

# HEALTH SEEKING BEHAVIOR AMONG MALAYSIANS WITH ACUTE DIARRHEAL DISEASE

GH Tee<sup>1</sup>, G Kaur<sup>1</sup>, P Ramanathan<sup>2</sup>, NM Amal<sup>3</sup> and K Chinna<sup>4</sup>

<sup>1</sup>Institute for Public Health, Ministry of Health, Kuala Lumpur; <sup>2</sup>Kuala Lumpur City Council, Kuala Lumpur; <sup>3</sup>Institute for Medical Research, Ministry of Health, Kuala Lumpur; <sup>4</sup>Universiti Teknologi Mara, Malaysia

**Abstract.** About 1.8 million people die annually from acute diarrheal disease globally. A nationwide cross-sectional survey was conducted via face-to-face interview with eligible subjects to determine the incidence and health seeking behavior of Malaysians with acute diarrheal disease (ADD). An acute diarrheal episode was defined as having three or more loose stools in any 24 hour period during the four weeks period prior to the interview. The exclusion criteria included pre-existing chronic diarrhea, such as with cancer of the bowel, ulcerative colitis or Crohn's disease. Forty three point three percent of those with ADD (95% CI 41.3-45.4) sought treatment for the illness. Younger age groups (0-4 years, 67.7%; 95% CI 61.5-73.4; 5-9 years, 56.5%; 95% CI 48.6-64.1) were more likely to seek care for ADD. Seventy-one point eight percent of those seeking treatment, (95% CI 69.0-74.4) did so within 12 hours of the onset of symptoms. Most people with ADD sought treatment at private clinics. The main reasons given for not seeking treatment were the illness was mild and did not warrant treatment and the practice of self-medication (22.4%; 95% CI 20.0-24.9). These findings show self-medication is a major health seeking behavior among Malaysians with ADD. Self-medication of ADD deserves more in-depth study to ensure it is safe.

**Keywords:** acute diarrheal disease, health seeking behavior, self-medication, Malaysian population

## INTRODUCTION

Acute diarrheal disease (ADD) is a major health problem globally. Diarrhea causes 4% of all deaths and 5% of health loss due to disability. Globally, there are about 4 billion cases of diarrhea causing 1.8 to 2.2 million deaths yearly. More than 90% of these deaths are in children under

five years of age, mostly in developing countries (WHO, 2005).

Epidemiologists and social scientists have devoted increasing attention to studying health seeking behavior associated with acute diarrheal disease in recent years. Community-based interview surveys, such as the National Health and Morbidity Survey III (NHMS III), appear to offer the best vehicle for analyzing health care seeking behavior among a population.

There are critical factors that determine health care seeking behavior for ADD, which are related to perceived

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Correspondence: Tee Guat Hiong, Disease Control Division, Institute for Public Health, Ministry of Health Malaysia, Jalan Bangsar, 50590 Kuala Lumpur, Malaysia.

Tel: +603 2297 9423; Fax: +603 2283 2050

E-mail: helentee.gh@iku.moh.gov.my

illness severity and recognition of certain signs and symptoms (Taffa and Chepngeno, 2005; Sreeramareddy *et al*, 2006; Sudharsanam and Rott, 2007). Hill *et al* (2003) argue that health beliefs and maternal ability to recognize symptoms are important factors in health care seeking behavior. Some illnesses are recognized as "not-for-hospital". Additionally, past experience with similar illnesses in children can motivate mothers to wait and see if the illness resolves on its own, particularly in situations where the cost of care is an inhibitory factor (D'Souza, 1999). There are studies demonstrating health seeking behavior is influenced by a variety of socio-economic variables, gender, age, the social status of women, the type of illness, access to services and perceived quality of the service (Tipping and Segall, 1995). Ahmed *et al* (2001) reported only 17% of neonates were taken to trained providers, and only 5% to government health facilities. Seeking care from trained providers was found to be associated with the gender of the neonate, birth order, and antenatal care of the mother from trained providers, the father's education and monthly expenditure of the family.

A proper understanding of health seeking behavior may reduce delay in diagnosis, improve treatment compliance and improve health promotion strategies in a variety of contexts.

Accessibility is commonly suggested as a factor in health facility use (Wang *et al*, 2004); however, the type of health care provider sought, or the health seeking behavior adopted, differs by the type of disease. Mbonye (2004) found that mothers were more likely to seek help for diarrheal disease than acute respiratory infections, since diarrhea weakens children more quickly than respiratory symptoms, despite the fact that both are

leading causes of child mortality in developing countries.

Despite ongoing evidence that people choose traditional and/or folk medicine or providers in a variety of contexts which have a potentially profound impact on health, few studies have recommended ways to incorporate individual preferences into the health care system. Ahmed *et al* (2000) concluded "...efforts should be made to raise community awareness regarding the importance of seeking care from trained personnel and the availability of services".

The main objective of this study was to obtain baseline epidemiological estimates of health seeking behavior among Malaysians with ADD.

## MATERIALS AND METHODS

This study was part of a nationwide cross-sectional community household survey (National Health and Morbidity Survey III) conducted between April and mid-August, 2006. The selection of enumeration blocks (EBs) and living quarters (LQs) was carried out by the Department of Statistics, Malaysia. A two-stage stratified random sampling proportionate to population size was used to select 2,150 EBs and 17,251 LQs. Ethical approval for the study was obtained from the Research and Ethics Committee, Ministry of Health, Malaysia. All eligible respondents, regardless of age, who gave verbal and written consent were interviewed by trained interviewers using a structured questionnaire. The mothers or guardians were interviewed for children  $\leq 12$  years old.

Acute diarrheal disease was defined as having three or more episodes of loose stool in any 24 hour period during the previous four weeks prior to the interview. Exclusion criteria included chronic diarrhea

(defined as more than three loose stools per 24 hours for more than four weeks) experienced by the respondent as a result of underlying diseases, such as cancer of the bowel, ulcerative colitis or Chrohn's disease. Respondent with a recent history of ADD were then asked further questions regarding health seeking behavior.

Health seeking behavior was measured by four parameters: 1) seeking treatment for the illness, defined as actively seeking or obtaining treatment for the diarrhea from anyone or any facility (allopathic or alternative medicine) outside the home, including a house call by a doctor; 2) place first sought treatment from for the illness, regardless of type of treatment rendered, such as allopathic or alternative medicine; 3) promptness of seeking treatment for the illness, defined as how soon the respondents first sought treatment for the diarrhea after the appearance of the symptoms, measured in hours; 4) reasons for not seeking treatment if applicable, defined as the main reason given by the respondent for not seeking any treatment for the illness.

Data were analyzed using the Statistical Package for Social Sciences Complex Samples add-on module (SPSS Version 16). Statistical analysis was performed by describing the characteristics of respondents. Proportions were summarized as percentages.

## RESULTS

The total number of eligible respondents of all ages was 56,710, which represents 21,095,810 people on weighted counts. The response rate was 98.3%. Table 1 shows the distribution of the respondents by their socio-demographic characteristics and geography. The majority of respondents (55.6%) were children

Table 1  
Socio-demographic characteristics of respondents.

Socio-demographic characteristics	Number	%
Total	55,748	98.3
Age group (yrs)		
0-4	5,912	10.6
5-9	6,629	11.9
10-19	10,900	19.6
20-29	7,497	13.4
30-39	7,136	12.8
40-49	7,325	13.1
50-59	4,810	8.6
≥ 60 yrs	5,510	9.9
Unclassified	29	0.1
Gender		
Male	26,245	47.1
Female	29,503	52.9
Ethnic group		
Malay	31,986	57.4
Chinese	10,059	18.0
Indian	4,333	7.8
Other Bumiputras	6,954	12.5
Others	2,416	4.3
Education level		
None	11,026	19.8
Primary	14,818	26.6
Secondary	18,008	32.3
Tertiary	3,344	6.0
Unclassified	355	0.6
Still studying	8,197	14.7
Monthly household income group (RM)		
< 400	4,617	8.3
400-699	8,447	15.1
700-999	6,454	11.6
1,000-1,999	14,992	26.9
2,000-2,999	8,418	15.1
3,000-3,999	4,217	7.6
4,000-4,999	2,018	3.6
> 5,000	4,511	8.1
Unclassified	2,078	3.7
Locality		
Urban	32,212	57.8
Rural	23,536	42.2

or young adults aged  $\leq 29$  years. Fifty-two point nine percent were females, 47.1% were males. More than half of the respondents (57.4%) were Malays and 32.3% had a secondary education. Sixty-two percent of respondents had a monthly household income  $\leq$ RM 1,999 and 58% lived in urban areas.

#### Seeking care for acute diarrheal disease

A total of 1,190 respondents (43.3%; 95% CI 41.3-45.4) who reported having ADD sought care for their diarrhea, while 56.3% (95% CI 54.3-58.4) did not seek care. The characteristics of those who sought care are as shown in Table 2.

The younger age groups (0-4 years, 67.7%; 95% CI 61.5-73.4; 5-9 years, 56.5%; 95% CI 48.6-64.1) were more likely to seek care for ADD than the rest of the age groups. The 10-19 year old age group had significantly the lowest percentage of seeking care (30.7%; 95% CI 27.2-34.3) compared to other age groups. There was no significant difference in health seeking behavior between males (49.3%; 95% CI 44.2-49.3) and females (36.7%; 95% CI 33.1-40.5). Indians were significantly more likely to seek care (54.0%; 95% CI 47.3-60.6) compared to other ethnic groups. Malays had the lowest percentage of seeking care for ADD (41.4%; 95% CI 38.9-44.0). The percentage of respondents with ADD who sought care was significantly lower in those with a primary education (36.7%; 95% CI 33.1-40.5) than other education levels. Seeking care was highest amongst the  $<$ RM400 household monthly income group, while the RM4,000-RM4,999 household monthly income group had the lowest percentage of seeking care. A higher percentage of respondents seeking care for ADD was from urban (44.3%; 95% CI 41.6-47.1) than rural locations (41.8%; 95% CI 38.9-44.8); however, this difference was not significant.

#### Place first sought care for acute diarrheal disease

The type of health facilities most commonly utilized by respondents when first seeking care for ADD were private clinics (41.9%), government health clinics (20.9%), pharmacies/Chinese medicine shops (16.7%) and government district hospitals (9.0%).

All age groups of respondents (except the 50-59 year old age group who preferred government health clinics) were first sought care from private clinics for their ADD. Three age groups, 20-29 years, 30-39 years and 40-49 years, reported their second choice of facility for seeking care was a pharmacy/Chinese medicine shop. The health facilities most commonly utilized by respondents when seeking care for their diarrhea were consistent for all age groups.

There was no difference between males and females in the choice of health facilities where the respondent first sought care. The health facilities utilized, in declining order of preference were private clinic, government health clinic, pharmacy/Chinese medicine shop, government district hospital and government general hospital.

Private clinics were the preferred choice for health care for ADD by Malays, Chinese, Indians and Others. In contrast, government health clinics were the primary choice of health facility for ADD by Other Bumiputras (including Bumiputras from Sabah and Sarawak).

Respondents from all education levels first sought care for their diarrhea at private clinics.

Those with a family monthly income  $<$  RM699 first sought care for ADD from government health clinics, followed by private clinics. All other household

Table 2  
Percentage of respondents who had sought care for acute diarrheal disease by socio-demographic characteristics.

Socio-demographic characteristics	Total percentage			Total	
	%	95 % CI		n <sup>a</sup>	N <sup>b</sup>
		Lower	Upper		
Overall	43.3	41.3	45.4	1,190	442,992
Age group (yrs)					
0 - 4	67.7	61.5	73.4	177	64,894
5 - 9	56.5	48.6	64.1	121	45,828
10 - 19	30.7	27.2	34.3	206	77,086
20 - 29	41.0	36.6	45.6	204	77,049
30 - 39	42.7	37.6	48.0	153	57,925
40 - 49	42.3	36.8	47.9	136	49,929
50 - 59	41.7	34.9	48.9	89	32,905
≥ 60	50.8	43.5	58.0	104	37,377
Gender					
Male	49.3	44.2	49.3	585	216,190
Female	36.7	33.1	40.5	605	226,802
Ethnic group					
Malay	41.4	38.9	44.0	705	262,693
Chinese	42.0	36.7	47.6	147	59,409
Indian	54.0	47.3	60.6	117	46,893
Other Bumiputras	46.8	41.2	52.6	188	62,539
Others	42.4	31.8	53.7	33	11,458
Education level					
None	49.3	44.2	49.3	212	79,376
Primary	36.7	33.1	40.5	264	95,999
Secondary	37.8	34.7	40.9	392	147,096
Tertiary	44.6	37.8	51.5	93	36,512
Monthly household income group (RM)					
< 400	46.9	40.4	53.5	116	41,133
400 - 699	41.3	36.3	46.4	180	63,106
700 - 999	44.2	37.6	51.0	131	47,556
1,000 - 1,999	43.1	39.3	47.0	317	118,684
2,000 - 2,999	44.4	39.1	49.9	186	70,253
3,000 - 3,999	42.9	35.6	50.5	87	34,164
4,000 - 4,999	38.7	30.0	48.1	37	14,655
> 5,000	43.6	37.2	50.1	99	14,655
Locality					
Urban	44.3	41.6	47.1	662	271,665
Rural	41.8	38.9	44.8	528	171,327

<sup>a</sup>Number of respondents; <sup>b</sup>Number of estimated population

monthly income groups utilized private clinics when they first sought care for ADD.

The main health facilities where respondents first sought care for ADD in urban areas were private clinics (51.7%), followed by pharmacies/Chinese medicine shops (14.5%) and government health facilities (14.3%). The majority of rural respondents first sought care from government health clinics (31.4%), followed by private clinics (26.2%) and pharmacies/Chinese medicine shops (20.2%).

#### **Promptness in seeking care for acute diarrheal disease**

Table 3 shows the percentages of respondents and promptness of seeking care for acute diarrheal disease by socio-demographic characteristics. Seventy-one point eight percent of respondents (95% CI 69.0-74.4) sought care  $\leq 12$  hours after the onset of diarrhea. The highest and lowest percentages were reported in the 60 years and above age group (84.3%; 95% CI 75.9-90.1) and 0-4 years age group (65.4%; 95% CI 57.4-72.6), respectively. Respondents sought care 13-24 hours after the onset of ADD and  $>24$  hours after the onset of ADD in the 50-59 year old age group (24.2%; 95% CI 16.5-34.1) and the 0-4 year old age group (21.4%; 95% CI 15.5-28.7), respectively.

A higher percentage of males sought care  $<24$  hours after the onset of diarrhea, whereas a higher percentage of females sought care  $>24$  hours after the onset of diarrhea. However, these differences are not significant.

A higher percentage of respondents seeking care  $\leq 12$  hours after the onset of diarrhea were observed among all ethnic groups compared to other time intervals.

A similar pattern of promptness in seeking care was seen at all education

levels. Those with tertiary education had the highest percentage of seeking care  $\leq 12$  hours after the onset of diarrhea (76.2%; 95% CI 66.8-83.6); the lowest percentage being observed in those with no formal education (72.4%; 95% CI 65.4-78.3).

The highest percentage of respondents seeking care  $\leq 12$  hours after the onset of diarrhea was seen in the RM2,000-RM2,999 monthly household income group (78.7%; 95% CI 71.9-84.2). Those families with a monthly household income of RM400-RM699 had the lowest percentage of seeking care  $\leq 12$  hours after the onset of diarrhea.

A significantly higher percentage of respondents seeking care in  $\leq 12$  hours was observed in urban (74.9%; 95% CI 71.3-78.2) than rural locations (66.9%; 95% CI 62.4-71.1). The majority who sought care did so in  $\leq 12$  hours after the onset of diarrhea; this was seen in both localities.

#### **Reasons for not seeking care for acute diarrheal disease**

Fifty-six point three percent of respondents (95% CI 54.3-58.4) with ADD during the preceding four weeks did not seek care. The commonest reasons for not seeking care were: the illness was mild (53.6%), self-medication (22.3%), and the illness was cured already (9.1%).

Reasons for not seeking care were generally consistent for all age groups. The reasons being the illness was mild, followed by the ability to self-medicate and the illness was cured already. For the 50-59 year old age group, the third reason given for not seeking care for ADD was treatment was not required. Unavailability of transportation was among the main reasons for not seeking care given by respondents in the  $\geq 60$  year old age group. Similar reasons for not seeking care were observed by both males and females.

Table 3  
 Percentage of respondents and timeliness of seeking care for acute diarrheal disease by socio-demographic characteristics.

Socio-demography characteristics	Total		Total percentage														
	%	N <sup>b</sup>	≤12 hrs after onset			<13-24 hrs after onset			>24 hrs after onset								
			%	95% CI	n <sup>a</sup>	N <sup>b</sup>	%	95% CI	n <sup>a</sup>	N <sup>b</sup>	%	95% CI	n <sup>a</sup>	N <sup>b</sup>			
			Lower Upper			Lower Upper			Lower Upper								
Overall	100	440,915	71.8	69.0	74.4	845	316,495	18.1	16.0	20.5	219	79,976	10.0	8.3	12.0	120	44,088
Age group (yrs)																	
0 - 4	100	64,535	65.4	57.4	72.6	115	42,178	21.4	15.5	28.7	37	13,790	21.4	15.5	28.7	24	8,566
5 - 9	100	45,023	73.5	63.9	81.2	86	33,074	18.3	11.9	27.1	23	8,248	8.2	4.4	14.9	10	3,700
10 - 19	100	76,692	69.2	62.3	75.4	141	53,087	18.6	13.8	24.6	39	14,254	12.2	8.3	17.5	25	9,350
20 - 29	100	76,366	69.6	62.8	82.1	140	53,127	15.2	10.4	21.7	36	13,828	8.2	4.8	13.8	26	9,409
30 - 39	100	58,935	76.0	68.6	82.1	117	44,782	15.2	10.4	21.7	25	8,939	8.2	4.8	13.8	13	4,859
40 - 49	100	49,025	72.6	64.2	79.7	97	35,610	16.6	11.2	24.0	23	8,162	10.7	6.2	17.9	14	5,251
50 - 59	100	33,308	70.3	59.6	79.2	63	23,427	24.2	16.5	34.1	22	8,072	5.4	2.3	12.4	5	1,808
≥ 60	100	37,029	84.3	75.9	90.1	86	31,207	12.6	7.5	20.5	14	4,679	3.1	1.0	9.2	3	1,142
Gender																	
Male	100	215,516	72.0	68.2	75.6	416	155,259	18.7	15.8	22.0	112	40,258	9.3	7.1	12.0	55	19,998
Female	100	225,399	71.5	67.6	75.2	429	161,236	17.6	14.7	21.0	107	39,717	10.7	8.4	13.6	65	24,090
Ethnic group																	
Malay	100	260,360	73.3	69.7	76.6	510	190,873	18.3	15.5	21.4	128	47,564	8.3	6.4	10.7	60	21,568
Chinese	100	59,461	77.6	69.4	84.1	114	46,120	11.8	7.0	19.3	17	7,012	10.6	6.5	17.0	16	6,328
Indian	100	46,859	71.2	61.8	79.0	83	33,347	15.4	10.0	23.0	18	7,215	13.4	8.2	21.2	16	6,295
Other Bumiputras	100	62,776	63.3	55.2	70.8	120	89,749	24.3	18.4	31.4	47	15,257	12.4	8.1	18.5	22	7,768
Others	100	11,458	55.9	39.6	71.0	18	6,404	25.5	14.2	41.6	9	2,926	18.6	8.4	36.1	6	2,127
Education level																	
None	100	78,135	72.4	65.4	78.3	150	56,533	18.8	13.7	25.1	40	14,669	8.9	5.7	13.6	19	6,931
Primary	100	96,826	72.5	66.8	77.6	191	70,235	17.5	13.2	22.8	48	16,957	9.9	6.9	14.2	27	9,632
Secondary	100	146,140	73.3	68.5	77.6	286	107,091	17.0	13.6	21.1	67	24,889	9.4	6.8	13.0	36	13,804
Tertiary	100	36,164	76.2	66.8	83.6	68	27,548	15.0	9.2	23.4	15	5,420	8.8	4.6	16.3	9	3,195

Monthly household income group (RM)	100	41,091	67.7	58.2	76.0	78	27,830	19.6	13.4	27.7	23	8,040	12.7	7.6	20.5	15	5,220
< 400	100	63,398	66.2	58.0	73.5	119	41,944	14.3	27.3	37.0	20	12,673	13.9	9.3	20.0	25	8,780
400 - 699	100	47,988	71.5	62.3	79.2	95	84,317	17.3	11.6	25.1	23	8,325	11.1	6.5	18.4	14	5,344
700 - 999	100	117,489	73.9	68.4	78.8	229	86,871	18.7	14.5	23.7	61	21,934	7.4	5.0	10.8	24	8,684
1,000 - 1,999	100	69,153	78.7	71.9	84.2	143	54,431	13.9	9.5	20.1	26	9,643	7.3	4.4	11.9	14	5,078
2,000 - 2,999	100	34,163	70.8	59.1	80.2	62	24,180	21.2	13.0	32.6	18	7,233	8.0	3.8	16.2	7	2,750
3,000 - 3,999	100	14,947	70.9	53.1	84.0	27	10,604	12.6	5.2	27.5	5	1,880	16.5	6.8	34.9	6	2,462
4,000 - 4,999	100	38,670	68.3	57.8	77.2	66	26,407	21.0	13.7	30.7	20	8,110	10.7	5.6	19.7	11	4,151
> 5,000																	
Locality	100	269,697	74.9	71.3	78.2	491	201,955	16.0	13.3	19.0	105	43,036	9.2	7.1	11.7	61	24,705
Urban	100	171,217	66.9	62.4	71.1	354	114,540	21.6	18.1	25.5	114	36,939	11.3	8.7	14.6	59	19,383
Rural																	

<sup>a</sup> Number of respondents; <sup>b</sup> Number of estimated population

Among all the ethnic groups in Malaysia, the main reason for not seeking care was the illness was mild and did not warrant care. However, a higher percentage of Indians self-medicated for ADD (34.3%; 95% CI 25.0-45.0) compared to other ethnic groups. Chinese had the lowest percentage of self-medication (16.1%; 95% CI 11.6-22.0).

The first three main reasons for not seeking care for ADD were similar across all education levels and all income groups: the illness was mild, self-medication, and the illness was cured already; except for the > RM 5,000 monthly household income group who cited treatment was not required as the third main reason. The same reasons for not seeking care held true for both rural and urban respondents.

## DISCUSSION

The National Health and Morbidity Survey III was conducted to obtain baseline estimates of health seeking behavior for ADD among Malaysians of all ages, as opposed to other studies which were confined to children under five years of age.

Forty-three percent of the studied population sought care for ADD in our study as compared to 21% and 18.4% in the United States (Imhoff *et al*, 2004) and Australia (Ozfoodnet, 2001), respectively. Respondents in younger age groups (0-4 and 5-9 years) were more likely to seek care than other age groups. Taffa and Chepngeno (2005) also found more children below one year old seeking health care. The Queensland Health 2001 Omnibus Survey reported that parents of young children with diarrhea were more than twice as likely to seek medical care than adults (RR2.5; 95% CI 1.8-3.5) (Ozfoodnet, 2001). Younger children are more likely to seek care suggesting



ADD is probably a more serious illness in younger children, or is perceived to be more serious by their parents than adults with similar symptoms. Most parents are aware of the greater risk of dehydration among young children with diarrhea. In contrast, Sudharsanam and Rott (2007) and Sreeramareddy *et al* (2006) reported that age did not influence health seeking behavior. In terms of promptness of seeking care, 71.8% of respondents with ADD sought care  $\leq 12$  hours after the onset of diarrhea. The greatest proportion seeking care promptly was in the  $\geq 60$  year old age group. This may be due to the perceived greater risk for other complications among older people.

No gender difference in seeking care for ADD was reported by Sudharsanam and Rott (2007) and Pillai and Williams (2003), which is in accordance with the result of NHMS III. Pokhrel and Sauerborn (2004) reported the gender of a Nepalese child affects illness reporting and the decision to choose a health care provider as well as the amount to spend on the sick child. We found that males were more likely to seek care  $\leq 24$  hours after the onset of diarrhea, whereas females more often sought care  $\geq 24$  hours after the onset of diarrhea. The gender bias in promptness for treatment seeking behavior could be due to cultural beliefs where male children are viewed to be more important than female children in some families.

Our study found that Indians were more likely to seek care than other ethnic groups. However, majority of all ethnic groups sought care  $\leq 12$  hours after the onset of diarrhea. This suggests all ethnic groups view ADD as a serious illness.

The population with no formal education was less likely to seek care than those with higher education levels, which is

in agreement with other studies (Kutty, 1989; Fosu, 1994). Persons with primary education (9.9%; 95% CI 6.9-14.2) delayed seeking care ( $\geq 24$  hours after the onset of diarrhea) more than those with tertiary education (8.8%; 95% CI 4.6-16.3). A study by Taffa and Chepngeno (2005) implied that education influenced a person's perception of severity of illness and thus health seeking behavior.

Respondents with a monthly household income  $< RM 400$  had the highest proportion of seeking care compared to respondents of other monthly household income groups. This observation has also been reported in another study where families with a higher economic status seek care less often (Pillai and Williams, 2003). As for promptness in seeking care, respondents with a monthly household income of RM 2,000-RM 2,999 had the highest proportion of seeking care  $\leq 12$  hours after the onset of diarrhea, compared to other monthly household income groups. Twenty-one point two percent of respondents in the monthly household income group of RM 3,000 - RM 3,999 and 21.0% of respondents in the  $> RM 5,000$  monthly household income group sought care for their ADD 13-24 hours and  $> 24$  hours after the onset of illness, respectively. A possible explanation may be that families with better economic status may wait for the illness to subside spontaneously or have enough resources needed to obtain care later if the illness gets worse.

In our study, geographical location seemed to determine health seeking behavior for ADD. Persons from more developed states, such as Malacca, Wilayah Persekutuan Labuan, Wilayah Persekutuan Kuala Lumpur and Johor, were more likely to seek care for ADD than those from less developed states, such as

Perlis, Kelantan, and Pahang. A greater proportion of urban residents tended to seek care for ADD than rural residents. These observations were also true for promptness in seeking care.

The three main health facilities where respondents first sought care for ADD were private clinics (41.9%), government health clinics (20.9%) and pharmacies/Chinese medicine shops (16.7%). This health seeking behavior was true for all age groups except for the 50-59 year old age group where they first sought care from government health clinics. Three adult age groups (20-29, 30-39 and 40-49) reported their second choice of facility for care was a pharmacy/Chinese medicine shop. In a previous study in western Nepal, it was found that medicine shops and traditional healers were common sources for seeking care (Shankar *et al*, 2003).

Pillai and Williams (2003) revealed gender did not determine whether children with diarrhea were taken for treatment, but gender of a child did influence the type of care received: male children were more often taken to the alternative system of medicine as compared to female children. However, our study did not reveal any gender differences in the type of health care system used. Similarly, there was no differences in the patterns of facilities first visited for ADD by the respondents in terms of ethnicity and education level. The majority of lower monthly household income groups (<RM699) first sought care from government health clinics, followed by private clinics. For respondents in all other monthly household income groups, they preferred private clinics when first seeking care for ADD. Private clinics also played a significant role in the provision of care in the NHMS II (Maimunah *et al*, 1998) where people

more often visited private clinics for recent illness/injury. Private clinics are the commonest type of health facility, both in urban and rural areas, and are often utilized to seek preventive and promotive health care.

Traditional practitioners were reported to be minimally utilized in 1986 (NHMS I) (Pathmanathan and Lawson, 1988) and in 1996 (NHMS II) (Maimunah *et al*, 1998). A similar trend was observed in the present study.

A total of 56.3% of the estimated population with self-reported ADD during the preceding four week period prior to the survey did not seek care. This finding is in agreement with the Victorian Population Health Survey (Ozfoodnet Working Group, 2001) where 70.6% of those with acute gastroenteritis did not seek medical care for their symptoms. The most important reason given for not seeking care was related to the severity of the illness: the illness was mild (53.6%). Other reasons included self-medication (22.4%) and the illness was cured (9.1%). The same three leading reasons were consistently observed with the selected socio-demographic characteristics of persons with ADD; namely, age group, gender, education level, monthly household income group and residence. Other studies also found the most common reasons for respondents with ADD not seeking care were the diarrhea did not last long enough and the illness was too mild (OzFoodNet, 2001; Taffa and Chepngeno, 2005).

About a quarter (22.4%) of the respondents in our study self medicated for their diarrhea. Our finding was lower than a Canadian study (Thomas *et al*, 2006) where 63.9% of the respondents self-treated their illness using one or more over the counter medications, such as painkillers,

anti-diarrheals, anti-nauseants or herbal remedies. Self-medication is defined as using prescribed or non-prescribed drugs, home remedies, such as using plaster and canes, herbal remedies and eating certain foods (Levin and Idler, 1983; Segall, 1990). We defined self-medication as treating oneself without being seen or advised either by a doctor, other health personnel or traditional/alternative practitioners. The behavior of self-medication was recorded in this study, but no information regarding the type of pharmaceutical products, medicines or herbs used by the respondents was collected. There was no attempt to differentiate between self-prescription and un-prescribed use of prescription drugs. In our study, more Indians (34.3%) self-medicated than other ethnic groups. This finding is in contrast with the findings of the NHMS II (Maimunah *et al*, 1998) where higher rates of self-medication for recent illness/injury were found among other Bumiputras. This study did not delve into the reasons for self-medication, for which qualitative research would be more appropriate.

The findings from the NHMS III reinforce the fact that self-medication is a major health seeking behavior among Malaysians. Therefore self-medication deserves greater in-depth study to make it safe and lend to better self-management of ADD.

In summary, acute diarrheal disease is a major public health problem in Malaysia with an incidence of 5.0% (Kaur *et al*, 2008) in the estimated population. Only 43% of subjects sought care for their ADD. Private clinics were the preferred choice of facility, where over 40% of those with ADD first sought care. About a quarter of persons with ADD self-medicated for their illness. It may be necessary to develop a guideline for the home management of ADD.

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