



Assessing the level of knowledge of pilgrims about the type of vaccinations and their importance to pilgrims among the Makkah Al-Mokarramah in Saudi Arabia Population during the Pilgrimage Seasons 2022

Maram Taher Alghabbashi¹, Reham F. Hasanain², Mazen Mannaa Alelyani³, Sami Yahya Jithmi⁴, Turki deab Mohammad alotibi⁵, Abdulelah Marzouq Saqr Alotaibi⁶, Yousef Khudhayr sunaytan Alotaibi⁷, Basmah ateeq Alharbi⁸, Hafsa Abdulkreem fillatah⁸, Abdulaziz Swaileh Saleh Alhelali⁹

¹Assistant professor, Faculty of Nursing Umm Al-Qura University, Makkah, Saudi Arabia.

²Lecturer At Clinical Nutrition Department at faculty of Applied Medical Sciences, King Abdul Aziz University, Jeddah, Saudi Arabia.

³Specialist of public Health, King Abdulaziz Hospital in Makkah, Saudi Arabia.

⁴Physiotherapy, Alardah General Hospital, Saudi Arabia.

⁵Specialist Nursing, Rafee al jemsh general Hospital, Saudi Arabia.

⁶Specialist Nursing, Eradah and Mental Health Hospital Qassim, Saudi Arabia.

⁷Specialist Nursing, Dawadmi General Hospital, Saudi Arabia.

⁸Nursing technician, Maternity and children's hospital, Saudi Arabia.

⁹EMT-paramedic, Maternity and children hospital-MAKKAH, Saudi Arabia.

***Corresponding author:** Maram Taher Alghabbashi, Assistant professor, Faculty of Nursing Umm Al-Qura University, Makkah, Saudi Arabia.

Submitted: 12 September 2022. Accepted: 20 October 2022. Published: 17 November 2022

ABSTRACT

A disease-like agent, often made up of the bacterium, its toxins, or one of the surface proteins that has been weakened or destroyed, is included in a vaccination. The vaccine's ingredients cause and encourage the body to identify the vaccination as a foreign substance. Given the amount of fatalities, accidents, and problems associated with non-vaccination, vaccination is essential. Religious activities that draw large crowds may provide serious public health risks, especially when it comes to the spread of infectious illnesses. The Hajj pilgrimage, which attracts more than 2 million visitors from more than 70 nations each year, is conducted in the Kingdom of Saudi Arabia (KSA). The pilgrims' close quarters and shared living space expose them to several health risks. KSA annually hosts the Hajj, a distinctive religious mass gathering of Muslims. It is a fifth pillar that all Muslims are required to uphold. Influenza virus, Neisseria meningitides and Streptococcus pneumoniae infections are particularly common among Hajj pilgrims in Saudi Arabia. The study's objective is to determine how well-informed pilgrims are about the different types of vaccines and how crucial they are to their safety during the 2022 pilgrimage season among the makkah al-mokarramah population in Saudi Arabia. **Methods:** An across-sectional descriptive study of pilgrims living in Makkah city from August 2022 to October 2022 was done Hajj 2022, There were (700) pilgrims in our whole sample set. Results demonstrate that vaccines and degree of knowledge are significantly correlated, with the majority of participants (48.14%) having average knowledge, followed by weak people (30.43%) and high participants (21.43%). while Range (3-15) Mean \pm SD (9.01 \pm 2.91) while shows a positive relationship

between level of knowledge correlation and vaccinations while X2 77.591.

Conclusion: Hajj pilgrims, particularly those with less education and those who are jobless, lack understanding about these vaccine-preventable illnesses and immunisation. To ensure that Hajj pilgrims are safeguarded, pilgrims and Umar are strongly urged to concentrate on these groups and create a particular course that focuses on these illnesses that may be prevented by vaccination. Before the Hajj, physicians must instruct and educate all participants about how to handle any infectious diseases. There are several possibilities to increase Hajj pilgrims' understanding of the value of implementing preventative health measures.

Keywords: *Assessing, knowledge, pilgrims, vaccinations, importance*

INTRODUCTION

Over 180 nations send over 10 million pilgrims to the Kingdom of Saudi Arabia (KSA) each year to do the hajj. For the Kingdom's public health sector, which works to lessen the burden of infectious illnesses and effectively regulate their spread both in KSA and pilgrims' home countries, this event poses significant problems.(1) The MOH, however, requires that pilgrims travelling from impacted countries be watched after, and any suspected cases be quarantined.(2) There is an increased danger of the transmission of infectious illnesses to both the visiting pilgrims and their contacts upon returning home due to the large number of pilgrims from diverse nations congregating during the Hajj season.(3) Numerous infectious illness outbreaks have been documented both during and after the Hajj. After the Hajj, there was a first worldwide epidemic of meningitis caused by *Neisseria meningitidis* serogroup A in 1987.(4) Prior to this epidemic, only pilgrims from sub-Saharan nations needed to be immunised against *Neisseria meningitidis* in order to acquire a visa for the Kingdom of Saudi Arabia (KSA). (5) Following this epidemic, oral ciprofloxacin became required for pilgrims from sub-Saharan nations, and immunisation with the bivalent A and C vaccine was made mandatory for all pilgrims.(6) An rise in the yearly number of pilgrims to the Kingdom of Saudi Arabia is associated with a higher risk of the transfer of infectious diseases. It is unknown, nevertheless, if their health is adequately safeguarded. For example, *Neisseria meningitidis*, influenza virus and *Streptococcus pneumoniae*, are particularly common among Hajj pilgrims in Saudi Arabia. This might be a result of the very congested and

dense population accross the globe (7). During the Hajj pilgrimages in 2000 and 2001, a meningococcal disease epidemic involving serogroup W135 spread throughout the globe.(9) Several reports from throughout the globe have shown that this W135 outbreak strain impacted not only the pilgrims, but also the family connections of returning pilgrims, as well as the society at large, with the possibility of spreading to other areas that were unrelated to the Hajj.(10). As a consequence, the KSA Ministry of Health (MOH) modified its meningococcal vaccination guidelines for the Hajj season in 2002 and required quadrivalent meningococcal immunization (A, C, Y, and W135).(11) Despite the fact that the Saudi Arabian government offers free medical services to pilgrims and that the Saudi Arabian health authorities advises vaccination and other steps to minimize diseases, many travelers do not seek medical advice. Additionally, a lot of people don't stay in hospitals for as long as they should in order to keep from missing any of the Hajj's rites. (12). The national health authorities should inform pilgrims on the signs of infectious illnesses, transmission routes, difficulties, prevention measures, and also variations in temperature that may results to harm on human health, in accordance to the Saudi Arabian Ministry of Health.(13) It is important to urge those who are participating in the Hajj and Umar to drink enough water and eat a balanced diet that includes plenty of fresh fruits and vegetables. Pilgrims should be informed about the importance of maintaining personal hygiene, how to prevent food poisoning during the Hajj, and any illnesses that may have an impact on their well-being. Consuming food and beverages

that contain salt is beneficial in restoring electrolytes and is recommended in cases of heat exhaustion or after perspiring heavily. To avoid and control health risks, nations and people should educate the public about the dangers that pilgrims face to their health.(14) The nations and pilgrims advised them to think about taking preventative health precautions while on this holy pilgrimage journey. However, a number of studies have shown that pilgrims' adherence to these parameters varies, and the causes of this heterogeneity are still unknown.(15)

LITERATURE REVIEW

Similar research on the fundamentals of Hajj demand for healthcare services amid congestion was conducted in Malaysia, where it was found that only 35.6% of Hajj pilgrims had enough information. This outcome typically demonstrated a lack of understanding of vaccine-preventable illnesses and vaccination among Malaysian Hajj pilgrims. Similar research on Hajj pilgrims' understanding of infectious illnesses and vaccinations revealed a serious lack of information (16). The research done in 2011 where they engaged health educators to promote understanding of healthy behavior among Hajj pilgrims (17) shows that it may be improved following educational intervention. When asked about the mechanism of transmission, it was found that although the majority of pilgrims (73.3%) were able to do so for influenza, only 44.4% and 47.4% of them were able to do so for meningococcal and pneumococcal infections, respectively. (18)

Numerous studies have been published to demonstrate the KAP of pilgrims from various nations in relation to the prevention of RTIs,(19) However, there is currently a paucity of information about Saudi Arabian Hajj pilgrims' awareness of and prophylactic measures against respiratory tract illnesses. There is a pressing need to collect crucial information for efficient management and preventative programs due to the rising occurrence of respiratory tract diseases among pilgrims doing the Hajj and Umrah.(20) This is comparable to the study done in Egypt, where just 23% of Egyptian Hajj pilgrims were able to recognize the meningococcal illness

transmission (21). A majority of respondents (69.6%) acknowledged that Hajj pilgrims were susceptible to infections in Mecca, and just over half of them (56.3%) knew that the meningococcal vaccination was a required shot. These findings highlight the need for more vaccine education for Malaysian Hajj pilgrims in order to guarantee their safety during their travel to Mecca.(23) All individuals visiting Saudi Arabia are required to have had a single dose of the quadrivalent meningococcal vaccine within the past five years, and must provide proof of the vaccination or prophylaxis in order for the Saudi Arabian authorities to grant a visa for the Hajj or Umrah (24). However, this research found that only 418 (41.3%) of the pilgrims polled had had this vaccine, which raises a previous concern that has to be looked at once again to prevent the spread of dangerous diseases. Recent investigations have revealed that this is particularly crucial during the COVID-19 pandemic (25). The Centers for Disease Control and Prevention (CDC) go even farther and highly advise that hajjis be vaccinated against seasonal influenza, which is advised for high risk pilgrims to lower their own morbidity and death rates as well as lower disease transmission (3). The congested circumstances were brought out by Barasheed et al. (2014) and others more recently (26) However, 88.9% of Hajj pilgrims were said to have a positive outlook. Nearly all of them (98.5%) claimed to have complied with the Tubing Haji recommendations for mandatory vaccinations, with 78.5% of respondents agreeing that it is vital to be vaccinated even if it is just advised. (27)

Rationale

Saudi Hajj pilgrims' pre-travel health advice-seeking behavior and usage of preventative measures were both subpar. One of the greatest mass meetings in the world, the Hajj assembly in Mecca, has an extremely high illness transmission rate. The greater risk of infection is caused in part by crowding and congestion during the journey. Acute respiratory infections are frequent among pilgrims, as shown by the fact that influenza and pneumonia are the most prevalent reasons for hospitalization in Saudi

Arabia. Several preventive health measures have been made available to Hajj pilgrims in an attempt to lower the danger of infectious diseases during the pilgrimage. All pilgrims must possess a current meningococcal vaccine, and those from endemic nations must also be immunized against polio and yellow fever, according to the Saudi Arabian MoH. Additionally, vaccinations against measles, pertussis, and influenza are advised. This project attempts to fill this knowledge gap by encouraging health officials in pilgrims' home countries to provide health education.

Aim of the study

To the level of knowledge of pilgrims about the type of vaccinations and their importance to pilgrims among the makkah al-mokarramah in Saudi Arabia Population during the Pilgrimage Seasons 2022

Objectives

Evaluating the awareness of Hajj and Umrah Pilgrims regarding vaccinations

disparities in social standing and lifestyle between the two groups. The findings of the study are expected to be helpful in understanding the preferences and needs of pilgrims in the future, particularly in the lead up to Hajj 2022.

Selection criteria

This disparity is reflected in biological differences, social disparities, and lifestyle choices.

Inclusion criteria

Hajj travelers who consent to take part in the research
Residence in the city of Makkah .40 years or older

Able and eager to take part in the study .

Exclusion criteria

Non-city residence in Makkah .Over 60

Pilgrims who decline to complete the informed consent form .

METHODOLOGY

Study design

Cross-sectional research methodology was employed to conduct this study. .

Study Area

The research project was conducted in the city of Makkah, which is often referred to as the Holy Capital. It is known for being the most sacred place on Earth due to being the birthplace of the Prophet Muhammad and being the primary destination for religious pilgrimage such as Umrah and Hajj. Makkah is located in the western region of Saudi Arabia and has a population of around 2.57 million. This survey was given to pilgrims who lived in Makkah city throughout the months of August and October 2022 with the purpose of gathering information for this research. The research explores the diverse demographic profile of these pilgrims, with a considerable portion of them coming from rural areas and others from urban ones. It highlights biological disparities as well as

The sample size

"The sample size has been determined by using the Raosoft sample size calculator based on (The margin of error: 5%, Confidence level: 95%, and the response distribution was believed to be 20%) appropriately to sample size from hajj pilgrims by the needed sample size; (700)." "The margin of error: 5%" "The confidence level: 95%" "The response distribution was considered to be 20%" "The margin of error: 5%" "The confidence level: 95%" " (men and women) and the sample size was increased by 10 so as to reduce the margin of error. After an oversampling factor of 5% had been factored in, the minimum sample size needed was 700. To ensure a fair selection of participants, a method of simple random selection was used, generated by a computer. During the year 2022, the researcher was responsible for collecting the necessary data.

Data collection tools of the study

A knowledge-structured questionnaire was used so that data could be collected. Following a

comprehensive examination of recent literature pertaining to the topic from both the United States and other countries, the researcher produced it. It was in the form of questions. The following components were included in this:

Part one: biosocial and demographic details, such as age, name, frequency of hajj, pilgrim number, sex, location of residence, phone number, leader name, years of schooling, and the existence of chronic conditions such as diabetes mellitus.

Part 2: This section includes quizzes to test your knowledge of vaccination-related topics such pneumococcus symptoms, transmission modes, preventative strategies, high-risk populations, and course of treatment. Community response to infected individuals, as well as information sources on illness and immunization .

Each participant who agrees to participate in the survey will get an informed consent form after receiving a brief explanation of the research. The research center will receive ethics clearance. Using Cronbash's alpha ($r=0.76$), the researcher constructed the study instrument and evaluated its validity and reliability. To test and confirm the tools' clarity, application, and feasibility, a pilot study on 10 pilgrims doing the Hajj was conducted. The surveys were completed by the pilgrims themselves, however members of the study team assisted those who needed assistance.

Data entry and analysis

For data input and analysis, the Statistical Package for Social Sciences (SPSS) software version 24.0 has been utilized. To examine the relationship and difference between two categorical variables, descriptive statistics (like as percentages and numericals) and analytical statistics employing Chi-Square tests (χ^2) were used. Statistical significance will be determined by a p-value of ≤ 0.05 .

Pilot study

Due to the target group's resemblance and the use of the same questionnaire, a pilot research was done with hajj pilgrims in the same sector to evaluate the study's methodology. The questionnaire will provide feedback, and the approach will be flawless.

Ethical considerations

The Makkah joint program Family Medicine program has come to an agreement that permission can be granted. To ensure approval from the Directorate of Hajj and all participants of the questionnaire, a survey was conducted. The survey data was kept confidential, and a report with the results was sent to the appropriate department for review.

Budget: Self-funded

RESULTS

TABLE 1: participants’ distribution based on socio demographic characteristics (Age, Level of education, Hajj for, Sex, Chronic diseases) (n=700)

| | N | % |
|------------|-----|----|
| Age | | |
| <40 | 147 | 21 |
| 40-50 | 273 | 39 |
| ≥ 50 | 280 | 40 |
| Gender | | |
| Male | 511 | 73 |
| Female | 189 | 27 |
| Education | | |
| Illiterate | 133 | 19 |
| Primary | 308 | 44 |
| Secondary | 147 | 21 |
| University | 112 | 16 |
| Residence | | |

| | | |
|---|-----|----|
| Rural | 539 | 77 |
| Urban | 161 | 23 |
| Number of times in Hajj is performed | | |
| First | 546 | 78 |
| 2-3. | 91 | 13 |
| >4 | 63 | 9 |
| Marital status | | |
| Married | 539 | 77 |
| Single | 161 | 23 |
| Received written guidelines to pilgrims about the type of vaccinations and their importance | | |
| Yes | 483 | 69 |
| No | 217 | 31 |
| History of vaccination | | |
| Influenza (flu) vaccine | 462 | 66 |
| Pneumococcal vaccine | 238 | 34 |
| Occupation | | |
| No | 203 | 29 |
| Yes | 497 | 71 |
| Economic level | | |
| Low | 147 | 21 |
| Medium | 294 | 42 |
| High | 259 | 37 |
| Chronic diseases | | |
| Yes | 301 | 43 |
| No | 399 | 57 |
| Sources of health recommendations for knowledge for pilgrims Hajj about the type of vaccinations and their importance | | |
| Booklets and brochures | 154 | 22 |
| Mass media | 217 | 31 |
| Own personal experience | 259 | 37 |
| Educational films | 56 | 8 |

Based on socio demographic features, this table shows that the highest proportion of participants age ≥ 50 years (40.0%) and 40-50 years of age (39.0%), regarding gender most of participant male (73.0%), but female were (27.0%), regarding level of education most of participant Primary were (44.0%) followed by Secondary, regarding the residence most of participant were rural were (77.0%), regarding number of times in Hajj is performed majority of participant were first times were (78.0%), but 2-3 were (13.0%), regarding Marital status majority of participant were Married were (77.0%), but single were (23.0%), regarding Received written guidelines to pilgrims about the type of vaccinations and their importance majority of participant answer Yes were (71.0%), but answer

No were (31.0%), regarding History of vaccination majority of participant answer Influenza (flu) vaccine were (66.0%), but Pneumococcal vaccine were (34.0%), regarding Occupation majority of participant answer Yes were (71.0%), but answer No were (29.0%), regarding Economic level majority of participant answer Medium were (42.0%), but answer High were (37.0%), regarding have chronic diseases majority of participant answer No were (57.0%), but answer Yes were (43.0%), regarding Sources of health recommendations for knowledge for pilgrims Hajj about the type of vaccinations and their importance majority of participant answer Own personal experience were (37.0%), but Mass media were (31.0%).

TABLE 2: Distribution of medical history of the pilgrims in studied sample

| Variable (n=301) | N | % |
|--|-----|-------|
| Types of chronic illness | | |
| Diabetes | 141 | 46.84 |
| Hypertension | 63 | 20.93 |
| Renal disorder | 102 | 33.89 |
| Liver disorder | 99 | 32.89 |
| Doctor counseling | | |
| Yes | 111 | 36.88 |
| No | 190 | 63.12 |
| Immunization | | |
| Yes | 69 | 22.92 |
| No | 232 | 77.08 |
| Healthy package to pilgrims about the type of vaccinations | | |
| Yes | 87 | 28.90 |
| No | 214 | 71.10 |

Regarding table 2 show regarding distribution of medical history of the pilgrims, this table depicts that the highest percentage of participants regarding types of chronic illness most of participant Diabetes were (46.84%), but Renal disorder were(33.89%),while Liver disorder were (32.89%), regarding Doctor counseling most of participant answer No were (63.12%)

followed by answer Yes were(36.88%), regarding the Immunization most of participant answer No were(77.08%),but Yes were(22.925) regarding Healthy package to pilgrims about the type of vaccinations majority of participant were answer No were(71.10%), but answer Yes were(28.90%).

TABLE 3: Distribution of knowledge of vaccines and reported reasons for accept and non-receipt.

| | N | % |
|---|-----|----|
| Meningococcal vaccines | | |
| No | 504 | 72 |
| Yes | 196 | 28 |
| Recommended vaccines | | |
| No | 434 | 62 |
| Yes | 154 | 22 |
| Both | 112 | 16 |
| Do you stop aerobic exercise for two consecutive days or more per week? | | |
| Always | 455 | 65 |
| Sometimes | 224 | 32 |
| No | 21 | 3 |
| Vaccinated reasons | | |
| I don't want to get sick | 525 | 75 |
| The vaccine is effective in protecting me against diseases | 448 | 64 |
| If I get sick my Hajj worship could be jeopardized | 567 | 81 |
| I am at risk because I'm elderly | 231 | 33 |
| I am at risk because I have chronic diseases | 322 | 46 |

Regarding table 3 show regarding distribution of knowledge of vaccines and reported reasons for accept and non-receipt that the highest proportion of participants regarding Meningococcal vaccines most of participant answer No were (72.0%), but answer Yes were(28.0%), regarding Recommended vaccines most of participant answer No were (62.0%) followed by answer Yes were(22.0%), but both were(16.0%), regarding you stop aerobic exercise for two

consecutive days or more per week most of participant answer Always were(65.0%),but Sometimes were(32.0%), regarding Vaccinated reasons majority of participant were answer If I get sick my Hajj worship could be jeopardized were (81.0%) but I don't want to get sick were(75.0%), but answer Yes were(28.90%), followed by the vaccine is effective in protecting me against diseases were(64.0%)

TABLE 4: distribution of participant's total knowledge regarding type of vaccinations .

| | Knowledge | | Score | |
|------------|-----------|---------|-------|-----------|
| | N | % | Range | Mean±SD |
| Weak | 213 | 30.43 | 3-15. | 9.01±2.91 |
| Average | 337 | 48.14 | | |
| High | 150 | 21.43 | | |
| Total | 700 | 100.00 | | |
| Chi-square | X2 | 77.591 | | |
| | P-value | <0.001* | | |

This table 4 shows that the majority of participants were (48.14%) have average knowledge followed by weak were(30.43%) but high were (21.43%) while Range (3-15) Mean±

SD (9.01±2.91) while reveals a positive association between level of knowledge correlation and vaccinations while X2 77.591

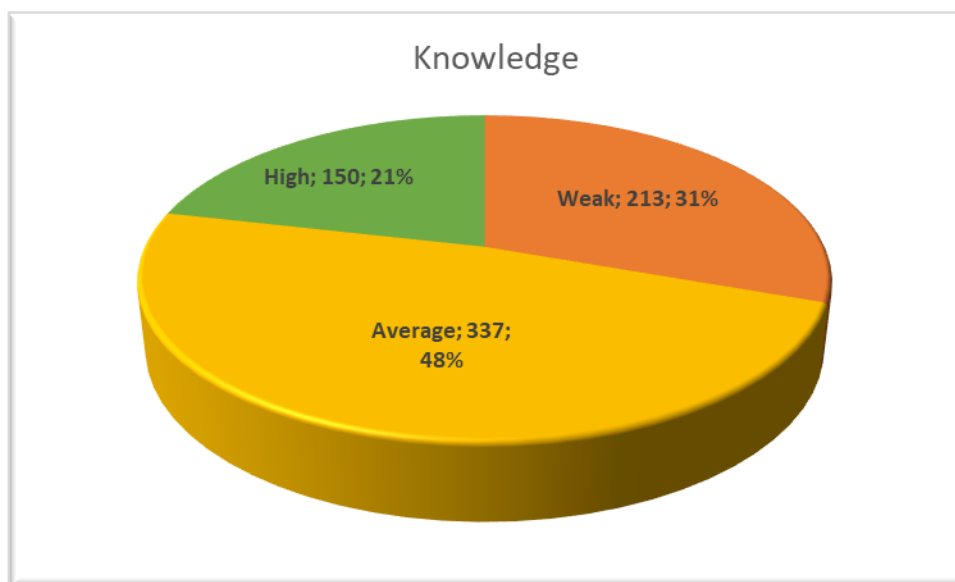


FIGURE 1: distribution of participant's total knowledge regarding type of vaccinations

TABLE 5: Distribution the relation between Knowledge associated with socio demographic characteristics

| | | | Knowledge | | | Chi-square | |
|----------------|------------|---|-----------|---------|-------|------------|---------|
| | | | Weak | Average | High | X2 | P-value |
| Age | <40 | N | 0 | 37 | 110 | 731.216 | <0.001* |
| | | % | 0.0% | 25.2% | 74.8% | | |
| | 40-50 | N | 1 | 235 | 37 | | |
| | | % | .4% | 86.1% | 13.6% | | |
| | ≥50 | N | 212 | 65 | 3 | | |
| | | % | 75.7% | 23.2% | 1.1% | | |
| Gender | Male | N | 154 | 249 | 108 | 0.264 | 0.876 |
| | | % | 30.1% | 48.7% | 21.1% | | |
| | Female | N | 59 | 88 | 42 | | |
| | | % | 31.2% | 46.6% | 22.2% | | |
| Education | Illiterate | N | 133 | 0 | 0 | 700.181 | <0.001* |
| | | % | 100.0% | 0.0% | 0.0% | | |
| | Primary | N | 80 | 208 | 20 | | |
| | | % | 26.0% | 67.5% | 6.5% | | |
| | Secondary | N | 0 | 109 | 38 | | |
| | | % | 0.0% | 74.1% | 25.9% | | |
| | University | N | 0 | 20 | 92 | | |
| | | % | 0.0% | 17.9% | 82.1% | | |
| Residence | Rural | N | 165 | 262 | 112 | 0.583 | 0.747 |
| | | % | 30.6% | 48.6% | 20.8% | | |
| | Urban | N | 48 | 75 | 38 | | |
| | | % | 29.8% | 46.6% | 23.6% | | |
| Marital status | Married | N | 166 | 261 | 112 | 0.595 | 0.743 |
| | | % | 30.8% | 48.4% | 20.8% | | |
| | Single | N | 47 | 76 | 38 | | |
| | | % | 29.2% | 47.2% | 23.6% | | |
| Occupation | Yes | N | 61 | 97 | 45 | 0.094 | 0.954 |
| | | % | 30.0% | 47.8% | 22.2% | | |
| | No | N | 152 | 240 | 105 | | |
| | | % | 30.6% | 48.3% | 21.1% | | |
| Economic level | Low | N | 45 | 102 | 0 | 155.648 | <0.001* |
| | | % | 30.6% | 69.4% | 0.0% | | |
| | Medium | N | 125 | 126 | 43 | | |
| | | % | 42.5% | 42.9% | 14.6% | | |
| | High | N | 43 | 109 | 107 | | |
| | | % | 16.6% | 42.1% | 41.3% | | |

Table (5) show relation between Knowledge associated with socio demographic characteristics regarding the age results show a significant relation between age and Knowledge were X2 731.216 and P-value=0.001, increase in age ≥50 in weak were (75.7%) followed by age 40-50 in average were(86.1%) but age <40 in high were(74.8%), regarding the gender results show no significant relation between gender and

Knowledge were X2 0.264 and P-value=0.876, increase in Male in average were (48.7%) followed by female in average were(46.6%) , regarding the Education results show a significant relation between Education and Knowledge were X2 700.181 and P-value=0.001, increase in Illiterate in weak were (100.0%) followed by Secondary in average were(74.1%) but University in high

were(82.1%), regarding the Residence results show no significant relation between Residence and Knowledge were X^2 0.583 and P-value=0.747, increase in Rural in average were(48.6%) but Urban in average were(46.6%), regarding the Marital status results show no significant relation between Marital status and Knowledge were X^2 0.595 and P-value=0.743, increase in Married in average were (48.2%) followed by Single in average were(47.2%) , regarding the Occupation results show no

significant relation between Occupation and Knowledge were X^2 0.094 and P-value=0.954, increase in answer Yes in average were (47.8%) followed by answer No in average were(48.3%), regarding the Economic level results show a significant relation between Economic level and Knowledge were X^2 155.648 and P-value=0.001, increase in low in average were (69.4%) followed by medium and high in average were(42.9%, 42.1%) .

TABLE 5: Distribution the relation between Knowledge associated with socio demographic characteristics

| | | | Knowledge | | | Chi-square | |
|---|-------|---|-----------|---------|-------|------------|---------|
| | | | Weak | Average | High | X2 | P-value |
| Number of times in Hajj is performed | First | N | 213 | 263 | 70 | 176.768 | <0.001* |
| | | % | 39.0% | 48.2% | 12.8% | | |
| | 2-3. | N | 0 | 47 | 44 | | |
| | | % | 0.0% | 51.6% | 48.4% | | |
| | >4 | N | 0 | 27 | 36 | | |
| | | % | 0.0% | 42.9% | 57.1% | | |
| Received written guidelines to pilgrims about the type of vaccinations and their importance | Yes | N | 73 | 318 | 92 | 246.545 | <0.001* |
| | | % | 15.1% | 65.8% | 19.0% | | |
| | No | N | 140 | 19 | 58 | | |
| | | % | 64.5% | 8.8% | 26.7% | | |
| Chronic diseases | Yes | N | 0 | 218 | 83 | 312.742 | <0.001* |
| | | % | 0.0% | 72.4% | 27.6% | | |
| | No | N | 213 | 119 | 67 | | |
| | | % | 53.4% | 29.8% | 16.8% | | |

show regarding the Number of times in Hajj is performed results show a significant relation between Number of times in Hajj is performed and Knowledge were X^2 176.768 and P-value=0.001, increase in 2-3 in average were (51.6%) followed by first in average were(48.2%) but >4 in high were(57.1%) but 2-3 in high were(48.4%), regarding the Received written guidelines to pilgrims about the type of vaccinations and their importance results show a significant relation between Received written guidelines to pilgrims about the type of vaccinations and their importance and Knowledge were X^2 246.545 and P-value=0.001, increase in answer Yes in average were (65.8%) followed by answer No in weak

were(64.5%) , regarding the Chronic diseases results show a significant relation between Chronic diseases and Knowledge were X^2 312.742 and P-value=0.001, increase in answer in Yes average were (72.4%) followed by answer No in average were(53.4%) .

DISCUSSION

This recent research, which is considered to be the most significant among Saudi Arabian Hajj and Umrah pilgrims, attempted to evaluate the participants' level of awareness of the various types of vaccines and the significance of these vaccinations to pilgrims. There have been various studies conducted and published to indicate the

level of awareness among pilgrims from a variety of countries about the significance of immunizations for pilgrims (28). On the other hand, there is currently a paucity of data about the understanding and preventative procedures regarding the outbreak of different infectious illnesses that have been reported regularly during and after the Hajj among Saudi Arabian Hajj pilgrims. Because respiratory tract illnesses are becoming more common among pilgrims participating in Hajj and Umrah, it is urgently necessary to collect the necessary data in order to develop control and prevention strategies that are both efficient and effective.(29)

Findings of this research revealed average knowledge score among the study participants towards importance of vaccinations. also the weak knowledge score was which also indicates a low level of knowledge.(See taibl4)shows that the majority of participants were (48.14%) have average knowledge followed by weak were(30.43%) but high were (21.43%) while Range (3-15) Mean± SD (9.01±2.91) while shows a positive correlation between level of knowledge correlation and vaccinations while X2 77.591.

The annual Hajj pilgrimage has been linked to a broad variety of upper and lower respiratory tract diseases caused by viruses and bacteria. Pneumonia is one of the most prevalent conditions that leads to hospitalization. There is a possibility that between twenty and eighty percent of pilgrims may have an infection of the respiratory system (30). A better understanding of the illnesses, the pathogens that cause them, and the ways in which they are spread may aid with disease management and prevention.

A study of 200 patients with suspected pneumonia has shown that direct laboratory testing of sputum, along with leukocyte counting, must be used as a consistent method for diagnosing the disease. It was found that the number of leukocytes (>25) and epithelial cells (10) per low-power field in sputum samples were the most indicative of a positive culture result.

There was a positive association among level of knowledge with age, economic level, number of

times in Hajj is performed, Received written guidelines to pilgrims about the type of vaccinations and their importance, Chronic diseases. (See table 5). Similar findings were observed in a research on medical staff at Mecca Hospital, where age ($p=0.882$), gender, and occupation ($p=0.39$) did not substantially influence the attitude level (13). However, a 2015 research on antibiotic usage among pilgrims found a strong correlation between attitude level and age, education, and career (14). Similar to this, a research (15) revealed that marital status had a major role in influencing the attitude level. This could be as a result of the imbalanced ratio of married to unmarried respondents, where married respondents were more numerous than unmarried respondents. In addition, the government's tight vaccination requirements for Hajj pilgrims, which are mandated regardless of age group, may be the source of unimpressive results. (31)During the Hajj preparation course, Tabung Haji and other health authorities stressed the need of vaccination and the avoidance of the sickness that is associated to it. Rituals related to the Hajj provide a risk of pneumococcal infection. There is a significant frequency of respiratory ailments among pilgrims, according to several research. The most frequent cause of acute respiratory illnesses among pilgrims is respiratory virus infections, including influenza virus, rhinovirus, and Streptococcus pneumonia infections.(27) A number of factors might be to blame for the reduced pneumococcal acquisition. Lack of knowledge about the disease's etiology, route of transmission, clinical manifestations, high risk groups, methods of prevention, and course of therapy is one of the potential causes. In addition to having a bad attitude about the illness. (32). The study's findings showed that there was a low degree of expertise. This research result was in agreement with the findings of Zhang et al. (2016) in their study titled "Vaccination Knowledge, Attitude, and Practice among Chinese Travelers Who Visit Travel Clinics in Preparation for International Travel", which revealed that the participants had limited understanding regarding vaccinations as a form of prevention (30).

CONCLUSION

This research has found a number of problems with the preventive practices used by the Hajj and Umrah in Saudi Arabia in 2022. This brought to light the need for better hygiene and safety standards, such as the availability and appropriate use of face masks during the Hajj and Umrah. The Saudi Ministry of Health has the authority to require immunization documentation. The research has shown that pilgrims are at a heightened risk of developing respiratory and other diseases because of their behavioral and practice difficulties. For the Hajj and Umrah, which often include elderly pilgrims and those with multiple medical concerns, the worsening of pre-existing medical disorders is especially important. Given that these pilgrims meet the profile of people more prone to encounter more severe symptoms and mortality, this is particularly true during the COVID-19 epidemic. In order to enhance public health, fundamental preventive measures and health education must be promoted. In order to encourage complete preventive actions during large-scale religious gatherings and pilgrimages, further research should concentrate on developing accessible health education information in a way that engages pilgrims from a variety of backgrounds.

REFERENCE

1. Yezli, S., & Khan, A. (2020). COVID-19 social distancing in the Kingdom of Saudi Arabia: Bold measures in the face of political, economic, social and religious challenges. *Travel medicine and infectious disease*, 37, 101692.
2. Jokhdar, H., Khan, A., Asiri, S., Motair, W., Assiri, A., & Alabdulaali, M. (2021). COVID-19 mitigation plans during Hajj 2020: a success story of zero cases. *Health security*, 19(2), 133-139.
3. Al-Tawfiq, J. A., Memish, Z. A., & Zumla, A. (2021). Mass religious gatherings events and COVID-19-easing of COVID-19 restrictions and a staged approach to scaling up the umrah pilgrimage. *Travel Medicine and Infectious Disease*, 40.
4. Tobaiqy, M., Alhasan, A. H., Shams, M. M., Amer, S. A., MacLure, K., Alcattan, M. F., & Almudarra, S. S. (2021). Assessment of preventative measures practice among Umrah Pilgrims in Saudi Arabia, 1440H-2019. *International Journal of Environmental Research and Public Health*, 18(1), 257.
5. Ebrahim, S. H., & Memish, Z. A. (2020). COVID-19—the role of mass gatherings. *Travel medicine and infectious disease*, 34, 101617.
6. Tobaiqy, M., Almudarra, S. S., M. Shams, M., Amer, S. A., F. Alcattan, M., & H. Alhasan, A. (2020). Assessment of experiences of preventive measures practice including vaccination history and health education among Umrah Pilgrims in Saudi Arabia, 1440H-2019. *medRxiv*, 2020-06.
7. Alslamah, T., & Abalkhail, A. (2022). The National Strategies for and Challenges in Infection Prevention and Control of the Healthcare System in the Kingdom of Saudi Arabia (Review Study). *Vaccines*, 10(8), 1302.
8. Alrefaei, A. F., Almaleki, D., Alshehrei, F., Kadasah, S., ALluqmani, Z., Alsulaimani, A., ... & Alruhaili, A. (2022). Assessment of health awareness and knowledge toward SARS-CoV-2 and COVID-19 vaccines among residents of Makkah, Saudi Arabia. *Clinical Epidemiology and Global Health*, 13, 100935.
9. Shafi, S., Azhar, E., Al-Abri, S., Sharma, A., Merali, N., Al-Tawfiq, J. A., ... & Lee, S. S. (2022). Infectious diseases threats at the Arba'een—a neglected but one of the largest annually recurring mass gathering religious events. *International Journal of Infectious Diseases*, 123, 210-211.
10. Badur, S., Khalaf, M., Öztürk, S., Al-Raddadi, R., Amir, A., Farahat, F., & Shibl, A. (2022). Meningococcal disease and immunization activities in Hajj and Umrah pilgrimage: a review. *Infectious Diseases and Therapy*, 11(4), 1343-1369.
11. El-Kafrawy, S. A., Alsayed, S. M., Alandijany, T. A., Bajrai, L. H., Faizo, A. A., Al-Sharif, H. A., ... & Azhar, E. I. (2022). High genetic diversity of human rhinovirus among pilgrims with acute respiratory tract infections during the 2019 Hajj pilgrimage season. *International Journal of Infectious Diseases*, 121, 130-137.
12. Coudeville, L., Amiche, A., Rahman, A., Arino, J., Tang, B., Jollivet, O., ... & Wu, J. (2022). Disease transmission and mass gatherings: a case study on meningococcal infection during Hajj. *BMC Infectious Diseases*, 22(1), 1-10.
13. Yezli, S., Yassin, Y. M., Awam, A. H., Attar, A. A., Al-Jahdali, E. A., & Alotaibi, B. M. (2017). Umrah. An opportunity for mass gatherings health research. *Saudi medical journal*, 38(8), 868.
14. Hashim, H. T., Babar, M. S., Essar, M. Y., Ramadhan, M. A., & Ahmad, S. (2021). The Hajj

- and COVID-19: how the pandemic shaped the world's largest religious gathering. *The American Journal of Tropical Medicine and Hygiene*, 104(3), 797.
15. Mróz, F. (2021). The impact of COVID-19 on pilgrimages and religious tourism in Europe during the first six months of the pandemic. *Journal of religion and health*, 60(2), 625-645.
 16. Zuraina, N. M. N., Sarimah, A., Suharni, M., Hasan, H., & Suraiya, S. (2018). High frequency of *Haemophilus influenzae* associated with respiratory tract infections among Malaysian Hajj pilgrims. *Journal of infection and public health*, 11(6), 878-883.
 17. Goni, M. D., Hasan, H., Wan-Arfah, N., Naing, N. N., Deris, Z. Z., Arifin, W. N., ... & Adam, B. M. (2020). health education intervention as an effective means for prevention of respiratory infections among Hajj pilgrims: a review. *Frontiers in public health*, 8, 449.
 18. Tan, Z. H., Zamli, F. N. A. M., Izal, L. H. M., Joseph, N., Mohamed, N. A., & Nordin, S. A. (2020). Knowledge and attitude towards vaccine preventable diseases and vaccination among prospective malaysian hajj pilgrims in Klang Valley, Malaysia. *Malaysian Journal of Medicine and Health Sciences*.
 19. Ali, M., Uddin, Z., Banik, P. C., Hegazy, F. A., Zaman, S., Ambia, A. S. M., ... & Ahsan, G. U. (2021). Knowledge, attitude, practice, and fear of COVID-19: An online-based cross-cultural study. *International journal of mental health and addiction*, 1-16.
 20. Gautret, P., Benkouiten, S., Griffiths, K., & Sridhar, S. (2015). The inevitable Hajj cough: surveillance data in French pilgrims, 2012–2014. *Travel medicine and infectious disease*, 13(6), 485-489.
 21. Badur, S., Khalaf, M., Öztürk, S., Al-Raddadi, R., Amir, A., Farahat, F., & Shibl, A. (2022). Meningococcal disease and immunization activities in Hajj and Umrah pilgrimage: a review. *Infectious Diseases and Therapy*, 11(4), 1343-1369.
 22. Taha, M. K., Presa, J., & Serra, L. (2021). A review of the epidemiology of invasive meningococcal disease and vaccination strategies in North Africa. *International Journal of Infectious Diseases*, 104, 189-197.
 23. Tan, M. P., Sekawi, Z., Abdul Manap, R., Razali, R. M., Mahadzir, H., Nordin, N., ... & Mokhtar, S. A. (2022). A Malaysian consensus recommendation for the prevention of influenza in older persons. *BMC Infectious Diseases*, 22(1), 943.
 24. Pane, M., Kong, F. Y. M., Purnama, T. B., Glass, K., Imari, S., Samaan, G., & Oshitani, H. (2019). Indonesian Hajj cohorts and mortality in Saudi Arabia from 2004 to 2011. *Journal of epidemiology and global health*, 9(1), 11.
 25. Algarni, H., Memish, Z. A., & Assiri, A. M. (2016). Health conditions for travellers to Saudi Arabia for the pilgrimage to Mecca (Hajj)–2015. *Journal of epidemiology and global health*, 6(1), 7.
 - Varon, E., Mainardi, J. L., & Gutmann, L. (2010). *Streptococcus pneumoniae*: still a major pathogen. *Clinical Microbiology and Infection*, 16(5), 401.
 26. Benkouiten, S., Charrel, R., Belhouchat, K., Drali, T., Nougairede, A., Salez, N., ... & Gautret, P. (2014). Respiratory viruses and bacteria among pilgrims during the 2013 Hajj. *Emerging infectious diseases*, 20(11), 1821.
 27. AlBarrak, A., Alotaibi, B., Yassin, Y., Mushi, A., Maashi, F., Seedahmed, Y., ... & Yezli, S. (2018). Proportion of adult community-acquired pneumonia cases attributable to *Streptococcus pneumoniae* among Hajj pilgrims in 2016. *International journal of infectious diseases*, 69, 68-74
 28. Alsukait, R., Wilde, P., Bleich, S. N., Singh, G., & Folta, S. C. (2020). Evaluating Saudi Arabia's 50% carbonated drink excise tax: Changes in prices and volume sales. *Economics & Human Biology*, 38, 100868.
 29. Amin, J., Siddiqui, A. A., Al-Oraibi, S., Alshammari, F., Amin, S., Abbas, T., & Alam, M. K. (2020). The potential and practice of telemedicine to empower patient-centered healthcare in Saudi Arabia. *International Medical Journal*, 27(2), 151-154.
 30. Al-Tawfiq, J. A., Gautret, P., Benkouiten, S., & Memish, Z. A. (2016). Mass gatherings and the spread of respiratory infections. Lessons from the Hajj. *Annals of the American Thoracic Society*, 13(6), 759-765.
 31. Gautret, P., & Benkouiten, S. (2016). Circulation of respiratory pathogens at mass gatherings, with special focus on the Hajj pilgrimage. In *The microbiology of respiratory system infections* (pp. 81-93). Academic Press.
 32. Zuraina, N. M. N., Sarimah, A., Suharni, M., Hasan, H., & Suraiya, S. (2018). High frequency of *Haemophilus influenzae* associated with respiratory tract infections among Malaysian Hajj pilgrims. *Journal of infection and public health*, 11(6), 878-883.