

# Assessment of Knowledge, attitudes and practices concerning travel health among Hajj pilgrims (1439 H- 2018 G) at Prince Mohammad bin Abdulaziz International Airport in AL-Madina, Saudi Arabia

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## Research

**Keywords:** Travel health, Hajj, knowledge, attitude, practice, pilgrims, Saudi Arabia

**Posted Date:** March 1st, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-254699/v1>

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**Version of Record:** A version of this preprint was published at Global Journal of Health Science on November 2nd, 2021. See the published version at <https://doi.org/10.5539/gjhs.v13n12p39>.

# Abstract

## Background

The Kingdom of Saudi Arabia (KSA) hosts the Hajj pilgrimage, the largest annual mass gathering in the world. The Ministry of Health (MoH) of KSA issues requirements and recommendations for entry visas relevant to travelers visiting KSA during Hajj. These recommendations include vaccinations, health checks, and specific immunizations either at or prior to entry into KSA. We assessed Hajj pilgrims' knowledge, attitude and practices regarding preventive, curative, hygienic and health promoting measures.

## Methods

We administered a questionnaire to a cross-section of Hajj pilgrims(2018 G)traveling through Prince Mohammad bin Abdulaziz International Airport in Al-Madina, KSA. Variables collected included demographics, Hajj health preparations, and knowledge and attitudes towards travel-related health behaviors.

## Results

Of 101 respondents, 20% were Saudi and 64%were male. Regarding travel profile, 75% were attending hajj for the first time. About half (52%) stayed in KSA for more than 2 weeks. Knowledge regarding travel health of respondents was high: 82% scored as excellent and 11% scored as good. Positive attitude toward travel medicine was reported by 60% of participants; 56% of them sought pre-travel advice. Regarding health protection behaviors, 79%reported using protective measures against respiratory infections, 70%for insects, 95%for food and waterborne Diseases, 99%against heat-related conditions and 100%for injuries.

## Conclusion

We found that less than half of participants obtained pre-travel advice, despite the health requirements for obtaining Hajj visas and the known health risks associated with attending Hajj. We identified a need for continued education and promotion of health prevention measures to ensure that Hajj pilgrims are able to have a safe and healthy experience in the Kingdom. This study may be a tool for a purposeful political will to empower countries to set up Hajj health programmes, which would be of great benefit and would go a long way to decrease mortality and morbidity, and associated burdens during Hajj.

## 1. Introduction

A mass gathering is defined by WHO as a planned or spontaneous event that gathers substantial numbers of attendees who might strain the health planning and response capacities of the host community, city, or country [1].

Mass gathering sporting and religious events pose important public health challenges, including the transmission of infectious diseases, exacerbation of non-communicable diseases, and disorders related to climate change [2]. Every year, the Kingdom of Saudi Arabia (KSA) hosts the Hajj pilgrimage, which is the largest mass gathering in the world held on a recurrent annual basis [3].

The KSA Government employs a well-coordinated, inter-sectoral approach to the planning, communication, public health, and safety issues of the Hajj. Planning for Hajj starts soon after the end of the current Hajj and the KSA Ministry of Hajj and Ministry of Health liaise with the governments of all countries from which pilgrims come to the KSA [4].

Each year, the Ministry of Health (MoH) of the Kingdom of Saudi Arabia issues the requirements and recommendations for entry visas relevant to pilgrims and seasonal workers who intend to visit KSA during forthcoming Hajj season. Requirements and recommendations may differ from year to year. These Recommendations include pre-travel health regulations and advice about vaccinations, health checks, and specific immunizations at the port of entry [5].

The risk of a traveler for contracting a travel-related infectious disease does not only depend on the destination of travel, length of the trip, and planned activities, but also on the traveler's personal risk profile [6].

Travelers' abilities to adapt, cope, and survive are influenced by many variables such as personality and experience, which differ according to age, gender, culture, social, education, and health [7]. One of the main determinants of the traveler's personal risk profile is usually presented as the knowledge, attitudes, and practices (KAP) of a traveler toward the prevention of travel-related infectious disease. In KAP studies, knowledge is usually defined as an accurate risk perception, whereas attitude is commonly defined as either intended risk-seeking or risk-avoiding behavior. Finally, practice is defined as the rate of protection against a certain travel-related infectious disease [6].

## **1.1 Rationale**

Based on our best of knowledge, this is the first study provides information on Knowledge, attitudes and practices regarding travel health among Hajj pilgrims. Relatively little is known about how travelers know and perceive the health risks associated with travel and how they utilize preventive measures before and while traveling abroad. This study may be a tool for a purposeful political will to empower countries to set up Hajj health programmes, would be of great benefit and would go a long way to decrease mortality and morbidity, and associated burdens during Hajj.

## **1.2 Aim & Objectives:**

To assess knowledge, attitude and practice of pilgrims about preventive, curative, hygienic and health promoting measures before and during the hajj season (1439H-2018G) at Prince Mohammad bin Abdulaziz International Airport about travel health in Al-Madina.

## **2. Methodology**

### **2.1 Study design:**

A cross-sectional survey

### **2.2 Study setting:**

Hajj terminals and international terminals at Prince Mohammad bin Abdulaziz International Airport in Madina

### **2.3 Study time &duration:**

Hajj season 1439 H (2018 G)

### **2.4 Target population:**

Hajj pilgrims arriving at Prince Mohammad bin Abdulaziz International Airport in Madina.

### **2.5 Sample size:**

A stratified random sample was assumed to include the top eleven pilgrim contributing nations that represent more than 75% of all pilgrims. The proportion from each stratum (nation) depends on the quota granted to each country by the Saudi Ministry of Hajj and Umrah (about 1000 pilgrims for each million Muslim in each country). The participants were from Indonesia, Pakistan, India, Bangladesh, Egypt, Nigeria, Turkey, Saudi Arabia, Sudan, Yemen, Algeria,

Assuming that good knowledge of pilgrims 80% and in order to achieve 95% confidence interval level with error less than 10%, so the sample size will be 62 according to the

$$n = \left( \frac{Z_{\alpha/2} \cdot \sqrt{p \cdot q}}{E} \right)^2$$

following equation:

Where:

$n$  – sample size;  $Z_{\alpha/2}$  – critical value for the desired confidence degree, usually: 1.96 (95%)

$E$  – standard error, usually:  $\pm 5\%$  of the proportion of cases (absolute precision),

$p$  – proportion of favorable results of the variable in the population;  $q$  – proportion of unfavorable results in the population ( $q=1-p$ ).

In order to compensate deviation from simple random sample the sample size was multiplied by 1.5 = 93 as this study is stratified random sample.

Final sample size was adjusted for expected attrition (10%). So, final sample size will equal 101 pilgrims.

## 2.6 Inclusion criteria:

Hajj pilgrims aged 18 years and more, coming from the top eleven pilgrim contributing nations based on hajj statistics 2017 and willing to participate.

## 2.7 Data collection & tool:

A structured interview questionnaire was administered to willing participants. This questionnaire was developed by principal investigator depending on previous similar studies and by reviewing the requirements and recommendations for the 2018 hajj season which are available on the KSA Ministry of Health website [3, 4, 5]. The questionnaire takes less than 20 min to complete. It was prepared in English, then was translated into Arabic, Turkish, Urdu, Indian, Bangladeshi languages; to accommodate a participant's preference, then back translated and reviewed by 5 experts then tested by pilot study on 20 participants to ensure comprehension & clarity and its results were not be included in the study. It consists of four main sections, including questions about some sociodemographic factors, travel knowledge, attitude and Health seeking behavior (practice).

Six questions was used to assess an individual traveler's knowledge (Recommended hajj vaccinations, preventive measure against Middle Eastern Respiratory Syndrome Corona Virus (MERS-CoV) and other respiratory infections, Food and Water-Borne Diseases, Heat-Related Conditions and injury) responses was ranked as excellent, good, or poor, as follows:  $\geq 80\%$  excellent, 60–80% as good,

and <60% as poor. Attitude toward travel health will be classified as positive (those who are willing to adopt risk-avoiding behavior) or negative (those who are intending to adopt risk-seeking behavior). Practice was assessed by asking pilgrims about travel health preparation before hajj regarding (travel preparation time, Seeking general information about Makka & hajj & its source, travel health or medical advice prior to departure & its time, Pre-travel preventive measures, Pilgrims with preexisting medical conditions, Ensure they have adequate Comprehensive travel insurance, first aid kit). while they were asked regarding travel health practice **during** Hajj about (*If you became ill, you sought medical advice?, take prophylactic or curative medications (e.g. antimicrobial) as ordered by doctor, use preventive measure against respiratory infections, against insects, Food and Water-Borne Diseases, Heat-Related Conditions and Use Injury prevention measures*). Data collection form is attached (appendix 1).

## 2.8 Data analysis

The data was entered, coded and analyzed using SPSS for windows version 22 statistical software program. The appropriate statistical tests were used. Normality of data was first tested by one sample K-S test. Parametric data were expressed in mean  $\pm$  standard deviation. Non-parametric data will be displayed in median and interquartile range. In addition, independent t test will be used to compare means for continuous parametric variables of each two different groups. Also, Mann-Whitney U test (z) will be used to compare non parametric continuous variables in two different groups. Pearson Chi-square tests will be used to compare the categorical variables between the both comparative groups. They will be presented in frequency tables and/or graphs as appropriate.

P value < 0.05 will be considered as statistically significant.

## 3. Results

Of 101 respondents, 20 (19.8%) were Saudi and 65(64.4%) were male. More than half of participants were married and their age ranged between 30 and 50 years. Regarding travel profile, 76 (75%) reported that they were attending hajj for the first time and travel related health preparation time was less than 2 weeks in 43(42.6%) of participants while source of travel related health information was mainly from internet. About half (52%) stayed in KSA for more than 2 weeks.

Knowledge regarding travel health of respondents was high: 82% scored as excellent (those with correct answers above than 80% of questions), 11% scored as good (correct answers 60–80%) while 8% scored as poor (correct answers less than 60%). Positive attitude toward travel medicine (those who are willing to adopt risk-avoiding behavior) was reported by 61 (60%) participants; 56 (56%) of respondents sought pre-travel advice.

Regarding factors associated significantly with excellent travel related health knowledge, were the age of participants ranged between 30 and 50 years, married and foreign pilgrims ( $p = 0.001, 0.003$  and  $0.0001$  respectively) while those associated significantly with positive attitude (those who were willing to adopt

risk-avoiding behavior) were employed pilgrims and those with educational qualifications university and above( $p = 0.0001$  and  $0.0006$  respectively)

The most common reported barriers to getting pre-travel consultation were: "Didn't know where to find information" by 8 (8%) participants, "I already knew the necessary information" by 7(7%), and "too busy" by 7(7%).

Regarding health protection behaviors, 79% reported using protective measures against respiratory infections, 70% for insects, 95% for food and waterborne Diseases, 99% against heat-related conditions and 100% for injuries.

Table 1  
Socio demographic characteristics of the respondents

Characteristic	Frequency	Percent
<b>Age (years)</b>	26	(25.8)
< 30	15	(14.9)
> 50	59	(58.4)
30–50		
<b>Gender</b>	35	(34.7)
Female	65	(64.4)
Male		
<b>Marital status</b>	3	(3.0)
Divorced	69	(68.3)
Married	25	(24.8)
Single	4	(4.0)
widowed		
<b>Education</b> Illiterate Primary Preparatory Secondary	2	(2.0)
University and above	3	(3.0)
	10	(9.9)
	20	(19.8)
	66	(65.3)
<b>Job</b>	77	(76.2)
Employed Unemployed	24	(23.8)
<b>Residence</b>	46	(45.5)
Others (Foreign)	55	(54.4)
Saudi Arabia (Domestic, Saudi & Non- Saudi)		

Table 2  
Distribution of Travel health knowledge score among studied participants according to socio-demographic characteristics

Characteristic	Excellent (> 80%) count (%)	Good (60–80%) count (%)	Poor (< 60%) count (%)	Significance (p-value)
<b>Gender</b> Female	30 (36.6)	3 (27.3)	2 (25.0)	0.905
Male	51 (62.2)	8 (72.7)	6 (75.0)	
<b>Marital status</b> Divorced	2 (2.4)	0 (0.0)	1 (12.5)	0.003*
Married	61 (74.4)	3 (72.7)	5 (62.5)	
Single	16 (19.5)	8 (72.7)	1 (12.5)	
Widowed	3 (3.7)	0 (0.0)	1 (12.5)	
<b>Age</b>	16 (19.5)	8 (72.7)	1 (12.5)	0.012*
< 30	14 (17.1)	0 (0.0)	1 (12.5)	
> 50	50 (61.0)	3 (27.3)	6 (75.0)	
30–50				
<b>Education</b> illiterate Preparatory	2 (2.4)	0 (0.0)	0 (0.0)	0.531
Primary Secondary University and high	8 (9.8)	0 (0.0)	2 (25.0)	
	3 (3.7)	0 (0.0)	0 (0.0)	
	14 (17.1)	3 (27.3)	3 (37.5)	
	55 (67.1)	8 (72.7)	3 (37.5)	
<b>Job</b> Employed Unemployed	62 (75.6)	9 (81.8)	6 (75.6)	0.899
	20 (24.4)	2 (18.2)	2 (25.0)	
<b>Residence</b>	45 (54.9)	1 (9.1)	0 (0.0)	< 0.001*
Others (Foreign)	37 (45.1)	10 (90.9)	8 (100.0)	
Saudi Arabia (Domestic)				
* p- value less than 0.05 significant				

Table 3  
Attitude of the studied group in relation to socio-demographic factors

Variable	Negative attitude count (%)	Positive attitude Count (%)	Significance(p-value)
<b>Gender</b>	14 (35.9)	21 (33.9)	0.720
Female	25 (64.1)	40 (64.5)	
Male			
<b>Marital status</b>	3 (7.7)	0 (0.0)	0.143
<b>Divorced</b>	24 (61.5)	45 (72.6)	
Married	10 (25.6)	15 (24.2)	
Single	2 (5.1)	2 (3.2)	
Widowed			
<b>Age</b>	10 (25.6)	15 (24.2)	0.958
<b>&lt; 30</b>	5 (12.8)	10 (16.1)	
> 50	23 (59.0)	36 (58.1)	
30–50			
<b>Education</b>	0 (0.0)	2 (3.2)	0.001*
<b>illiterate</b>	7 (17.9)	3 (4.8)	
Preparatory	3 (7.7)	0 (0.0)	
Primary	12 (30.8)	8 (12.9)	
Secondary	17 (43.6)	49 (79.0)	
University and high			
<b>Job</b>	24 (61.5)	53 (85.5)	0.006*
<b>Employed</b>	15 (38.5)	9 (14.5)	
Unemployed			

\* p- value less than 0.05 significant

Variable	Negative attitude count (%)	Positive attitude Count (%)	Significance(p-value)
<b>Residence</b>  <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <b>Others (Foreign)</b>             Saudi Arabia            (Domestic)         </div>	21 (53.8)	25 (40.3)	0.184
	18 (46.2)	37 (59.7)	
* p- value less than 0.05 significant			

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<b>Gender</b>	14 (35.9)	21 (33.9)	0.720
Female	25 (64.1)	40 (64.5)	
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<b>Divorced</b>	24 (61.5)	45 (72.6)	
Married	10 (25.6)	15 (24.2)	
Single	2 (5.1)	2 (3.2)	
Widowed			
<b>Age</b>	10 (25.6)	15 (24.2)	0.958
<b>&lt; 30</b>	5 (12.8)	10 (16.1)	
> 50	23 (59.0)	36 (58.1)	
30–50			
<b>Education</b>	0 (0.0)	2 (3.2)	0.001*
<b>illiterate</b>	7 (17.9)	3 (4.8)	
Preparatory	3 (7.7)	0 (0.0)	
Primary	12 (30.8)	8 (12.9)	
Secondary	17 (43.6)	49 (79.0)	
University and high			
<b>Job</b>	24 (61.5)	53 (85.5)	0.006*
<b>Employed</b>	15 (38.5)	9 (14.5)	
Unemployed			

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Variable	Negative attitude count (%)	Positive attitude Count (%)	Significance(p-value)
Residence	21 (53.8)	25 (40.3)	0.184
Others (Foreign)	18 (46.2)	37 (59.7)	
Saudi Arabia (Domestic)			
* p- value less than 0.05 significant			

Table 4  
Hajj relevant characteristics among the respondents

Characteristic	Frequency	Percent
<b>Number of times attending Hajj</b>	76	(75.2)
First time	4	(4.0)
2-5	21	(20.8)
6-10		
<b>Length of current hajj stay</b>	24	(23.8)
< 1 week	52	(51.5)
1 week – 2 week	24	(23.8)
>2 week		
<b>Travel related health preparation time</b>	43	(51.5)
< 2 weeks	29	(23.8)
> 4 weeks	20	(23.8)
2-4 weeks		
<b>Source of information about Makka&amp; hajj *</b>	70	(96.3)
Internet	59	(58.4)
Travel agent	52	(51.5)
Travel book	61	(60.4)
Friends or relatives		
* Categories are not mutually exclusive.		

Table 5  
Travel health related- Practice among the studied pilgrims

Items	Yes (%)
Did you seek travel health or medical advice prior to departure?	56 55.4
<b>If you did not seek medical advice prior to travel: Why not? *</b>	
Costs too much	<b>3 3.0</b>
Didn't know where to find information	8 7.9
I already knew the necessary information	7 6.9
No medical concerns	5 5.0
Other	1 1.0
Too busy	7 6.9
<b>If yes, when did you get the pre-travel advice?</b>	
< 2w	
> 4w	<b>19 18.8</b>
2-4w	20 19.8
	17 16.8
<b>Source of health advice*</b>	
Governmental health facility	
Internet	<b>26 25.7</b>
Mass media	8 7.9
Private health facility	4 4.0
	8 7.9

Table 6  
Pre-travel preventive measures among the studied group

Pre-travel preventive measures	NO (%)	Yes (%)
Seeking general information about Makkah & hajj	19 (18.8)	82 (81.2)
Pre-travel preventive measures	14 (13.9)	87 (86.1)
Vaccine(s)	32 (32.7)	69 (68.3)
Antimicrobial		
Over the counter medications	36 (35.6)	65 (64.4)
<b>Pilgrims with preexisting medical conditions:</b>		
Consulted doctor for hajj suitability.	37 (36.6)	64 (63.4)
If on prescribed medications, they have a sufficient supply to cover their time abroad with some extra in case of delays	38 (37.6)	63 (62.4)
Carry a copy of their prescription.	34 (33.7)	64 (66.3)
Ensure they have adequate Comprehensive travel insurance	39 (38.6)	62 (61.4)
A first aid kit to help them manage common issues such as cuts and grazes, headaches and travelers' diarrhea	20 (19.8)	81 (80.2)

## 4. Discussion

The impact of travel medicine on health cannot be ignored. There has been a focus on infectious diseases in travel medicine. This may seem logical, as travel medicine has generally focused on pre-travel vaccination and disease prophylaxis, and continuous upgrading of knowledge that travelers receive [8, 9].

More than three quarter of this study participants (82%) had an excellent level of travel health knowledge. This is similar to a study from Oman where 77.5% of the respondents had a good level of travel knowledge [10]. This was more than results reported from Malaysia, it was (54.1%) having good knowledge [11]. This may be because the age of the subjects in these studies may play a role. In Our study, the average age of study subjects was 38.9 years versus 36.7 years in Oman study, while it was 34.9 in Malaysia study. There is room for improvement as literature showed that older age subjects tend to have better travel health knowledge [12].

Concerning health protection behaviors, more than 70 % of participants reported using protective measures against respiratory infections, insects, food and waterborne Diseases, heat-related conditions

and for injuries. This is higher than the 6.9% reported in a study from Oman [10]. This could be because 27.5% of the subjects in the study from Oman were females versus 34.7 % in our study. This could be explained by, females prefer take smaller risks in life than males. Moreover, Females are more aware of and cautious about their health and have better health seeking behavior than males [11].

Risk perception is very important for self-protection against many diseases associated with travel [13]. About 1 % of our participants had poor knowledge scores regarding the risk of travel-associated communicable diseases and methods of preventions. In addition, nearly 39% of travelers with a negative attitude toward travel medicine denied their need to any preventive measures. This findings suggests a higher susceptibility of exposure to travel risks. Poor risk perception was also detected in studies conducted in Gulf countries [14, 15, 16] as well as in developed countries [15, 17, 18].

While more than half of pilgrims (60%) had a positive attitude toward travel medicine, travel medicine services were underutilized, as only 55.4 % of pilgrims sought travel health advice and more than 62 % of the study participants reported practice of any pre-travel preventive measures. Rates of utilization for pre-travel health advice have been reported in several studies ranging from as high as 86% in Johannesburg to as low as 19% in Qatar [17, 19, 20, 21, 22]. Of those who did seek pre-travel health advice, the governmental travel clinic was the most important source of pre-travel health advice. This was consistent with the study conducted in the Swedish and South African travelers [19, 22, 23]. On the other hand, the internet was the most frequent source of pre-travel health advice, as found in Korea [24].

Pilgrims' KAP might be affected by their personal characteristics, as well as by the characteristics of their travel. In this study, being adult (30–50 years) or married were the most important factors associated with Excellent knowledge. This may be explained by the fact that adult are more familiar with computers and the Internet, which was rated as the most common source of pre-travel advice in this study. While being married may be affected by the fact that married take fewer risks by nature than others and that they are more cautious about their health and visit physicians more frequently [25]. Moreover, being employed or higher educated were the significant factors associated with positive attitude regarding travel related health. This result can be explained by the fact that those groups who had this attitude were more likely to acquire information about the potential risks of travel diseases.

## **5. Conclusion And Recommendations**

The results from this study are fairly consistent with the current body of literature available on the knowledge, attitudes, and practices among travelers. Overall, travelers still appear to be ill prepared regardless of where geographically the study takes place. Previous studies found that less than half of their study participants sought pre-travel health prior to travel, which is consistent with these study findings. We found that less than half of participants obtained pre-travel advice, despite the health requirements for obtaining Hajj visas and the known health risks associated with attending Hajj. We identified a need for continued education and promotion of health preventive measures to ensure that Hajj pilgrims are able to have a safe and healthy experience in the Kingdom.

Therefore there is an urgent need to increase awareness of the travel medicine for pilgrims through media attention, simple health education materials and travel web sites. Travel agencies could be provided with educational materials developed by travel medicine clinic and can also play a role in referring travelers to travel clinics, would be the best strategies to improve this situation. Standardized airport questionnaire surveys should be carried out at regular intervals to monitor the success of such interventions.

Our study has many limitations; it included only pilgrims from top eleven countries, may not reflect all travelers. Moreover, it did not relate the level of knowledge to the actual practice of travel health preventive measures.

## Abbreviations

### ***KSA:***

The Kingdom of Saudi Arabia

### ***MOH:***

Ministry of health

### ***MERS-CoV***

Middle Eastern Respiratory Syndrome Corona Virus

### ***KAP:***

Knowledge, Attitudes, and Practices

## Declarations

### **Acknowledgements**

“Not applicable”

### **Funding**

“Not applicable”

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## **Authors' contributions**

E E: Conceptualization, Methodology, Software, data curation, Writing- Original draft preparation, Reviewing and Editing L A, L A, L A, A A, O A: Data collection & curation, Software. A A, SA: Reviewing and Editing, SA: Supervision.

## **Ethics declarations**

### **-Ethics approval and consent to participate**

Participants got informed consent before answering the questionnaire. An informed written consent was obtained from all participants after clarification of the objectives, confidentiality of data, voluntary involvement in the study. In the questionnaire, there are no sensitive and private questions and their identity was anonymous. Responses was treated as confidential and no incentives were provided to enhance participation. In order to guarantee the respondents' anonymity, their names were not be taken. All data were stored directly onto an Excel spreadsheet, which was held in a password-protected laptop. Any gathered information were only be used for the purposes of this research. Ensuring no harm done to the participants during the study. In addition, an approval was taken from the ethical committee of the research center at King Fahad Medical City, Riyadh (NO. 18-0429E), attached as (appendix 2).

### **-Consent for publication**

Not applicable. The manuscript does not include details, images, or videos relating to an individual person.

### **-Patient consent for publication**

Not applicable.

### **-Competing interests**

All authors declare no competing interest.

## **Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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## Figures

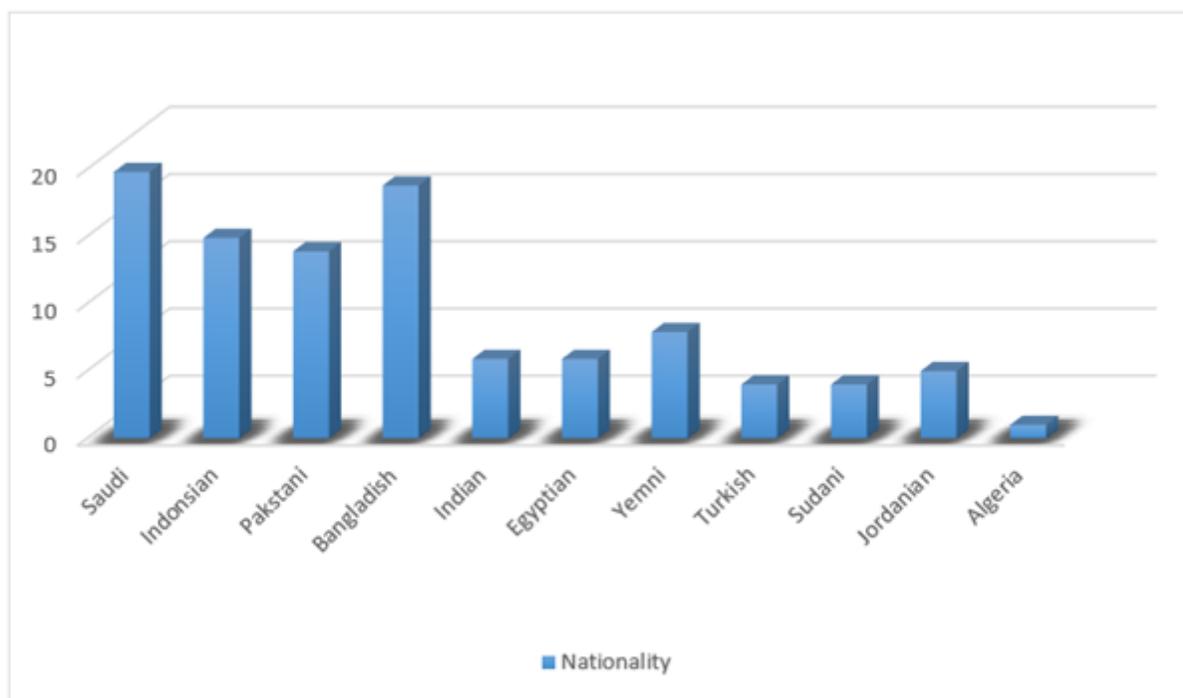


Figure 1

Showing distribution of participants according to nationality

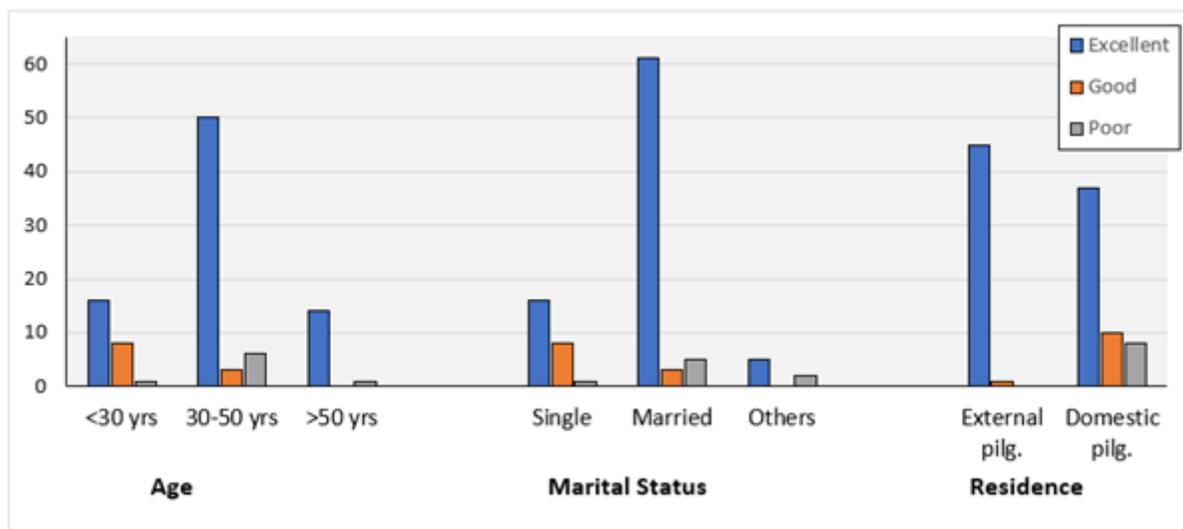


Figure 2

Sociodemographic factors with significant associations with excellent travel-related health knowledge score among study participants in Medina, 1439H

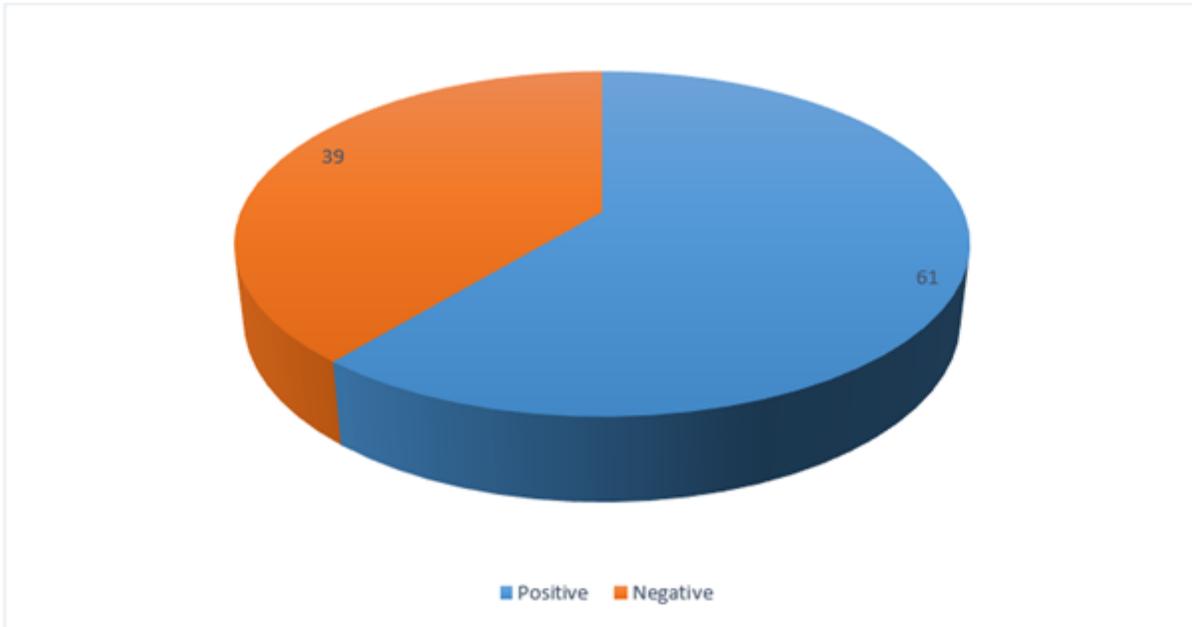


Figure 3

Showing Attitude of participants toward travel health

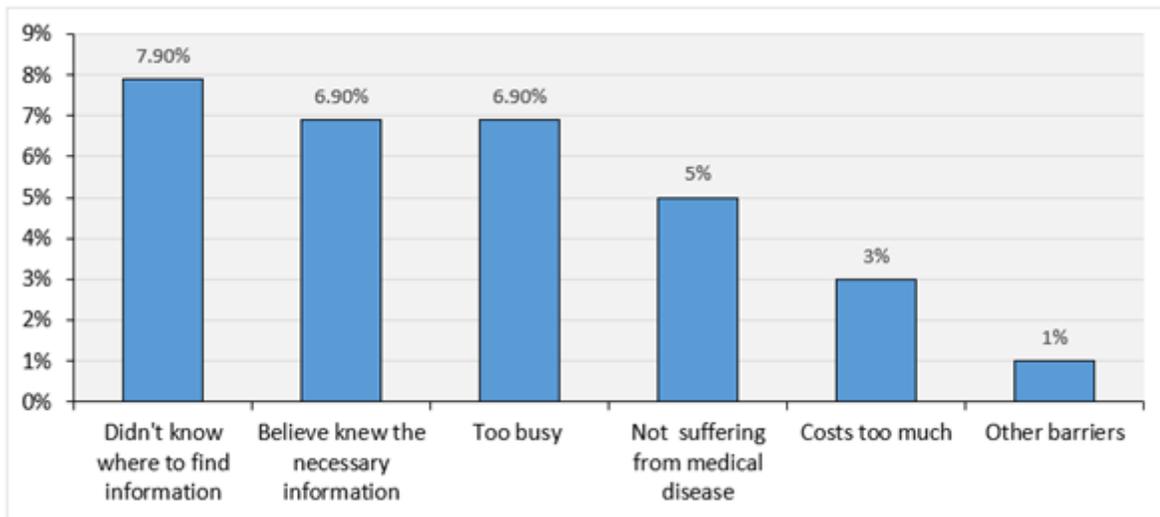


Figure 4

Barriers to pre-travel health-seeking practices

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