Assessing the Understanding and Perception of the Significance of Seasonal Immune Care among the Taif Population during the Pilgrimage Seasons: Emphasis on Influenza and Meningitis Vaccines

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Abstract

Background: A vaccine contains a disease-like agent, often consisting of the microbe, its toxins or one of the surface proteins, which is weak-ended or killed. The components of the vaccine trigger and encourage the body to recognize the vaccine as a foreign body. A vaccination is critical when considering the number of mortalities, accidents and complications for non-vaccine recipients.

Objectives: The current study aimed for the evaluation of the prevalence of understanding among the Taif population of the importance of seasonal immunization, particularly influenza and meningitis vaccines, during Omrah and Hajj seasons.

Methods: A cross-sectional study conducted in the province of Taif using an online questionnaire to determine the level of awareness and knowledge among public individuals about influenza and meningitis vaccines. About 467 responses were included in the study.

Results: The results of the current study showed high knowledge regarding the significance of seasonal immunization among the general population although the majority of the population (i.e., 68.7%) do not have health-related backgrounds. It showed that 66.17% of participants were conscious of the effects of seasonal immunization. The study showed a considerable increase in the number of people who knew the purpose (i.e., 90%) compared with only 10% who were not aware. Moreover, approximately 78.80% of the participants reported that the key reason for seasonal immunization before and during the pilgrimage seasons was diseases transmission. The results showed that there were no significant differences in the population the danger of seasonal flu and its immunization (i.e., 50%). Nevertheless, with respect to the risk of meningitis and if immunization with meningitis should be required, the findings were substantially high. Around 88% of the population accepted that meningitis is dangerous and vaccination is necessary.

Conclusion: The level of awareness about influenza and meningitis vaccination is comparatively high, while the commitments to seasonal immunization are fairly low. In order to increase annual seasonally vaccinated need, more information is needed and explanations of the low level of the side effects after immunization. For the seasonal vaccination recommendations, the attention of health officials is vital to enhanced protection for communities during pilgrimage seasons.
INTRODUCTION

A vaccine is biologically produced to enhance immunity to a particular disease, according to the World Health Organization (WHO). A vaccine usually includes a micro-organism-like agent that often has the microbe, its toxins, or its surface proteins, weakened or killed [1]. The vaccine components activate and then prompt the body’s immune system to identify the vaccine as a foreign body. Thus the immune system can easily recognize and kill the microorganism by using the vaccine to prevent infection [2]. All vaccinations must undergo lengthy and meticulous reviews by scientists, doctors and the federal government to ensure that they are safe for the public. Vaccines, however, have side effects, which can be the case with any medication [2,3]. Childhood vaccination is seen as an important and effective way to minimize infectious disorders and infancy death rates. For example, if we consider meningitis, the rates and number of cases of bacterial meningitis have declined very steadily since the pneumococcal vaccine became available [1]. Certain vaccines showing notable changes in vaccine numbers include Hemophilus influenza type B and most pneumococcal serotypes [1]. In fact, vaccines not only reduce the number of outbreaks but have also been proven to be effective in preventing mortality and reducing hospital admissions and are a cost-effective means of preventing serious infectious disease and their complications [4,5].

A vaccine is significant if the numbers of deaths, injuries and complications among those who have not received the vaccine are considered. Almost 2.5 million deaths per year (i.e. mainly among children under 5 in Africa and Asia) from diseases than can be prevented by using vaccine [6,7]. One of the highly epidemic seasonal infections is influenza, which is a serious infection of the respiratory tract and is considered a worldwide public health problem. Strains resistant to the approved antivirals can grow and spread abruptly, causing an outbreak [8]. Moreover, existing trivalent and/or quadrivalent influenza vaccines are distributed over seasons and are based on annual forecasts and guidelines from WHO influenza experts and physicians. Such recommendations are based on globally reported circulating influenza strains [6,7,8,9] months before the targeted season. [9,10]. Another highly epidemic and dangerous infection is meningitis, which refers to inflammation influences the meninges [11]. It is typically an infectious, fungal or bacterial infection. The most common type of meningitis occurs during the summer and fall due to a viral infection. The signs may include nausea, sleepiness and headache. Other meningitis symptoms that can be caused by bacterial infection occur unexpectedly, including headache, fever, chills, stiff neck, bruises (purple skin areas), nausea, vomiting, and light sensitivity [11]. The meningitis vaccine is designed to reduce disease incidence, and its complications and the type of vaccine depends on the organism that caused it [12].

In the Kingdom of Saudi Arabia (KSA), transmission of respiratory pathogens, particularly influenza, is a widespread phenomenon in holy cities, such as Makkah and Al-Madinah, during religious mass gatherings. That is a major problem for public health [13]. Throughout the month of Ramadan, Umrah, and during Hajj pilgrimages, millions of Muslims from highly diverse geographical regions visit these holy places through the international airport, mostly via Jeddah, Madinah and Taif cities. Sometimes, these individuals remain in contact with each other for an extended period that can be up to one month. This could introduce many species and not only new or highly pathogenic strains but also the resistant viruses into Saudi Arabia, particularly during peak influenza seasons [13]. Therefore, measuring the rate of flu and meningitis vaccinations among the general population and health workers in KSA is essential. It is well-established that all

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healthcare professionals (HCPs) are advised to take influenza vaccination [14,15,16]. Nonetheless, HCP vaccination rates are low, which may be due to uncertainty regarding the vaccine value and the fear of its negative effects. [14,15,16]. Similarly, a number of studies have been done on the evaluation of meningococcal immunization among HCPs. In 2018, a study by Badahdah, A. M. et al. focused on assessing the main factors that affect health workers’ immunization rate during the Hajj seasons, particularly estimating the usage rate of compulsory meningococcal vaccines. The study was conducted among HCWs during the Hajj of 2015–2017 or visited hospitals and health facilities in Makkah and Mina [17]. The study showed that the three vaccines were only received by 11.6% of the participants, pneumococcal vaccine (13.8%), in-fluenza (68.1%) and meningococcal (76.1%). In addition, about 78.8% of participants believed that the key purpose for getting the vaccine was the ability to obey the advice from the health authorities, but the main reason for failure was that they were up-to-date on vaccination (39.8%). Many HCWs in Hajj lack the strongly recommended and necessary vaccines, and a main obstacle is their lack of awareness. Strict approaches may be required to boost their health education and thereby increase the vaccination rate [17].

Some studies focused on determining health workers’ level of knowledge of preventive action for communicable diseases among pilgrims and highlight the challenges that HCWs face at the point of entry with the implementation of preventive action. A study by Al-Ghamdi, A. S. and Kabbash, I. A. (2011) was done during the Hajj season at the King Abdulaziz International Airport Hajj Terminals in Jeddah, KSA. HCWs had difficulties with refusing vaccine or phylaxis by certain pilgrims, language differences and pilgrim organisation. Many HCWs have replied correctly to the various elements related to meningococcal meningitis except for preventative measures for children and infants. Fewer than half knew the time limit and steps needed for non-vaccinated pilgrims in relation to the yellow fever vaccine certificate [18]. Only 32.9% knew about the preventive measures to be taken to combat influenza A (H1N1). Doctors, those who read instructions and individuals with a high degree of expertise have shown considerably better knowledge than other groups [18]. Additionally, another study by Al-Asmary, S. et al. (2007) estimated the duration and efficacy of preventive measures, including influenza vaccination, in the 2005 season among 250 employees of Taif Armed Forces Hospitals and Alhada Armed Forces Hospitals during a Hajj medical mission, in the section of Acute respiratory tract infections (ARI). They found that in the Hajj season or two weeks before the return, the attack rate for ARI was 25.6%. A logistic regression analysis of the factors involved in ARI acquisition showed that pilgrims’ contacts faced an extreme risk of infection of 95%. Additional risk of acquiring ARI is eight times lower for people who always use alcohol for hand disinfection (95%) [19]. The logistical regression model has inadvertently shown that Saudi nationals have a three times higher risk of ARI than non-Saudi nationals (95%) [19].

For the seasonal vaccine during the pilgrimage seasons to reach a good percentage of coverage, the myths and malpractices toward vaccines should be eliminated. Instead, a good awareness campaign should be initiated to share knowledge. Even though general knowledge about seasonal vaccinations among HCW was studied, knowledge of the significance of seasonal immunization, particularly during the Hajj and Umrah seasons among the public, was not well studied. In particular, the immunization rate for people in the Makkah region needs to be studied. Therefore, the current research intends to assess the awareness and understanding, among the general population in Taif city, Saudi Arabia, of the importance and practice of seasonal immunization, particularly against meningitis and seasonal influenza during the Umrah and Hajj seasons.

2 | MATERIALS AND METHODS:

A cross-sectional study conducted in the province of Taif using an online questionnaire to determine the level of awareness and knowledge among public individuals about influenza and meningitis vaccines. The research took place between February and April 2019. The target population included all the residents of Taif province in the city and the rural areas.
People of all genders and nationalities participated and filled out our questionnaire. The sample size would have been 467 responses. The data obtained for the study were entered into the computer program. The online questionnaire form was distributed to all the residents of Taif using social media. To assess the characteristics of the included population, the questionnaire queried about the personal details (i.e. age, gender education level). The questionnaire also covered other questions about meningitis and influenza vaccinations, the risk of vaccine, side effects and the participant’s source of vaccination information. Participants were also questioned about the significance of vaccines and whether vaccination should be avoided due to common misconceptions.

3 | SYSTEM OF DATA ANALYSIS:

The Statistical Package for the Social Sciences (SPSS–version 21.0) was used to analyze the data from our population. Table display the characteristics of our population, age, gender and educational distribution. T-test was used to demonstrate our study’s significant findings and to relate awareness rates with age, gender, nationality, source of information and marital status.

4 | ETHICAL CONSIDERATIONS:

The ethical research committee of Applied Medical Sciences College at Taif University, Saudi Arabia approved the research. The questionnaire stated the intent of the analysis and clarifying that the data will be handled confidentially and used only for scientific purposes.

5 | RESULTS:

A total of 467 responses was analyzed, of which 83.1% came from Taif city and 16.9% from rural Taif. Saudis represent 94.6%, females 69.6%, and singles 64.5% (Table 1). The age of participants showed that about 58.89% was at the age of 18–25 years old, 18.63% were 26–35 years old and 19.49% were 36–49 years-old (Table 1). The majority of the sample (64%) had a bachelor’s degree, 26.1% had a high school diploma, 6% a diploma, and 3.85% a higher education. Almost 64.03% of the participants were bachelor’s degree holders; 68.74% of the participants were from non-health fields, and 31.26% were from a health-related background (Table 1).

Table 1: The research population socio-demographic data

<table>
<thead>
<tr>
<th>Socio-demographic data of the study population</th>
<th>Questions</th>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nationality</strong></td>
<td>Saudi</td>
<td>442</td>
<td>94.65%</td>
</tr>
<tr>
<td></td>
<td>Non-Saudi</td>
<td>22</td>
<td>3.23%</td>
</tr>
<tr>
<td><strong>City</strong></td>
<td>Taif</td>
<td>388</td>
<td>82.09%</td>
</tr>
<tr>
<td></td>
<td>Taif villages</td>
<td>79</td>
<td>16.92%</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td>Male</td>
<td>142</td>
<td>30.41%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>325</td>
<td>69.59%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>18–25</td>
<td>275</td>
<td>58.89%</td>
</tr>
<tr>
<td></td>
<td>26–35</td>
<td>87</td>
<td>18.63%</td>
</tr>
<tr>
<td></td>
<td>36–45</td>
<td>91</td>
<td>19.49%</td>
</tr>
<tr>
<td></td>
<td>Over 50</td>
<td>14</td>
<td>3.06%</td>
</tr>
<tr>
<td><strong>Social status</strong></td>
<td>Single</td>
<td>301</td>
<td>65.51%</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>162</td>
<td>34.49%</td>
</tr>
<tr>
<td><strong>Educational level</strong></td>
<td>High school</td>
<td>152</td>
<td>32.12%</td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>28</td>
<td>6.06%</td>
</tr>
<tr>
<td></td>
<td>Bachelor’s degree</td>
<td>299</td>
<td>64.03%</td>
</tr>
<tr>
<td></td>
<td>Higher education</td>
<td>18</td>
<td>3.85%</td>
</tr>
<tr>
<td><strong>Work and study field</strong></td>
<td>Health field</td>
<td>146</td>
<td>31.26%</td>
</tr>
<tr>
<td></td>
<td>Non-health field</td>
<td>321</td>
<td>68.74%</td>
</tr>
</tbody>
</table>

Knowledge about the importance of seasonal immunization has been asked of the population, and about 74.95% of participants showed their awareness of the significance of seasonal immunization. This result significantly higher in the currently surveyed population compared with 25% of the population who did not know about the importance of seasonal immunization ($P < 0.05$) (Figure 1). The subsequent question sought to know if they took seasonal immunization. The result showed that about 62.53% of the participants were not taking this kind of immunization. However, this result was considerably higher compared to people who take the seasonal immunization (i.e., 37. 47%, $P < 0.05$). Furthermore, the result presented that about 31.26% of the population was annually taking seasonal immunization compared with 68.74% who were not taking any (Figure 1). Collectively, almost a half percent of people who knew about the significance of seasonal
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immunization (i.e., 74.95%) were encouraged to take these immunizations as the result showed 37.47% and 31.26% were annually taking the seasonal immunization (Figure 1).

The contraindications of immunization were taking place in the current study, as answering the questions could help to evaluate the reasons behind not taking the seasonal immunization. The results indicated that about 66.17% of participants were aware that there are side effects associated with taking seasonal immunization and 33.83% of the population agreed that there is no side effect for vaccinations (Figure 2A). This result was significantly high using the statistical examination ($P < 0.05$). With regard to evaluating types of temporary contraindications for vaccinations, the results showed no significant variations in the current population that participated in the study. It presented about 48.61% of the population who knew about the immunization contraindications compared with 51.39% of the population who were not aware of it (Figure 2A). The knowledge of possible contraindications of immunization was also analyzed in the study. The results showed that about 42.40% of the population determined that pregnancy and breastfeeding were contraindications. The other reasons showed that chronic disease 27.91% and 22.91% for the reason of taking medications (Figure 2B). The ability of the population to find information on vaccinations against common diseases was also determined. The results showed that 54.2% searched for information on vaccination while 45.8% of the population did not search for information on vaccination (Figure 2A). This result showed there are no significant differences between the above-mentioned groups ($P > 0.05$). About 72.2% indicated that the vaccination information was provided by their family physician. Nevertheless, 50.1% got their information from the doctor, 30.6% from the media, 15% from friends, and 4.3% from others (Figure 2B).
Focusing on the need for seasonal immunization during the Hajj and Omrah periods, the population were asked about their awareness of the purpose of immunization before and during the pilgrimage seasons. The results showed a considerable higher in the population of those who knew about the purpose (90%) compared with only 10% who were not aware of the purpose \((P<0.05)\) (Figure 3A). In addition, almost 78.80% of participants believed that disease transmission is the main reason for taking seasonal immunization before and during pilgrimage seasons. In addition, 19.7% believed it was to prevent the generation of a new disease during these seasons (Figure 3B). Based on the literature, seasonal flu and meningitis are the most prevalent diseases that could be transmitted and elevated during their seasons, especially among pilgrims. In addition, as the current study took place in Taif city, which is a part of the Makkah region that accepts millions of pilgrims every year, it was important to evaluate the knowledge of the danger of the seasonal flu and meningitis during the pilgrimage. The results showed that there were no significant differences in the population regarding the danger of seasonal flu and its immunization. About 50% of the population agreed that seasonal flu is dangerous and immunization should be taken. However, the results were significantly high regarding the danger of meningitis and whether immunization against meningitis should be taken \((P<0.05)\). It showed that about 88% of the population agreed that meningitis is harmful and immunization is important (Figure 3A).

6 | DISCUSSION:

Determining the level of understanding is seen as the key phase in planning any action to improve understanding of any issue. It is, therefore, essential to consider popular concepts to assess the possible effects that may result from improper conduct. The current study was keen to assess the prevalence of understanding about the significance of seasonal immunization during the pilgrimage seasons, particularly flu and meningitis vaccines, among the Taif city population.

According to the Saudi authorities, to obtain a visa for entry, pilgrims should submit evidence of the conjugated meningococcal ACW135Y vaccine given at least ten days before arrival in Saudi Arabia [20]. However, how can we assess the commitment to these immunizations among people who live inside Saudi Arabia, especially the Makkah region? Therefore, this study took place in Taif city, which is near to Makkah and is considered to have a high disease transmission incidence during the pilgrimage seasons.

Saudi Arabia is the venue of the biggest gatherings in the world, receiving millions of Hajj and Umrah pilgrims from all over the world annually [15]. As previously mentioned, studies have been carried out in KSA, focused on the knowl-edge and acceptance of health workers regarding immunization against the seasonal flu [14,16,18] and meningitis [17,18,21]. However, the level of knowledge among the general population about...
the significance of being immunized during the pilgrimage seasons had not been assessed. Thus, the current study could provide a clear understanding of seasonal immunizations among the Taif population during the Hajj and Umrah seasons. However, the results of the current study showed high knowledge regarding the significance of seasonal immunization among the general population although the majority of the population included in the current study (i.e., 68.7%) do not have health-related backgrounds. It showed that about 74.5% of the participants agreed with the need for seasonal immunization. However, although there is a good understanding of the benefits of seasonal immunization, the ability of participants to take these vaccines was low compared to those who could actually take these vaccines. Only 37.4% were able to take these vaccines. In addition, these results were also correlated with the percentage of the population who annually take seasonal vaccines (i.e., 31.3%). Collectively, almost half the percentage of people who knew about the significance of seasonal immunization (i.e., 74.95%) were encouraged to take these immunizations, as the result showed that 37.47% and approximately 31.26% were annually taking seasonal immunization. In agreement with our results, low rate of vaccination has been identified (i.e. 20% of adults) [22]. European WHO countries with recommendations of influenza vaccine record vaccine uptake levels below 40% [23], but in studies carried out in France much lower rates were recorded (32.5%) [24], Ireland (29.1%) [25] and Germany (23%) [26]. Collectively, although there is high knowledge of the importance of seasonal vaccines, the population is still not taking them.

Subsequently, the present study was also profound in evaluating the possible factors that could help explain the reasons behind not taking the seasonal immunization. Knowing the side effects of immunization could be an important factor that could discourage the taking of seasonal immunization. Thus, the current study found that 66.17% of participants were aware that there are side effects associated with seasonal immunization and 33.83% of the population agreed that there is no side effect for vaccinations, which could be correlated with the above finding of the percentage of people who take seasonal vaccines annually (i.e., 31.26%). In addition, the other factor could have effect on seasonal vaccines, and that factor could be related to temporary contraindications. Therefore, the knowledge of possible contraindications of immunization was also analyzed in this study. The results showed that about 42.40% of the population determined that pregnancy and breastfeeding are a cause of contraindications. Thus, this result in correlation with 69.59% of participants was female. The other reasons showed that chronic disease (27.91%) and 22.91% for the reason of taking medications.

The other factor that could help increase the percentage of those who take seasonal vaccines is providing information related to seasonal immunizations. Thus, the ability of the population to find information on vaccinations against common diseases was also determined. The results showed that 54.2% searched for information on vaccination while 45.8% of the population did not search for information on vaccination. More specifically, about 72.2% indicated that the vaccination information was provided by their family physician. Nevertheless, 50.1% got their information from the doctor, 30.6% from the media, 15% from friends, and 4.3% from others. Moreover, the results agree with the study by Alqahtani A. S. et al. (2017) that the majority of participants indicated that healthcare workers’ advice was the most reliable source of information [16]. Thus, collectively, more information about the needs for seasonal vaccines and explaining the low levels of side effects after immunization is required to increase the demand for annual seasonal vaccination, particularly during the Omrah and Hajj seasons. That would help reduce the occurrence of disease. Focusing on the need for seasonal immunization during the Hajj and Omrah periods, the population was asked about their awareness for the purpose of immunization before and during the pilgrimage seasons. The study showed a considerable increase in the number of people who knew the purpose (i.e., 90%) compared with only 10% who were not aware. In addition, almost 78.80% of the participants stated that disease transmission is the main reason behind seasonal immunization before and during the pilgrimage seasons. In addition, 19.7% believe vaccination is meant to prevent the generation of a new disease during these seasons. These findings could be correlated with the study
by Abu-Rish et al. (2016), which stated that concern on vaccine safety and efficacy has been the biggest obstacle to vaccination for adults and children, while recommendations made by the physician and funding from the Government have been the most reliable predictors of potential vaccination for adults and children. The availability of vaccine within the national vaccination programme was a significant determinant of the vaccinated acceptance among children [22]. Additionally, the present study is also in line with the study carried out in Saudi Arabia regarding influenza vaccine awareness, which showed that about 84.5% of participants understood that the vaccine is a safe and effective means of preventing infectious diseases [16]. Approximately 52.9% of participants (52.9%) known that receiving the vaccine is the best way of preventing the disease. The immunised participants showed that their knowledge regarding the seasonal influenza vaccine is better than non-immunised individuals [16].

In the current study, it was important to evaluate the knowledge of the danger of the seasonal flu and meningitis during the pilgrimage seasons. The results showed that there were no significant differences in the population regarding knowledge of the danger of seasonal flu and its immunization. About 50% of the population agreed that the seasonal flu is dangerous and immunization should be taken. However, the results were significantly high with regard to the danger of meningitis and whether immunization against meningitis should be taken. It showed about 88% of the population agreed that meningitis is harmful and immunization is important. Overall, although the commitments to have the seasonal immunization are relatively low, the level of knowledge about vaccination for influenza and meningitis is relatively high. Even though KSA has seen a number of meningococcal disease outbreaks, most respondents who have been vaccinated in this study were not vaccinated in accordance with Saudi MOH recommendations. This result agrees with the study by Badahdah, A. M. et al. (2019) on the level of vaccination among pilgrims inside KSA, which showed that the shortage of knowledge is the main obstacle behind missing the mandatory meningococcal vaccine by most national pilgrims [21]. The accordance with pilgrims' vaccination guidelines among pilgrims from abroad (or a considerable distance from Makkah) was enhanced by the prescription of pre-Hajj training. Hence, strict approaches to healthcare education can be necessary to improve the vaccination rate. In addition, continuous monitoring of vaccination procedures is required. The present study emphasized some preventive measures, particularly among non-physicians, highlighting the importance of pre-Hajj training courses.

The study concluded that knowledge alone is not enough to increase the uptake of influenza and meningitis vaccines. Thus, despite the acceptance of and participation in influenza and meningitis vaccinations, only a low percentage of the population of Taif in KSA is vaccinated against the seasonal flu and meningitis. The commitment of health policymakers is needed to enhance the compliance of communities with the seasonal vaccination guidelines during the pilgrimage seasons. Moreover, a continuous review of immunization activities and more awareness campaigns in the future are required.

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