

## ORIGINAL ARTICLE

# Assessment of the belief and attitudes of Iranian healthcare personnel's toward the influenza infection and influenza vaccination

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## Keywords

Healthcare professionals • Influenza • Vaccination • Attitude • Belief • Iran

## Summary

**Introduction.** Influenza is one of the main public health problems and health care personnels (HCPs) are one of the at-risk groups for this infection. The goal of the current study was to identify the beliefs and attitudes of the Iranian HCPs about influenza and the influenza vaccine.

**Methods.** This cross-sectional study was performed in a general hospital in Tehran, Iran from January to June 2016. A total of 418 questionnaires were distributed among the HCPs. The Chi<sup>2</sup> test, linear regression and one-way ANOVA were used for data analysis,  $\alpha$ : 0.05 was considered as a statistically significant level. All analyses were performed using the SPSS19 software.

**Results.** The influenza vaccination coverage was 57.7%; the highest vaccine rate belongs to the allied health professionals (68.2%). Two main causes for avoiding the influenza vaccination were; the "fear of vaccine adverse effects" and the "uncertainty about the vaccine effectiveness". The linear regression analysis identified that the physicians had the highest belief score, followed by the nurses and the allied health professionals ( $p < 0.001$ ).

**Conclusions.** Educational planning on influenza and influenza vaccination is necessary to improve the vaccination coverage and to reduce the influenza mortality and morbidity in susceptible patients.

## Introduction

Influenza is one of the main public health issues; annually, 5-15% of worldwide populations are likely to be affected by influenza [1, 2]. The HCPs are at risk of exposure to the influenza virus in hospitals due to their contact with patients [3]. On the other hand, HCPs may transmit the virus to patients with critical conditions [4]. It is the most common cause of absenteeism and work disruption of hospital personnel's during winter [5]. Immunization of the HCPs against the influenza is a verified infection control method [6, 7]. Influenza vaccination reduces the risk of influenza infection among the HCPs. It also protects susceptible patients and could significantly decrease the patients' mortality and morbidity [8]. Despite promotional campaigns, the global health workers compliance for influenza vaccination is suboptimal, so the herd immunity is not satisfied [4, 5, 9-11]. A review of the literature on belief and attitude of respondents for not being immunized, identified some factors as responsible. These factors include: concern about influenza vaccine side effects, fear of needle, doubts as to the vaccine effectiveness, and lack of concern about the importance of flu [5, 12]. The latter also showed that self-esteem and perceived stress are associated with individuals' tendency to use influenza vaccine. A few studies have been carried out on the

HCPs' knowledge, attitudes and vaccine coverage for influenza virus and correlation of their belief scores with variables such as profession, age, and sex in the Iranian hospitals [13-15]. The studies reported different influenza vaccination coverage among the HCPs in different hospitals. Because of the importance of the subject, the purpose of the current study was to investigate the beliefs and attitudes of HCPs about influenza vaccine and its associated factors in the Baharloo Hospital in Tehran.

## Methods

The current cross-sectional study was carried out in a general hospital in Tehran-Iran with more than 300 beds capacity, From January 2016 to June 2016, the Baharloo Hospital's HCPs were provided with an anonymous, self-administered questionnaire which was completed voluntarily. This study was approved by the ethics committee of the Hospital. The study protocol was approved by the Baharloo Hospital of Tehran University of Medical Sciences. The whole body of the HCPs working at the Baharloo Hospital was invited to participate in the present study. Two trained hospital staffs (one nurse and one physician) were responsible for distributing the questionnaires and providing instructions to the participants. The completed questionnaires were gathered on the same day. The HCPs

participated voluntarily in the study. After reviewing the questionnaires present in the literature [8, 16-18], a questionnaire was designed for the present study. A 39-item questionnaire was finalized, and a pilot study was conducted among 20 HCPs to determine the reliability of the tools. The validity of this questionnaire was confirmed by the expert's opinion using qualitative method. To assess the validity of the designed questionnaire, three groups of experts were used. The first group of experts was Content expert which include two persons of Infectious Disease Specialist who have Clinical Expertise about understudy subject. The second group was two lay experts which includes two persons of health care workers and finally one epidemiologist as a methodologist. The mentioned expertise checked all questions of questionnaire about relevancy and clarity also the comprehensiveness of questionnaire. All comments of mentioned expertise group applied in the questionnaire, and finally the questionnaire was approved by all experts.

The reliability of this questionnaire was estimated using the Cronbach's alpha test. The overall reliability of this test was about 0.72. The questionnaire included three sections. The first section was comprised of 5 items to gather the descriptive information of the respondents and included questions about history of previous vaccinations against the influenza. The second section consisted 14 items about the HCPs beliefs and attitudes about influenza infection and influenza vaccine. The third section consisted 5 items, about the reasons for declining the influenza vaccination. The questionnaire included 14 items to assess the belief, the range of Scores was from 1 to 4. 4 and 1 points have been considered for each correct and incorrect response respectively. The sum of all correct answers resulted in a continuous variable, ranging from 4 to 56.

**STATISTICAL ANALYSIS**

The Multicollinearity between variables was tested, but there was none. Upon the completion of data collections, the data were coded into categorical, nominal and ordinal variables. The Chi<sup>2</sup> test, linear regression and one-way ANOVA were used for data analysis. The  $\alpha$ : 0.05 was considered as a statistically significant level. All analysis performed using the SPSS software version 19.

**Results**

A total of 418 questionnaires were distributed among the HCPs in the Baharloo Hospital. The response rate was about 90.4 % (n = 378). Most of the participants were from the 20-30 years age group (167; 44.2%). The majority of the HCPs were females (276; 73%). By the profession, the majority of respondents were nurses (270; 71.4%), followed by the allied health professionals (66; 17.5%) and the physicians (42; 11%). More details are shown in Table I. The influenza vaccine coverage in the HCPs was 57.7%, without significant difference between males and females (p = 0.55). The allied health professional's vaccination rate was about 68.2%, followed by the nurses (58.9%) and the physicians (33.3%)

(p < 0.001). The highest influenza vaccination rate was seen in 31-40 year age group (66%). More details are shown in Table II.

The most common causes of avoiding influenza vaccine were: the "fear of adverse reaction" and the "worry about its effectiveness" (51; 31.9% for each mentioned factors). The other causes were the "getting flu after vaccination" (39; 24.4%), "fear of transmission of the virus to other persons" (21; 13.1%), and "fear of needle" (17; 10.6%) (Tab. III). The HCPs beliefs and attitudes

Tab. I. Descriptive characteristic of Iranian HCPs in the current study.

Variables	Number	Frequency
<b>Age group</b>		
20-30	167	44.2%
31-40	159	42.1%
41-50	39	10.3%
51-60	13	3.4%
<b>Profession</b>		
Allied health professions	66	17.5%
Nurse	270	71.4%
Physician	42	11.1%
<b>Gender</b>		
Male	102	27%
Female	276	73%
<b>Influenza vaccination done in last 6-12 months</b>		
Yes	218	57.7%
No	160	42.3%

Tab. II. The vaccine coverage according to gender, professions and age group in Iranian HCPs.

Variables	N (%)	P
<b>Gender</b>		
Male	56 (54.9%)	0.558
Female	162 (58.7%)	
<b>Professions</b>		
Physician	14 (33.3%)	0.001
Nurses	159 (58.9%)	
Allied health professions	45 (68.2%)	
<b>Age group</b>		
20-30	83 (49.7%)	0.020
31-40	105 (66%)	
41-50	24 (61.5%)	
51-60	6 (42.2%)	

Tab. III. The most common cause for non-compliance with vaccination recommendations in Iranian HCPs.

Questions	Agree N (%)	Disagree N (%)
Fear of needles	17 (10.6%)	143 (89.4%)
Fear of vaccine adverse effects	51 (31.9%)	109 (68.1%)
Worry about vaccine ineffectiveness	51 (31.9%)	109 (68.1%)
By getting vaccinated, I getting flu	39 (24.4%)	121 (75.6%)
By getting vaccinated, the virus transmission to others	21 (13.1%)	139 (86.9%)

**Tab. IV.** The attitude of Iranian HCPs about the influenza and influenza vaccine.

Questions	Totally agree N (%)	Partially agree N (%)	Partially disagree N (%)	Totally disagree N (%)
Influenza is a serious illness	247 (65.3%)	115 (30.4%)	10 (2.6%)	6 (1.6%)
I prefer to get flu than to be vaccinated	23 (6.1%)	54 (14.3%)	93 (24.6%)	208 (55%)
The influenza complications are serious	95 (21.1%)	144 (38.1%)	107 (28.3%)	32 (8.5%)
Influenza vaccine can cause influenza	28 (7.4%)	119 (31.5%)	123 (32.5%)	108 (28.6%)
Influenza vaccine can prevent influenza	102 (27%)	211 (55.8%)	56 (14.8%)	9 (2.4%)
HCPs must be vaccinated against influenza	195 (51.6%)	133 (35.2%)	43 (11.4%)	7 (1.9%)
I totally disagree with influenza vaccination	21 (5.6%)	62 (16.4%)	102 (27%)	193 (51.1%)
Influenza virus can transmit to others after vaccination	26 (6.9%)	65 (17.2%)	117 (31%)	170 (45%)
Influenza vaccination can protect me against influenza	107 (28.3%)	192 (50.8%)	59 (15.6%)	20 (5.3%)
By getting vaccinated, I protect my family against influenza	88 (23.3%)	141 (37.7%)	69 (18.3%)	80 (21.2%)
By getting vaccinated, I protect my patients against influenza	94 (24.9%)	135 (35.7%)	69 (18.3%)	80 (21.2%)
My family believe I must be vaccinated against influenza	129 (34.1%)	164 (43.4%)	65 (17.2%)	20 (5.3%)
The pregnant woman must be vaccinated against influenza	107 (28.3%)	112 (29.6%)	92 (24.3%)	67 (17.8%)
Hospital encourage HCPs to get vaccinated	127 (33.6%)	164 (43.3%)	53 (14%)	34 (9%)

**Tab. V.** Different professions' attitudes about the influenza vaccination in pregnant women.

Profession	Totally agree N (%)	Partially agree N (%)	Partially disagree N (%)	Totally disagree N (%)	Totally agree N (%)	P
Allied health professions	29 (43.9%)	15 (22.7%)	11 (16.7%)	11 (16.7%)	29 (43.9%)	0.003
Nurse	61 (22.6%)	79 (29.3%)	76 (28.1%)	54 (20%)	61 (22.6%)	
Physician	17 (40.5%)	18 (42.9%)	5 (11.9%)	2 (4.8%)	17 (40.5%)	

about the influenza and influenza vaccine have been addressed as the followings; most of the participants were aware about the necessity of influenza vaccination (328; 86.8%), the majority of the HCPs believed that the influenza virus could not be transmitted after the vaccination (287; 78%). Also there was a significant difference among the professions about this statement: “the influenza vaccine can cause influenza” ( $p < 0.001$ ). The majority of the nurses believed that the influenza vaccine can cause influenza infection (119; 44%) (Tab. IV). 219 (57.9%) of the HCPs believed that a pregnant women should be vaccinated against the influenza. However, there were significant differences among different professions about the “necessity of influenza vaccination for a pregnant women” ( $p = 0.03$ ). A great majority of the physicians believed about its necessity (35; 83.4%), fol-

lowed by the allied health professions (44; 66.6%) and the nurses (104; 38.5%) (Tab. V). Scoring the correct responses revealed that the physicians had the highest attitude and belief scores about influenza and influenza vaccination ( $31.92 \pm 4.57$ ;  $p < 0.001$ ) followed by the nurses ( $30.86 \pm 4.6$ ) and the allied health professionals ( $28.81 \pm 3.89$ ) (Tab. VI). To identify the effective fac-

**Tab. VI.** The attitude score of different Professions about the influenza vaccine.

Variables	Mean $\pm$ SD	P
<b>Profession of respondents</b>		
Physicians	31.92 $\pm$ 4.57	0.001
Nurses	30.86 $\pm$ 4.6	
Allied health professional	28.81 $\pm$ 3.89	

tors on the belief or attitudes score, linear regression was applied. The profession was associated with the belief score ( $p < 0.001$ ); and the physicians' score was higher than the nurses and the allied health professionals' score. There was no significant association between age group and gender with attitude score (Tab. VII). The older age group presented slightly higher attitude score about influenza and influenza vaccine.

## Discussion

The present study investigated the beliefs, attitudes and the rate of influenza vaccination among the HCPs in the Baharloo Hospital. The best method for prevention of influenza is vaccination, which results in decreasing of death in the HCPs and vulnerable patients [4, 19]. The current study found that the influenza vaccination rate among the HCPs was 57.7%. Previous studies revealed that the influenza vaccination rate in the HCPs varied in a broad range, in the European and Asian countries [20]. Its acceptance rate in the HCPs of the Arabic nations was different between 24.7% in United Arab Emirate to 67.2% in Kuwait [20]. Despite decades of promotional campaigns for influenza vaccination, the outcome has been relatively low coverage, as follow: 12% in Norway and Wales in 2009/10, between 30% and 50% in England, Hungary, Portugal and Scotland in 2010/11 and between 14% and 28% in France, Germany, Norway, Slovenia, Spain and Wales in 2010/11. The mean vaccination coverage rate of European countries was 29.8% [4, 8, 21-23]. Previous Iranian studies suggested that the influenza vaccination rate in the HCPs varied in a broad range from 5.2% to 66.9% [13-15]. The influenza immunization rate for Shiraz University HCPs in the 2005-2006 seasons was found to be low at 5.2%, whereas it was found to be 66.9% for Tehran University HCPs in the 2008-2009 influenza season [13, 14]. In the present study, the high rate of influenza immunization in the HCPs may be explained by the regular annual influenza conferences and the continuous flow of relevant information that raise their awareness. The other factor that might have contributed to the rather high rate of vaccination in Iranian HCPs (i.e., as compared to the other

neighboring nations) is probably the fact that the HCPs are provided the vaccine free of charge. In the current research, it is found that there was a significant difference in influenza vaccination rate among the HCPs with different professions. The physician's vaccination rate was the lowest. The studies in Saudi Arabia identified similar result; the physician's vaccination rate was relatively low as compared with other HCPs [17, 24]. According to Durando et al. [5], being physician was independently accompanied with adherence to immunization against influenza. In the current study, 90.5% of the physicians believed that the HCPs should be vaccinated against influenza, however, they showed the least coverage rate (i.e., amongst the HCPs). Conclusively there was no relationship between the attitude score and the vaccination rate in the present study. In the current study, 38.9% of the HCPs believed that "they might get flu after influenza vaccination". In the literature review, the HCPs' misconception about getting flu after influenza vaccination was different; from as low as 38.1% to as high as 78% [15, 25-27]. The lower rate of the misperception in the present study indicates their higher awareness. Majority of the HCPs believed that there was no live virus in the flu shot 82.8% of the HCPs believed that the influenza vaccination can prevent the influenza infection, whereas, in the study by Alshammari et al., only 71.43% of the HCPs believed such [17]. In the present research, 57.9% of the HCPs agreed with the vaccination of pregnant women against influenza. This is in sharp contrast with the study by Rehmani and Memon who identified that 10% of the HCPs agreed with the pregnant woman vaccination [8]. This is a salient point because the majority of the HCPs in our hospitals are the young female, so with this level of awareness, most of them were inclined to be vaccinated against the influenza. Therefore, the mortality and morbidity risk are expected to decrease in the pregnant HCPs. Influenza vaccination for the pregnant woman appeared as a controversial issue; the sub-analysis among the HCPs with different professions revealed significant differences. The approval rates were as follow: the physicians (83.4%), the allied health professionals (75.8%), and the nurses (51.9%). On the other hand, a research in 2016, disclosed that there was no significant difference between the physicians, the nurses and other health professional groups on this issue (i.e., "influenza vaccination for pregnant women") [25]. It is found out here that the widespread causes of refusing the influenza vaccine were the "fear of vaccine side effects" and the "vaccine ineffectiveness". These are similar to the other studies worldwide [18, 25]. An Iranian research in 2016 presented that 19.8% of the respondents were concerned about the influenza vaccine side effects [15]. Globally, fear of the influenza vaccine adverse reaction is one of the most important barriers for the acceptance of vaccine [2, 5]. The range of this misconception was between 11-66% in different studies [15, 25]. Another influenza vaccination obstacle was the "fear of the needle" that 10% of our respondents expressed. This was significantly lower than the 66.7% suggested in the study by Haffman et al. [27]. In a study by Alshammari

Tab. VII. The linear regression results about the factors affecting on attitude score in Iranian HCPs.

Variables	Regression coefficients	Standard error	p
<b>Age</b>			
21-30	1	-	-
31-40	0.004	0.502	0.993
41-50	0.67	0.82	0.417
51-60	0.64	1.356	0.631
<b>Sex (female)</b>	- 0.676	0.550	0.22
<b>Professions</b>			
Nurse	1	-	-
Physician	0.76	0.797	0.337
Allied health	- 2.42	0.669	< 0.001



et al., the “fear of getting flu” was found to be the main reason for refusing the influenza vaccine [17]. In the present study, this figure was 24.4%. It seems that we need to improve the HCPs knowledge regarding adverse reactions of influenza vaccine. The linear regression analysis reveals the association of the profession with most of the 14 items of beliefs and attitudes, the physicians score was more than the other HCPs. One study identified that the job experience, the age, and the profession were significant factors influencing the knowledge score of the HCPs; the nurses score was more than the other HCPs [26]. The present research revealed that the older age the HCPs, the more belief score they get. Also, the female’s belief score was less than their male’s counterparts. However, the gender impact on HCPs belief score was not significant. Some researchers found that there was a non-significant association between the age and the gender with the attitude and knowledge of the HCPs [14]. This study has both limitations and strengths as follow respectively. All data of the current research was self-reported, we had to rely on the respondents consideration to report correct data. Also, the HCPs’ knowledge of influenza and influenza vaccine was not investigated in current research. Amongst the strengths of the present study are; the sample size and response rate of our research were more than most the other studies. Also, this study reveals the responders attitudes on the influenza vaccination in pregnant women; an issue rarely regarded in the literatures.

## Conclusions

Overall influenza vaccine coverage in the current study was 57.7% and the physician’s vaccination rate was the lowest among the HCPs of Baharloo Hospital in Tehran. However, the physician’s belief score about the influenza vaccine was the highest score. The current study identifies that there is no association between the belief or attitude score and adhering to the vaccination policies. Several factors such as concern about the influenza vaccine side effects, fear of getting flu and fear of needles are linked with declining influenza vaccination in the HCPs. Further research and campaigns are needed on the influenza vaccination along with promotional support to motivate the HCPs for influenza vaccination.

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## Conflict of interest statement

None declared.

## Authors’ contributions

HH planned the study, contributed in data collection, data analyses, drafting the manuscript and finalizing the manuscript. ARK contributed in data collection and literature review. MG contributed in data collection and manuscript preparation. SA contributed in data collection, data analyses and drafting the manuscript. YA contributed in data analyses, drafting the manuscript and finalizing the manuscript.

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