

## Causes of Non-Vaccination of Influenza in Healthcare Workers at Zanjan Educational Hospitals, Iran

Mojtaba Kamali Aghdam<sup>1</sup>, Zahra Shojaeyan<sup>2</sup>, Diana Noemi Diaz<sup>3</sup>, \*Kambiz Eftekhari<sup>4</sup>

<sup>1</sup>Assistant Professor of Pediatric Infectious, Pediatric Department, Mousavi Hospital, Zanjan University of Medical Sciences, Zanjan, Iran.

<sup>2</sup>General Physician, Zanjan University of Medical Sciences, Zanjan, Iran.

<sup>3</sup>Assistant Professor of Pediatric Surgery, Pediatric Department, Mousavi Hospital, Zanjan University of Medical Sciences, Zanjan, Iran.

<sup>4</sup>Associate Professor of Pediatric Gastroenterology, Pediatric Gastroenterology and Hepatology Research Center, Tehran University of Medical Sciences, Department of Pediatric, Bahrami Children's Hospital, Tehran, Iran.

### Abstract

**Background:** Influenza is an acute respiratory illness that can cause hospitalization, and confers a high mortality rate, especially in high-risk groups. Influenza vaccination for hospital staff can play an effective role in controlling nosocomial flu infections. The purpose of this study was to investigate causes of non-vaccination of influenza in healthcare workers at Zanjan educational hospitals.

**Materials and Methods:** This was a cross-sectional study conducted during three months at two Zanjan educational hospitals, Iran. Two hundred and ten workers belonging to the hospital staff were randomly selected. The reasons for not receiving the vaccine and the demographic information of the staff were recorded in a special questionnaire. The questionnaire included demographic information such as: age, gender, occupation, work place, history of Influenza vaccination last year, and reason for non-vaccination of Influenza.

**Results:** Two hundred individuals were enrolled, which included 58% of physicians and 42% of nurses. In the past year, 51% of the subjects have received influenza vaccine. Of these, 45.7% were physicians and 58.3% were nurses. The most common reasons for non-vaccination were: the belief that healthy people do not have the chance of getting the infection (28.6%), forgetfulness (24.5%), lack of adequate information and fear of complications from the vaccine (14.3%).

**Conclusion:** The status of influenza vaccination in the staff of these hospitals was relatively acceptable (51% of the subjects were vaccinated); however, it has not yet reached the ideal. According to the results, the most common reasons for non-vaccination were: wrong thinking about getting the infection, forgetfulness, and fear of complications.

**Key Words:** Healthcare workers, Influenza Vaccine, Iran, Physician, Nurses.

\*Please cite this article as: Kamali Aghdam M, Shojaeyan Z, Noemi Diaz D, Eftekhari K. Causes of Non-Vaccination of Influenza in Healthcare Workers at Zanjan Educational Hospitals, Iran. Int J Pediatr 2019; 7(10): 10167-174. DOI: [10.22038/ijp.2019.41274.3483](https://doi.org/10.22038/ijp.2019.41274.3483)

### \*Corresponding Author:

Kambiz Eftekhari (M.D), Mailing Address: Pediatric Department, Bahrami Children's Hospital, Kiaee Street, Tehran Iran. Postal Code: 16417-44991

Email: [dr\\_k\\_eftekhary@yahoo.com](mailto:dr_k_eftekhary@yahoo.com)

Received date: Mar.26, 2019; Accepted date: Aug.22, 2019

## 1- INTRODUCTION

Influenza is an acute respiratory infection that is commonly associated with annual attacks. This disease can cause hospitalization and mortality, especially in high-risk groups (including children, the elderly, and people with some underlying illnesses). Hospital epidemics of influenza are common and their control has many challenges. On the other hand, the transmission of disease is possible between health care workers and patients and vice versa (1). Health care workers have an important role in the spread of the disease, both as a source of the outbreak in the hospital and at the community level. Vaccination of hospital staff against Influenza can play a very important protective role against the infection, and it is effective in controlling this disease in hospitals (1). Therefore, the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have recommended the vaccination of health care staff (2-5). Their vaccination can lead to a reduction in absenteeism and savings in health care financing (6, 7).

Some studies have shown that a number of health care workers remain inclined to work during the course of the flu, which could be a risk factor for the transmission of infection to patients (8). Influenza vaccination is essential for health care workers in any country (9, 10). According to the results of studies in different countries, less than 50% of these people receive the vaccine. The reasons why the health workers are reluctant to get this vaccine can be due to lack of adequate knowledge about the flu and its complications (11, 12). According to Iranian studies, fewer than 50% of health care workers received influenza vaccine last year. The results of Darwish et al., showed 46.8% and Honarwar et al., detected only 30% of health care workers had a history of vaccination last year (13, 14).

There are various reasons for lack of influenza vaccination in different regions. The purpose of the present study was to evaluate the status of influenza vaccination among medical staff (including physicians and nurses) working in Zanjan educational hospitals, and to identify the potential reasons for not receiving the vaccine in these high-risk groups. Based on these findings, we can increase vaccination among healthcare personnel according to a precise and targeted planning. As a result, it can increase the health condition of patients and hospital workers during the annual epidemics of influenza.

## 2- MATERIALS AND METHODS

### 2-1. Study design

This was a cross-sectional study conducted during three months (from December 22, 2017 to March 22, 2018), at two Zanjan Educational Hospitals (Mousavi and Vali-asr Hospital), Iran. The study population included physicians and nurses working at Mousavi Hospital [comprising four departments: Pediatrics, Children's Emergency Department, Pediatric Intensive Care Unit (PICU), and Adult Intensive Care Unit (ICU)], and Vali-asr Hospital (with five departments: Infectious Diseases, Internal Medicine, Neurology, Emergency, and ICU). They were divided into 18 separate groups according to their occupation and departments. Finally, the population was randomly selected from each group and the total sample size. The reason for selecting some specific departments for this study was their importance in influenza epidemics and the higher incidence of hospitalization due to the severe complications of infection in these areas. The sample size was calculated 210. A questionnaire was used to collect data and was prepared by searching in scientific texts and previous articles. The validity of the questionnaire was reviewed and approved by experts, including infectious

pediatricians, pediatricians, social medicine specialist, and infectious disease nurses. To assess the reliability of the questionnaire, especially for questions about the causes of non-vaccination or vaccination of influenza, the questionnaire was provided to 30 hospitals' healthcare staff at two time intervals of 10 days. Thus the reliability for reasons of non-vaccination and vaccination were obtained, 0.83 and 0.87 respectively. The questionnaire contained baseline characteristics including age, gender, and occupation, level of education, department, work place, history of Influenza vaccination last year, and reason for non-vaccination or vaccination of Influenza.

**The reasons for non-vaccination of Influenza include:**

1. Believing that healthy people are less likely to suffer from influenza,
2. Doubts about the usefulness and efficacy of the influenza vaccine,
3. Fear of complications of the vaccine,
4. Believing that the complications of the vaccine are greater than the complications of the disease,
5. Believing that the influenza vaccine can cause the Influenza infection,
6. Lack of easy access and the cost of the vaccine,
7. Fear of any type of injection,
8. Lack of time, Lack of adequate information, Forgetfulness.

**The reasons for vaccination of Influenza including:**

1. Feeling responsible for patients and reducing the risk of influenza transmission to patients,
2. Reduce the probability of absenteeism due to influenza,
3. Fear of influenza transmission to the family,
4. Ease of access to influenza vaccine and it is free of charge.

After characterizing the samples, the questionnaires were completed by a colleague student (intern) by referring to the department. The other colleagues contributed to the collection of information, statistical analysis and interpretation of data, writing a paper and final review. The sampling was done by a simple random method from personnel of the mentioned departments. Two hundred and ten questionnaires were delivered to the workers.

**2-2. Inclusion criteria**

Physicians and nurses working in Pediatrics Department, Children's Emergency, Pediatric PICU, and ICU at Mousavi Hospital, and at the Departments of Infectiology, Internal Medicine, Neurology, Emergency, and ICU at Vali-Asr Hospital.

**2-3. Exclusion criteria**

Those who did not complete the questionnaire.

**2-4. Ethical Considerations**

This study was approved by the Ethics Committee of Zanjan University of Medical Sciences (Approval Number: IR.ZUMS.REC.1397.69).

**2-5. Statistical methods**

The data were statistically analyzed by SPSS software (version 18.0). Chi-square test was used to determine the relationship between qualitative and nominal variables. In the all tests, values of less than 0.05 (P-value <0.05) were considered significant.

**3- RESULTS**

The questionnaires were completed for 210 selected personnel (including 120 physicians and 90 nurses). However, 200 questionnaires were completed correctly and ten people were excluded due to incomplete questionnaires (respond rate: 95.2%). Ninety-six (48%) participants

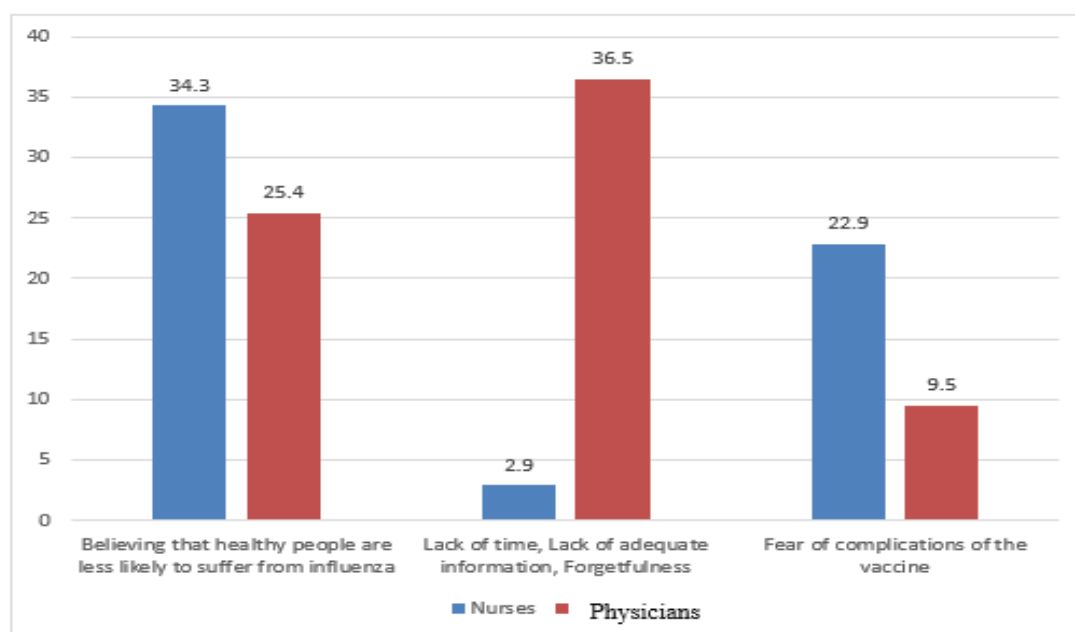
belonged to medical staff of Mousavi Hospital and 104 (52%) from Vali-Asr Hospital. They included 54 males (27%), and 146 females (73%). Fifty-eight of them were physicians (n=116), and 42% nurses (n=84). Ninety-eight (49%) subjects had not been vaccinated in the last year, which included 63 physicians (54.3% doctors), and 35 nurses (41.7% nurses). Twenty-eight non-vaccinated were male (51.9% from men), and 70 were female (47.9% from women). Although vaccination during the last year in nurses was higher than in doctors, and in women more than in men, there was no significant difference between the two groups (P-value=0.624 and P-value=0.077, respectively). The frequency distribution of personnel vaccination status during the last year was different in various departments, and the highest incidence was reported in workers of the pediatric departments but it was not a significant difference (P-value>0.05). The vaccination status of personnel was also different in various age groups (in 3 age groups including: 20-29, 30-39, and 49-40 years), and the highest incidence of the vaccination was seen in the age group of

20-29 years, but this difference was not statistically significant (P-value = 0.39). **Table.1** shows the reasons for non-vaccination in physicians and nurses. The most common reasons for non-vaccination were: belief that healthy people are less likely to suffer from influenza (28.6%), forgetfulness and insufficient notification (24.5%), fear of complications of the vaccine (14.3%) (**Figure.1**).

Based on the results, there was a statistically significant difference between physicians and nurses regarding: 1-doubts about the usefulness and efficacy of the influenza vaccine (P-value=0.042); 2-belief that the complications of the vaccine are greater than the complications of the disease (P-value = 0.04) 3-lack of time, lack of adequate information, and 4-forgetfulness (P-value <0.001). **Table.2** summarizes the reasons for non-vaccination based on gender. As seen in this table, there was no significant difference between the genders for each of the mentioned reasons (P-value > 0.05 has been recorded in all of them).

**Table-1:** Reasons for non-vaccination by physician and nurse at Zanzan educational hospitals (n=200).

Reasons for non-vaccination	Physician	Nurse	P-value
	Number (%)	Number (%)	
Believing that healthy people are less likely to suffer from influenza	16 (25.4)	12 (34.3)	0.351
Doubts about the usefulness and efficacy of the influenza vaccine	3 (4.8)	6 (17.1)	0.042
Fear of complications of the vaccine	6 (9.5)	8 (22.9)	0.071
Believing that the complications of the vaccine are greater than the complications of the disease	4 (6.3)	7 (20)	0.040
Believing that the influenza vaccine can cause the Influenza infection	0	0	---
Lack of easy access and the cost of the vaccine	12 (19)	3 (8.6)	0.168
Fear of any type of injection	0	0	
Lack of time, Lack of adequate information, Forgetfulness	23 (36.5)	1 (2.9)	<0.001



**Fig.1:** The most common causes for non-vaccination of Influenza (Percentage).

**Table-2:** Reasons for non-vaccination based on gender at Zanjan educational hospitals (n=200).

Reasons for non-vaccination	Male	Female	P-value
	Number (%)	Number (%)	
Believing that healthy people are less likely to suffer from influenza	7 (25)	21 (30)	0.621
Doubts about the usefulness and efficacy of the influenza vaccine	3 (10.7)	6 (8.6)	0.740
Fear of complications of the vaccine	2 (7.1)	12 (17.1)	0.201
Believing that the complications of the vaccine are greater than the complications of the disease	5 (17.9)	6 (8.6)	0.188
Believing that the influenza vaccine can cause the Influenza infection	0	0	---
Lack of easy access and the cost of the vaccine	7 (25)	8 (11.4)	0.092
Fear of any type of injection	0	0	---
Lack of time, Lack of adequate information, Forgetfulness	5 (17.9)	19 (27.1)	0.334

#### 4- DISCUSSION

Iranian studies suggested fewer than 50% of health care workers received influenza vaccine last year. (13, 14). The present study was conducted to investigate the causes of non-vaccination of influenza in healthcare workers at Zanjan educational hospitals. Influenza is an acute respiratory viral infection. It can occasionally lead to various complications including secondary bacterial infections, myocarditis (sometimes fatal),

neurological disorders such as encephalopathy, diffuse dysfunction in the brain, Status epilepticus (SE), Guillain Barre syndrome, acute myositis, Acute Respiratory Distress Syndrome (ARDS), Disseminated intravascular coagulation (DIC), etc. Influenza vaccination for target and high-risk groups can reduce the incidence and hospitalization and lead to very good results in terms of general health. Inactivated vaccines (available in our country) can protect 50 to 80% of the

infection (15, 16). Our results showed that about half of the participants in the study did not have a history of influenza vaccination during the previous year and the reasons for non-vaccination were different among physicians and nurses. The most important reasons for non-vaccination of doctors were lack of time, lack of adequate information and forgetfulness. The next reasons in this group were the lack of easy access and the cost of the vaccine. On the other hand, the most important reason for non-vaccination of nurses was the belief that healthy people are less likely to suffer from influenza.

The next reasons among nurses were: complications of the vaccine greater than the complications of the disease, fear of complications of the vaccine and doubt about the efficacy and usefulness of the influenza vaccine. There was a significant difference between doctors and nurses in this regard. A study by Honarvar et al. (2010) in Shiraz (13) showed that only 30% of health workers had a history of influenza vaccination during the previous year, which showed a lower level of vaccination coverage than our study (30 to 50%). This difference can be attributed to the interval between these two studies, because in recent years more emphasis has been placed on influenza vaccination for medical staff. In this study, unlike ours, there was no distinction between the reasons for non-vaccination among doctors and nurses. The most important reasons for non-vaccination in Honarvar's study were low probability of influenza, doubt about the efficacy of the vaccine and fear of complications from the vaccine. These findings were similar to ours among nurses. This similarity can be attributed to a large number of nurses participating in Honarvar's study (76.8%) (13). The study by Esposito et al. in a university hospital in Italy (2008) showed that the staff vaccination was very low, ranging from 17.6% in the emergency department to

24.3% in the surgical ward, which was less than our study (9). In the study of Nutman and Yoeli (2016), the incidence of influenza vaccination was reported 42% in health workers (17). In this study, the rate of vaccination among doctors was 56%, much higher than among our physicians (45.7%). However, the rate of vaccination among nurses varied (41% and 58.3%, respectively). The most important reason for non-vaccination in the Nutman and Yoeli's study was the belief that the vaccine could cause Influenza infection.

This finding was in contradiction with our results since none of our study groups (doctors and nurses) had that belief. In this study, about 40% of people believed that the side effects of the vaccine could be more severe than the Influenza infection, while in our study this was only 13%. Our study showed that influenza vaccination in the health workforce is relatively acceptable, although it is still far from ideal. The rate of vaccination can be easily upgraded considering the reasons for non-vaccination. For example, the lack of information or the cost of the vaccine was the reasons for a significant number of non-vaccinations. Vaccination of the staff is free and further information can be very effective in improving this situation. Special training and more information can be used to improve the rate of vaccination especially in the nursing group.

#### **4-1. Study Limitations**

One of the most important limitations of this study is the lack of cooperation of some participants when filling the questionnaire, which was modified by pointing out the objectives of the study and emphasizing the confidentiality of the information. It is recommended that health workers get more vaccination information, especially at the onset of the flu season. In a further study, the role of encouragement to increase vaccination of staff will be evaluated.

## 5- CONCLUSION

Identifying the causes of non-vaccination of influenza among doctors and nurses is very important. As the study suggested, the most common reason for non-vaccination was the belief that healthy people are less likely to develop influenza, on the other hand, forgetfulness and insufficient notification in physicians, and being fearful about the complications of the vaccine in nurses were other common causes. So the physicians need more information and nurses need more training on the benefits and side effects of the vaccine.

**6- CONFLICT OF INTEREST:** None.

## 7- ACKNOWLEDGMENT

We thank all of the personnel of Mousavi and Vali-Asr hospitals in Zanjan who participated in this study.

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