A KNOWLEDGE ATTITUDE AND PRACTICE (KAP) STUDY ON DENGUE/DENGUE HAEMORRHAGIC FEVER AND THE AEDES MOSQUITOES

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SUMMARY

A KAP study on dengue/dengue haemorrhagic fever (DF/DHF) was carried out in three areas in the Federal Territory. *The three areas were selected based on their ethnic group composition and were Jinjang North (Chinese), Kampung Bahru (Malays) and Sentul (Indians). Houses were selected by a systematic sampling method and house-to-house interviews were carried out with a pre-tested, predesigned questionnaire. 546 (87.62%) of the households responded.*

The study indicated that all three communities knew of DF/DHF with the majority describing it as a disease caused by mosquitoes. Though a large number were able to give some sign or symptom of DF/DHF, many Chinese were unable to do so. Knowledge about the mosquito, its habits and habitats was generally good and many realised that unclean surroundings and storage of water would cause mosquitoes to breed. This knowledge, however, did not always lead to good practices and discrepancies between knowledge and practice were seen. Knowledge about legislation, though widespread, lacked specificity with many admitting ignorance about the duration of jail sentence and amount of fine that could be imposed. More than half the respondents did not know abate and the majority of these were Chinese.

Health personnel did not seem to participate actively in health education. The mass media was found to be the main source of information.

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INTRODUCTION

Dengue and dengue haemorrhagic fever (DF/DHF) are endemic in Malaysia in addition to which there have been periodic epidemics of the disease. The first of these epidemics was in 1962 followed by epidemics in 1973–74 and 1982. While a total of 1,487 cases and 2,200 cases were reported in 1973 and 1974 respectively, the number increased to 3,006 cases in the 1982 epidemic. These numbers were obviously in excess

of the cases reported between 1975–1981. (The average for this period was only 769 cases.)[1]

However, it is not the incidence per se of DF/DHF which makes these diseases a public health problem but the high case fatality rate (CFR), especially in young children that justifies the special attention given to these diseases by the Ministry of Health. Deaths are usually due to DHF; the CFR due to DHF diseases in the 1973 epidemic was 5.57%. The figure increased to 7.02% in 1974. In the 1982 epidemic it was 4.07%.[1]

As there is at present no vaccine to prevent the diseases or drug to cure them, the only measures available to control the diseases are measures to prevent transmission of the diseases by the Aedes mosquitoes. The Ministry of Health's Dengue Control Programme concentrates on health education, legislation and surveillance. As control measures require the cooperation and participation of the community, it is important to have information on the knowledge, attitude and practices (KAP) of the community with regard to these diseases. Dobbins and Elsie conducted a KAP study on DHF and its control in an urban Malay village in 1975.[2] Unfortunately the Chinese and Indian communities were not included in this study; no study has been conducted on these two communities to date. This study attempts to assess the KAP of the three major ethnic groups i.e., Malays, the Chinese and Indians, with regard to dengue, the vector and preventive measures.

MATERIALS AND METHODS

As the diseases are mainly an urban problem, the study was carried out in the *Wilayah Persekutuan* (Federal Territory). Three areas were selected based on their ethnic group composition, that is, areas which were predominantly Chinese (Jinjang North), Malay (Kampung Bahru) and Indian (Sentul) were selected. Systematic sampling was carried out for a total of 1,095, 640 and 229 households in Jinjang North, Kampung Bahru and Sentul, respectively. One adult (i.e., person above 15 years of age) from each household was interviewed with a pre-tested and pre-coded questionnaire. Trained interviewers were assigned to each area taking into consideration the language of the ethnic group under study. The study was carried out during April – May 1983. For the purpose of this study, both dengue and dengue haemorrhagic fever were treated as one entity and referred to as dengue.

RESULTS

Of the 623 households sampled, 546 (87.6%) responded. The distribution of respondents by ethnic group and areas is shown in Table I. The majority of respondents were housewives.

Knowledge

The Disease

With regard to knowledge of the disease, all respondents had heard of dengue. When asked to describe the disease in their own words, the majority (370 (67.8%) out of 546 respondents) understood it as a disease caused by a mosquito with 14.3% of these specifically mentioning "Aedes mosquito". 35 persons (6.4%) understood dengue to be a disease characterised by signs and symptoms such as fever, rashes, bodyache, etc. The rest, 141 (25.8%), who had heard of dengue said it was a disease but were unable to elaborate further.

When asked about the signs and symptoms of the disease, 457 (83.6%) of respondents were

TABLE I

DISTRIBUTION OF RESPONDENTS BY ETHNIC GROUP AND AREA

Ethnic Group	Area			Total	(%)
	Kampung	Jinjang	Sentul		
Malays	151	2	80	232	(42.7)
Chinese	0	185	9	194	(35.3)
Indians	0	1	118	119	(21.8)
Total	151	188	207	546	(100)

able to give either singularly or in combination some sign or symptom of the disease. The most commonly mentioned sign and symptom was fever with 68.7% of respondents mentioning it, followed by rashes (mentioned by 33.7%) and bleeding. It must be noted here that 71 (36.6%) of Chinese respondents did not know any sign or symptom of the disease compared with 11 (4.7%) of Malays and 7 (5.9%) of Indians.

When asked about the cause of dengue, the majority of respondents, 356 (65.2%), attributed dengue to mosquitoes. 33 respondents (6%) thought dengue was caused by ingesting unclean food/water and 14 (2.6%) mentioned virus as the aetiologic agent. 186 (34.1%) said they did not know the cause of dengue. (Multiple response were given by a few respondents.) When asked if dengue could spread or was infectious, 407 (74.6%) respondents thought dengue could spread from person to person, 58 (10.6%) said it would not spread and 81 (14.8%) did not know whether it was infectious or not.

The Vector

With regards to the habits and habitats of the vector, the common breeding sites of mosquitoes as mentioned by respondents is shown in Table II. When questioned about the biting habits of mosquitoes, 132 (24.2%) of respondents said that mosquitoes would bite during the day; 182 (33.3%) thought they would bite at night; 80 (14.7%) thought they would bite "anytime"; and 96 (17.6%) did not know when mosquitoes would bite. Others mentioned times like dusk 41 (7.5%), and dawn 15 (2.7%).

When asked about methods to prevent breeding of mosquitoes, 300 (54.9%) mentioned cleaning of compounds and disposal of garbage as methods to prevent mosquitoes from breeding (Table III). It is seen that various measures regarding the storage of water were also mentioned: changing stored water frequently (31.7%), not storing water (25.1%), adding a chemical to stored water (22.7%), and covering stored water (6.8%). Multiple responses were sometimes given for this question.

TABLE II

FREQUENCY OF BREEDING SITES OF DENGUE MOSQUITOES MENTIONED BY RESPONDENTS

Breeding site	Frequency of respondents	
	No.	(%)
Discarded tins	331	(60.7%)
Water storage jars/tanks	171	(31.2%)
Flower pots and vases	159	(29.2%)
Small drains	148	(27.2%)
Bath tubs/troughs	124	(22.8%)
Old tyres	115	(21.1%)
Monsoon drains	34	(6.2%)
Ant traps	29	(5.3%)
Gutters	27	(5.0%)
Total respondents	546	(100)

Note: Multiple sites were mentioned by some respondents.

Abate

Enquiry into the knowledge about abate showed that 250 (46.8%) of respondents knew of abate while 296 (54.2%) did not. The Chinese formed the largest percentage of those who were ignorant, with 163 (84%) being unaware of abate compared with 75 (32.2%) Malays and 58 (48.7%) Indians who were unaware of it when asked (Table IV).

Legislation

The knowledge that one could be penalised if one infringed the Dangerous Disease-Bearing Insect Act was high, with over 95% of all ethnic groups saying they were aware of this. Specific knowledge about the penalty was lacking as seen by the fact that 60% admitted ignorance about the maximum duration of jail sentence and 41% did not know about the amount of fine that could be imposed.

TABLE III

KNOWLEDGE OF METHODS TO PREVENT MOSQUITO-BREEDING BY ETHNIC GROUP

Methods to prevent breeding	Respondents by Ethnic Group						Total	
	Malay		Chinese		Indian			
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Clean drains and surrounding/ proper disposal of garbage	129	(55.4)	121	(62.4)	50	(42.0)	300	(54.9)
Spraying/fogging with insecticide	66	(28.3)	35	(18.0)	62	(52.1)	163	(29.9)
Changing stored water frequently	66	(28.3)	56	(28.9)	51	(42.9)	173	(31.7)
Not storing water	80	(34.3)	29	(14.9)	28	(23.5)	137	(25.1)
Use a chemical in stored water	69	(29.6)	35	(18.0)	20	(16.8)	124	(22.7)
Covering stored water	17	(7.3)	3	(1.5)	17	(14.3)	37	(6.8)
Total respondents	233	(7.3)	194		119		546	

Note: To this question each respondent may have given multiple responses.

TABLE IV

KNOWLEDGE OF ABATE BY ETHNIC GROUP

Knowledge of Abate	Ethnic Group						Total	
	Malay		Chinese		Indian			
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Know of Abate	158	(68.8)	31	(15.9)	61	(51.3)	250	(46.8)
Do not know of Abate	75	(32.3)	163	(84.0)	58	(48.7)	296	(54.2)
Total respondents	233		194		119		546	(100)

Attitude and Practices

About 82% of households said they stored water for domestic purposes. There was no significant difference between the three ethnic groups; the main reason for storing water was because it was customary or convenient to do so. Only 32.4% stored water out of necessity, i.e., because of the unreliability of the piped-water supply. It was seen that 109 (81.3%) of the 137 persons who had earlier said that one way to prevent mosquitoes from breeding was by not storing water admitted later that they stored water. When asked about the measures taken to prevent mosquitoes breeding in this stored water, it was found that 69 (55.6%) out of the 124 persons who had mentioned that addition of abate to stored water could prevent mosquito-breeding in it, did not now mention adding abate to the water they stored. Thus discrepancies between knowledge and practice were seen.

To a question of measures employed for protection from mosquito bites, a total of 888

responses were obtained as some respondents gave more than one response. The use of mosquito coils was the most popular method – 347 (63.6%), while insecticide sprays were mentioned by 167 (30.6%). Prevention of mosquito-breeding by keeping the surroundings clean and disposing garbage properly as a method of reducing mosquito bites was mentioned by 211 (38.6%). Mosquito nets for protection from bites was mentioned by 138 (25.3%), while 15 (2.7%) mentioned other measures like the use of fans, leaving lights on at night, closing of doors and windows, and use of mosquito proof-netting on windows. 10 (1.8%) respondents also said they did not do anything to protect themselves from mosquito bites.

The respondents were asked whose responsibility it was to control mosquito-breeding and the majority, 234 (43%), felt it was the people's responsibility. It was seen that a large number, 210 (36.6%), felt that both the people and the authorities should be involved in the control of mosquito-breeding. Only 67 (12.3%) felt that the Government should be responsible. 35 (6.4%) could not comment.

To a question of whether it was fair to be fined on infringing the DDBI Act, the majority, 470 (86.4%), said it was. The Chinese differed slightly from the Malays and Indians with only 74.2% saying it was fair compared to 93% of the other two ethnic groups.

Activities of health personnel

Out of 546 respondents, 322 said they had been visited by health personnel over the past year.

Table V shows the activities carried out by health personnel during these home visits, according to the respondents. It is seen that health education was obviously not given much importance by health personnel and the major activity carried out was checking for mosquito-breeding.

Sources of information on dengue

As seen from Table VI the ethnic groups differed in their source of information about dengue. While Malays and Indians frequently cited television and radio as sources of information, the Chinese mentioned newspapers and friends too. It is seen that the role played by medical

TABLE V

ACTIVITIES OF HEALTH PERSONNEL BY AREAS

Activities	Areas						Total	
	Jinjang		Sentul		Kampung Bahru			
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Check for mosquitoes	153	(89.5)	36	(42.9)	90	(61.2)	279	(69.4)
Fogging/spraying	8	(4.7)	45	(53.6)	39	(26.5)	92	(22.9)
Advice on prevention of mosquito-breeding	9	(5.3)	3	(3.6)	17	(11.6)	29	(7.2)
Give information about dengue (verbal or written)	0	(0)	0	(0)	1	(0.7)	1	(0.2)
Compound the owner or give warning	1	(0.6)	0	(0)	0	(0)	1	(0.2)
Total responses	171		84		147		402	

Note: Only 322 of the 546 respondents had been visited by health personnel; multiple responses may be given by each respondent.

TABLE VI

SOURCE OF INFORMATION ON CAUSE AND SPREAD OF DENGUE BY ETHNIC GROUP

Source of Information	Ethnic Group							
	Malay		Chinese		Indian		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Television	221	(94.5)	61	(31.9)	116	(97.5)	398	(73.3)
Radio	164	(70.4)	25	(13.1)	80	(67.2)	269	(49.5)
Newspapers	82	(35.2)	103	(53.9)	25	(21.0)	210	(38.7)
Friends/neighbours	40	(17.2)	89	(45.9)	25	(21.0)	154	(28.4)
Medical personnel	37	(15.9)	6	(3.1)	13	(10.9)	56	(10.3)
Pamphlets/posters	19	(8.2)	4	(2.1)	23	(19.3)	46	(8.5)
Relatives	9	(3.9)	5	(2.6)	15	(12.6)	29	(5.3)
Cinema	5	(2.1)	0	(0.0)	2	(1.7)	7	(1.3)
Books/magazines	2	(0.9)	0	(0.0)	3	(2.5)	5	(0.9)
Total respondents	233		191		119		543*	

Note: *The responses of three respondents were not recorded; each respondent may give multiple responses.

personnel in disseminating information was minimal.

DISCUSSION

The result of the study are discussed, keeping in mind certain limitations of the study. Firstly, the study was conducted using a quantitative survey method and it is realised that attitudes cannot be accurately gauged with such a method. Secondly, the questionnaires were prepared only in the Bahasa Malaysia and English languages due to the inability of interviewers to read Tamil or Chinese. The interviewers used the nearest, most appropriate verbal translation. However, to minimise variation, the translations were discussed and standardised as far as possible. In addition, each interviewer was assigned a fixed area and did not interview other areas thereby further reducing interviewer variation.

The study reveals that all respondents had heard of dengue and many recognised it as a febrile illness. This is probably due to the educational message over the mass media which states "anyone with sudden high fever could be suffering from dengue and should seek medical treatment immediately".

With regards to the signs and symptoms of the disease, the Chinese were most ignorant of the signs and symptoms while the Malays performed consistently well. A possible reason for this could be that the health educational messages over the television and radio are usually in Bahasa Malaysia, a language with which the Malays would be familiar. Employing various languages to give health education is one way of ensuring that messages reach a larger population. The authors realise that Bahasa Malaysia is the national language and that all Malaysians should be familiar with it. Unfortunately, in practice, this is not so. A large number of Malaysians, especially those in the older age groups, are unable to understand or speak the language. In the author's experience, this is especially true of the Chinese community. Health education in different languages is therefore still a necessity in this country.

The Chinese were also relatively ignorant about the infectiousness of dengue and about the use of abate. Inability to understand Bahasa Malaysia may explain this too.

Although over half, 212 (52.1%), of the respondents mentioned mosquitoes as aetiologic agents, 33 (6%) had attributed dengue to direct contact with "dirty" food and water. The latter could be a popular misconception as exemplified by an article in a newspaper *(The Star,* 2 August 1982) during the last dengue epidemic which highlighted the fact that a Red Crescent official had complained that "with the prevailing dengue epidemic in the country . . . no provision had been made for boiled water to be served". It is necessary to rectify such misconceptions. Moreover, about a third of the respondents had said they did not know the cause of dengue. This gap in their knowledge must be filled by appropriate health education.

Knowledge of respondents with regard to mosquitoes and their breeding habits was good with a large number quoting environmental cleanliness, proper disposal of garbage, as well as measures against stored water as methods to prevent mosquitoes from breeding. This indicates that the people were aware of the health educational messages stressing on environmental cleanliness and measures against stored water.

However, discrepancies between knowledge and practices were seen as implying that knowledge need not necessarily lead to practice. A possible reason for this could be that most knowledge came from the mass media. It is a well known fact that education through the mass media is often ineffective in discouraging deeply ingrained habits (like storage of water) and encouraging distasteful habits (like adding chemicals to drinking water).

Many were unaware that mosquitoes would bite during the day; the mosquito coils and nets resorted to for protection against bites would be ineffective as such measures are usually used at night. The biting habits of the Aedes mosquito should be made known to the public and it must be emphasised that the most effective way to prevent bites is by preventing the breeding of Aedes mosquitoes.

The practice of storing water is obviously widespread and seems to be a deeply ingrained habit which might be difficult to eradicate. It might therefore be a good idea to emphasise methods of protecting stored water from mosquitoes by covering it, changing it frequently, adding abate or scrubbing containers instead of trying to stop storage of water. Such messages must be given through more personal methods, without any dependence on the rather impersonal mass media. Health education should also be carried out in languages familiar to the people, as mentioned earlier.

Responses to the question of responsibility to prevent breeding of mosquitoes and fairness of legislation require cautious interpretation. As mentioned earlier this is a quantitative survey and attitudes are difficult to gauge. Though many said the people themselves should be involved in preventive measures against mosquitoes and that it was fair to impose a fine, all these could be polite lip service. The results can be verified with an in-depth or qualitative study method.

The mass media seemed to be the main source of information. The role of health personnel in health education seemed minimal. This might be because health inspectors are usually asked to check for Aedes breeding grounds and might not have been requested to give information. Health personnel should be encouraged to give health education at all times, as such education might be more effective than education via the mass media.

It is therefore recommended that health education be continued with greater emphasis on: the signs and symptoms of DF/DHF so that people are more aware of the disease and will be motivated to seek treatment early; the role of the Aedes mosquito in the aetiology and mode of spread of the disease, emphasis on its breeding and biting habits so that people are motivated to prevent breeding of the mosquito.

It is also recommended that health education be carried out: by more personal methods so that deeply-ingrained habits will be changed and there will be less discrepancy between knowledge and practice; in languages familiar to the respondent, so that there would be better understanding of the health educational message.

CONCLUSION

In conclusion, it could be said that most people were knowledgeable about dengue and Aedes mosquitoes. The Chinese were less informed and this could be attributed to the fact that health education was in Bahasa Malaysia, a language with which they may, often, not be familiar. The mass media was a major source of information and could have failed to change deep-rooted habits. It is suggested that more personal methods be used and that health personnel play a more active role in health education.

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