	Students	130	52.0
	Non-students	120	48.0

Occupation

	Own Business	37	14.8
	Unemployed	7	2.8
	Private	72	28.8
	Government	21	8.4
	Students	113	45.2

Household income

	RM 1, 000 – RM 3, 000	76	30.4
	RM 4, 000 – RM 6, 000	34	13.6
	<RM 1, 000	114	45.6
	>RM 6, 00	26	10.4

Housing type

Condominium	77	77
Flat	98	98
Terrace	75	75

Table 3: The comparison of mean ± SD, mean differences and p-value between total score of knowledge (K), Attitude (A) and Practice (P) with status of infected (yes) and non-infected (no) dengue fever among communities

Parameters (total score)	Yes (n=92)	No (n=158)	Mean Diff (95% CI)	p-value
Knowledge	11.11 ± 2.95	11.00 ± 2.69	- 0.11 (-0.83,0.61)	0.755
Attitude	*7.36 ± 1.12*	7.39 ± 1.12	0.04 (- 0.25,0.33)	0.785
Practice	*8.35 ± 2.62*	8.11 ± 2.22	- 0.23 (- 0.85,0.38)	0.452

Independent t-test (N=250)
*No significance difference = $p > 0.05$

Table 4: Correlation analysis between total score of knowledge (K) with non-infected among communities towards dengue infections

Parameters (Total Score)	Correlation Coefficient, r	p-value	Correlation strength
Knowledge vs. infected	-0.984**	0.000	Positive correlation
Attitude vs. infected	-0.259	0.013	Weak correlation

Pearson correlation, (N=250)
*Correlation is significant at the 0.05 level (2 tailed)
** Correlation is significant at the 0.01 level (2 tailed)