

Knowledge, Attitude, and Practice Toward Prevention of Respiratory Tract Infections among Hajj and Umrah Pilgrims: KSA

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Abstract

Hajj and Umrah are two of the major gatherings that draw a lot of pilgrims from a wide geographical area. Respiratory Tract Infections (RTI) are the most common illness during this season which makes it a big challenge for Saudi Arabia and other countries to prevent the risk of importing infectious diseases into their home countries when they return. This study aims to assess knowledge, attitude, and practice toward the prevention of respiratory tract infections among Hajj and Umrah pilgrims in Saudi Arabia in 2022. An observational study was carried out in Saudi Arabia. A self-administered randomized anonymous questionnaire, written in English and Arabic, was used as a study tool. The study included 434 participants, 68% of them were females and 32% of them were males. Almost half of the participants were between 20-30 years old. 95.2% of participants received the influenza vaccine, 27.2% received the meningococcal vaccine and 16.6% received the pneumococcal vaccine. 86.9% of participants had good knowledge of respiratory tract infections while 13.1% had poor knowledge scores. 32.7% of participants had a positive attitude toward respiratory tract infections, 55.1% had a neutral attitude and 12.2% had a negative attitude. However, 37.3% had acceptable practice. The study illustrated good knowledge with bad attitudes and practices from participants with respiratory tract infections in Hajj Umrah pilgrims. Knowledge score was only associated with participants' jobs. Attitude was significantly associated with marital status and participants' jobs. However, practice was significantly associated with age and marital status.

Keywords: Knowledge, Attitude and practice, Hajj and Umrah pilgrims, Respiratory tract infection, Saudi Arabia

INTRODUCTION

Hajj and Umrah are two of the major gatherings that draw a lot of pilgrims from a wide geographical area [1]. The risk of infectious diseases spreading significantly increases when a huge number of pilgrims are present in crowded and congested regions. The most common illnesses that travelers spread to one another are respiratory tract infections (RTIs) [2].

The holy pilgrimage to Mecca, in Saudi Arabia, is among the five cardinal pillars of worship for every financially and physically able Muslim individual [3]. The Hajj is a seasonal event because it follows the Islamic lunar calendar. It occurs in month 12 of the lunar calendar, lasting five days, from days 8 to 12 [4]. Over 2 million people travel there every year to celebrate the pilgrimage, which presents a challenge to Saudi Arabia and other countries because of the possibility that returning pilgrims will bring infectious diseases back to their home countries. The most common health risks during the Hajj are respiratory tract infections (RTIs), such as pneumonia and influenza [5].

In 2018, a cross-sectional study including 225 Umrah and Hajj pilgrims was carried out in Malaysia. The knowledge, attitude, and practice (KAP) of pilgrims taking part in a weekly orientation session regarding RTI prevention were evaluated. The mean scores for attitude and practice are 32.65 (4.72) and 25.30 (4.9), respectively, while the interquartile range (IQR) score for knowledge is 18.0 (6.0). Therefore, a

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comprehensive health education program should be available to pilgrims to raise awareness [6]. Additionally, a study conducted in Saudi Arabia shows that 790 participants in the poll had a 12.65% regular immunization rate, with those under 24 having the highest rate (57%). Furthermore, more than 90% of people who had chronic illnesses disclosed infrequent histories of seasonal flu vaccines. The study suggests that the rate of seasonal influenza vaccination among the Saudi population is low [7]. According to the results obtained from a study conducted in Turkey, 96.9% of the pilgrims admitted that they should routinely wash their hands and 88.7% of them admitted the use of hand sanitizer when they can't get to a water source. The statistical findings revealed a strong correlation between the pilgrims' age, gender, history of chronic illness, degree of education, and awareness of protective factors to stop the spreading of RTIs [8].

According to Saudi Arabia's Vision 2030, which intends to develop outstanding economic and health services for the benefit of the country's tourists, especially Hajj and Umrah pilgrims, and since the World Health Organization (WHO) identified coronavirus disease-19 (COVID-19) as a global pandemic in March 2020, the Saudi Arabian government has implemented several strong public health measures and limitations to control the spread of COVID-19 and other RTIs during the pilgrimage [9, 10].

Several limitations are presented in the previous studies, including selection bias owing to the non-randomized selection of participants. Taking into consideration the millions of Hajj and Umrah pilgrims who visit the Saudi Arabia holy cities annually, low participation, time constraints, and language barriers can affect the results of research and make it not representative of the entire population. Our study aimed to assess knowledge, attitude, and practice in a larger and more randomized sample with the incorporation of different races to make it a heterogeneous population.

MATERIALS AND METHODS

Study Design and Setting

This is a cross-sectional observational study that was carried out in Saudi Arabia from June 2022 to July 2023 among Umrah and Hajj pilgrims. The sample was collected randomly with voluntary participation.

Inclusion and Exclusion Criteria

This study included Hajj and Umrah pilgrims, Males and Females, and Saudi and non-Saudi adults who agreed to participate in our study. However, adults and adolescents who are not Hajj or Umrah pilgrims were excluded.

Sample Size

The sample size was calculated by using the formula:

$$n = P(1-P) * Z^2 / E^2$$

with a 5% margin of error, and a confidence interval (CI) of 95%. The minimum sample size estimated for the study:

$$n = 0.50(1 - 0.50) * (1.96)^2 / (0.05)^2 = 384.$$

n: the required sample size

P: the estimated prevalence of knowledge

Q: $(1-0.50) = 50%$, i.e. 0.50

Z: the value corresponding to level of confidence required $(1-\alpha) = 1.96$.

E: the percentage of maximum acceptable error = 0.05.

Method for Data Collection and Instrument (Data Collection Technique and Tools)

A self-administered randomized anonymous questionnaire, written in English and Arabic, was used as a study tool. The questionnaire was sent to participants online (social media and e-mail). It collects participants' demographics including age, gender, nationality, occupation, and marital status, as well as the history of vaccination, comorbidities, and signs and symptoms of respiratory tract infections before departure to Hajj or Umrah.

There are four areas to the questionnaire: practice, knowledge, attitude, and sociodemographic. The knowledge portion of nine questions designed to assess pilgrims' overall understanding of the signs and symptoms, consequences, risk factors, origin, spread, and prevention of respiratory tract infections. Thirteen questions were utilized in the attitude part to evaluate the self-motivation and obstacles to compliance with respiratory tract infection prevention. Thirteen practice-related questions were utilized to assess the real adherence to the adoption of different preventive strategies [11].

Scoring System

Answers that were unclear or inaccurate (i.e., did not know) on the knowledge questions received a score of zero, while selecting the right response earned one point. Nine was the anticipated maximum total knowledge score. In the practice and attitude sections, selecting the response that best reflected good practice or a positive attitude received a score of 1, while selecting the response that best reflected a negative practice or a poor attitude received a score of 0. The expected maximum total attitude score is 65 and the minimum score of 13. A correct statement with options strongly agree, agree, not sure, disagree, and strongly disagree is scored 5, 4, 3, 2, and 1, respectively. Practice is scored 2, 1, and 0 for "always", "occasional" and "never" respectively.

Based on Bloom's cut-off point, pilgrims' KAP levels were classified as "good" or "poor." Pilgrims were classified as having high knowledge if their score was above 60% and as having weak knowledge if it was below 60%. Pilgrims who scored 80% or higher on the attitude scale were classified as

having a good attitude; those who scored between 60 and 79% were classified as moderate; and those who scored less than 59% were classified as having an undesirable attitude. For the practice section, participants with scores >80% were classified as having acceptable preventive practice, while those with scores <80% were considered to have unacceptable preventive practice.

Analyzes and Entry Method

All the information provided by the participants through a self-administrative questionnaire was accurately recorded, analyzed, and categorized with maximum confidentiality using the latest edition of the Microsoft Office Excel program and Statistical Package for the Social Sciences SPSS.

RESULTS AND DISCUSSION

The study included 434 participants, 68% of them were females and 32% of them were males. Almost half participants were between 20- 30 years old while 18.2.% were less than 20 years old. 93.3% were Saudi. 55.5% were single and 39.2% were married. 47.9% were students while 25.3% were government employees (**Table 1**).

Table 1. Sociodemographic characteristics of participants (n=434)

	Parameter	No.	%
Gender	Male	139	32.0
	Female	295	68.0
Age	less than 20	79	18.2
	20 - 30	222	51.2
	31 - 40	69	15.9
	41 - 50	40	9.2
	51 - 60	24	5.5
Nationality	Saudi	405	93.3
	Non-Saudi	29	6.7
Marital status	single	241	55.5
	married	170	39.2
	divorced	18	4.1
Occupation	widow	5	1.2
	self employed	6	1.4
	private sector	49	11.3

housewife	50	11.5
student	208	47.9
Retired	11	2.5
government employee	110	25.3

As illustrated in **Table 2**, 95.2% of participants received the influenza vaccine, 27.2% received meningococcal vaccine and 16.6% received the pneumococcal vaccine. As for comorbidities, 12.4% have diabetes, 14.7% have allergic rhinitis, and 9% have hypertension 5.1% of participants reported having respiratory disease before leaving for Hajj.

Table 2. Knowledge of participants of online nutritional applications and tele-dietetics (n=434).

	Parameter	No.	%
Vaccines received	Influenza vaccine	413	95.2
	meningococcal vaccine	118	27.2
	Pneumococcal vaccine	72	16.6
Presence of comorbidities	diabetes	54	12.4
	Allergic rhinitis	64	14.7
	heart disease	32	7.4
	Neuromuscular disorder disease	10	2.3
	Chronic obstructive pulmonary disease	24	5.5
	Hypertension	39	9.0
	Chronic kidney disease	5	1.2
Suffering from a respiratory disease before leaving for Hajj	nothing	302	69.6
	Yes	22	5.1
	no	388	89.4
	maybe	24	5.5

Regarding knowledge in **Table 3**, 81.3% reported that Influenza-like illnesses are often caused by viruses. 61.5% reported that Influenza-like diseases are spread by air. 74.7% agree that influenza-like illnesses spread rapidly. According to 83.6% of respondents, getting vaccinated can help shield you from illnesses similar to the flu. A two-ply surgical face mask and a fabric mask are equally effective, according to 29.3% of respondents.

Table 3. Knowledge of participants of respiratory tract infections (n=434)

	Parameter	No.	%
Influenza-like illnesses are often caused by:	bacteria	33	7.6
	sensitive	48	11.1
	virus	353	81.3
	air	267	61.5
	dust	122	28.1
Influenza-like diseases are spread by:	Shake the hand of someone who has a cough and/or cold	326	75.1
	Sharing a towel with an infected person	195	44.9
	water	48	11.1

Flu-like illnesses spread rapidly:	I agree	324	74.7
	I do not agree	14	3.2
	neutral	96	22.1
	Diabetics	106	24.4
Which of the following people is more likely to develop a flu-like illness	Asthma patients	268	61.8
	People who are in crowded places	257	59.2
	smokers	177	40.8
	among many people	257	59.2
What are the complications of influenza-like illnesses? (Bias risk)	People with arthritis	42	9.7
	Seniors 65 and over	275	63.4
	difficulty breathing	309	71.2
	bronchitis	322	74.2
The following practices can help protect you from flu-like illnesses:	Pneumonia	200	46.1
	Multiple organ failure	33	7.6
	Receiving vaccinations	363	83.6
	Hand washing with hand sanitizer	286	65.9
Among the reasons for wearing a muzzle:	Wear masks	316	72.8
	Cover your nose with your hands	146	33.6
	Being near people who are coughing	302	69.6
	Being in crowded places	325	74.9
A cloth face mask is as effective as a two-ply surgical face mask:	when I'm sick	281	64.7
	Agree	127	29.3
	Neutral	137	31.6
	Disagree	170	39.2
I am not sick; the used face mask can be stored in a bag for later use	Agree	130	30.0
	Neutral	84	19.4
	Disagree	220	50.7

As shown in **Table 4**, 25.6% of participants strongly agree that flu vaccination has unpleasant side effects. 22.8% strongly agree that getting a flu shot is a big deal. 64.7% believe that a person with a respiratory tract infection should cover their mouth and nose with a tissue when they cough or sneeze. 51.4% believe that a person with a respiratory tract

infection should cover their mouth and nose with their hand when they cough or sneeze. 48.2% strongly agree that flu vaccines protect pilgrims from influenza. 46.5% strongly agree that wearing a proper face mask is effective in preventing influenza-like illness.

Table 4. Participants attitude towards respiratory tract infections (n=434).

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Since the end of the avian flu, acute respiratory syndrome, Middle East respiratory syndrome, and swine flu, I no longer need to worry about catching a flu-like disease	150 34.6%	70 16.1%	84 19.4%	93 21.4%	37 8.5%
I am generally opposed to wearing a face mask	99 22.8%	50 11.5%	57 13.1%	111 25.6%	117 27.0%
flu vaccination has unpleasant side effects	111 25.6%	91 21.0%	120 27.6%	82 18.9%	30 6.9%
I get affected by negative news about flu vaccines	106 24.4%	88 20.3%	93 21.4%	84 19.4%	63 14.5%
Getting a flu shot is a big deal	99 22.8%	60 13.8%	69 15.9%	112 25.8%	94 21.7%
If I have a flu-like illness, I might spread it to others	146 33.6%	143 32.9%	70 16.1%	24 5.5%	51 11.8%
I believe that a person with a respiratory tract infection should cover their mouth and nose with a tissue when they cough or sneeze.	281 64.7%	97 22.4%	46 10.6%	7 1.6%	3 .7%

I believe that a person with a respiratory tract infection should cover their mouth and nose with their hand when they cough or sneeze.	223 51.4%	100 23.0%	54 12.4%	34 7.8%	23 5.3%
Flu vaccines protect pilgrims from influenza.	209 48.2%	132 30.4%	79 18.2%	11 2.5%	3 .7%
Using hand lotion can keep you from getting a flu-like illness.	171 39.4%	152 35.0%	94 21.7%	14 3.2%	3 .7%
I think cough and flu can be prevented by wearing a face mask outside	197 45.4%	160 36.9%	61 14.1%	12 2.8%	4 .9%
Wearing a proper face mask is effective in preventing respiratory tract infections	202 46.5%	147 33.9%	66 15.2%	11 2.5%	8 1.8%

As for practice, **Table 5** shows that 54.6% of participants always eat vegetables. 54.6% eat fruits. 85.5% use soap to wash their hands. 58.8% use antiseptic wipes or hand gel to

wash their hands. 69.8% wash their hands after touching personal items of someone who has a cough/cold. 77.6% received the influenza vaccine.

Table 5. Participants practice towards respiratory tract infections (n=434)

	Always	Sometimes	Never
Eating vegetables	237 54.6%	188 43.3%	9 2.1%
Eating fruits	237 54.6%	186 42.9%	11 2.5%
I use soap to wash my hands	371 85.5%	61 14.1%	2 .5%
When wearing a face mask, test it to make sure it fits properly	240 55.3%	149 34.3%	45 10.4%
I use antiseptic wipes or hand gel to wash my hands	255 58.8%	158 36.4%	21 4.8%
I use a washable cloth wipe to clean my hands	149 34.3%	142 32.7%	143 32.9%
I wash my hands after touching personal items of someone who has a cough/cold	303 69.8%	109 25.1%	22 5.1%
I wash my hands after shaking hands with people who have a cough and/or cold	266 61.3%	129 29.7%	39 9.0%
I wash my hands after touching the door handles	215 49.5%	190 43.8%	29 6.7%
Refrain from being close to people who are coughing or sneezing	245 56.5%	173 39.9%	16 3.7%
Refrain from shaking hands with people who have a cough/cold	220 50.7%	185 42.6%	29 6.7%
Refrain from touching the nose a lot	228 52.5%	171 39.4%	35 8.1%
Received the flu vaccine	337 77.6%	34 7.8%	63 14.5%

Figure 1 shows that 86.9% of participants had good knowledge of respiratory tract infections while 13.1% had poor knowledge scores.



Figure 1. Knowledge scores of participants of RTIs

As illustrated in **Figure 2**, 32.7% of participants had a positive attitude towards respiratory tract infections, 55.1% had a neutral attitude and 12.2% had a negative attitude. The practice scores of participants towards respiratory tract infections as 37.3% had acceptable practice while 62.7% had unacceptable practice.

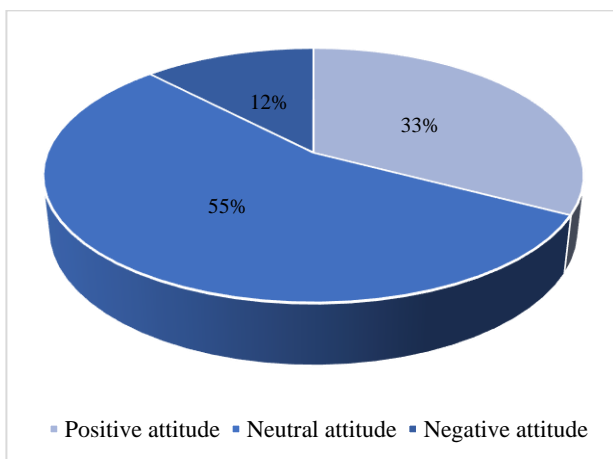


Figure 2. Attitude scores of participants towards RTIs

One of the most frequent illnesses causing hospital admissions during the Hajj is respiratory tract infection. Pneumonia during Hajj can be serious, and the influenza virus is the main cause of upper respiratory tract infections. This study aimed to assess knowledge, attitude, and practice toward the prevention of respiratory tract infections among Hajj and Umrah pilgrims in Saudi Arabia in 2022.

The results of this study revealed a good KAP score as 86.9% of participants had good knowledge scores while 13.1% had poor knowledge scores. This was in line with a previous study that reported good knowledge scores as well as 56.0% of the research contributors towards RTIs. A good level of knowledge was also indicated by the median knowledge score of 18.0 (6.0) [12]. These findings support those of a study that was done among American Hajj travelers [13, 14].

Only 20.0% of the participants thought viruses weren't a factor in RTI. These outcomes are consistent with those of Tashani *et al.* [15], who found that 58% of the pilgrims reported using the proper method of transmission. In contrast to the findings of this study regarding RTI knowledge, other studies indicated a low degree of RTI knowledge [16, 17].

The current study reported that 61.5% reported that Influenza-like diseases are spread by air. According to another study's findings, RTIs are spread most frequently through the air (85.3%), 51.6% through sharing towels with an infected individual, and 39.1% through water. Furthermore, the high percentage of knowledge shows the consistency of theory-based approaches in modifying human behavior through information based on individual beliefs that may promote or inhibit behavior change for better health [18].

Regarding complications, 74.2% of our study participants identified bronchitis as a complication of respiratory tract infection, 71.2% identified difficulty in breathing, and 46.1% identified pneumonia.

Similar results were found in a prior study, which found that the majority of participants were aware that RTIs are linked to pneumonia (64.4%) and bronchitis (46.2%). Contrarily, 23.1% and 25.8% of individuals thought that multiorgan failure and trouble breathing were, respectively, consequences of RTIs [12]. In a cohort trial, pneumonia and bronchitis were identified as side effects of RTI [19].

Generally, the study members possessed improper attitudes as only 32.7% of participants had positive attitudes toward respiratory tract infections, 55.1% had neutral attitudes and 12.2% had negative attitudes. However, this was higher than reported in the previous study as 93.8% had a negative attitude [12]. This was similar to results reported from Egypt (60.3%) [20].

In practice, only 37.3% of our participants had acceptable practice while 62.7% had unacceptable practice. This was more than the previous study's findings, which indicated that just 16.9% of the pilgrims followed appropriate precautions to avoid respiratory tract infections. Nonetheless, the majority of respondents ensured that the face mask was correctly fitted before to use it. The majority of the participants were not immunized against RTIs, although they were aware that the required vaccines were available [12]. 54.6% of our participants always eat vegetables. 54.6% of people consume fruit. 85.5% of people wash their hands with soap. 58.8% of people wash their hands with hand gel or antiseptic wipes. After handling a coughing or cold-stricken person's personal belongings, 69.8% of people wash their hands 77.6% received the influenza vaccine. Another research revealed higher percentages (89.8%) for guaranteeing a healthy diet. The percentages for receiving a vaccination (83.1%), cleaning one's hands with hand sanitizer (87.1%), donning a face mask (90.7%), and coughing politely (68.0%) were all

similar. For the knowledge of vaccination, nearly similar results (61.3%) were seen in Saudi Arabia [21]. Most of the French pilgrims who took part in the 2008 Hajj were aware that face masks are a useful tool for self-defense (41.3%), that hand disinfectants should be used (2.8%), and that social distance should be maintained (48.7%) [22].

Knowledge score was only associated with participants' jobs. Attitude was highly related with marital status and participants' jobs. However, practice was highly related with age and marital status. In contrast, a previous study found that knowledge ratings were substantially correlated with occupation, educational attainment, the pilgrims' prior Umrah experiences, neuromuscular disease, diabetes, and prescribed immunizations. However, there is a strong correlation between mean attitude scores and gender, educational attainment, prior Hajj experience, and meningococcal vaccination. Similarly, gender, occupation, and previous Hajj experience were the only variables that were substantially correlated with mean practice scores [12].

CONCLUSION

The study showed that among pilgrims performing the Hajj and Umrah, those with respiratory tract diseases had good knowledge but poor attitudes and practices. Participants' jobs were the only factors linked to their knowledge score. Attitude was significantly associated with marital status and participants' jobs. However, practice was significantly associated with age and marital status. These results may also give the Hajj commission and health authorities ideas on how to enhance health education, stronger public awareness, and publicity to better the knowledge, attitude, and practice of the pilgrims.

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