

Original Research Article

Prevalence, knowledge, attitude, and practices associated with influenza vaccination among healthcare workers in primary care centers in Jazan, Saudi Arabia: A cross-sectional study

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Abstract

Purpose: To assess the prevalence, knowledge, attitude and practices of health care workers (HCWs) in Jazan Province regarding the annual influenza vaccination program.

Methods: A cross-sectional, self-administered questionnaire-based study was conducted among HCWs ($n = 368$) at the primary 18 health care centers in Jazan, Saudi Arabia during the period January – April, 2016.

Results: The overall vaccination coverage was 87.0 % in the previous year and 79.9 % in the last 5 years. In all, 97 % of males and 59.5 % of females considered influenza as a serious disease ($p = 0.005$). Regarding prevention of influenza infection, 91.2 % of respondents believed that HCWs were at risk of influenza infection, while 62.5 % considered vaccination as the best preventive measure ($p = 0.003$). The most common reasons for receiving vaccine were “to protect oneself or one’s family” (99.4 %), while the most common reason for not taking the vaccine was “fear of side effects” (49 %).

Conclusion: HCWs exhibit positive attitudes toward influenza vaccine, and notwithstanding the high vaccine coverage in Jazan Province. However, influenza vaccine campaigns should include information to enhance the awareness of HCWs about the risk of exposure to influenza, and information about the adverse reactions to influenza vaccine.

Keywords: Healthcare workers, Influenza vaccine, Risk of exposure, Adverse reactions.

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INTRODUCTION

Influenza is a contagious respiratory illness caused by influenza viruses. It is considered as one of the most prevalent respiratory illnesses [1]. Worldwide, seasonal influenza leads to

substantial morbidity and mortality [2]. Although influenza may occur throughout the year, it is reported mostly during the winter season [1]. Vaccination is the most effective method for preventing influenza. However, unlike other viruses, the influenza viruses change constantly,

as a result of which individuals do not develop lifelong immunity after vaccination. For this reason, the vaccine composition has to be changed every year [3,4].

Health care workers (HCWs) are considered as a high-risk group for influenza [5]. They can contract influenza from patients, visitors, and even from other HCWs. It has been shown that influenza vaccination of HCWs can decrease clinical disease in healthy adults by 70 - 90 %, and can reduce all-cause mortality in long-term care patients by up to 29 % [5,7]. In addition, vaccination of HCWs against influenza might have positive impact on hospitalized patients [8,9]. Indeed, annual influenza vaccination program for HCWs has been recommended by different health authorities [4,10]. However, it has been estimated that in the last decade, seasonal influenza vaccine coverage for HCWs was relatively low in many countries [12-17].

In Saudi Arabia, the coverage of influenza vaccination among HCWs at King Abdul-Aziz Hospital, Al-Ahsa, Saudi Arabia was low (34.4 %) in the 2008 – 2009 season [18]. A survey carried out to assess the compliance of multi-nationality HCWs in Saudi Arabia with influenza vaccination revealed an overall influenza vaccination of 41 % in the preceding year, and 69 % in the preceding 5 years [20].

The most common reasons for not getting vaccinated were (a) HCWs do not need vaccination, (b) vaccines are associated with adverse reactions, (c) the vaccines do not work, and (d) HCWs are unable to get vaccinated due to time constraints [20,21]. In addition, other common reasons for not getting vaccinated include misconceptions or lack of knowledge about influenza infection/vaccination, and lack of convenient access to the vaccine [22].

The motivation for getting vaccinated has been studied by many researchers, and the most common motivating factor was identified as self-protection against influenza infection [21,22,26]. Studies have shown that HCWs have positive attitudes and perceptions about the flu vaccine, and those who received the vaccine the previous year were more likely to be vaccinated in subsequent years [22,24,26].

A comprehensive review of the existing literature shows that no studies have been conducted to assess the prevalence, knowledge, practices and attitude of HCWs toward influenza vaccine in Jazan Province, Southwest Saudi Arabia. Thus, the aim of this study was to assess the prevalence, knowledge, attitude and practices of

HCWs toward influenza vaccine in Jazan Province.

METHODS

Study design, setting and participants

This descriptive cross-sectional study was conducted in Jazan City, the capital of Jazan province. The province is located in the southwest corner of Saudi Arabia and lies on the western coast of the Red Sea. The total population of the region is estimated to be around 1.5 million, according to 2010 Population and Housing Census. The study population comprised HCWs of the Primary Healthcare Centers (PHCCs) belonging to Ministry of Health (MOH), Jazan Health Directorate. The inclusion criteria were: (a) HCWs currently working at PHCCs belonging to MOH in Jazan City, and (b) participants who read, understood and signed written consent forms. The study was approved by the Standing Committee For Biomedical Research Ethics, Jazan University (Project 1437-SCBRE-07). Participants were told that they were free to participate in the study or to withdraw from it at any time. The ethics procedures of this study was conducted in accordance with Saudi Arabia and the International ethical guidelines for biomedical research [27].

Sampling

In Jazan city, there are 18 PHCCS belonging to MOH, staffed with 368 HCWs (71 physicians, 14 dentists, 194 nurses, 35 pharmacists, and 54 laboratory technicians). All HCWs in these centers were invited to participate in the study by filling in the study questionnaire.

Study instrument

A self-administered questionnaire was used for data collection. Permission to use the questionnaire was obtained from Al-Tawfiq [20]. The questionnaire was validated and consisted of four parts. The first part comprised 7 socio-demographic variables (age, gender, nationality, marital status, year of experience, job category, and history of chronic diseases). The second part centered on HCWs practices regarding influenza vaccine, which consisted of 6 items: accepting the vaccine, reasons for accepting influenza vaccine, and reasons for refusing it. The third part concerned the respondent's attitude towards influenza and influenza vaccine (3 items), while the fourth part dealt with questions about influenza and its efficacy; potential adverse

events, and recommendations associated with influenza immunization (10 items).

Data collection

Data was collected using a self-administered questionnaire with a cover letter explaining the purpose of the study. Names were not disclosed so as to ensure confidentiality. The questionnaires were distributed among all HCWs from selected PHCCs by the study team during their break or free time, and the completed forms were collected the same day.

Statistical analysis

All data collected were verified manually, and inconsistencies were reviewed when necessary and then coded before entry in computer. Data entry and analysis were done using the Statistical Package for Social Sciences (SPSS) statistical program version 22. Descriptive statistics using frequencies, simple tabulation and percentages were utilized. Inferential statistics based on chi-square test were used to identify differences among subsets of categorical groups. Values of $p < 0.05$ were considered statistically significant.

RESULTS

Table 1 shows the demographic characteristics of the study population. A total of 368 HCWs

signed the consent form and were included (99.7 % response). Most of them were Saudis (85.6 %). The HCWs consisted of 39.9 % male and 60.1 % female. Almost 80 % of the participants were in the middle-age group (24 - 44 years). The respondents comprised 194 nurses (52.7 %), 71 physicians (19.3 %), 54 laboratory technicians (14.7 %), 35 pharmacists (9.5 %) and 14 dentists (3.8 %).

Table 2 shows the overall vaccination coverage among the study population in the last 5 years, which was 79.9 %. The coverage was significantly higher among non-Saudis (92.5 %; 95 % CI, 82.1 - 96.9) than among Saudis (77.8 %; 95 % CI, 72.8 - 82.0), and also higher in females (84.6 %; 95 % CI, 79.2 - 88.8) than in males (72.8 %; 95 % CI, 65.0 - 79.3). The coverage was significantly higher among those with 6 - 10 years of experience (94.3 %; 95 % CI, 86.2 - 97.7).

Table 3 shows the vaccination coverage among the study population in the last year. The overall vaccination coverage among the participants in the last year was 87.0 %. The coverage/compliance was significantly higher among those with 11-20 years of experience (94.7 %; 95 % CI, 87.1 - 97.8), and 6 - 10 years of experience (88.6 %; 95% CI, 79.0 - 94.0) than in those with 1-5 years of experience (86.9 %; 95 % CI, 80.0 - 91.2), and those with 21 years of experience (79.0 %; 95 % CI, 86.9 - 96.4).

Table 1: Demographic profile of the study population

| Variable | Male, n (%) | Female, n (%) | Total, n (%) |
|-------------------------------|-------------|---------------|--------------|
| Nationality | | | |
| Saudi | 118 (80.3) | 197 (89.1) | 315 (85.6) |
| Non-Saudi | 29 (19.7) | 24 (10.9) | 53 (14.4) |
| Marital status | | | |
| Single | 15 (10.2) | 39 (17.6) | 54 (14.7) |
| Married | 130 (88.4) | 175 (79.2) | 305 (82.9) |
| Divorced | 0 (0) | 7 (3.2) | 7 (1.9) |
| Widow | 2 (1.4) | 0 (0) | 2 (0.5) |
| Age group (years) | | | |
| 24-34 | 16 (41.5) | 157 (71.0) | 218 (59.2) |
| 35-44 | 30 (20.4) | 44 (19.4) | 74 (20.1) |
| 45-60 | 56 (38.1) | 20 (9.0) | 76 (20.7) |
| Job experience (years) | | | |
| 1-5 | 38 (25.9) | 104 (47.1) | 142 (38.6) |
| 6-10 | 20 (13.6) | 50 (22.6) | 70 (19.0) |
| 11-20 | 31 (21.1) | 44 (19.9) | 75 (20.4) |
| 21+ | 58 (39.5) | 33 (10.4) | 81(22.0) |
| Job category | | | |
| Physician | 44 (29.9) | 27 (12.2) | 71 (19.3) |
| Dentist | 8 (5.4) | 6 (2.7) | 14 (3.8) |
| Nurse | 31 (21.1) | 163 (73.8) | 194 (52.7) |
| Pharmacists | 25 (17.4) | 10 (4.4) | 35 (9.5) |
| Laboratory Technician | 39(26.4) | 15 (6.9) | 54 (14.7) |
| Total | 147 (100) | 221(100) | 368 (100) |

Table 2: Prevalence of vaccination among the study population in the last (5 years)

| Characteristic | Number vaccinated/ Total | Coverage | 95 % CI | P-value |
|-------------------------------|-----------------------------|----------|-----------|--------------|
| Age group (years) | | | | 0.019 |
| 24-34 | (176/218) | 80.7 | 75.0-85.4 | |
| 35-44 | (65/74) | 87.8 | 78.4-93.4 | |
| 45-60 | (53/76) | 69.7 | 58.6-78.9 | |
| Job experience (years) | | | | 0.001 |
| 1-5 | (105/142) | 73.9 | 66.1-73.9 | |
| 6-10 | (66/70) | 94.3 | 86.2-97.7 | |
| 11-20 | (67/75) | 89.3 | 80.3-94.4 | |
| 21+ | (56/81) | 69.1 | 58.3-78.1 | |
| Nationality | | | | 0.007 |
| Saudi | (245/315) | 77.8 | 72.8-82.0 | |
| Non-Saudi | (49/53) | 92.5 | 82.1-96.9 | |
| Gender | | | | 0.006 |
| Male | (107/147) | 72.8 | 65.0-79.3 | |
| Female | (187/221) | 84.6 | 79.2-88.8 | |
| Job category | | | | 0.619 |
| Physician | (57/71) | 80.3 | 69.5-87.4 | |
| Dentist | (13/14) | 92.9 | 68.1-98.3 | |
| Nurse | (155/194) | 79.9 | 73.7-84.9 | |
| Pharmacists | (27/ 35) | 77.1 | 60.8-87.9 | |
| Laboratory Technician | (42/54) | 77.7 | 65.0-86.8 | |
| Overall coverage | (294/368) | 79.9 | 75.6-83.7 | |

Table 3: Coverage of vaccination among study population in the previous year

| Variable | Number vaccinated/ total | Coverage | 95 % CI | P-value |
|-------------------------------|-----------------------------|----------|-----------|--------------|
| Age group (years) | | | | 0.469 |
| 24-34 | (191/218) | 87.6 | 82.6-91.3 | |
| 35-44 | (66/74) | 89.2 | 80.1-94.4 | |
| 45-60 | (63/76) | 82.9 | 72.7-89.7 | |
| Job experience (years) | | | | 0.035 |
| 1-5 | (123/142) | 86.6 | 80.0-91.2 | |
| 6-10 | (62/70) | 88.6 | 79.0-94.0 | |
| 11-20 | (71/75) | 94.7 | 87.1-97.8 | |
| 21+ | (64/81) | 79.0 | 86.9-96.4 | |
| Nationality | | | | 0.687 |
| Saudi | (273/315) | 86.7 | 82.5-90.0 | |
| Non-Saudi | (47/53) | 88.7 | 77.4-94.6 | |
| Gender | | | | 0.127 |
| Male | (123/147) | 83.7 | 76.8-88.8 | |
| Female | (197/221) | 89.1 | 84.3-92.6 | |
| Job Category | | | | 0.506 |
| Physician | (59/71) | 83.1 | 72.7-90.0 | |
| Dentist | (11/14) | 78.6 | 51.9-92.2 | |
| Nurse | (172/194) | 88.7 | 83.4-92.4 | |
| Pharmacists | (31/ 35) | 88.5 | 73.9-95.3 | |
| Laboratory Technician | (47/54) | 87.0 | 75.5-93.5 | |
| Overall coverage | (320/368) | 87.0 | 83.1-90.0 | |

Table 4 shows the knowledge and attitudes of the HCWs toward the influenza vaccine. In all, 97 % of the males and 59.5 % of the females considered influenza as a serious disease ($p = 0.005$). Regarding prevention of the influenza infection, 91.2 % of respondents believed that HCWs were at risk of getting influenza infection, while 62.5 % of respondents considered vaccination as the best preventive measure $p = 0.003$). A significant number of respondents (65.2 %) had positive attitudes toward the

vaccine, and believe that the vaccine was effective in preventing influenza (65.2 %, $p = 0.000$), and 87.2 % believe that HCWs should receive annual vaccination ($p = 0.043$). The most common reasons for receiving the vaccine were "to protect oneself or one's family" (99.4 %) and "to protect the patients" (98.2 %). The most common reason for not taking the vaccine was "fear of side effects" (49 %). The next most common reasons were "influenza is not serious disease" (40 %) and "the vaccine is not effective"

(36.6 %). Other reasons behind receiving or not receiving the vaccine are shown in Table 5.

DISCUSSION

The degree of response in this study was much higher than 51 % response reported in similar

studies [25]. The overall vaccination coverage was 87.0 % in the last year and 79.9 % in the last 5 years, despite Saudi Thoracic Society guidelines for annual influenza vaccinations (SCIPV) for all persons aged ≥ 6 months of age, including pregnant and breastfeeding women [6].

Table 4: Knowledge and attitudes of the respondents towards influenza vaccine

| Item | Male, n (%) | Female, n (%) | Total, n (%) | P-value |
|--|-------------|---------------|--------------|--------------|
| Influenza is potentially a serious disease | | | | |
| Agree | 97 (66.0) | 122 (55.2) | 219 (59.5) | 0.005 |
| Disagree | 34 (23.1) | 45 (20.4) | 79 (21.5) | |
| Uncertain | 16 (10.9) | 54 (24.4) | 70 (19.0) | |
| Vaccine is the best preventive measure for influenza | | | | |
| Agree | 97 (66.0) | 133 (60.2) | 230 (62.5) | 0.003 |
| Disagree | 35 (23.8) | 36 (16.3) | 71 (19.3) | |
| Uncertain | 15 (10.2) | 52 (23.5) | 67 (18.2) | |
| Vaccine is effective in preventing influenza | | | | |
| Agree | 113 (76.9) | 127 (57.5) | 240 (65.2) | 0.000 |
| Disagree | 22 (15.0) | 46 (20.8) | 68 (18.5) | |
| Uncertain | 12 (8.2) | 48 (21.7) | 60 (16.3) | |
| Healthcare worker should receive the vaccine annually | | | | |
| Agree | 135 (91.8) | 186 (84.2) | 321 (87.2) | 0.043 |
| Disagree | 11 (7.5) | 25 (11.3) | 36 (9.8) | |
| Uncertain | 1 (0.7) | 10 (4.5) | 11 (3.0) | |
| It is recommended for pregnant women | | | | |
| Agree | 109 (74.1) | 178 (80.5) | 287 (78.0) | 0.146 |
| Disagree | 14 (9.5) | 22 (10.0) | 36 (9.8) | |
| Uncertain | 24 (16.3) | 21 (9.5) | 45 (12.2) | |
| Health care workers are at risk of getting influenza | | | | |
| Agree | 131 (89.1) | 204 (92.3) | 335 (91.0) | 0.016 |
| Disagree | 12 (8.2) | 5 (2.3) | 17 (4.6) | |
| Uncertain | 4 (2.7) | 12 (5.4) | 16 (4.3) | |
| Healthcare worker can spread influenza to patients | | | | |
| Agree | 135 (93.1) | 198 (89.6) | 333 (91.0) | 0.099 |
| Disagree | 8 (5.5) | 10 (4.5) | 18 (4.9) | |
| Uncertain | 2 (1.4) | 13 (5.9) | 15 (4.1) | |

Table 5: Reasons associated with refusal and acceptance of influenza vaccine

| Reasons for vaccine refusal/acceptance | Male | Female | Total | P-value |
|--|------------|-------------|------------|--------------|
| Reasons for refusal | | | | |
| Adverse effect | 31 (42.5) | 66 (52.8) | 97 (49.0) | 0.186 |
| Fear of injection | 11 (14.7) | 37 (29.1) | 48 (23.8) | 0.538 |
| Inconvenient to access | 24 (32.9) | 29 (22.5) | 53 (26.2) | 0.148 |
| Alternative protection | 17 (23.3) | 45 (35.4) | 62 (31.0) | 0.103 |
| Not at risk | 27 (37.0) | 42 (32.1) | 69 (33.8) | 0.505 |
| Flu not a serious disease | 26 (35.6) | 54 (42.5) | 80 (40.0) | 0.418 |
| Vaccine not effective | 23 (31.5) | 51 (39.5) | 74 (36.6) | 0.324 |
| Reasons for acceptance | | | | |
| Supervisors | 98 (72.1) | 177 (82.3) | 275 (78.3) | 0.023 |
| Risk of Influenza | 132 (97.1) | 210 (97.7) | 342 (97.4) | 0.722 |
| Patient's protection | 133 (97.8) | 212 (98.6) | 345 (98.3) | 0.568 |
| Self-protection | 134 (98.5) | 215 (100.0) | 349 (99.4) | 0.074 |

The vaccination coverage obtained in this study more than doubles the vaccination coverage of 34.4 % reported in a study done among HCWs at King Abdul-Aziz Hospital, Al-Ahsa in 2008/2009 season [18]. It also exceeds the vaccination coverage of 41 % obtained in a multi-nationality HCWs survey done in Saudi Arabia in the 2010 - 2011 influenza seasons [20]. Moreover, the vaccination coverage in the present study exceeds the values seen among HCWs in three Arabic Gulf countries (United Arab Emirates, Kuwait and Oman) for the 2009-2010 season, where the coverages were 24.7, 67.2 and 46.4 %, respectively [21]. These differences could be due to the determination and sustained efforts of the Ministry of Health aimed at increasing vaccination coverage in this high-risk group.

Statistically significant differences were seen in the acceptance of the vaccine in the last 5 years based on the nationalities of the HCWs: vaccine acceptance was higher in non-Saudi than in Saudi HCWs. This is similar to the finding of the multi-nationality HCW survey in Saudi Arabia in 2009, where belonging to other Arab nationalities was one of the important factors for increased vaccine acceptance [19]. This finding could be explained by the external pressure to get vaccinated, because non-Saudi considered the acceptance of vaccine very important for keeping their jobs. Thus, the highly positive attitudes of non-Saudi HCWs toward the flu vaccine is understandable.

There was no statistically significant gender difference in vaccine acceptance in the last year [20,26]. However, female acceptance of vaccine was significantly higher in the last 5 years.

In this study, the most common motivations for receiving the vaccine centred on self-protection, patients protection, and the increasing risk of influenza among HCWs. These findings are in agreement with results from other studies where self-protection and patient protection were the most motivating factors for vaccination [18,20,25]. These findings suggest that HCWs understand that vaccines help protect them and the patients. The most common barriers against vaccination were fear of adverse reactions, belief that influenza is not a serious disease, and belief that the vaccine is not effective. These findings are similar to the results from a study done among HCWs in three Middle-East countries [21], and also similar to those usually cited by studies done locally in Saudi Arabia and in many international studies [18,20,22,23,25]. Thus, these barriers are commonly encountered in HCWs. Another barrier for not taking the vaccine was that some HCWs believe they are not at risk

of getting influenza. A similar barrier was cited by respondents in a multi-nationality HCW survey done in Saudi Arabia to assess their attitudes towards influenza vaccination [19].

Study limitations

It ought to be mentioned that the present study has limitations, as it was based on a cross-sectional survey design. Thus, the direction of relationships and causal relationships could not be determined.

CONCLUSION

The HCWs in this study demonstrate a positive attitude towards influenza vaccine and the rate of vaccine coverage among them is high. However, the fear of adverse reactions and the wrong beliefs that HCWs are not at great risk of influenza militates against full vaccination coverage. Thus, influenza vaccine campaigns should include efforts to enhance the awareness of HCWs about their exposure risk to influenza. Efforts should also be made to provide correct information on the adverse reactions to influenza vaccine.

DECLARATIONS

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Competing interests

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Contributions of authors

We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. GM and OBM conceived and designed the study, and drafted and revised the manuscript. GM designed the research, and collected and revised the data. MSM and OBA analyzed the data and drafted and revised the paper. All authors read and approved the final version of the manuscript.

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