



Preparedness and Performance of Health Care Workers Participating in Hajj season on the implementations of International health Regulations, Immunizations and Preventive health measures against Infectious diseases at King Abdul Aziz International Airport

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Abstract

Background: The unique mass gathering of hajj represent substantial international public health burden with subsequent challenge for the health authorities in the host country. In this respect, Saudi Arabia, through updated comprehensive plan is providing preventive as well as curative services to more than two million pilgrims every season. To achieve this, a large number of health workers are moved to cover health services throughout the whole path of the pilgrims. Preparedness and compliance of the health workers to the guidelines are crucial for successful outcome. As there is paucity of researches in this era, the current study aim at assessment of the preparedness and compliance of the health workers at one of the main entry gates during hajj season in 1436 H /2015

Subjects and Methods: Through a cross section design, a sample of 112 health workers sharing work at King Abdul Aziz international airport during hajj were interviewed using semi structured questionnaire reflecting their preparedness to participate in work at airport as well as observing their compliance to guidelines while providing international recommended tasks.

Main Results: Most of the participants (88; 78.6%) received recommended immunization before hajj, only one quarter of the participants previously attended training courses about international health regulations (25; 22.3%) and personal preventive measure (33; 29.5%). Their overall response to key items reflecting their preparedness to provide adequate preventive measures accounted for 55.5%; the participants who attended training courses before hajj had significantly better achievements. All health workers were checking immunization cards for each pilgrim (111; 99.9%), most of them were wearing gloves (94; 83.9%) and only one half of them (56; 50.9%) were fitting face masks properly.

Conclusion and Recommendations: Although that the participants showed fair preparedness to work in King Abdul Aziz international airport during hajj season, better achievement was observed among those who reported that they had received training courses about international health regulations and personal preventive measures before attending Hajj season, which calls for the necessity of future mandatory enrollment in such training courses for all health workers before sharing work in hajj.

Keywords: Preparedness, Performance, Health Care Workers, Immunizations, Preventive Health Measures, Infectious Diseases.

Introduction

Hajj is the largest annual religious mass gathering where more than two million Muslims from over

160 countries travel to Makkah at certain days of the year to perform their rituals⁽¹⁾. Even though this enormous number of international travelers

can introduce any infectious agents they may harbor⁽²⁾, yet It is not only the number of pilgrims that matter, but also the wide variety of health risks which put the health authorities in the Kingdom of Saudi Arabia at a real challenge. Among the health risks, infectious diseases come on the top, as the pilgrims are usually coming from countries where a lot of endemic communicable diseases are prevalent⁽³⁾. To face this challenge, the ministry of health put annually updated preventive plan based on the conventional spread of communicable diseases worldwide. This plan is principally targeting prevention of imported infectious diseases⁽¹⁾. In this respect, airports are considered as the frontier gates where proper international public health measures are likely to reduce the possibility of allowing the entrance of communicable disease to a country⁽⁴⁾. The King Abdul Aziz international airport is the main entry port for pilgrims which accustom 80.000 passenger at one time. About 600 employees of different jobs are recruited from the ministry of health, where they are designated at different parts of the airport including entry hubs. Health workers at the entry hubs are responsible for applying the International health regulations regarding screening of the pilgrims for certain recommended issues such as checking the immunization cards and ensure applying preventive medicines and immunization, in addition, pilgrims who are apparently ill are referred to be seen by a physician. Alongside, the health workers have to adhere to the recommended guidelines to protect themselves against acquiring any infectious diseases.

The role of health care providers at the hubs is critical. Despite its importance little had been done to ensure their performance, therefore the current study aim at evaluating preparedness of the participants to their tasks and the level of adherence to guidelines in their performance.

The study attempts to answer the following questions:

- Are the participants adequately prepared to apply the international health preventive

measures as abide by the international health regulations ?

- To what extent their performance achieve the screening of the coming pilgrims?
- Are they strictly adhere to guidelines regarding protecting themselves against potential hazards of communicable diseases?

Subjects and Methods

Study Design

This study is a cross-sectional study that was conducted during the pilgrims' arrival period between first and fifth day of Thul-Hija, 1436, at King Abdul Aziz International Airport, Saudi Arabia.

Population of the study and sampling

There are 14 hubs, which represent the first exit point for pilgrims, at each hub there are 6-13 health workers distributed proportionally according to the expected work load at each hub; making a total of 245 health workers. Each group is considered a team that constitute chiefly of at least one physicians and the rest are either nurses or health inspectors. To cover 24 hours work, there are two 12 hours' shifts; making a total of 28 shifts daily.

The sample size was based on assumption that the 0.5 of the participants were adequately prepared to take over work in the airport, with an acceptable level of variation ± 0.05 , and at a confidence level of 95%, the sample size accounts for 112, which is almost one half of the total number of health workers.

To facilitate sampling and ensure the representativeness of different health workers' jobs, the selection was based on the shifts, as half of the population of study is required, one half of all the shifts was assigned randomly, as seven morning shifts and seven night shifts. All health workers in each shift were invited to be enrolled in the study.

Tool of the study

A semi-structured questionnaire was constructed to collect relevant data. The questionnaire included closed-ended as well as open-ended

questions. It covers three main aspects, demographic characteristics, previous training such as attendance of training courses related to hajj, and adherence to self protective guidelines. The questionnaire was constructed in Arabic language and piloted on 20 individuals. All questionnaires were filled out during personal interviews. The interviews were conducted by the researcher and three trained assistants. Notes of the open-ended responses were taken while the participants were practicing at the hubs.

Results

Almost all participants at King Abdul Aziz international airport were Saudis (96.4%), their mean age was 34.9 ± 7.4 years which ranged between 23-56 years; who were mainly had Diploma degree (78.6%) with only one who had PhD degree. Health inspectors constituted more than one half of them (54.5%) followed by nurses (38.4%) while physicians formed only 4.5% of the participants [Table 1].

More than one half of the participants were recruited from Riyadh 63(56.3%) followed by Jeddah 15(13.4%) while the rest were recruited from other areas such as Hail 9(8.0%) Al Qaseem 7(6.3%) and Dammam 7(6.3%).

Regarding preparedness of the participants for sharing in services provided to pilgrims in the airport; as shown in [Table 2], it was realized that despite most of them (78.6%) indicated that they received recommended immunizations for health workers sharing in hajj, and 72.3% reported that they passed training course about CPR, only one half of them (55.4%) pointed that they had read about international health regulations and a much lower percentage (22.3%) attended previously training course about these regulations. Less than one third of the participants (29.3%) attended training courses about personal protective measures while dealing with crowd of pilgrims in the airport, and 40.2% of them received formal training about how to fix the face mask. As work with different parties in the international airport needs additional skills, the participants were

verified for being prepared for such tasks; only one third of them (36.6%) addressed that they had been acquainted about work in the airport before being enrolled in work, and few minority (13.4%) said that they had attended training course about communication skills and how to deal with different parties in the airport.

To ensure preparedness of the participants for dealing with different recommended preventive measures, they were asked to respond on selected key aspects as shown in [Table 3]. Only one quarter of the participants (25.9%) knew that the first thing to think about when facing a possible case of Ebola is the hand hygiene, and only one half of them (52.7%) who knew that the last to be taken off after finishing a preventive task is the gloves.

Despite that the majority of the participants knew that all pilgrims from all over the world should be screened for possible meningitis cases (82.1%) and those who are proven that they hadn't take the vaccine should receive Ciprofloxacin (83.9%). Only less than one half (43.8%) who knew that Ciprofloxacin is given as a measure to control for the carrier state and prevent transmission to other pilgrims, while one third of the participants thought that it is given as a replacement for immunization against meningitis. On the same line, slightly more than one half of the participants (54.5%) knew that there is no need for giving meningitis vaccine for unvaccinated pilgrims who are coming from the African girdle when arriving at the airport.

Similarly, one half of the participants (48.2%) thought that for pilgrims who are coming from polio endemic areas, only children who should be vaccinated at the airport.

Although Rifampicin intake is not included under the Saudi guidelines for preventive measures provided to pilgrims at airport; almost one half of the participants (46.4%) thought that it is recommended measure to protect against cholera in adults. The same apply on Ceftriaxone intake which is not included in the guideline, yet, 41.1%

of the participants thought that it is given to children to protect them against meningitis.

The right answers of the nine items reflecting knowledge of the participants about these items were summed up with one score for each right answer making a total of 9. The overall mean score was 5.1±1.4 out of 9 making an average level of knowledge of 55.6%. To investigate the impact of previous training and attendance of courses, [Table 4] shows that the participants who had attended courses about international health regulations, and those who attended courses about personal protective measures and how to apply face mask before coming to Hajj season had significantly better knowledge than those who indicated that they didn't attend such courses

Table1: Characteristics of the study group (n=112).

Characteristics	No.	%
Nationality:		
Saudi	108	96.4
Non Saudi	4	3.6
Age:		
<30years	30	26.8
30-39 years	54	48.2
40+ years	28	25.0
Mean ± SD (Range)	34.9 ± 7.4 years (23-56)	
Qualifications:		
Diploma	88	78.6
Bachelor	23	20.5
PhD	1	.9
Job:		
Physician	5	4.5
Nurse	43	38.4
Health inspector	61	54.5
Pharmacy technician	3	2.7

Table 2: Preparedness of the participants to serve in health related activities in the airport (n=112).

Preparedness activities	No.	%
Previous immunization:		
Yes	88	78.6
No	24	21.4
Passed training course about CPR :		
Yes	81	72.3
No	31	27.7
Read about international health regulations:		
Yes	62	55.4
No	50	44.6
Attended training course about international health regulations:		
Yes	25	22.3
No	87	77.7
Attended training course about personal protective measures:		
Yes	33	29.5
No	79	70.5
Trained about fixing face mask:		
Yes	45	40.2
No	67	59.8
Attended acquaintance course about work in King Abdul Aziz International airport during Hajj :		
Yes	41	36.6
No	71	63.4
Attended training course about communication skills:		
Yes	15	13.4
No	97	86.6

p<0.05. On the other hand, although participants who addressed that they had read about the international health regulations and those who passed CPR course besides those who had been acquainted before about work in airport had better knowledge, the differences was not statistically significant p>0.05.

By observing performance of the participants while they were involved in checking pilgrims at the hubs, it was found that almost all of them (99.1%) were checking the immunization cards of the pilgrims, and the majority of them (83.9%) were wearing gloves, and (78.6%) were properly giving the polio vaccine, while 50.9% of them who were fixing face masks properly while they were doing their job [Figure 1].

Table 3: Response of the participants to items reflecting their preparedness to specific situations (n=112).

Items	No.	%
<i>First action when confronted with suspected Ebola case:</i>		
Wearing mask	59	52.7
Hand hygiene	29	25.9
Wearing gloves	24	21.4
<i>For personal protective measures, the last procedure is:</i>		
Take mask off	36	32.1
Take shoes off	17	15.2
Take gloves off	59	52.7
<i>All pilgrims should be screened for possible meningitis:</i>		
Yes	92	82.1
No	20	17.9
<i>Unvaccinated pilgrims with meningitis from all over the world should receive single dose of ciprofloxacin :</i>		
Yes	94	83.9
No	18	16.1
<i>The purpose of providing Ciprofloxacin to pilgrims from African girdle is:</i>		
As a replacement for the vaccine	44	39.3
To protect themselves	19	17.0
To protect other pilgrims	49	43.8
<i>Unvaccinated pilgrims from yellow fever endemic areas are given the vaccine at their arrival to airport:</i>		
Yes	51	45.5
No	61	54.5
<i>Children from polio endemic areas are the only to be vaccinated at the airport:</i>		
Yes	54	48.2
No	58	51.8
<i>Rifampicin is given to protect against Cholera in adults :</i>		
Yes	52	46.4
No	60	53.6
<i>Ceftriaxone is given to children against meningitis :</i>		
Yes	46	41.1
No	66	58.9

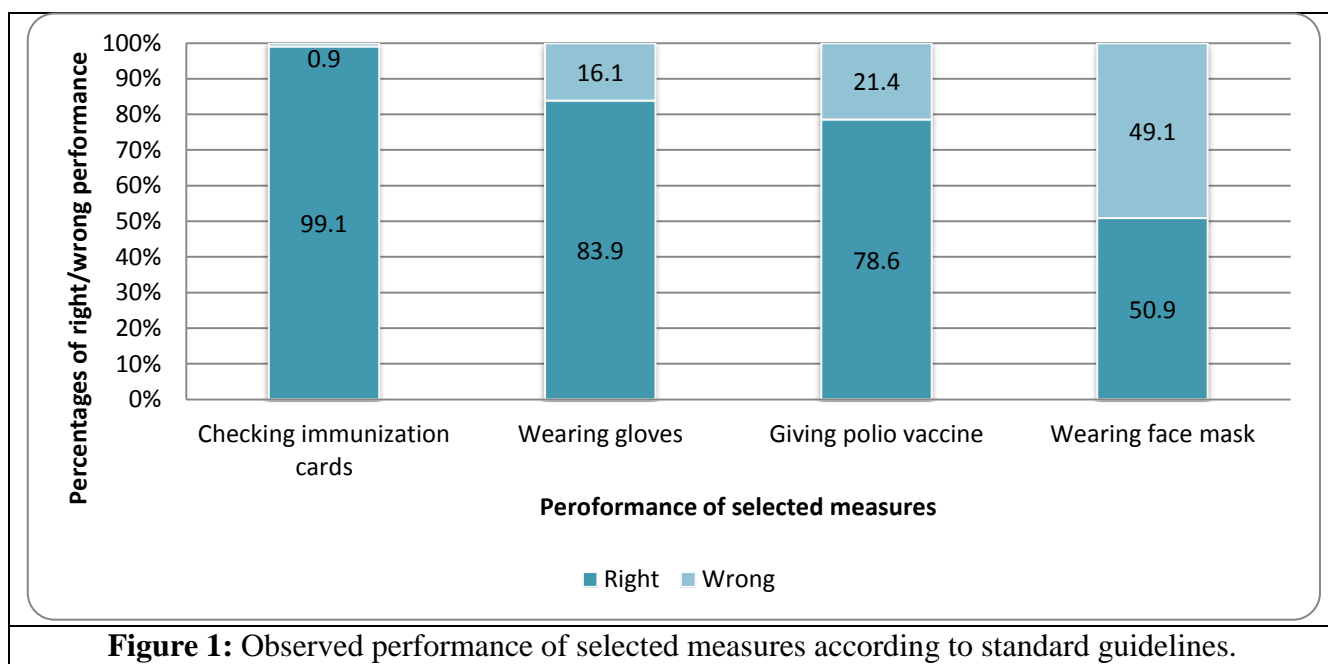


Figure 1: Observed performance of selected measures according to standard guidelines.

Table 4: Impact of previous reading and training about health regulations on the mean score of knowledge about items reflecting their preparedness (n=112).

Previous training activities	Mean±SD. Out of 9	P*
<i>Read about international health regulations:</i>		
Yes	5.1±1.5	0.837
No	5.0±1.4	
<i>Attended training course about international health regulations:</i>		
Yes	5.8±1.7	0.004**
No	4.9±1.3	

<i>Attended training course about personal protective measures:</i>		
Yes	5.6±1.7	0.002**
No	4.8±1.2	
<i>Trained about fixing face mask:</i>		
Yes	5.6±1.5	0.003**
No	4.7±1.3	
<i>Attended acquaintance course about work in King Abdul Aziz International airport during Hajj :</i>		
Yes	5.4±1.7	0.075
No	4.9±1.3	
<i>Passed training course about CPR :</i>		
Yes	5.1±1.5	0.446
No	4.9±1.2	

• Based on independent sample t test

** Statistically significant

Discussion

Hajj presents a significant challenge that impacts the international public health through potential risks of disease transmission and other health hazards. The Saudi Arabian authorities in collaboration with international bodies interested in this mass gathering are concerned with management of the hajj and the successful outcome of this event. In this respect, updated guidelines are established annually by the Ministry of Health, these guidelines are typically including two subsets of instructions. The first one is regarding measures towards pilgrims, and the second aim at protecting the service providers from acquiring any health hazards. These instructions are expected to be followed strictly, that necessitate preparing health workers before joining work at the airport and ensuring that they are fully compliant to these instructions. Among these instructions, all health workers who would share in hajj should be vaccinated against meningitis ⁽⁵⁾ and influenza ⁽⁶⁾. This obligatory instructions showed itself in the current study where most of the participants reported that they received the recommended immunizations.

Meningococcal disease outbreak are well recognized at hajj ⁽⁷⁾; its risk increases during the hajj due to overcrowded, high humidity, and dense air pollution that could raise carrier rates up to 80% ⁽⁸⁾. For these reasons, the Saudi authorities stipulated mandatory immunization against meningitis for pilgrims. To check compliance of pilgrims to these instructions; their immunization status is checked properly by health workers at the entry ports. Pilgrims who have no documented immunization or invalid immunization in addition

to those who are coming from highly endemic areas should receive compulsory oral ciprofloxacin (500 mg) to reduce carrier rates ⁽⁹⁾. By validity of the meningitis immunization, it is meant that it must be taken at least ten days before arrival and no longer than 3 years before ⁽⁵⁾. Although these procedures are performed routinely by our participants, only less than one half (43.8%) of them knew the scientific background for giving ciprofloxacin.

According to the International Health Regulations, travelers from yellow fever endemic countries should present valid immunization certificate that the person had been vaccinated at least ten days before arrival and no longer than ten years ⁽¹⁰⁾; otherwise they had to be put under strict surveillance for six days ⁽¹¹⁾, in contrary, about one half of the participants (54.5%) thought that the alternative is to give the yellow fever vaccine. Poliomyelitis is still prevalent in certain countries around the world, visitors from these countries to the hajj may pose a health risk for other visitors. All travelers from these countries; regardless of their age should receive one dose of oral poliovirus vaccine at least six weeks prior departure to Saudi Arabia; in addition, they also must receive another dose of OPV at borders' points on arrival in Saudi Arabia ^(1;6). Polio vaccination is essentially given to all travelers from endemic areas to develop herd immunity which is an important supplement to immunization ⁽¹²⁾. One half of the health workers who knew that not only the children from the specified countries who should receive one dose of oral poliovirus at their arrival in the airport.

Moreover, only one half of the participants were administering the vaccine properly.

The continuing threat posed by the Ebola virus in some African countries⁽¹³⁾ from which pilgrims might come for hajj, necessitate cautious preparedness; the committee on communicable disease prevention who felt that the risk of disease transmission is thought to be high with potential catastrophic consequences if occurring during the hajj⁽¹⁴⁾. In this context, the Saudi guidelines put strict rules for health workers based on the Personal Protective Equipment (PPE) guidelines⁽¹⁵⁾, these guidelines include steps that must be followed accurately⁽¹⁶⁾. In this regards, only one quarter of our participants knew that hand hygiene come first before wearing gloves and fitting face mask.

Two items were included intentionally in the questionnaire although they are not listed under the regulations, the aim of its inclusion was to ensure acquaintance of the participants about the full list of the guidelines. The first one was about using rifampicin for control of cholera: although vibrio cholera is susceptible to rifampicin⁽¹⁷⁾, only one half of the participants knew that it is not one of the recommended preventive guidelines. Similarly, despite that ceftriaxone could be used for treatment of meningitis among adults⁽¹⁸⁾, yet, only one half of the participants realized that it not within the list as a measure for control of meningitis among children.

Generally, while observing performance of the participants, it was realized that the majority of them were wearing gloves but only one half of them were fitting face mask properly, in addition to what was remarked after summing their overall level of knowledge about the above selected items, it was revealed that their average knowledge was 55.5%; could be attributed to lack of pre hajj formal training. This explanation is supported by the findings of the bivariate analysis which showed that the participants who attended training courses about international health regulations, personal protective measures and how to fix face mask before attending Hajj season had

significantly better achievements than those who did not attend such courses.

Conclusion

Health care participants were fairly prepared to work in King Abdul Aziz international airport during hajj season, the better achievement observed among those who reported that they had received training courses about international health regulations and personal preventive measures before coming to participate in this season which pinpoint the significance of necessitate future mandatory enrollment in such training courses for all health workers before sharing work in hajj.

Recommendations

According to the study findings we recommend that all Health Care Workers Participating in Hajj season at King Abdul Aziz International Airport who perform preventive Measures on all Hajjes as approved and abide by the international health regulations should:

- A. Before coming to King Abdul Aziz International Airport:
 - 1- Complete all their vaccinations and deliver the (vaccination certificates).
 - 2- Provide a certificate of attendance session of the definition of the procedures and policies adopted in the Airport by International Health regulations.
 - 3- Provide a training certificate on Personal Protective Equipments.
 - 4- Provide a training certificate on Fit Test.
 - 5- Bring uniforms after taking the appropriate measures.
 - 6- Attend an introductory course about communication skills.
- B. After coming to King Abdul Aziz International Airport:
 - 1- Attend an introductory session to King Abdul-Aziz Hajj Airport.

- 2- Strictly adhere to the regulations of preventive measures at the airport.

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