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Knowledge, Attitude and Practice on Dengue among Rural Communities in Rembau and Bukit Pelanduk, Negeri Sembilan, Malaysia

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Author's contribution

Author TKL designed the study, wrote the protocol, executed and supervised the study, performed the statistical analysis and wrote the manuscript.

Original Research Article

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ABSTRACT

Aims: The aim of the study was to assess the level of knowledge, attitude and practices concerning dengue among rural communities of Rembau and Bukit Pelanduk district, Negeri Sembilan, Malaysia.

Study Design: This was a community based cross-sectional study.

Place and Duration of Study: The study was conducted among household members in two villages from Rembau and Bukit Pelanduk districts respectively in Negeri Sembilan, Malaysia in August 2010.

Methodology: A total of 400 respondents were included in the study with 100 respondents from each of the four villages. Data was collected by a face-to-face interview of all residents aged 18 years and above in the selected households using a pretested structured questionnaire. The questionnaire consist of three sections; the first section concerned with knowledge comprising of 10 questions, the second part related to attitude comprised of six questions and the third part concerned with practice with seven questions.

Results: It was found that knowledge among the respondent was only adequate. The main source of information on dengue was from the television or radio (88.5%). The respondents' attitude was good and most was supportive of Aedes control measures. There was significant association between knowledge and attitude ($P < 0.001$) with an Odds Ratio of 3.8 (95% CI: 2.2, 6.7). Knowledge was associated with age, ethnicity and

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educational level; attitude was associated with ethnicity and educational level while practice was associated with ethnicity and marital status.

Conclusion: Attitude and practice among respondents were good but knowledge was poor. However, isolated knowledge on symptoms and prevention was adequate. The results are useful as a baseline data for future health education and promotion intervention programs for rural communities.

Keywords: Dengue; aedes; socio-demographic; rural community; Malaysia.

1. INTRODUCTION

Dengue virus infection is increasingly recognised as one of the world's emerging infectious diseases [1-4]. There were about 50 to 100 million cases of dengue fever and 500,000 cases of dengue haemorrhagic fever (DHF) with 24,000 deaths reported annually [5]. World Health Organization (WHO) declares dengue to be endemic in South East Asia [1].

Dengue is caused by the infection of dengue virus, a flavivirus in the family of Togaviridae with *Aedes mosquito* serving as a vector for the transmission of the virus. *Aedes aegypti* is the most important vector. *Aedes aegypti* is found in urban areas while *Aedes albopictus* predominates in the rural setting [6,7].

The first case of dengue was documented in 1902 in Malaysia with the first outbreak in 1962 [8]. In 2009, the incidence rates of dengue and dengue haemorrhagic fever were 136.89 and 9.67 per 100,000 population respectively with evidence of urban-rural shift [8-10].

The only effective measure available to prevent and control dengue is by preventing transmission of the disease by the *Aedes mosquito*. Control measures require support, cooperation and participation by the community. It is important to know the level of knowledge, attitude and practices (KAP) of the community concerning the disease. In 1975, a KAP study on DHF and its control was conducted in an urban Malay village [11]. In 1989 another KAP study on dengue was carried out in three urban areas in the Federal Territory and this study compared KAP concerning dengue between the Malays, Chinese and Indians [12]. In 2002 a KAP study on dengue among rural communities in Kuala Kangsar, Malaysia was done [13].

At present there is limited KAP study on dengue conducted on communities in the rural setting. It is important to conduct a KAP study concerning dengue on rural communities because almost a quarter of dengue cases occur in the rural setting [10]. In 2010, there were 1501 notified cases of dengue infections (dengue fever and dengue haemorrhagic fever) in Negeri Sembilan with 20% of the cases from rural areas [14].

The objective of the study was to assess the level of knowledge, attitude and practices concerning dengue among rural communities of Rembau and Bukit Pelanduk district, Negeri Sembilan, Malaysia.

2. MATERIALS AND METHODS

This was a cross-sectional study of households from Rembau and Bukit Pelanduk districts in Negeri Sembilan, Malaysia which represents the rural community. Two villages from each district were selected randomly. The study was carried out in August 2010.

A sample size of 400 respondents was required to fulfill the objective of the study at a 95% confidence level assuming a 50% prevalence of good knowledge and attitudes, 5% bound-of-error and inflated the sample by 15% to account for non-respondents and incomplete interviews. A sample of 100 respondents from each village was selected by simple random sampling to represent each village giving a total of 400 surveyed respondents.

Data was collected by a face-to-face interview of all residents aged 18 years and above in the selected households using a pretested structured questionnaire. The questionnaire consist of three parts; the first part concerned with knowledge comprising of 10 questions, the second part related to attitude comprised of six questions and the third part concerned with practice with seven questions. The medium of interview was in Bahasa Malaysia as it is widely spoken by the respondents.

Data was entered and analysed using the Statistical Package for Social Science (SPSS) version 17.5. Each question was analysed individually. Knowledge, attitude and practice were assessed using a scoring system. Each appropriate answer was given a point and the points for each section of the questionnaire were totalled. Knowledge was assessed as 'good' or 'poor' based on an arbitrary cut-off point. The same principle applied for attitude and practice. A respondent categorised as having good knowledge was based on \geq seven out of 10 points, attitude was based on \geq four out of six points and practice was based on \geq four out of seven points.

The study was approved by the Ethical Review Committee and the District Health officer of Rembau and Bukit Pelanduk.

3. RESULTS

There were a total of 400 respondents in the study. Table 1 describes the socio-demographic characteristics of the respondents.

Out of the 400 respondents, eight (2.0%) had never heard of dengue. The main source of information was from the television or radio (88.5%) followed by information from relatives and friends (40.3%). The most under-utilised source of information was the internet (6.6%).

When asked about whether dengue was transmissible, 77.3% of the respondents answered yes with 88.3% correctly identified the mode of transmission for dengue. 240 (60%) of respondents could name the type of mosquito (*Aedes*). The most common symptoms of dengue identified by the respondents were fever (84.3%) and rash (43.0%). When asked on mosquito bite time, 64.5% of respondents gave the correct answer of 'at dusk and dawn'. Other answers given include morning, noon and night. Only 211 (52.8%) respondents knew that stagnant clean water was needed for *Aedes* mosquito to breed. Out of the 400 respondents, 352 (88.0%) were aware that it is against the law to have larvae at their property.

Table 1. Socio-demographic characteristics of the respondents (N=400)

Socio-demographic characteristics		n	%
Gender	Male	168	42.0
	Female	232	58.0
Age (years)	<30	121	30.3
	30 to 49	158	39.4
	≥50	121	30.3
Ethnicity	Malay	272	68.0
	Chinese	73	18.3
	Indian	55	13.7
Marital status	Single	108	27.0
	Married	272	68.0
	Divorced/ widow	20	5.0
Occupation	Pensioner	30	7.5
	Professional	27	6.7
	Self-employed	42	10.5
	Skilled manual/clerical	67	16.7
	Unskilled manual	47	11.7
	Housewife	117	29.3
	Unemployed	25	6.3
Educational level	Student	45	11.3
	No formal education	10	2.5
	Primary level	89	22.2
	Secondary level	238	59.5
Monthly household income (RM)	Tertiary level	63	15.8
	<1,000	84	21.0
	1,000 to 2,999	227	56.7
	≥3,000	90	22.3

The majority of respondents (93.8%) considered dengue as a serious illness. Three hundred and ninety respondents (97.5%) believed that they shall seek treatment for dengue. All respondents would seek treatment at a health clinic or hospital except for one respondent who would go for self-care.

Only 34.3% of the respondents felt that it was their own responsibility to control Aedes while another 9.0% felt it was the sole responsibility of the government. Over half (56.7%) of the respondents have the opinion that it was a shared responsibility. Majority of respondents (92.3%) would support activities by the health authorities aimed at eradicating Aedes with 81.8% respondents agree that it is appropriate to punish those found to harbour the Aedes larvae in their property.

About two thirds (61.5%) of the respondents stored water at home, out of which only 62.6% cover the water and 88.2% change the stored water frequently. Over eighty percent (84.3%) of respondents claim to practice some form of prevention against mosquito bite. The common types of prevention taken include personal protection, environmental measures and insecticide use. The most frequent measure taken by the authorities was fogging (79.5%), followed by house-to-house inspection (46.0%) and educational campaign (19.3%).

Based on the scoring system described in the methodology, 58.0% of the respondents have

good knowledge on dengue, 83.3% had good attitude and 76.0% had good practice to prevent and control dengue and Aedes mosquito. Cross tabulation between knowledge, attitude and practice was performed. No significant association was noted between knowledge and practice, and attitude and practice. Significant association was noted between knowledge and attitude ($P<0.001$) with an Odds Ratio of 3.8 (95% CI:2.2, 6.7).

The association between knowledge, attitude and practice, and the socio-demographic characteristics of the respondents was analysed. Knowledge was significantly associated with age, ethnicity and educational level; attitude was significantly associated with ethnicity and educational level while practice was significantly associated with ethnicity and marital status (Table 2). Individuals aged between 30 and 49 years old, Malay ethnicity and with at least secondary school level education showed better knowledge. Malay ethnicity and with at least secondary school level education showed better attitude while Malay ethnicity and married individuals demonstrated better practice (Table 3).

Table 2. Association between knowledge, attitude and practice, and socio-demographic characteristics of the respondents

Socio-demographic characteristics	P-value		
	Knowledge	Attitude	Practice
Gender	0.264	0.295	0.525
Age	0.022*	0.143	0.665
Ethnicity	0.026*	0.001*	0.001*
Marital status	0.204	0.234	0.009*
Occupation	0.051	0.057	0.224
Educational level	0.001*	0.022*	0.134
Monthly household income	0.338	0.166	0.977

* statistically significant at $P<0.05$

Table 3. Socio-demographic characteristics significantly associated with knowledge, attitude and practice of the respondents

Socio-demographic characteristics	Knowledge		Attitude		Practice	
	Good n(%)	Poor n(%)	Good n(%)	Poor n(%)	Good n(%)	Poor n(%)
Age						
<30	68(56.2)	53(43.8)				
30 to 49	104(65.8)	54(34.2)				
>=50	60(49.6)	61(50.4)				
Ethnicity						
Malay	170(62.5)	102(37.5)	238(87.5)	34(12.5)	222(81.6)	50(18.4)
Chinese	34(46.6)	39(53.4)	50(68.5)	23(31.5)	47(64.4)	26(35.6)
Indian	28(50.9)	27(49.1)	45(81.8)	10(18.2)	35(63.6)	20(36.4)
Educational						
No Formal	2(20.0)	8(80.0)	7(70.0)	3(30.0)		
Primary	40(44.9)	49(55.1)	66(74.2)	23(25.8)		
Secondary	147(61.8)	91(38.2)	203(85.3)	35(14.7)		
Tertiary	43(68.3)	20(31.7)	57(90.5)	6(9.5)		
Marital Status						
Single					72(66.7)	36(33.3)
Married					219(80.5)	53(19.5)
Divorced/ widow					13(5.0)	7(35.0)

4. DISCUSSION

In this study, 98% of the respondents had heard of dengue. Studies in Malaysia showed similar findings [13,15,16]. Anita A et al reported only 90% of the respondents in Delhi, India were aware of dengue [17]. In Brazil, only 78% respondents knew about dengue [18] while in Thailand only 67% of the respondents knew about dengue [19]. Mass media was the main source of information. This illustrates the importance of mass media in conveying important health issues to the public. Studies conducted in Malaysia by Hairi et al. [13], Wan Rozita et al. [15] and Madiha et al. [16] showed similar findings.

Most respondents attributed the cause of dengue to mosquitoes with 60% correctly naming the mosquito. However, only a minority of respondents were able name the virus as the cause. Most health education programs by the Ministry of Health Malaysia focus on the Aedes vector and not the virus. This approach is appropriate as the most effective way of dengue control is on the mosquitoes.

Most respondents were aware of at least one sign or symptom of dengue. 84.3% of respondents were able to identify fever as a common symptom of dengue. Hairi et al. and Wan Rozita et al have reported fever as the common symptom of dengue recognized by the respondents [13,15]. Hairi et al explained that the health education program in the mass media focused on sudden onset of high fever as the primary symptom of dengue [13]. Slightly over 60% of the respondents knew about the biting time of mosquitoes. This is important to the public on the timing of the use of protective measures from mosquito bites. Only 9% of the respondents believed that Aedes control is solely the government's responsibility. This showed that the health education program has persuaded responsibility among the community.

The studied showed 58% of respondents have good knowledge, 83.3% with good attitude and 76% had good practice to prevent and control dengue and Aedes mosquito. Hairi et al. [13] reported figures of 68.5%, 91.5% and 51.5% while Wan Rozita et al. [15] reported 14.3%, 75.2% and 49.6%.

Cross tabulation between knowledge, attitude and practice were performed. Significant association was only noted between knowledge and attitude ($p < 0.001$) with an Odds Ratio of 3.8 (95% CI:2.2, 6.7). Hairi et al. and Kyu et al. showed similar findings [13,20]. Knowledge, attitude and practice were further analyzed with socio-demographic characteristics of the respondents. Knowledge was significantly associated with age, ethnicity and educational level. Individuals aged 30 to 49 years old, Malay ethnicity and with at least secondary school education showed better knowledge. Better or higher knowledge was reported to be associated with higher education level [15,16,21,22], higher household income [23] and male gender [21].

This study showed significant association between attitude; and ethnicity and educational level. Malay ethnicity and with at least secondary school education showed better attitude. Practice was significantly associated with ethnicity and marital status. Malay ethnicity and married individuals showed better practice. Wan Rozita et al showed better attitude associated with male gender and better practice associated with respondents owning a house [15]. However Hairi et al. [13] showed no association between socio-demographic characteristics and knowledge, attitude or practice while Shuaib et al. [22] showed no association between socio-demographic characteristics and attitude or practice.

The results are useful as a baseline data for future health education and promotion intervention programs for rural communities.

5. CONCLUSION

In conclusion, attitude and practice among respondents were good but knowledge was poor. However, isolated knowledge on symptoms and prevention was adequate. There was significant association between knowledge and attitude. Ethnicity was significantly associated with knowledge, attitude and practice. The available evidence is limited and there is a need for a nationally representative study to assess the knowledge, attitude and practice among rural communities in Malaysia.

CONSENT

Written informed consent was obtained from the respondents for the study. Confidentiality of data and privacy were respected at all times.

ETHICAL APPROVAL

The project received ethical approval from the International Medical University Research (Department) Committee.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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