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ASSESSMENT OF AWARENESS AND ATTITUDE TOWARD PREVENTION OF PNEUMOCOCCAL INFECTION AND VACCINATION AMONG HAJJ AND UMRAH PILGRIMS FROM MAKKAH IN 2018

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Abstract:

Background

The Kingdom of Saudi Arabia (KSA) annually hosts more than three million Muslim pilgrims from around 184 countries during the Hajj pilgrimage. Respiratory tract infection (RTI) is a major public health challenge during the Muslim pilgrimage to Makkah. It is necessary to take health precautions among these pilgrims the uptake of health preventive measures among Hajj pilgrims from Saudi Arabia, bacteremia, otitis media, and bacterial meningitis, in addition to a significant cause of sinusitis, osteomyelitis, septic arthritis, endocarditis, and peritonitis. Complications of each of these diagnoses are common. Pneumonia is one of the leading causes of hospitalization and intensive care unit among pilgrims in Saudi hospitals during Hajj. During the 1986 Hajj season, pneumonia was the second most common cause of hospitalization with the highest case fatality ratio among those aged over 50 years, therefore pneumococcal vaccination is recommended. Clinical symptoms, signs and physical examination findings alone cannot differentiate pneumonia disease from infections caused by other pathogens,to our knowledge there is no study that has explored the knowledge, attitude, and practices related to pneumococcal infection and vaccination among all Hajj pilgrims in KSA.

Aim of the study: To assessment of awareness and Attitude toward Prevention of Pneumococcal Infection and vaccination among Hajj and Umrah Pilgrims from Makkah in 2018

.**Methods:**Methods: Across sectional descriptive study conducted among pilgrims who resident in Makkah city during May 25, 2018 to 24 October 2018 Hajj 2018, Our total Sample size of pilgrims participants were (500)

Results: the majority of participants (67.0%) have a weak knowledge while Range (1-21) Mean± SD (8.155±3.011). While more than half of them (61.0%) have a positive attitude about the disease, while Range (0-8) Mean± SD (3.944±1.098

)**Conclusion:**Before Hajj doctors must teach and inform all the participants about how to deal with any infectious disease, particularly pneumonia.Significant opportunities for improving Knowledge and awareness among Hajj pilgrims about the importance of using preventive health measures. Moreover, emphasizes the need for better communication between official health authorities in Saudi Arabia and all Hajj pilgrims regarding Hajj health information.

Keywords:awareness, attitude, prevention, Pneumococcal, Infection, vaccination, Hajj, Umrah Pilgrims.

1.Introduction

The Muslim pilgrimage to Mecca in Saudi Arabia is among the five pillars of the religion of Islam and is obligatory to each financially and able-bodied Muslim to perform it at least once in a lifetime. Umrah, also known as Lesser Hajj, can be performed at any time of the year and is not obligatory. This pilgrimage attracts millions of worshippers for Umrah and about two to three million people from various countries across the globe converge for the yearly Hajj rituals [1]. Hajj attendance increases the risk of respiratory infections including pneumonia. Pneumococcal infections are caused by Streptococcus pneumonia, a gram-positive, catalase-negative organism normally mentioned as pneumococcus, The presence of such a large number of pilgrims from across the globe in close contact creates conditions where the potential for transmission of infectious organisms is high and, including those related to severe diseases such as pneumonia, pneumonia is the most mutual reason of community acquired pneumonia (CAP)[2]

However, a recent study involving state-of-the-art diagnostic techniques for bacterial, viral, and fungal infections indicated that a specific pathogen was detected in only 38% of CAP cases. Of these cases, one or more viruses were retrieved in 23% of cases and bacteria in 11%. A combination of bacterial and viral pathogens was seen in 3%. Fungal and mycobacterial organisms accounted for 1%. Human rhinoviruses were isolated in 9% of cases and influenza virus in 6%. S pneumonia remained the most common cause of bacterial CAP, at 5% of patients [3,4]

Pneumonia is an infection of the lungs that can cause mild to severe illness in people of all ages. Depending on the cause, it can often be treated with medicine or prevented with vaccines. Common signs of pneumonia include cough, fever, and difficulty breathing". "Pneumonia can be caused by viruses, bacteria, and fungi. In the United States, common causes of viral pneumonia are influenza and respiratory syncytial virus (RSV), and a common cause of bacterial pneumonia is Streptococcus pneumonia (pneumococcus)".[5,6]

The majority of pilgrims develop one form of respiratory tract infection or another during their stay in Makkah and Madinah [7]. Various adverse conditions like overcrowding, extreme climatic condition, pollution, shared accommodation characterize these pilgrimages. Similarly, most of the pilgrims are older people (>50 years) with comorbidities such as hypertension, diabetes, and liver diseases [5,6]. These scenarios could increase the risk of spread and transmission of infections, particularly respiratory tract infections (RTIs) [7]. Respiratory pathogens and symptoms are highamong all Hajj pilgrims and range from 58.9% to 94.3% [8,9].

Risk factors for pneumococcal infection include extremes of age children <2 years old and adults ≥65 years old, diabetes mellitus, cigarettes smoking, alcoholism, congenital immunodeficiency (B or T lymphocyte deficiency, complement C1, C2, C3, and C4 deficiencies), acquired immunodeficiency (HIV, immunosuppressive therapy, long term steroid use, and radiation, malignancy (e.g., leukemia, lymphome, Hodgkins, multiple myeloma, and disseminated malignancies), chronic liver disease (primary biliary cirrhosis, primary sclerosing cholangitis, sarcoid, hepatitis B or C virus, alcoholic cirrhosis, cryptogenic cirrhosis, autoimmune hepatitis, and hemochromatosis), chronic heart disease (congestive heart failure, cardiomyopathy), chronic lung disease (asthma, chronic obstructive airways disease, cystic fibrosis, bronchiectasis, idiopathic pulmonary fibrosis, and pneumoconiosis), chronic renal disease (chronic renal failure from any cause and Nephrotic syndrome), solid organ transplantation (heart, liver, kidney, and other), Hemoglobinopathies (sickle cell disease and other), splenectomy, and Congenital or acquired asplenia, or splenic dysfunction.[10,11]

1.2 Literature Review

In 2014 a cohort study was conducted to French pilgrims to evaluate the Knowledge, attitudes and practices about pneumococcal infection and vaccination by face-to-face questionnaire their result showed that A "total of 300 participants took part. Their overall knowledge about the severity of pneumonia and the existence of the vaccine was very low. Out of 101 participants who had an indication for pneumococcal vaccination, irrespective of their travel status, only 7% were advised to have the vaccine by their general practitioner".[12]

Tashani etal (2014) reported The lack of knowledge about pneumococcal infection at Hajj in French pilgrims corroborates results obtained from a survey of Australian pilgrims in 2013 [13]

We observed in 2013, similar a lack of knowledge about Middle East respiratory syndrome among French pilgrims [14] that was also comparable to the Australian data [15]. These results reinforce the need for better dissemination of information either during the pre-travel counseling or at the entry point of KSA [16]. Tour leaders may also play a significant role in promoting vaccination [17]

In other study reported the low rate of vaccination against pneumococcus among pilgrims prior to consultation at our specialized clinic is similar to that observed here in 2010 [18], 2011 and 2013.

Furthermore, in 2009 a cross-sectional study was done on hajj pilgrims to evaluate the knowledge and attitude of acute respiratory infection showed that the knowledge and attitude of preventable method was variable. It indicates that most of the participant agreed that face mask is a preventable method and only 10% choose hand washing as preventable method.[19]

Alqahtani et al(2016) reported in the study showed that less than half of Saudi pilgrims soughtpre travel advice before departing to Hajj. This rate was low compared to previous studies conducted among Arab pilgrims(including Saudi pilgrims) in 2006 and among Australian pilgrims in 2014. These studies found that 74% of Arab pilgrims and 65%of Australian pilgrims received some sort of health advice before departing to Hajj [14,20].

According to the study conducted by Ridda and his collaborators 2014, they concluded that at least one third of Hajj pilgrims are 'at risk' of pneumococcal disease either by virtue of age or pre-existing medical conditions, consideration should be given to vaccinating high risk pilgrims against pneumococcal disease. Other preventive measures such as smoking cessation, pollution reduction and vaccinations against influenza and pertussis should also be considered. Precisely defining the epidemiology of pneumococcal disease to identify an optimum vaccination schedule for Hajj pilgrims is a current research priority.[21]

It has been noted that very few studies have aimed to investigate pre travel advice-seeking behavior among Hajj pilgrims, yet these studies found that pre travel advice was significantly associated with positive health practices among pilgrims during Hajj [22,23,24,25]. This association has not been fully explored; therefore, more studies are needed to cover this knowledge gap.

2. Rationale:

In an effort to reduce infectious disease risks during Hajj, various preventative health measures have been introduced to Hajj pilgrims, lack of awareness is the main barrier of measures uptake and recommended to Preventive infection measures also incorporate low-cost measures such as hand hygiene and face-masks. Additionally, health authorities in pilgrims' countries oforigin are encouraged to provide health education this study aims to address this knowledge gap .

2.1 Aim of the study: To assessment of awareness and Attitude toward Prevention of Pneumococcal Infection and vaccination among Hajj and Umrah Pilgrims from Makkah in 2018.

2.3.Objectives:

- To assess the awareness and Attitude of Hajj and Umrah Pilgrims toward Pneumococcal Infection
- To assess the knowledge and attitudes of Hajj and Umrah Pilgrims toward towards pneumococcal vaccination

3. Methodology:

3.1Study design:

This study is a cross-sectional study design was used in carrying out of this study.

3.2 Study Area

The study has been carried out in the city of Makkah. Makkah is the holiest spot on Earth. It is the birthplace of the Prophet Mohammad and the principal place of the pilgrims to perform Umrah and Hajj. It is located in the western area in Kingdom of Saudi Arabia and called the Holy Capital. Contains a population around 1.578 million. This study was conducted conduct to pilgrims who resident in Makkah city during, during May 25, 2018 to 24 October 2018 Hajj 2018,the study has been conduct on a convenience sample of 500 pilgrims' residents in Makkah city matching the inclusion criteria and exclusion, it reflects a diversified demographic profile with a considerable portion of the pilgrims to perform Umrah and Hajj comes from rural descent, while others come from an urban one. This difference translates into biological, socioeconomic and lifestyle differences.

.33 .Selection criteria:

This difference translates into biological, socioeconomic and lifestyle differences

3.3.2Inclusion criteria:

- hajj pilgrims who agree to participate in the study
- Residency in In Makkah city .
- Over 40 years of age
- Able and willing to participate in the study.

3.3.3Exclusion criteria:

- Residency outside Makkah city .
- >60
- Pilgrims that refusing sign Informed consent.

3.4 The sample size

The sample size has been calculated by applying Raosoft sample size calculator based on (The margin of error: 5%, Confidence level: 95%, and the response distribution was considered to be 20%) accordingly to sample size from hajj pilgrims by the required sample size; (500). (male and female) and adding 10 more to decrease margin of error. After adding 5% oversampling, the minimum calculated sample has been 500. Computer generated simple random sampling technique was used to select the study participants. Data collection was done by the researcher during the 2018

4. Data collection tools of the study:

To collect data knowledge and attitude (KA) structured questionnaire was used. It was developed by the researcher after reviewing of current national and international related literature. It composed of 33 questions. This included the following parts:

Part one: biosociodemographic characteristics: as name, pilgrim number, age, sex, phone number, leader name, frequency of hajj, years of education, area of residence, and presence of chronic diseases as diabetic mellitus.

Part two: this part including questions to assess the knowledge, attitude and practices regarding pneumococcus and vaccination such as signs and symptoms of pneumococcus, mode of transmission, methods of prevention, high risk groups, and line of treatment. Questions concerning attitude and practices included pilgrim's hajj feeling, and community reaction toward people with pneumococcus infection, and sources of information about pneumococcus infection.

Following a short briefing about the study, informed consent will obtain from each participant who agreed to join the survey. Ethics approval will obtain from Zmzm charity research center. The study tool was developed by the researcher and checked for validity and reliability using Cronbash's alpha (r=0.76). Pilot study was done on 10 pilgrims Hajj to check and ensure the clarity, applicability and feasibity of tools. Pilgrims completed the surveys themselves; however, research team members helped those who were unable to complete the questionnaires themselves.

5. Data entry and analysis:

The Statistical Package for Social Sciences (SPSS) software version 24.0 has be used for data entry and analysis. Descriptive statistics (e.g., number, percentage) and analytic statistics using Chi-Square tests ($\chi 2$) to test for the association and the difference between two categorical variables were applied. A p-value ≤ 0.05 will be considered statistically significant

6. Pilot study

A pilot study has be conducted in hajj pilgrims the same sector due to the similarity to the target group using the same questionnaire to test the methodology of the study. As a feedback, the questionnaire will be clear and no defect has be detected in the methodology

7. Ethical considerations

Permission from the Makkah joint program Family Medicine program has be obtained. Permission from the Directorate of hajj, verbal consents from all participants in the questionnaire were obtained. All information was kept confidential, and results has be submitted to the department as feedback .

8. Budget: Self-funde

4. Results :

Table 1: distribution of participants according to socio demographic characteristics (Age, Sex, Hajj for, Level of education, Chronic diseases)

	N	%
Age		
<40	100	20
40-50	150	30
50-60	175	35
>60	75	15
Range	24-71	
Mean±SD	48.350±9.754	
Sex		
Male	295	59
Female	205	41
Hajj for		
First time	370	74
Second time	80	16
Third time	30	6
More than three	20	4
Level of education		
Illiterate	125	25
Primary School	55	11
Intermediate School	115	23
Secondary School	95	19
University School	60	12
Postgraduate	50	10
Chronic diseases?		
No	160	32
Yes	340	68

Regarding socio demographic characteristics, this table shows that the highest proportion of participants age 50-60 years (35.0%)and 40-50 years of age (30.0%), male (59.0%), Hajj for the first time (74.0%), Level of education (25.0%)Illiterate, have chronic diseases (68.0%

Table 2: distribution of the participants' knowledge about pneumococcal infection

	N	%
What are the signs and symptoms of pneumococcal virus		
Fever and chills	205	41
Cough	165	33
Cough that lasts longer than 3 weeks	20	4
Coughing up blood	30	6
Severe headache	60	12
Nausea	40	8
Weight loss	30	6
Fever	155	31
Fever without clear cause that lasts more than 7 days	25	5
Chest pain	95	19
Shortness of breath	125	25
Ongoing fatigue	100	20
Do not know	140	28
How can a person get pneumococcal virus?		
Through handshakes	90	18
Through the air when a person with corona virus coughs or sneezes	300	60
Through sharing dishes	75	15
Through eating from the same plate	45	9

Through touching items in public places (doorknobs, handles in transportation, etc.)	80	16
Do not know	200	40
How can a person prevent getting pneumococcal virus?		
Vaccination	100	20
prophylactic antibiotic	30	6
Avoid shaking hands	250	50
Covering mouth and nose when coughing or sneezing	300	60
Washing hands after touching items in public places	155	31
Closing windows at home	20	4
Through good nutrition	30	6
By praying	20	4
Do not know	160	32
In your opinion, who can be infected with pneumococcal virus?		
Anybody	260	52
Only poor people	50	10
Only homeless people	15	3
Only alcoholics	20	4
Only drug users	15	3
Only people living with HIV/AIDS	50	10
Only people who have been in prison	10	2
Do not know	200	40

	N	**%**
Can pneumococcal virus be cured?		
Yes	375	75
No	125	25
How can someone with pneumococcal virus be cured?		
Herbal remedies	60	12
Home rest without medicine	75	15
Praying	30	6
Specific drugs given by health centre	220	44
DOTS	40	8
Do not know	150	30
Do you feel well informed about pneumococcus?		
Yes	200	40
No	300	60
Who would you talk to about your illness if you had pneumococcal virus?		
Doctor or other medical worker	395	79
Spouse	130	26
Parent	80	16
Child(ren)	110	22
Other family member	95	19
Close friend	40	8
No one	10	2
What would you do if you thought you had symptoms of pneumococcus?		
Go to health facility	450	90
Go to pharmacy	25	5

Got to traditional healer	15	3
Pursue other self-treatment options (herbs, etc.)	10	2

This table shows that the highest proportion of participant reported fever and chills (41.0%), cough (33.0%), fever without clear cause that lasts more than 7 days (31%), do not know (28%), shortness of breath (25.0%) as the signs and symptoms of pneumococcal infection.

The virus can be transmitting through the air when a person with corona virus coughs or sneezes. (60.0%), while Avoid shaking hands were (50.0%) or washing hands after touching items in public places (31.0%) and vaccination (20.0%) can prevent exposure to virus. While (32.0%) don't know how a person can prevent getting pneumococcal virus.

In addition, the highest percentage of pilgrims agreed that anybody can be infected with pneumococcal virus (52.0%), pneumococcal virus can be cured (75.0%), report doctor or other medical worker if they had infection (79.0%), and go to health care facility (90.0%).

Table 3: distribution of participants' attitudes regarding pneumococcal infection

	N	**%**
Which statement is closest to you're feeling about people with pneumococcus?		
I feel compassion and desire to help	255	51
I feel compassion but I tend to stay away from these people	110	22
It is their problem and I cannot get TB	30	6
I fear them because they may infect me	75	15
I have no particular feeling	30	6
In your community, how is a person who has pneumococcus virus usually regarded/treated?		
Most people reject him or her	150	30
Most people are friendly, but they generally try to avoid him or her	200	40
The community mostly supports and helps him or her	150	30
Do you think that HIV positive people should be concerned about pneumococcus?		
Yes	325	65
No	175	35
Why YEs?		
Person with HIV is more likely to develop corona virus	440	88
Do not know	60	12
Why not?		
Person with HIV is not more likely than	195	39
Do not know	305	61
Do you wish you could get more information about pneumococcus?		
Yes	405	81
No	95	19
What would be your reaction if you were found out that you have pneumococcus?		
Fear	185	37
Surprise	60	12
Shame	30	6
Embarrassment	125	25
Sadness or hopelessness	100	20
In your community, how is a person who has pneumococcus usually regarded/treated?		
Most people reject him or her	155	31
Most people are friendly, but they generally try to avoid him or her	145	29
The community mostly supports and helps him or her	200	40

Regarding the participants feeling about people with Pnemocuccus virus , this table shows that more than half of them (51.0%) feel compassion and desire to help. Concerning the participants' community treatment for person who has Pnemocuccus virus , (40.0 %) reported thatthe Most people are friendly, but they generally try to avoid him or

her .three quarters of participants (65.0%) think that that HIV positive people should be concerned about Pnemocuccus virus and majority of them (81.0%) wish to get more information about Pnemocuccus virus. Less than half of them (37.0%) reported that they may feel fear if they were found out that having pneumococcus virus

Table 4:distribution of the sources of information about Pneumococcus

	N	**%**
What are the sources of information on corona virus?		
Newspapers and magazines	125	25
Radio	95	19
TV	245	49
Billboards	10	2
Brochures, posters and other printed materials	30	6
Health workers	110	22
Family, friends, neighbours and colleagues	195	39
Religious leaders	10	2
Teachers	10	2

Regarding the sources of information on corona virus respectively (49.0%, 39.0%, 25.0%) of participants reported that their sources of knowledge are TV, Family, friends, neighbours and colleagues and Newspapers and magazines.

Table 5: distribution of participant's total knowledge and attitude regarding Pneumococcus .

	N	**%**	**Range**	**Mean±SD**
Knowledge				
Weak	335	67	1-21.	8.155±3.011
Average	100	20		
High	65	13		
Attitude				
Negative	195	39	0-8.	3.944±1.098
Positive	305	61		

This table shows that the majority of participants (67.0%) have a weak knowledge while Range (1-21) Mean± SD (8.155±3.011). While more than half of them (61.0%) have a positive attitude about the disease, while Range (0-8) Mean± SD (3.944±1.098)

Figure (1) distribution of participant's total knowledge regarding Pneumococcus

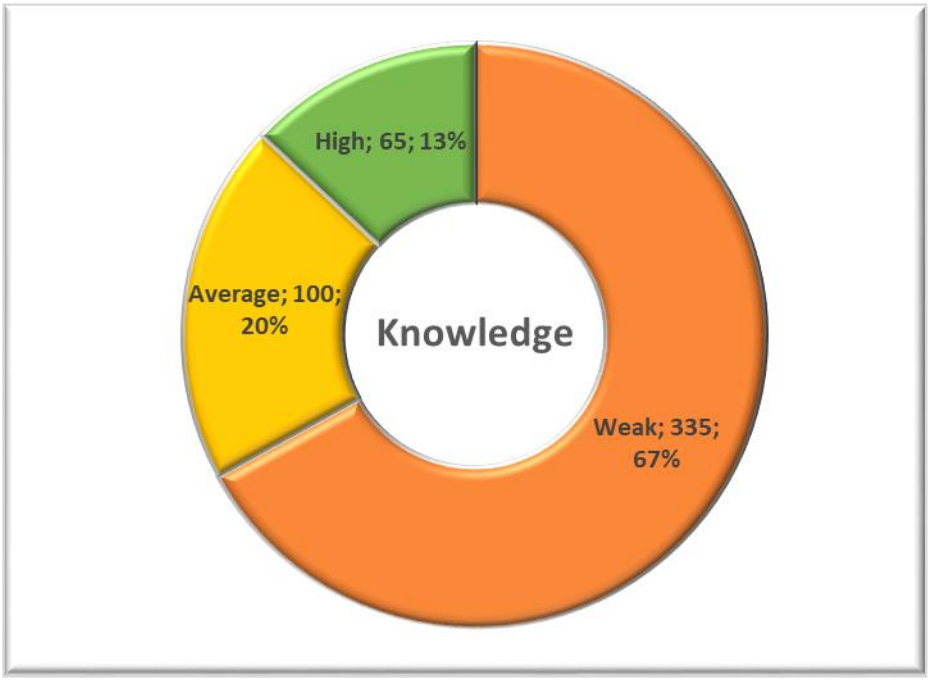


Figure (2) distribution of participant's total attitude regarding Pneumococcus

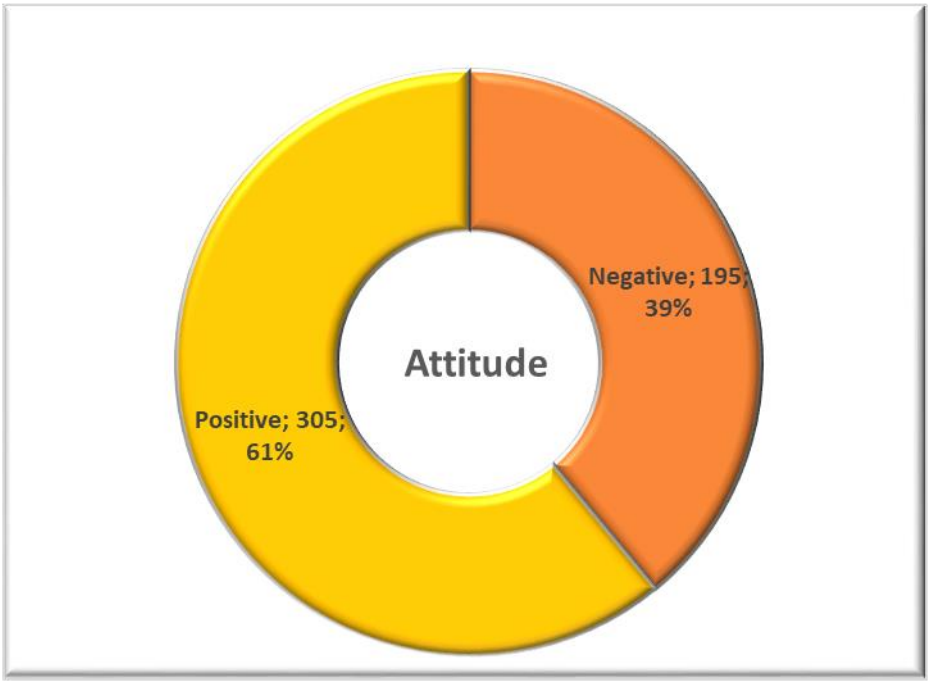
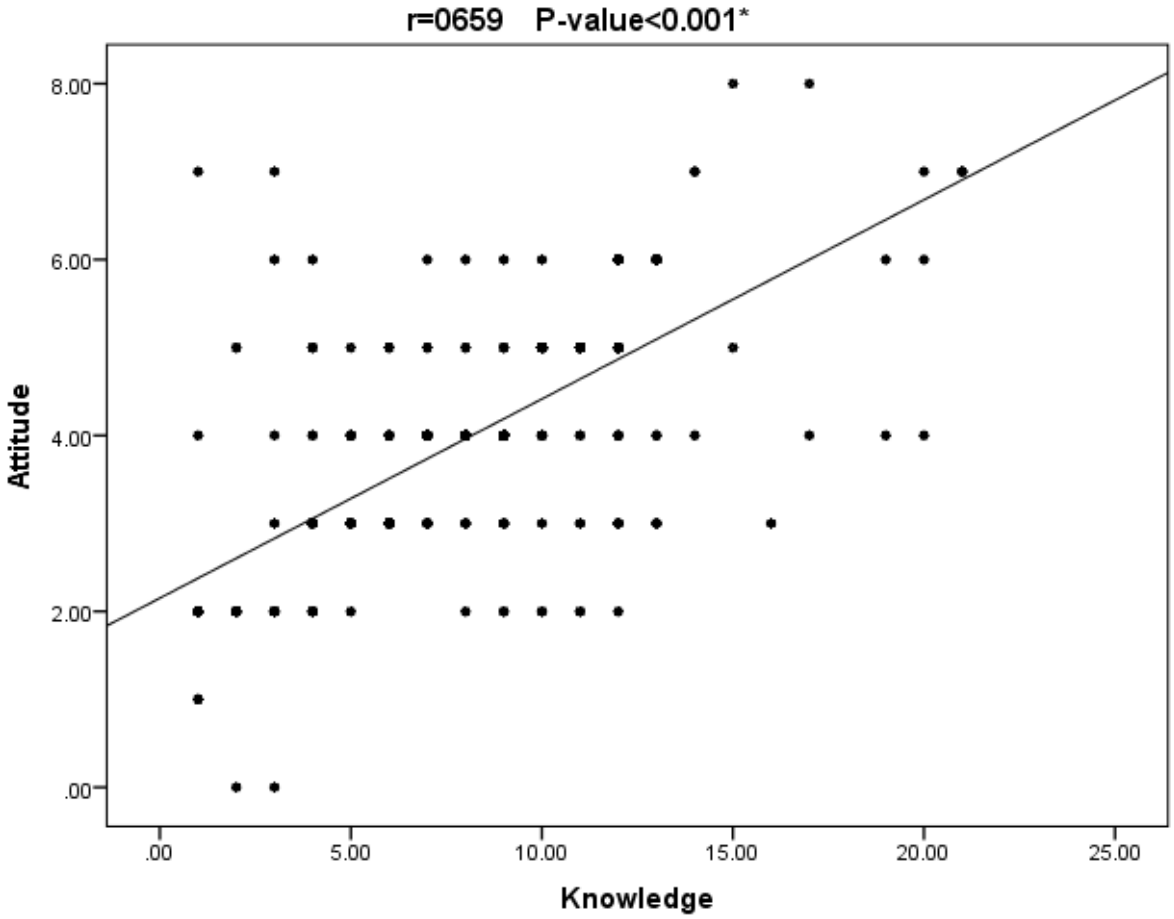


Figure (3)correlation between knowledge and attitude

This table shows a significant correlation between level of knowledge and attitude. were r= 0.715 and P= 0.001.



5.

Discussion:

The annual Hajj has been connected with a wide range of viral and bacterial upper and lower respiratory tract infections [26]. Pneumonia is a common reason for hospitalization [27]. The probable incidence of respiratory tract infections amid pilgrims ranges from 20 to 80 percent[28,29]. Understanding the diseases, their causative agents, and modes of transmission can help manage and avoid them.

An earlier study with 200 suspected pneumonia patients concluded that direct laboratory examination of sputum and leukocyte count must be implemented consistently in patients with suspected pneumonia as leukocyte (>25) and epithelial (<10) counts in sputum samples per low-power field seem to be the most significant criterion for expecting a positive culture [30]

performing Hajj rituals is a risk factor for pneumococcal acquisition .Numerous studies have shown a high prevalence of respiratory symptoms among pilgrims. Respiratory viruses, especially influenza virus, rhinovirus and Streptococcus pneumonia infections are the most common cause of acute respiratory infections among pilgrims.[14,27] The lower pneumococcal acquisition might be caused by several reasons. One of the possible reasons be lack of pilgrim Hajj about the disease; causes, mode of transmission, clinical manifestation, high risk groups, ways of prevention and line of treatment. In addition to negative attitude toward the disease. Therefore, this study aimed to assess of awareness and Attitude toward Prevention of Pneumococcal Infection and vaccination among Hajj and Umrah Pilgrims from Makkah in 2018. (31,32)

The results of the study revealed weak level of knowledge were (67.0%)and positive attitude were (61.0%) toward pneumococcal infection with a significant correlation between knowledge, attitude regarding pneumococcal infection and education. This results was in line with Zhang et al (2016) who conduct a study entitled with vaccination knowledge, attitude and practice among Chinese travelers who visit travel clinics in Preparation for international travel and found a low level of knowledge regarding vaccination as a protective measure among participants[33]

The results are also supported by Dumyati, et al (2018) who found that there were unsatisfactory level of knowledge, practice an attitude of Algerian Hajj Pilgrims about Pneumococcal Infection with a correlation between knowledge and education, area of residence. They recommend that before Hajj doctors must teach and inform all the participants about how to deal with any infectious disease, particularly pneumonia.[34]

Sahin et al (2015) study results was consistent with the study finding. They revealed that half of the participants realized the importance of protective measures against respiratory infections such as hand washing, mask use and avoiding contact with sick people.[35]

6. Conclusion

Pneumonia is a main source of serious disease during Hajj and occurs among considerable crowding and pilgrim density. Improved efforts at avoidance for patients at risk prior to Hajj and additional attention to physical crowding during Hajj can reduce this risk. pilgrims should strictly adhere to preventive measures.

Severe pneumonia amid Hajj is associated with substantial comorbidities and these may be helpful in recognizing patients at increased risk prior to travel to Saudi Arabia.

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