

Attitude towards Seasonal Influenza Vaccination by Healthcare Workers

Norah Abdullah Alqartun

Almaarefa Colleges for Science & Technology, Riyadh, Saudi Arabia.

ABSTRACT

Background: Influenza is an airborne communicable disease; it is effectively can be prevented by vaccination. Healthcare workers (HCWs) contact with different patients with different diseases and different immunity levels, vaccination of healthcare workers for influenza can protect both healthcare workers and their patients. Although the vaccine is available and proved to be safe, there is low rate in uptake of vaccination. **Aim:** To estimate the influenza vaccination rate among HCWs and determine the role of different factors on acceptance of influenza vaccine. **Methods:** This cross-sectional study was conducted on all healthcare workers at Al-Wazarat health care center, PSMC, Riyadh, Saudi Arabia. A well-established questionnaire was used in this study to obtain required data including demographics and vaccination state of participants and their beliefs about the vaccination.

Results: There were 50.5% of HCWs have received influenza vaccination for 2016-2017 season. Several factors were associated with vaccination state including age (P-value=0.04), nationality (P-value=0.01) and having chronic disease (P-value=0.004). The mean score for HCWs' attitude was 37.6 ± 5.67 , and it significantly increased in vaccinated (39.15 ± 5.23) than non-vaccinated participants (36.19 ± 5.7). Nature of work and nationality significantly affected the mean score (P-value=0.02, 0.01) respectively. **Conclusion:** Vaccination uptake rate was low among health care workers with moderate acceptance rate for vaccination, vaccinated persons had higher acceptance score than non-vaccinated one.

Keywords: Influenza vaccination, HCWS vaccination acceptance, HCWS Vaccination in KSA.

INTRODUCTION

Influenza is the most common airborne infection [1] and a highly contagious-vaccine preventable-infectious disease [2]. It was evaluated that the influenza affected almost 9% of population in the world annually and accounts for annual 1 billion infections and 3-5 million severe cases and deaths [3]. Influenza symptoms range from mild to severe reaching to death [1]. Healthcare workers (HCWs) are more prone to transmit communicable diseases as they work in hospitals dealing with different patients with different diseases [4]. Influenza virus can be transmitted from persons infected with influenza virus, even those with subclinical infections to individuals who are at higher risk of complications from influenza such as immune-compromised and elder patients [5]. Healthcare facilities are perfect places for the rapid spread of influenza, it was identified that HCWs were the primary vectors for spreading influenza virus within these facilities [6,7]. The risk of infection and influenza-like-illness for HCWs can be reduced by influenza vaccination [8]. In HCWs, the vaccination is the important preventive strategy against influenza [9]. Influenza vaccine can prevent influenza in healthy adults whose age less than 65 years old by a rate of 70-90% [10,11], while in those with age of 65 years, vaccination reduces the risk for influenza-related hospitalization and death and it prevents secondary complications [12]. Both WHO and Centers for Disease Control and Prevention (CDC) recommend influenza vaccination for HCWs [13] as well as United States Advisory Committee on Immunization Practices (ACIP) [14]. Although vaccination is available, it was found that

the uptake of vaccination by HCWs is low in rate in many countries [15,16]. It was found that in US, 36% of HCWs received influenza vaccination [17], however other studies [18,19] reported rates of immunization among doctors ranged from 38% to 82%. It was stated in one study that in Saudi Arabia the overall rate of influenza vaccination was low [20]. In the present study we aimed to assess the acceptance of influenza vaccination among HCWs.

SUBJECTS AND METHODS

Subjects and study design

This study is cross sectional study that included all healthcare workers at Al-Wazarat health care center, PSMC, Riyadh, Saudi Arabia. It was conducted in the period from October 2017 to November 2017. A well-structured questionnaire was used to get the relevant data needed in our study. The first part of the questionnaire included introduction and instructions. The second part was about socio-demographics and included age, gender, marital status, nationality and occupation. The third part was carefully designated to ask about the acceptance of influenza vaccine among HCWs and factors that influence it. An ethical approval for this study was obtained from ethics review committee in King Saud Medical City. The confidentiality of the anonymous collected data was maintained all the time. All data were stored in a secure and safe place which was only accessible by the researcher. Informed consent was distributed with the questionnaire to all participants.

The study was done after approval of ethical board of Almaarefa Colleges for Science.

Statistical analysis

Statistical analysis was done using SPSS 16.0 statistical software package. Results were presented as mean and standard deviation for quantitative data and as frequencies and per cent for qualitative data. Independent t-test was used to compare quantitative variables between two study groups. ANOVA test was used when comparing score between more than two groups. Chi-square test was used for comparing qualitative variables between groups. A probability value of less than or equal 0.05 was considered statistically significant. Scoring system for influenza belief question (11 questions); answer for each point was as follow 1 for strongly disagree and ascending to 5 for strongly agree, the maximum score was 55.

RESULTS

The present study included 200 healthcare personnel from Al-Wazarat health care center, PSMCMC, Riyadh, Saudi Arabia. The majority of participants were Saudi 110(55%), while 90(45%) were non-Saudi. There were 112(56%) in the age range 21-30 years old, 57(28.5%) in the range of 31-40 years old, 20 (10%) and 11(5.5%) were in the range of 41-50 and >50 years old respectively. The large majority of participants were males 138 (69%),

whereas there were 62 (31%) females. 150 (75%) were Muslims, 41 (20.5%) were Christians and 9 (4.5%) were of other religions. The least number of participants 7(3.5%) were of education below the university, while 44 (22%) were university students, 15 (7.5%) were postgraduate and 134 (67%) were graduate. 62 (31%) had income of <5000 SR, 62 (31%) had income of 5000-10000 SR, 37(18.5%) and 39(19.5%) had income of 10001-15000 SR and >15000 respectively.

47(23.5%) of participants were physicians, 51(25.5%) were nurses, 21 (10.5%), 17(8.5%), 22(11%) and 42 (21%) were pharmacists, administrators, technicians and other positions respectively. The large majority of participants 128(64%) were performing clinical work, while 72(36%) were performing non-clinical work. Most of healthcare workers 104(52%) were working in health care field for less than 5 years, 68(34%) were working for 5-10 years and 28 (14%) were working for more than 10 years. Table1 summarizes the demographics of healthcare workers and table2 shows the basal characteristics of healthcare personnel.

Table1: Socio-demographic characteristic

Characteristics		N	%
Age	21 - 30	112	56.0
	31 - 40	57	28.5
	41 - 50	20	10.0
	>50	11	5.5
Sex	Male	138	69.0
	Female	62	31.0
Nationality:	Saudi	110	55.0
	Non Saudi	90	45.0
Religion	Islam	150	75.0
	Christianity	41	20.5
	Other	9	4.5
Education	graduate	134	67.0
	postgraduate	15	7.5
	University student	44	22.0
	Lower level of education	7	3.5
Income	< 5000 SR	62	31.0
	5000 – 10000 SR	62	31.0
	10001 – 15000 SR	37	18.5
	> 15000 SR	39	19.5
Occupation	Physician	47	23.5
	Nurse	51	25.5
	Pharmacist	21	10.5
	Administrator	17	8.5
	Technician	22	11.0
	Others	42	21.0
The nature of your work	Clinical	128	64.0
	Non-clinical	72	36.0
Number of years working in care field	< 5 years	104	52.0
	5 – 10 years	68	34.0
	> 10 years	28	14.0

Table 2: Basal characteristics of Healthcare workers

Questions		N	%
Diagnosed with seasonal influenza infection	Yes	109	54.5
	No or not sure	91	45.5
Having received the seasonal influenza vaccine	Yes	137	68.5
	No or not sure	63	31.5
How many times have you received an influenza vaccine?	Never	61	30.5
	Once	64	32.0
	Twice	40	20.0
	Many	35	17.5
Have you received the influenza vaccine of this sea (2016-17)?	Yes	101	50.5
	No	99	49.5
Would you receive flu vaccine for coming season?	Yes	85	42.5
	No or not sure	115	57.5
Having chronic disease	Yes	36	18.0
	No	164	82.0

There were 109(54.5%) of healthcare personnel diagnosed with seasonal influenza before and 36(18%) only reported having chronic disease. 137(68.5%) reported receiving the seasonal influenza vaccine, 64(32%) received it once, 40 (20%) received it twice and 35(17.5%) received it many times. 50.5 % of our participants had received the vaccine for the current season (2016-2017) and 85(42.5%) reported their intention to receive it for coming seasons. Regarding demographics and other variables, there were significant effect of age (P-value=0.04), nationality (P-value=0.015) and having chronic disease (P-value=0.004) on the vaccination state of healthcare workers, table 3.

Table 3: Correlation between different variables and vaccination state

Variables		Non-vaccinated N=99 N(%)	Vaccinated N=101 N(%)	P-value
Age (years)	20-30	61(54.5%)	51(45.5%)	0.04
	31-40	30(52.6%)	27(47.4%)	
	41-50	5(25.0%)	15(75.0%)	
	>50	3(27.3%)	8(72.7%)	
Sex	Male	70 (50.7%)	68(49.3%)	0.605
	Female	29(46.8%)	33(53.2%)	
Nationality	Saudi	63(57.3%)	47(42.7%)	0.015
	Non-Saudi	36(40.0%)	54(60.0%)	
occupation	Physician	26(55.3%)	21(44.7%)	0.855
	Nurse	23(45.1%)	28(54.9%)	
	Pharmacist	10(47.6%)	11(52.4%)	
	Administrator	10(58.8%)	7(41.2%)	
	Technician	11(50.0%)	11(50.0%)	
Nature of work	Others	19(45.2%)	23(54.8%)	0.1
	Clinical	58(45.3%)	70(54.7%)	
Experience	Non-clinical	41(56.9%)	31(43.1%)	0.06
	< 5 years	58(55.8%)	46(44.2%)	
Having chronic disease	>5 years	41(42.7%)	55(57.3%)	0.004
	Yes	10(27.8%)	26(72.2%)	
	No	89(54.3%)	75(45.7%)	

The score of vaccination acceptance among participants ranged from 23 to 51 with a mean \pm SD of 37.69 ± 5.67 , there was a significant difference (P-value=0.001) between the mean score of vaccinated and non-vaccinated HCWs, figure 1.

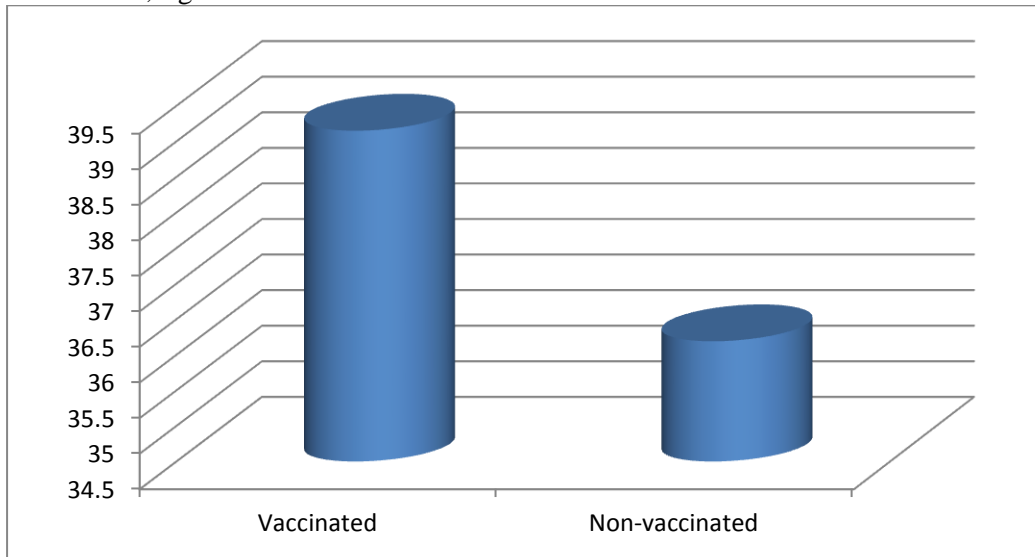


Fig1: Comparison between the mean score of vaccination acceptance among HCWs

The mean score of participants was significantly affected by nature of work (P-value=0.02) and nationality (P-value=0.01), table 4.

Table4: Correlation between the mean score and several variables

Variables	Mean \pm SD	P-value
Nature of work		0.03
Clinical	38.35 \pm 5.49	
Non-clinical	36.5 \pm 5.83	
Experience		0.2
<5 years	37.22 \pm 5.19	
>5 years	38.19 \pm 6.14	
Chronic disease		0.4
Yes	38.3 \pm 5.15	
No	37.55 \pm 5.78	
Occupation		0.1
Physician	37.8 \pm 6.77	
Nurse	37.25 \pm 5.6	
Pharmacist	38.28 \pm 6.95	
Administrator	39.17 \pm 5.84	
Technician	40 \pm 3.87	
Others	35.97 \pm 3.83	
Age		0.2
21-30	37.3 \pm 5.38	
31-40	37.45 \pm 5.55	
41-50	39.4 \pm 6.02	
>50	39.72 \pm 8.06	
Sex		0.1
Male	37.27 \pm 5.58	
Female	38.61 \pm 5.8	
Nationality		0.01
Saudi	36.75 \pm 5.86	
Non-Saudi	38.83 \pm 5.24	

DISCUSSION

In the present study there was low rate of influenza vaccination uptake among HCWs as there were 50.5% received the vaccine, while 49.5% didn't. In a previous study conducted in three Arabian countries including UAE, Kuwait and Oman [21] it was found that 24.7% of HCWs were vaccinated in UAE and 46.4% in Oman, while the highest percent 67.2% were reported from Kuwait. Our results seems better than that reported in previous study from US which showed that the vaccination rate among HCWs was 28% [22], while it was very close to that previously reported from Saudi Arabia, where the vaccination rate was 51% [20], higher rate was reported previously in Saudi study [1], which was conducted on medical students, there were 57.2% of medical students received the vaccine. Another Saudi study reported vaccination rate of 38% among HCWs [23], a lower rate was reported in a cross-sectional Saudi study by **Rehmani and Memonet** [24] where the rate of vaccination among 512 HCWs was 34% only. Much lower rate was reported in Australia, only 22% of HCWs received influenza vaccination [25].

There was an association between age and vaccination state of participants in this study, the large majority (51 individuals) of vaccinated participants were in age range of 20-30 years old.

The opposite was reported from UAE and Kuwait as there was no association between age and vaccination state, while association was reported from Oman, there was a significant association between age and vaccination state, where most of the unvaccinated individuals were less than 25 years old, while the large majority of those who were vaccinated were in the age range of 36-45 years old [21]. A study from Malaysian teaching hospital reported a significant association between age and vaccination state (P -value<0.001) [9].

In contrast to our findings, the age wasn't associated with vaccination state in a previous Saudi study [20]. Nationality and having chronic disease were significant factors related to vaccination state in this study, most vaccinated persons were non-Saudi and had no chronic disease, while another Saudi study [1] reported no association between having chronic illness and receiving vaccination among medical students. One Saudi study reported results, which were in agreement with ours, where nationality was significantly associated with vaccination state (P -value=0.01), most of vaccinated persons (61.7%) were from other Arabian nationalities, while fewer Saudi individuals were vaccinated [20]. In the present study, gender, nature of work, experience and position of HCWs were factors

that didn't associate with vaccination state. In a study in 3 Arabian countries [21] it was found that both gender and professional group weren't associated to vaccination state in the three countries. There was Saudi study conducted on medical students also showed that gender wasn't associated with receiving influenza vaccination [1]. In agreement with our findings, it was reported that gender and nature of work weren't significant factors to associate with vaccination state [9], as well as job position (P -value=0.06) as reported in a previous Saudi study, however gender was a significant factor (P -value=0.01) [20].

In the current study, the range of vaccination acceptance score was 23 to 51 with a mean of 37.69, which reflects moderate acceptance level. The higher score was found for those who were vaccinated (39.51). The present study revealed that the mean score of vaccination acceptance was significantly associated with the nature of work and nationality, those with clinical work had higher score than those with non-clinical work, and also higher score was found for non-Saudi persons than Saudi ones.

This study showed that gender, age, experience, having chronic disease and position of HCWs had no association with the mean score of vaccination acceptance. In the present study there were limitations and strength points, limitations included that we didn't investigate the possible reasons other than demographics for the low rate of vaccination uptake among HCWs, while scoring the acceptance of participants was first performed in our study, there was no previous study used the scoring system to measure attitude of HCWs.

CONCLUSION

Low rate of influenza vaccination was found among healthcare workers and this rate was associated with age and nationality where more individuals with younger age, suffering no chronic disease and non-Saudi individuals were vaccinated than other participants. The acceptance of influenza vaccination among HCWs was moderate with more acceptances in vaccinated individuals.

The barriers for vaccination acceptance were non-clinical work and Saudi nationality. It is much recommended to establish programs to encourage HCWs for receiving influenza vaccine, especially those with chronic disease as they are more susceptible to communicable diseases. It is also very important to encourage Saudi HCWs for the uptake of the vaccines as they are the main vulnerable constituent of the Saudi community.

REFERENCES

- 1- **Abalkhail MS, Alzahrany MS, Alghamdi KA, Alsoliman MA, Alzahrani MA, et al.(2017):** Uptake of influenza vaccination, awareness and its associated barriers among medical students of a University Hospital in Central Saudi Arabia. *Journal of Infection and Public Health*,10:644–648.
- 2- **Ricco M, Cattani S, Casagrande F, Gualerzi G and Signorelli S(2017):** Knowledge, attitudes, beliefs and practices of Occupational Physicians towards seasonal influenza vaccination: a cross-sectional study from North-Eastern Italy. *J Prev Med Hyg.*,58: E141-E154.
- 3- **Girard MP, Cherian T, Pervikov Y, Kiemy MP(2005)** A review of vaccine research and development: human acute respiratory infections. *Vaccine*,23:5708–24.
- 4- **An Advisory Committee Statement (ACS)(2001):** National Advisory Committee on Immunization (NACI). Supplementary statement on influenza vaccination: continued use of Fluviral influenza vaccine in the 2000-2001 season. *Can Commun Dis Rep.*,27:1-3.
- 5- **Kruy SL, Buisson Y, Buchy P(2001):** Asia: avian influenza H5N1. *Bull Soc Pathol Exot.*,101:238-242.
- 6- **Heimberger T, Chang HG, Shaikh M, Crotty L, Morse D, Birkhead G(2005):** Knowledge and attitudes of healthcare workers about influenza: why are they not getting vaccinated? *Infect Control Hosp Epidemiol.*,16:412–415.
- 7- **Pachucki CT, Pappas SA, Fuller GF, Krause SL, Lentino JR, Schaaff DM(1998):** Influenza A among hospital personnel and patients. Implications for recognition, prevention, and control. *Arch Intern Med.*,149:77–78.
- 8- **Saxen H, Virtanen M(2009):** Randomized, placebo-controlled double blind study on the efficacy of influenza immunization on absenteeism of health care workers. *Pediatr Infect Dis J.*,18:779-783.
- 9- **Rashid ZZ, Jasme H, Liang HJ, Yusof MM, Sharani ZMZ et al.(2015):** Influenza Vaccination Uptake Among Healthcare Workers At A Malaysian Teaching Hospital. *Southeast Asian J Trop Med Public Health*,46(2):215-225.
- 10- **Wilde JA, Mc Millan JA, Serwint J, Butta J, O’Riordan MA, Steinhoff MC(1999):** Effectiveness of influenza vaccine in health care professionals: a randomized trial. *JAMA.*,281: 908-13.
- 11- **Bridges CB, Thompson WW, Meltzer MI et al.(2000):** Effectiveness and cost benefits of influenza vaccination of healthy working adults. *JAMA.*,284: 1655-63.
- 12- **Wilde JA, Mc Millan JA, Serwint J, Butta J, O’Riordan MA, Steinhoff MC.(2011):** Effectiveness of influenza vaccine in health care professionals: a randomized trial. *JAMA.*,281: 908-13.
- 13- **Fiore AE, Shay DK, Broder K, Iskander JK, Uyeki TM, Mootrey G, Bresee JS, Cox NJ(1999):** Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2009. *MMWR Recomm Rep.*, 209;58:1-52.
- 14- **Pearson ML, Bridges CB, Harper SA(2006):** Influenza vaccination of health-care personnel: recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Advisory Committee on Immunization Practices(ACIP). *MMWR Recomm Rep.*,55:1–16.
- 15- **Habib S, Rishpon S, Rubin L(2000):** Influenza vaccination among healthcare workers. *Isr Med Assoc J.*,2:899-901.
- 16- **Centers for Disease Control and Prevention (CDC)(2005):** Estimated influenza vaccination coverage among adults and children- United States, September 1, 2004-January 31, 2005. *MMWR Morb Mortal Wkly Rep.*,54:304-307.
- 17- **Bridges CB, Harper SA, Fukuda K et al.(2003):** Prevention and control of influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR.*,8:1–34.
- 18- **Martinello RA, Jones L, Topal JE(2003):** Correlation between healthcare workers’ knowledge of influenza vaccine and vaccine receipt. *Infect Control Hosp Epidemiol.*,24:845–847.
- 19- **Wodi AP, Samy S, Ezeanolue E et al.(2005):** Influenza vaccine: immunization rates, knowledge, and attitudes of resident physicians in an urban teaching hospital. *Infect Control Hosp Epidemiol.*,26:867–873.
- 20- **Al-Tawfiq JA, Antony A and Abed MS(2009):** Attitudes towards influenza vaccination of multinationality health-care workers in Saudi Arabia. *Vaccine*,27: 5538–5541.
- 21- **Abu-Gharbieh E, Fahmy S, Abdul Rassol B and Khan S(2010):** Influenza Vaccination: Healthcare Workers Attitude in Three Middle East Countries. *Int J. Med.Sci.*,7:319-325.
- 22- **Piccirillo B, Gaeta T(2006):** Survey on use of and attitudes toward influenza vaccination among emergency department staff in a New York metropolitan hospital. *Infect Control Hosp Epidemiol.*,27:618-622.
- 23- **Alshammari TM, AlFehaid LS, AlFraih JK and Aljadhey HS(2014):** Health care professionals’ awareness of, knowledge about and attitude to influenza Vaccination. *Vaccine*,32:5957–5961.
- 24- **Rehmani R, Memon JI(2010):** Knowledge, attitudes and beliefs regarding influenza vaccination among healthcare workers in a Saudi hospital. *Vaccine*,28:4283–7.
- 25- **Seale H, Leask J and MacIntyre CR(2009):** Attitudes amongst Australian hospital healthcare workers towards seasonal influenza and vaccination. *Influenza and Other Respiratory Viruses*,4(1), 41–46.