

Knowledge And Practices Towards Influenza A (H1N1) Among Adults in Three Residential Areas in Tampin Negeri Sembilan: A Cross Sectional Survey

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SUMMARY

A cross-sectional survey was conducted with the objective to explore a community's knowledge and practices towards prevention of Influenza A (H1N1) in three residential areas in Tampin. Respondents were randomly selected from a list of residences and interviewed face-to-face using a structured questionnaire. A total of 221 respondents (80.9%) were involved with the majority (64.7%) comprising female and who had attained secondary level of education (86.0%). The main source of information was from television/radio. The total score for knowledge questions was 15 and practice questions were 25. A total of 60.2% attained "adequate knowledge" and 52.0% "good practice". Mean (SD) for knowledge score was 11.6(2.3) and practice was 18.1(4.1). Ethnicity, education, income and practice score were identified as predictors for knowledge score. Income and knowledge scores were predictors for practice score. There was positive correlation between knowledge and practice scores.

KEY WORDS:

Influenza, pandemic, knowledge, practices, community, Tampin

INTRODUCTION

Deadly outbreak of influenza pandemic had occurred long time ago, probably originating in the earliest cities where humans lived in crowded areas and in close proximity. Pandemic influenza has been documented since the 16th century and since then, each century has seen an average of three pandemics occurring at intervals ranging from 10 - 50 years¹.

In April 2009, World Health Organization (WHO) announced a novel strain of influenza A ((H1N1)) referred to as "swine flu" which has since spread rapidly throughout the world^{2,3,4}. This virus was originally referred to as "swine flu" because laboratory testing showed that many of the genes in the virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study showed that the 2009 (H1N1) virus is very different from that which normally circulates in North American pigs. It has two genes from flu viruses that normally circulate in pigs in Europe and Asia and bird (avian) genes and human genes (quadruple reassortant)³. This novel virus seems to be transmitted rapidly through air and contact with contaminated surfaces⁵.

Some community and health care workers may not be aware of the signs and symptoms of the disease and this can contribute to occurrence of high number of cases. A previous study on Avian Influenza mentioned that lack of knowledge on the recommended prevention guidelines had increased the risk for inconsistent adherence to recommended guidelines⁶. It was also reported that good knowledge is important for individual to have good practice in influenza risk reduction⁷.

WHO coordinates international efforts to monitor outbreaks and prevent spread of Influenza A (H1N1) virus. Various health-related information were given to the public and health personnel to prevent the spread of the disease such as encouraging hand washing, wearing face mask, covering nose and mouth during sneezing and coughing. WHO guidelines have been developed to guide countries in conducting surveillance, which is a prerequisite for other activities, including public health interventions and health care system response. Due to differences in the environment, socio-demographic characteristics, and health delivery system, the epidemiology of Influenza A (H1N1) virus across countries could vary⁸. Improving knowledge on disease transmission and prevention is a useful public health strategy to reduce risk of contracting the disease⁶.

Malaysia is one of the countries suffering from this pandemic with the first case reported on May 15, 2009⁹. Ministry Of Health Malaysia had aggressively taken preventive measures to prevent the spread of Influenza A (H1N1) virus. Health information was given to the public via mass media and also by the personnel of health centres. Although many preventive measures were taken by the government, there is an urgent need to assess the success of these efforts. The assessment of knowledge and practice in the community is important to ensure the preparedness of the public in facing subsequent outbreak of Influenza A (H1N1) virus. Practice of good preventive measures is a pre-requisite in facing this pandemic.

Another pandemic of Influenza A (H1N1) epidemic is expected to occur at any time. If the knowledge and practice towards Influenza A (H1N1) among the communities are not good, there will be a high number of cases that can lead to higher morbidity and mortality during future outbreak. Knowledge and practice related to (H1N1) are often purported

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as important measures to prevent its spread, but little is known regarding its level among the community. This study was conducted with an objective to explore and describe knowledge and practices in the community towards prevention of Influenza A (H1N1) as a basis for health care management and future in depth study of Influenza A (H1N1).

MATERIALS AND METHODS

A community survey was performed between January to February 2010, to explore community knowledge and practices towards prevention of Influenza A (H1N1) after the local epidemic started middle of May 2009.⁹ The study population were all adults aged 18 years and above from three residential areas located in Tampin Tengah, Tampin Negeri Sembilan, Malaysia. The three residential areas were selected based on the recommendation and permission from the respective community leaders and the medical officer in charge of district health office. All the three areas were located less than five kilometres from Tampin town. Ethical clearance was obtained from Management of Tampin District Health Office and Committee for Residence of Tampin Tengah. The estimated adult residents were about 1000 people with an ethnic distribution of approximately 40% Indian, 40% Malay, and 20% Chinese.

The inclusion criterion was all residents in the selected area aged 18 years and above. Exclusion criteria were residents with medically diagnosed mental or psychiatric problem (as reported by another person at home during the study period). At confidence level of 95% and based on the assumption that 50% of the population are aware about Influenza A (H1N1), a minimum of 273 respondents were required using sample size calculator, OpenEpi version 2.3. Mapping of the housing area was used to randomly select the house for interview visit. Simple random sampling method was applied to select only one adult from each selected household. The entire face-to-face interviews were conducted at the subjects' home. The interview was guided by a set of pre-tested questionnaire which was designed in Malay language. The interviewers were trained prior to data collection to reduce interviewer bias.

The questionnaire was developed using references from Ministry of Health Malaysia¹⁰ and Centre of Disease Control and Prevention⁵ and a survey was conducted to pretest the questionnaire among adults from other residential area with almost similar profile with the study population. The questionnaire consisted of four parts namely sociodemographic profile, general questions on Influenza A (H1N1), knowledge and practices. A "Yes" answer for question "have you heard about Influenza A (H1N1)" was the prerequisite to proceed with the interview and ask further questions.

For the knowledge section, there were 15 close ended questions with 'Yes', 'No' or 'Unsure' responses. The questions covered information pertaining to etiological agent, symptoms, complications, high risk groups, route of transmission, prevention and treatment. An "Unsure" answer was considered as wrong answer. Each correct answer was given one (1) mark and each wrong or unsure answer was

given zero (0) marks. For knowledge category, the total scores were 15 marks. Respondents that scored below the median of score for knowledge (12) were considered as "inadequate knowledge" and equal and above median score were categorised as "adequate knowledge"

The question on practices consisted of 25 close ended questions with "Yes" or "No" options. The questions covered six (6) parts namely practices on "coughing and sneezing", "hand washing", face mask usage", social distancing", "practices in crowded areas" and "self health care". For each correct response, one (1) mark was given and for wrong answer the score was zero (0) mark. The total score for practice questions was 25. Respondents that scored below the median of score for practice (19) were considered as "poor practice" and those who scored equal and above the median score were categorised as "good practice"

All data were coded accordingly and entered into Statistical Package for Social Science (SPSS) application version 17.0 for analyses. The demographic variables of the respondents and respondents' response towards knowledge and practices questions were presented as percentages. Scores for knowledge and practices were presented as mean with Standard Deviation (SD) and median with Inter Quartile Range (IQR). Chi-square tests of significance were used to analyse categorical variables. The correlation between knowledge and practice scores was examined using bivariate correlation analysis. Multivariate linear regression analyses were performed to determine the significant predictors for both knowledge and practice scores. Statistical significance was considered at $p < 0.05$ and confidence interval was 95%. With regards to ethical consideration, this study upheld ethical principles by obtaining ethical clearance from Tampin District Health Office and Committee for Residence of Tampin Tengah. Informed and written consent from respondents were obtained. Client autonomy, anonymity and confidentiality were assured and maintained.

RESULTS

Demographic

A total of 221 respondents were involved in this study giving an overall response rate of 80.9%. Table I provides a demographic overview of the respondents. The majority of the respondents were aged between 30 to 59 years old (68.3%) and female comprised 64.7%. The main ethnic group was Indians (39.8%) followed by Malays (37.6%) and Chinese (21.3%). In terms of the educational level, majority of the respondents (86.0%) had attained education up to secondary school. The total household income for the majority of the respondents was below Ringgit Malaysia (RM) 700.

All of the respondents had heard about Influenza A (H1N1) prior to the interview and two respondents (0.9%) had been diagnosed with Influenza A (H1N1). As illustrated in Figure 1, Their main source of information pertaining to Influenza A (H1N1) were from television/radio (72.3%) followed by newspaper/magazine (17.3%).

With reference to Table II, the mean (SD) for knowledge score was 11.6 (2.3) and median (IQR) was 12.0 (3). A total of 133

(60.2%) respondents had “adequate knowledge” and 88 (39.8%) had “inadequate knowledge”. With regards to practice, the mean (SD) for practice score was 18.1 (4.1) and median (IQR) was 19.0 (6). A total of 115 (52.0%) respondents had “good practice” and 106 (48.0%) had “poor practice”.

Regarding questions on knowledge (Table III), majority of the respondents generally had good knowledge on Influenza A (H1N1) with the exception of slightly low awareness for question that pertaining to “virus did not originate from mice” (57.5%), “pregnant women are high risk of getting the infection” (67.1%) and “consuming pork does not transmit the disease” (35.6%). About 84.0% of the respondents thought that there was a vaccine available for the disease at the time of the survey, even though it was not yet available.

Table IV shows respondents’ practices in terms of hygienic practices towards preventing themselves from getting Influenza A (H1N1) or preventing the spread of the disease. More than 80% of the respondents had good cough and sneeze etiquette. Respondents reported that they covered their mouth when coughing and sneezing (88.9%) using tissues or handkerchief (85.8%) and they disposed the tissues properly in a waste bin (88.9%). Majority of the respondents claimed that they did not spit in public areas (91.2%) and turned away their faces from others when coughing or sneezing (91.2%). High percentages of the respondents reported that they washed their hands using soap (93.8%) before eating (98.7%) and after going to toilet (98.7%). Slightly lower percentages of respondents (81.9%) washed their hands after covering their nose and mouth when sneezing. Only 35.8% of the respondents claimed they adhered and practised proper hand washing steps as recommended by the Ministry of Health Malaysia.

Table V illustrates respondents’ practices on self-care and safety measures during pandemic Influenza A (H1N1). The practices of using face mask was moderate with 76.5% of the respondents using face mask during pandemic and they ensured that their face masks were properly fitted and covering their mouth and nose (75.2%). About 74.3% wear the face mask recommended by the Ministry of Health during the pandemic. More than half of the respondents (54.0%) used face mask when they had influenza like symptoms but 40.3% of the respondents admitted that they reused their face mask more than once. Respondents’ practices on social distancing were generally good. Majority of the respondents avoided going (88.9%) or bringing their child unnecessarily to crowded places like shopping areas (83.2%). If respondents needed to be in the crowded area, safety measures in term of wearing face mask were only practiced by 64.6% of the respondents and only 30.1% applied hand sanitizer when necessary. As for self health care, majority of the respondents drank plenty of water for hydration (77.0%) and avoided sharing fork and spoon during eating (79.2%). Only 37.2% of the respondents had the initiative to seek for additional information regarding Influenza A (H1N1) other than that given by government. Only 36.7% of the respondents consumed food supplements during the pandemic phase. Quite a high percentage of the respondents (68.6%) did not practice hand washing after shaking hands with others.

Table VI shows analyses of the categorical variables for demographic variables and two categories of scores for knowledge and practice. Age group, ethnicity, education level and household income were significantly associated with knowledge scores categories (p<0.05). However none of the demographic variables were significantly associated with practice scores categories.

From the multivariate linear regression analyses adjusting for potential confounders (Table VII) the final significant predictors for higher knowledge scores were higher practice scores (p<0.001), ethnic (p=0.008), education level (p=0.050) and household income (p<0.001). The final significant predictors for practice scores were higher knowledge scores (p<0.001) and household income (p=0.016).

A significant positive correlation was found between knowledge scores and practice scores (r = 0.36, p <0.01).

DISCUSSION

This study provides information on factors related to knowledge and practices towards Influenza A (H1N1) and correlation between knowledge and attitudes scores in a community of a small town of Negeri Sembilan. The findings from this study have implications in terms of planning health education and programs for Pandemic Influenza. Ministry of Health Malaysia had played their role in educating the public about the disease and it was done aggressively through the media and its health care facilities. Accurate knowledge about the infection will help the public to protect themselves from contracting the infection.

Table I: Demographic Distribution of the Respondents (n=221)

	n	%
Age (years old)		
less than 30	38	17.2
30 – 59	151	68.3
60 and above	32	14.5
Gender		
Male	78	35.3
Female	143	64.7
Ethnicity		
Malay	83	37.6
Indian	88	39.8
Chinese	47	21.3
Others	3	1.4
Education		
Up to secondary level	190	86.0
Tertiary level	31	14.0
Income(RM)		
700 and below	149	67.4
701- RM3500	42	19.0
3501 and above	30	13.6

Table II: Scores for Knowledge and Practices Questions

	Mean (SD)	Median (IQR)
Knowledge scores	11.6 (2.3)	12.0 (3)
Practice scores	18.1 (4.1)	19.0 (6)

Table III: Frequency Distribution of Respondents by Knowledge on Various Aspect of Influenza A (H1N1)

Questions	Correct answer n (%)	Wrong/unsure answer n (%)
Etiologic agent (H1N1) virus originates from mice	126 (57.5)	93 (42.5)
Symptoms High grade fever for more than 3 days	155 (70.8)	66 (29.2)
Cough is one of the common symptoms	153 (69.9)	68 (30.1)
Complication Severe illness that can lead to death	205 (94.0)	16 (6.0)
Those with higher risk to get (H1N1) Pregnant woman	147 (67.1)	74 (32.9)
Children, especially below 5 years old	183 (83.6)	38 (16.4)
Routes of transmission Spread from person to person	201 (91.8)	20 (8.2)
Touching objects contaminated with patient's droplets	174 (79.5)	47 (20.5)
Consuming pork	78 (35.6)	143 (64.4)
Virus easily spread in crowded place	212 (96.8)	9 (3.2)
Prevention Washing your hands frequently	204 (93.2)	17 (6.8)
Prevent spreading by using facemask	197 (90.0)	24 (10.0)
Reduce spread by covering mouth with tissue/handkerchief during coughing	204 (93.2)	17 (6.8)
Treatment Panadol can cure (H1N1)	166 (75.0)	55 (25.0)
(H1N1) vaccine is already available for prevention	35 (16.0)	186 (84.0)

Table IV: Frequency Distribution of Respondents' Response to Practice Questions Pertaining to Hygiene

	Yes (%)	No (%)
a. When coughing and sneezing:		
I did not cover my mouth and nose at all	11.0	89.0
I covered my mouth and nose with tissue or handkerchief	85.8	14.2
I threw away the used tissue into the bin	88.9	11.1
I turn my face from others	91.2	8.8
I spit in public area	8.8	91.2
b. I wash my hands		
Before eating	98.7	1.3
After toilet	98.7	1.3
Using soap	93.8	6.2
After covering my nose when sneezing	81.9	18.1
By practising the recommended steps from Ministry of Health	35.8	64.2

Table V: Frequency Distribution of Respondents' Response to Practice Questions Pertaining to Self-care and Safety Measures during Pandemic

	Yes (%)	No (%)
a. Face mask usage:		
I never use it	23.5	76.5
I make sure mask fully covered my mouth and nose properly	75.2	24.8
I wear the face mask recommended by Ministry of Health	74.3	25.7
I changed to a new face mask after using it once	59.7	40.3
I wear face mask when having fever, cough or runny nose	54.0	46.0
b. Social distancing during outbreak		
I avoid going to crowded places	88.9	11.1
I avoid bringing children to shopping mall	83.2	16.8
I practised social distancing	74.3	25.7
c. Crowded areas		
I wear facemask at crowded areas	64.6	35.4
I used 'hand sanitizer' at crowded places	30.1	69.9
d. Self health care		
I washed my hands after shaking hands with others	31.4	68.6
I avoid sharing fork and spoon during eating	79.2	20.8
I do seek for additional information regarding (H1N1)	37.2	62.8
I consumed food supplements (e.g. vitamins)	36.7	63.3
I drink plenty of water	77.0	23.0

Table VI: Demographic and respondents' knowledge and practice categories

	Adequate knowledge n(%)	Inadequate knowledge n(%)	P value	Good practice n(%)	Poor practice n(%)	P value
Age (years old)						
less than 30	24(18.0)	14(15.9)	0.050*	17(14.8)	21(19.8)	0.290
30 – 59	96(72.2)	55(62.5)		84(73.0)	67(63.2)	
60 and above	13(9.8)	19(21.6)		14(12.2)	18(17.0)	
Gender						
Male	44(33.1)	34(38.6)	0.398	34(29.6)	44(41.5)	0.063
Female	89(66.9)	54(61.4)		81(70.4)	62(58.5)	
Ethnicity						
Malay	63(47.4)	20(23.5)	0.001*	45(39.1)	38(36.9)	0.449
Indian	42(31.6)	46(54.1)		49(42.6)	39(37.9)	
Chinese	28(21.1)	19(22.4)		21(18.3)	26(25.2)	
Education						
Up to secondary	108(81.2)	82(93.2)	0.012*	96(83.5)	94(88.7)	0.063
Tertiary level	25(18.8)	6(6.8)		19(16.5)	12(11.3)	
Income (RM)						
700 and below	100(75.2)	49(55.7)	<0.001*	76(66.1)	73(68.9)	0.069
701- RM3500	12(9.0)	30(34.1)		18(15.7)	24(22.6)	
3501 and above	21(15.8)	9(10.2)		21(18.3)	9(8.5)	

* Statistically significant

Table VII: Multivariate linear regression of scores for knowledge and practices towards Influenza A (H1N1)

	Knowledge score			Practice score		
	β	95% CI	p value	β	95% CI	p value
Age	0.031	-0.560,0.933	0.623	0.047	-0.882,1.880	0.477
Gender	0.086	-0.170,0.989	0.165	0.069	-0.487,1.661	0.283
Ethnic	0.162	-0.194,1.306	0.008*	-0.113	-1.974,0.103	0.077
Education	-0.125	-1.623,-0.000	0.050*	-0.053	-2.123,0.903	0.427
Income	0.222	0.491,1.669	<0.001*	-0.157	-2.468,-0.253	0.016*
Knowledge scores				0.411	0.500,0.962	<0.001*
Practice scores	0.380	0.146,0.281	<0.001*			

* Statistically significant

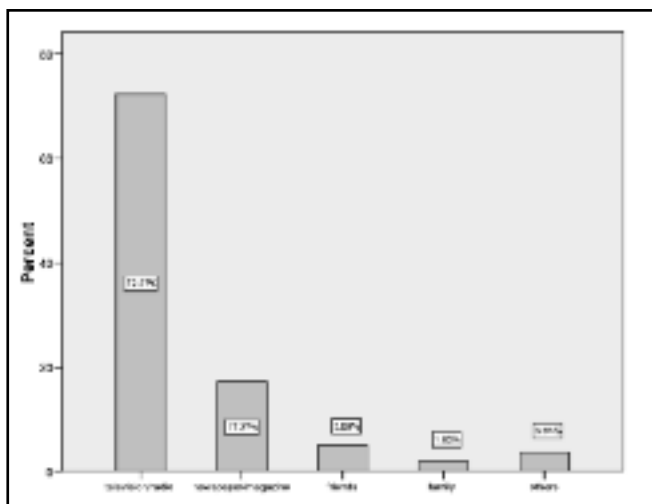


Fig. 1: Main sources of Information for Influenza A (H1N1)

Findings from this study suggested that television/radio being the preferred media for acquiring information about Influenza A (H1N1). This finding was in agreement with previously reported findings by Keith Eastwood *et al* who reported in Australia that 31.2% of their respondents

preferred television and 13.8% radio¹¹. Ivar S *et al* reported even higher percentages (more than 80%) for mass media as sources of information¹². Ministry of Health Malaysia has been doing their health education and promotion extensively through health care facilities and mass media. As highlighted by this study, the mass media and in particular television should be included in any communication plan. However district health centres and clinics should also take the opportunity and maximize their effort in giving health education and promotion to their people in their district because they are nearer to their own community. This has been reported in previous study that found general practitioners were regarded by the public as a source of reliable information during disease threats¹¹.

It was evident in this study that knowledge score was positively and strongly correlated with practice score. This finding concur with findings reported by Yap *et al* and Keith Eastwood *et al*^{7,11}. This suggested that good knowledge is important to enable individuals to have good practice to protect themselves and others from Influenza A (H1N1).

It is known that Influenza A (H1N1) is easily transmitted from person to person but this infection can also be prevented by practicing good personal hygiene and wearing basic personal protective equipment (PPE) which is the face mask.

Respondents in this study had very good knowledge pertaining to prevention of infection whereby more than 90% of them answered correctly on the need of using face mask to prevent from contracting or spreading the infection. Of interest, only 64.6% of the respondents reported using face mask at crowded areas and this percentage was low compared to the level of knowledge that they had. However, this percentage was still high compared to results from Saudi where 56% of their respondents used face mask in crowded areas¹³. Adherence to face mask usage might be a problem in our community as it was not a common practice. Previous study even suggested that community use of face mask is not an effective way of controlling seasonal influenza but adherent to mask usage among exposed groups had significant reduction in the risk for clinical infection. Having been infected with pandemic influenza appears to have good substantial impact in face mask usage with high percentages of influenza cases wear face mask⁷ but less than 50% of adults who had been exposed to child with respiratory illness during pandemic adhered to face mask¹⁴. The study location seems to be low infection area with only 0.9% had been infected by Influenza A (H1N1) and this might probably influence respondents perception and practice towards face mask usage.

The Centre of Disease Control Atlanta recommended disposing face mask after using it⁵. However, almost half of the respondents did not change to a new facemask after using it once. Further study should explore on factors that contribute to the using of face mask more than once. Respondent's income may play a role because majority of the respondents were from middle and low income group (67.4% and 19.0% respectively) thus buying face masks may incur a financial burden for them.

This study found that more than 90% of the respondents had good knowledge pertaining to cough etiquette which was translated into high percentages of good cough and sneezing etiquette practice. These hygienic practices are good as the virus spread mainly from person to person through coughing or sneezing. A person may become infected by touching contaminated surfaces as the Influenza A (H1N1) virus can survive on environmental surface for up to eight hours^{5,10}. The percentages in this study was high compared to the study done in Saudi Arabia whereby only about one third of their respondents had good cough and sneezing etiquette¹³.

Hand washing is another important practice that one should consider and some studies have shown the protective effect of hand washing in reducing upper respiratory tract infection^{15,16}. This study found high percentages of respondents with good knowledge for hand washing which translated into high percentages for correct hand washing practices. This finding was in agreement with the previous work done by Balkhy *et al* in Saudi where hand washing was the most frequently reported preventive measures compared to other measures during pandemic¹³. Recommended hand washing technique by the Ministry of Health Malaysia was not readily followed since only about one third of the respondents admitted they followed the proper steps of basic hand washing technique. This was supported by a study done in Turkey that reported only 42.4% of their respondents practices proper basic hand washing¹⁶. Duration of hand washing is not the main

indicator of the effectiveness of the hand washing but the most important is the correct technique¹⁷. This highlighted the importance of putting more effort on teaching the public the importance of proper way of hand washing.

It was also found that more than two-thirds of the respondents did not wash their hands after shaking hands with others. This may be due to cultural practices and customs of certain ethnic groups whereby it is considered as improper, impolite or rude to be seen washing their hands immediately or soon after shaking their hands with another person.

Hand washing should be encouraged and facilitated by making hand hygiene facilities available in crowded areas where higher risk of transmission would be expected. During pandemic, use of alcohol-based hand sanitizer should be encouraged in areas with no or limited water supply because if used properly it will be more efficient and less time consuming when compared to traditional hand washing^{17,18,19}. In this study less than one third of the respondents used hand sanitizer in crowded places which is still higher compared to the findings of Yalcin SS among school children in Turkey who reported that only 0.2% of their cases used hand sanitizer¹⁶.

Restrictions on movement (social distancing) were also recommended during pandemic phase^{17,20}. In this study, more than 90% of our respondents were aware that Influenza A (H1N1) can be easily transmitted from person to person especially in crowded areas. Thus the majority of the respondents avoided crowded places. Individuals may proactively practice social distancing when they are aware that the disease can spread rapidly²¹. This is a good indicator for pandemic preparedness and awareness as social distancing has been used in past pandemics and remains a very practical and feasible option for retarding the spread of pandemic influenza and mitigating public health impact of influenza pandemic²².

It was evident in this study that knowledge scores predict practice scores with strong positive correlation between knowledge and practices. It was also found that practice scores also predict knowledge scores. This shows that good knowledge is important to enable individuals to have good practices in influenza risk reduction. These findings were in agreement with a previous study done in Singapore that found similar correlation and association between knowledge and practices towards Influenza A (H1N1)⁷.

Of interest, it was found in this study that higher education level was a significant negative predictor for knowledge scores but not significant for practice scores. Higher education level does not necessarily translate into good knowledge about Influenza A (H1N1). This finding contradicted work done by Abbate *et al* who reported that respondents with good knowledge were those with higher education level⁶.

Ethnic groups may play a role in determining their acceptance for education and knowledge scores. This study found that ethnicity was a significantly predictor knowledge scores but not for practice scores. Economic status plays a

role in predicting knowledge and practice. Those with higher socioeconomic group had more knowledge and practice scores. Marshall *et al* also reported that knowledge scores among their respondents increasing with each quartile of socioeconomic status²³. This may reflect the lack of easily accessible resources during the time of pandemic. The lower economic group may perceive acquiring knowledge for Influenza A (H1N1) was less important than fulfilling their daily needs and working. For instances, face mask is not a cheap item especially during pandemic state and this could burden a low income community thus causing some reluctance for usage.

This study has some limitation as the study population was only confined to adults. Although results in this study are useful in pandemic preparedness, the community response may change over time as compared to the time of study. This study was a cross sectional survey and may not have been able to assess the true association between knowledge and practices. Thus future study with different study design should be considered for validation.

CONCLUSION

Knowledge is a significant predictor for practice during a pandemic. Our observation indicated that mass media (television/radio) were highly trusted by community in acquiring medical knowledge during pandemic. The government should exploit the mass media for health promotion purposes. Educating the public with correct information on disease transmission and preventive measures for Influenza A (H1N1) is important as it will influence their knowledge. Education should be made available to the community without making any discrimination on their level of knowledge. Overall efforts to educate the public should therefore be extended to the entire population but need to cater for differences in language and cultural practices.

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