

## ORIGINAL ARTICLE

# Knowledge and Attitude Towards Vaccine Preventable Diseases and Vaccination Among Prospective Malaysian Hajj Pilgrims in Klang Valley, Malaysia

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## ABSTRACT

**Introduction:** Hajj is a unique religious mass gathering among Muslims hosted by Kingdom of Saudi Arabia (KSA) annually. It is a fifth pillar that is compulsory to be carried among muslim. Infections due to *Neisseria meningitidis*, *Streptococcus Pneumoniae* and Influenza virus are very high among Hajj pilgrims in KSA. Study shows knowledge and attitude towards vaccine preventable disease and vaccination which is very important for the prevention of these infectious diseases. This study aims to determine knowledge and attitude among the prospective Malaysian hajj pilgrims on vaccine preventable disease and vaccination. **Method:** A cross sectional study was conducted among prospective hajj pilgrims in June 2019. Self-administered questionnaires were given to the respondents through simple random sampling. The socio-demographic characteristics were described using descriptive analysis. Chi-square test was used to analyse the association between the socio-demographic and Malaysian hajj pilgrims' knowledge and attitude towards the vaccine preventable diseases and vaccination. **Results:** A total of 135 respondents were recruited in the study. There were statistically significant associations between the knowledge and the highest education level ( $p=0.01$ ), and also between the knowledge and the occupation ( $p=0.02$ ) on vaccine preventable disease and vaccination. **Conclusion:** There is a lack of knowledge among the Malaysian hajj pilgrims about these vaccine preventable diseases and vaccination, especially those who have lower education level and also unemployed. Tabung Haji are highly advised to focus on these group and prepare a special course that focused on these vaccine preventable diseases so that Malaysian Hajj pilgrims will be protected.

**Keywords:** Knowledge, Attitude, Meningococcal, Influenza, Pneumococcal, Malaysia

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## INTRODUCTION

Hajj is a unique religious mass gathering among Muslims hosted by Kingdom of Saudi Arabia (KSA) annually. It is a fifth pillar that must be carried out as stated in the five Pillars of Islam. This religious duty must be performed by Muslims at least once in their lifetime for those who are physically and financially capable to do it (1). Apart from being obligatory duty for Muslims, this eventful religious gathering can bring together and stronger the brotherhood among Muslims from different

parts of the world irrespective of their sociodemographic characteristics.

According to the General Authority for Statistics of KSA, there has been substantial increase in the number of pilgrims during the last five years from the year 2013 to 2018 which is from 1,980,249 increase to 2,371,675 pilgrims. 612,953 of the total pilgrims in 2018 were from domestic pilgrims and 1,758,722 of them were from other countries' pilgrims (2). It was reported from Tabung Haji Malaysia, that Hajj quota for Malaysian increased to 30,200 in 2018 from 22,230 people in 2013 (2).

Higher risk of transmission of infectious disease can be found with increased in the number of pilgrims to the

Kingdom of Saudi Arabia annually. However, it is not known whether their health is safely protected. Infections of some type of bacteria and virus like *Neisseria meningitidis*, *Streptococcus Pneumoniae* and Influenza virus are very high among Hajj pilgrims in KSA. This may be associated with the high density and extreme congestion population from various geographical areas over the world (3).

According to Yezli et al. (2016) in the study regarding prevention of meningococcal disease during the Hajj and Umrah mass gathering, they stated that following various series of outbreaks caused by *N.meningitidis* in KSA that were been reported from 1987 to 2002, Saudi Arabian health authorities changed their vaccination policy. This include the mandatory uptake of the quadrivalent ACWY polysaccharide meningococcal vaccine to all Hajj visitors which is not less than 10 days before entering the kingdom (4). In fact, due to the strict policy from Saudi Arabia of having vaccination among all Umrah and Hajj pilgrims, thus the number of laboratory-confirmed cases of meningococcal disease were low (n=184) and only 9% of them were pilgrims. On top of that, there were no meningococcal diseases reported in Mecca since 2006 and 14 cases of meningococcal disease were reported confirmed by laboratory in Saudi Arabia between the year 2012-2015. However, all of the cases were reported outside of Mecca and not during the Hajj season (4).

In Malaysia, all of the selected prospective Malaysian Hajj pilgrim for the respective year will attend Haji Perdana course provided by Tabung Haji, Malaysia. The course is provided as the final preparation for all Hajj pilgrims before performing Hajj in the current year. Commonly, the course is usually being held in the month of Syawal in every state and gathers pilgrims from all districts of the state. The main purpose of the course is to provide a more comprehensive Hajj and Umrah practical exercise in larger congregation (5). According to Tabung Haji Malaysia (2019), one of the modules that will be learned by them is about health, this includes health care prior to the Holy Land, Mecca, health care during their stay in Holy Land and also general health advice for pilgrims (5).

## MATERIALS AND METHODS

### Study Population

The study was a cross-sectional study conducted among prospective Malaysian Hajj pilgrims using simple random sampling. The data collection was done at Masjid Sultan Salahuddin Abdul Aziz Shah and Masjid Wilayah Persekutuan in Klang Valley, Malaysia, where prospective Malaysian Hajj pilgrims gathered for Haji Perdana course. The respondents were 18 and above.

### Instrument

The data was collected using self-administered

questionnaire adapted from previous study (6-8), Section A was designed to determine the socio demographic status of respondents including gender, age, highest educational level, marital status and occupation. Section B was designed to measure the knowledge and attitude towards vaccine preventable diseases and vaccination. The questionnaire focused on the mandatory and strongly recommended vaccines by Kingdom of Saudi Arabia. The knowledge questions focused on the mode of transmission, risk of contracting diseases and mandatory vaccination uptake for meningococcal vaccine and also additional immunization. For awareness part, the questions focused on the general knowledge regarding the meningococcal, influenza and pneumococcal diseases and vaccination, their common symptoms. Questions in attitude section includes acceptances and attitudes toward vaccination policy instructed by Saudi Arabia government, vaccination benefit, additional information about the vaccines and their attitude to seek for more information regarding vaccination for pilgrims. Finally, the last 3 questions were designed to determine the attitude towards the practice of Malaysian pilgrims on their obligatory towards vaccination program required by Tabung Haji and others preventive measure.

The total questions for knowledge were 5 with maximum score of 5. One score was given for each correct response. Scores equal or more than 4 (75% of the maximum score) was considered 'good knowledge'. Awareness questions were not scored and only analysed descriptively. Meanwhile, 7 questions (with the maximum score of 7) were designed to assess the attitude. Scores equal or more than 5 (approximately 75% of the maximum score) was considered 'good attitude'.

### Ethics Statement

This research was conducted with the approval from JKEUPM (Ethics Committee For Research Involving Human Subject) and also from Tabung Haji. Written informed consent was obtained from each of the respondents for this research.

### Statistical Analysis

Statistical Package for the Social Science (SPSS Version 25) was used to analyse the data. These data were used to do descriptive analysis in order to determine the frequency and percentage of the sociodemographic characteristics. Chi-square test was used to compare between 2 categorical variables and association between the level of knowledge and level of attitude. The level of significance was set as  $\alpha = 0.05$  and a p-value that is less than 0.05 was considered significant.

## RESULTS

### Demographic characteristics

Among 138 questionnaires that were distributed to Hajj pilgrims in Klang Valley only 135 questionnaires were

collected back completely with consent. The response rate was 98%. Majority (43.0%) of the Hajj pilgrims were at the age range of 56 to 65 years old. 84 (62.2%) of them were females and 51 (37.8%) of them were males and (91.1%) of them were married. Majority had secondary qualifications (45.2%). Almost a third of them (28.9%) were housewives (Table I).

**Table I : Frequency distribution of answers regarding knowledge of Hajj Pilgrims in Klang Valley towards vaccine preventable diseases and vaccination (n=135)**

No.	Knowledge	Yes (%)	No (%)	Not Sure (%)
1)	Which of the following is transmitted by respiratory droplets?			
a)	Meningococcal disease	60 (44.4)	75 (55.6)	NA
b)	Influenza	99 (73.3)	36 (26.7)	NA
c)	Pneumococcal disease	64 (47.4)	71 (52.6)	NA
2)	Do you think you are at risk of contracting the disease when you travel to Mecca?	94 (69.6)	25 (18.5)	16 (11.9)
3)	Which vaccination is mandatory according the Saudi Arabia policy for Hajj Pilgrims?			
a)	Meningococcal disease	76 (56.3)	15 (11.1)	44 (32.6)
b)	Influenza	42 (31.1)	49 (36.3)	44 (32.6)
c)	Pneumococcal disease	32 (23.7)	59 (43.7)	44 (32.6)

NA= Not Applicable

### ***Knowledge of prospective Malaysian Hajj pilgrims towards vaccine preventable diseases and vaccination***

Majority (87%) of respondents had poor knowledge (scores less than 4 out of 5) towards vaccine preventable diseases and vaccination. Sixty (44.4%) respondents were able to identify meningococcal disease is transmitted by respiratory droplets whereas for influenza, 73.3% were able to identify the mode of transmission. On the other hand, 64 out of 135 (47.4%) successfully identified that pneumococcal disease is transmitted by respiratory droplets. For the knowledge regarding the risk of contracting diseases in Mecca, majority of them (69.6%) identified that Hajj pilgrims are at risk of contracting the diseases in Mecca. In terms of knowledge on the mandatory vaccination based on the Saudi Arabia policy (8) for Hajj pilgrims, slightly more than half of the Hajj pilgrims (56.3%) were able to identify meningococcal vaccine as mandatory vaccination (Table I).

### ***Attitude of prospective Malaysian Hajj pilgrims towards vaccine preventable diseases and vaccination***

Majority (88.9%) were reported to have good attitude. Almost all (97.0%) respondents agreed that vaccination is beneficial to them. Most of the respondents, 98.5% (133) stated that it is important to receive vaccine if it required and 78.5% of the respondents also agreed to receive vaccines if it is just recommended. About 80% (108) of the respondents will seek more information

about vaccine preventable diseases and vaccination for Hajj Pilgrims. Majority (98.5%) of the respondents followed the obligatory vaccination program provided by Tabung Haji. Unfortunately, only 35.6% of the respondents searched for other available vaccines and 85.2% of the respondents stated that they will apply preventive measures such as wearing masks to avoid meningococcal, influenza or pneumococcal infection during the Hajj season (Table II).

**Table II : Frequency distribution of answers regarding attitude towards vaccine preventable diseases and vaccination (n=135)**

No.	Attitude	Yes (%)	No (%)	Not Sure (%)
1	Do you think vaccination is beneficial?	131 (97.0)	0 (0.0)	4(3.0)
2	Is it important to receive vaccines if it is required?	133(98.5)	0 (0.0)	2(1.5)
3	Is it important to receive vaccines if it is just recommended?	106(78.5)	20(14.8)	9(6.7)
4	Will you seek more information about vaccine preventable diseases and vaccination for Hajj Pilgrims?	108(80.0)	21(15.6)	6(4.4)
5	Do you follow the obligatory vaccination programs?	133(98.5)	1(0.7)	1(0.7)
6	Will you search for other available vaccines (Example: Hepatitis, Yellow Fever)?	48(35.6)	71(52.6)	16(11.9)
7	Will you apply any preventive measure (Example: Wearing Mask) to avoid meningococcal, influenza or pneumococcal infection?	115(85.2)	13(9.6)	7(5.2)

### ***Awareness of prospective Malaysian Hajj pilgrims towards vaccine preventable diseases and vaccination***

Influenza was the most heard disease (82.2%), followed by pneumococcal disease (62.2%) and meningococcal disease (61.5%). Besides that, common symptom that mostly heard was influenza with 69.6% of respondents followed by pneumococcal disease with 45.9% and meningococcal meningitis 45.9%. For the vaccination, influenza vaccination also was the most heard by the respondent with 83.7% of the respondent, while meningococcal vaccination with 76.3% and pneumococcal vaccination with 71.9%.

### ***Source of information***

Majority (68%) of respondents received information regarding vaccine preventable diseases and vaccination from healthcare providers. Other sources of information include social media (42%), posters or flyers (24%), television and radio (29%) and friends or family (17%).

### ***Association between socio-demographic factors of Hajj pilgrims and level of knowledge towards vaccine preventable diseases and vaccination***

For socio-demographic factors, there was no significant association between age ( $p=0.10$ ), gender ( $p=0.49$ ) and marital status ( $p=1.00$ ) with level of knowledge of

respondents. However, highest education level ( $p=0.01$ ) and occupation ( $p=0.02$ ) have statistically significant association with knowledge level among respondents (Table III).

**Table III : Association between socio-demographic factors of Hajj pilgrims and level of knowledge towards vaccine preventable diseases and vaccination (n=135)**

Variables	Level of knowledge		Total n (%)	Statistical Test		
	Good knowledge (%)	Poor knowledge (%)		$\chi^2$	df	p value
<b>Age (year)</b>						
18-55	24(43.6)	31(56.4)	55(100)	2.66	1	0.10
56-85	24(30.0)	56(70.0)	80(100)			
<b>Gender</b>						
Male	20(39.2)	31(60.8)	51(100)	0.48	1	0.49
Female	28(33.3)	56(66.7)	84(100)			
<b>Marital status</b>						
Married	44(35.8)	79(64.2)	123(100)	0.03	1	1.00 <sup>a</sup>
Unmarried	4(33.3)	8(66.7)	12(100)			
<b>Highest education level</b>						
Lower education level	20(26.3)	56(73.7)	76(100)	6.48	1	*0.01
Higher education level	28(47.5)	31(52.5)	59(100)			
<b>Occupation</b>						
Employed	34(44.2)	43(55.8)	77(100)	5.79	1	*0.02
Unemployed	14(24.1)	44(75.9)	58(100)			

<sup>a</sup>Fisher's Exact Test

\*significance at level 0.05

**Association between socio-demographic factors of Hajj pilgrims and level of attitude toward vaccine preventable diseases and vaccinations**

There are no significant association between age ( $p=0.95$ ), gender ( $p=0.06$ ), marital status ( $p=0.36$ ), highest education level ( $p=0.81$ ) and occupation ( $p=0.39$ ) with the level of attitude of respondents (Table 4).

**Association between level of knowledge and level of attitude of Hajj pilgrims**

Among those who have good knowledge, a slightly higher percentage (91.7%) of them have good attitude. Among those who have poor knowledge, only 87.4% have good attitude. However, the results are not significant ( $p = 0.45$ ) (Table 5).

**DISCUSSION**

Based on the finding, we can see that most of the pilgrims were aged from late 40s until 60s age group which most probably because of the policy made by Lembaga Tabung Haji in a "First-Come, First-Served" concept for hajj registration system since 1995. There was similar study regarding the fundamental of Hajj demand for healthcare services within congestion in

**Table IV : Association between socio demographic factors of Hajj pilgrims and level of attitude toward vaccine preventable diseases and vaccinations (n=135)**

Variables	Level of attitude		Total n (%)	Statistical Test		
	Good attitude (%)	Poor attitude (%)		$\chi^2$	df	p value
<b>Age (year)</b>						
18-55	49(89.1)	6(10.9)	55(100)	0.004	1	0.95
56-85	71(88.8)	9(11.3)	80(100)			
<b>Gender</b>						
Male	42(82.4)	9(17.6)	51(100)	3.56	1	0.06
Female	78(92.9)	6(7.1)	84(100)			
<b>Marital status</b>						
Married	108(87.8)	15(12.2)	123(100)	1.65	1	0.36 <sup>a</sup>
Unmarried	12(100)	0(0)	12(100)			
<b>Highest education level</b>						
Lower education level	68(89.5)	8(10.5)	76(100)	0.06	1	0.81
Higher education level	52(88.1)	7(11.9)	59(100)			
<b>Occupation</b>						
Employed	67(87.0)	10(13.0)	77(100)	0.64	1	0.42
Unemployed	53(91.4)	5(8.6)	58(100)			

<sup>a</sup>Fisher's Exact Test

\*significance at level 0.05

**Table V : Association between level of knowledge and level of attitude of Hajj pilgrims toward vaccine preventable diseases and vaccinations (n=135)**

Variables	Level of attitude		Total n (%)	$\chi^2$	df	p-value
	Good attitude (%)	Poor attitude (%)				
<b>Level of knowledge</b>						
Good knowledge	44 (91.7)	4 (8.3)	48 (100)	0.58	1	0.45
Poor knowledge	76 (87.4)	11 (12.6)	87 (100)			

Makkah reported the highest number of respondents are 51-60 years old age group (9).

Only 35.6% of Hajj pilgrims were reported to have good knowledge. This result generally showed relatively poor knowledge among Malaysian Hajj pilgrims towards vaccine preventable diseases and vaccination. Similar study conducted on knowledge of Hajj pilgrims towards infectious diseases and vaccination demonstrated a significant lack of knowledge (6,8,10). However, it can be improved after educational intervention as shown in the study conducted in the year 2011 in which they used health educator to improve knowledge of healthy behaviour among Hajj pilgrims (11). For question regarding the mode of transmission, it was noted that most of the pilgrims (73.3%) were able to identify the mode of transmission for influenza but only 44.4% and 47.4% of them were able to identify the mode of transmission for meningococcal and pneumococcal respectively. This is on par with the research conducted in Egypt as only 23% among the Egypt Hajj pilgrims were able to identify the

transmission of meningococcal disease (6). Majority of the respondents (69.6%) identified that Hajj pilgrims are at risk of contracting the diseases in Mecca and slightly more than half of them (56.3%) were able to identify the meningococcal vaccine as a mandatory vaccine. These results show it is important to further educate Malaysian Hajj pilgrims regarding vaccination to ensure their safety throughout their journey to Mecca.

On the other hand, 88.9% of Hajj pilgrims were reported to have good attitude. Almost all of them (98.5%) stated that they followed the obligatory vaccination provided by Tabung Haji and it is important to receive vaccine if it is required while, 78.5% of the respondents also agreed to receive vaccines if it is just recommended. Besides that, 80% of the respondents said they will seek more information about vaccine preventable diseases and vaccination for Hajj Pilgrims, supporting the data from study conducted to Egypt's Hajj pilgrims about knowledge and attitude towards meningococcal vaccination (6). This attitude to seek more information is a good sign to Malaysian pre-travel counselor because the health education regarding the risk diseases and vaccination is potentially effective and useful. 97% of the respondents agreed that vaccination is beneficial to them and 85.2% of the respondents stated that they will apply preventive measures during Hajj seasons but unfortunately, only 35.6% of the respondents searched for other available vaccines. The generally good attitude towards the vaccine preventable diseases and vaccination may be due to the experience shared by the previous Hajj pilgrims that gave a good insights and understanding.

Most Malaysian Hajj pilgrims were aware of influenza (82.2%) followed by pneumococcal disease (62.2%) and meningococcal disease (61.5%). In Malaysia, the high awareness of influenza may be due to the more frequent outbreak and it is relatively more common compared to the other diseases. Thus, the information regarding influenza is more widely disseminated. In terms of the common symptoms, similarly, most of the respondents were aware of influenza with 69.6% of respondents followed by pneumococcal disease with 45.9% and meningococcal meningitis 45.9%. Research from Egypt regarding attitude about meningococcal vaccination among hajj pilgrims reported that only less than one third of the participants (28%) knew that meningococcal meningitis presents with headache, fever, and unconsciousness (6). Furthermore, most of the Algerian Hajj pilgrims (56.80%) did not know anything about pneumococcal disease (12). This is a good indication to focus the education towards meningococcal meningitis and pneumococcal disease. For awareness in the context of vaccination, influenza vaccination is the most heard by the respondent with a high percentage at 83.7%, while meningococcal vaccination with 76.3% and pneumococcal vaccination with 71.9%. In

conclusion, Malaysian Hajj pilgrims were more aware of influenza in terms of disease, symptoms and also the vaccination. However, knowledge about meningococcal disease and vaccination is low even though the vaccine is compulsory. This situation might be due to the fact that meningococcal disease is far less common than influenza in this country.

There were no significant association between age ( $p=0.10$ ), gender ( $p=0.49$ ) and marital status ( $p=1.00$ ) with the level of knowledge. For the age group, previous studies showed opposite result whereby there was a significant association between the age and the level of knowledge ( $p=0.0014$  and  $p=0.002$ ) respectively (6,13). The difference may be highly due to the briefing given by Tabung Haji or health authorities regarding disease and vaccination is not specific for certain age groups only. There was a similar finding regarding the non-significant result between gender and level of knowledge in the research reported in the study towards MERS-CoV infection at Makkah hospital (13). In contrast with research finding among Egypt's Hajj pilgrims regarding meningococcal vaccine, where it stated that the level of knowledge is affected by marital status ( $p=0.011$ ) (6), our result showed there was no significant association between marital status and knowledge's level. This could be due to the lower number of respondents that are unmarried participated in the research compared to the high number of married respondents. There were a significant association between the level of knowledge with highest education level ( $p=0.01$ ) and occupation ( $p=0.02$ ). The finding is in par with study reported regarding knowledge towards antibiotic use among pilgrims attending the 2015 Hajj gathering where education level and health related occupation was significantly correlated with level of knowledge (14).

There was no significant association between level of attitude with age ( $P=0.95$ ), gender (0.06), marital status ( $p=0.36$ ), highest education level ( $p=0.81$ ) and occupation ( $p=0.39$ ). Similar result was found in the study conducted towards healthcare provider at Mecca hospital whereby age ( $p=0.882$ ), gender ( $p=0.749$ ) and occupation ( $p=0.39$ ) were not significantly affecting the level of attitude (13). However, study about antibiotic used among pilgrims in 2015 reported that there was a significant association between the age, education and occupation with the level of attitude (14). Similarly, there was a study showed that marital status was a significant factor in determining the level of attitude (15). This may be due to the unbalanced number of respondents between unmarried to married where married had higher in number compared to unmarried respondents. Other than that, strict implementation of vaccination among Hajj pilgrims which have been forced by the government despite age group might be the cause of insignificant result. The difference between the result also may be due to the due to respondent's

own awareness about vaccination and the disease as it's being highlighted by Tabung Haji and other health authority during Hajj preparatory course regarding vaccination and prevention of the disease related to it.

There was no significant association between the level of knowledge towards vaccine preventable diseases and vaccination and level of attitude towards vaccine preventable diseases and vaccination among Malaysian Hajj pilgrims ( $p=0.45$ ). However, significant positive correlations were found between the mean knowledge score and attitude score in similar study (13). Besides that, similar positive correlation between knowledge and attitude of healthcare workers towards MERS-CoV was reported in a study conducted in multispecialty hospitals of Qassim, Saudi Arabia (16). From the previous research, it could be established that adequate knowledge can lead to positive attitude. The theory of Reasoned Action also explained the findings. The reason why the results from our research differ from the previous research is most probably due to our limitation that prevent us to get more samples.

## CONCLUSION

Meningococcal disease, pneumococcal disease and influenza are the three main vaccine preventable diseases that can cause serious outbreak during Hajj season and occurs among considerable crowding and pilgrim density. There is a lack of knowledge among the Malaysian hajj pilgrims about these vaccine preventable diseases and vaccination, especially those who have lower education level and also unemployed.

## RECOMMENDATIONS

More comprehensive and interactive slots should be conducted during hajj preparatory course to ensure all pilgrims understand the risk and related prevention. The information should be disseminated months before Hajj season so that the pilgrims have adequate time to explore more about the diseases and to look for related vaccines. Sessions should be conducted by giving out lectures on health education and distribute brochures with information regarding infectious diseases focusing on the three main vaccine preventable diseases which are meningococcal disease, pneumococcal disease and influenza, symptoms of the disease, mode of transmission and vaccination should be given to pilgrims.

In addition, general preventive measures that include hand hygiene, cough etiquette and wearing mask should also be disseminated. Last but not least, all pilgrims should be encouraged to give a prior report on pass travel history and hospitalization to their primary care provider or health professional in order to consider the

possible acquisition of Hajj-related contagious disease and to implement appropriate measures to prevent the spread of the diseases.

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