

# The Evaluation of Knowledge, Opinions, and Attitudes of Hospital Staff Except Physicians and Nurses Regarding Seasonal Influenza Vaccine

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## Abstract

**Objective:** Seasonal influenza infections are a leading cause of illness, death, productivity loss, and absenteeism. Annual influenza vaccination is recommended for healthcare workers, but vaccination rate is low in many countries. The aim of this study was to investigate the knowledge, opinions, and attitudes of hospital staff except physicians and nurses toward influenza and influenza vaccination.

**Material and Methods:** In this descriptive study, among 248 hospital staff working at the Hacettepe University, Ihsan Dogramaci Children's Hospital in Ankara, Turkey, 179 participated in the study. A questionnaire with 33 questions was administered to the hospital staff. The participants answered questions about their sociodemographic characteristics; status of influenza vaccination; and their opinions, attitudes, and information about influenza and influenza vaccination. Chi-square test was used to evaluate the significance of the observed differences. The results were accepted as statistically significant if p value was lower than 0.05.

**Results:** Among the participants, 55.3% (n=99) were female and 86.0% (n=154) had been working for ≥5 years. The seasonal influenza vaccination rate among all participants during the 2013–2014 season was 18.4% (n=33). The most important reasons for declining seasonal vaccination were rare occurrence of flu (53.4%), apprehension regarding adverse effects (24.6%), concern regarding falling ill after vaccination (16.4%), and not being convinced about the necessity for vaccination (15.7%). With regard to revaccination in 2014–2015, 93.9% of the hospital staff vaccinated in the previous season underwent revaccination, whereas only 27.2% of those who were not previously vaccinated did (p<0.001).

**Conclusion:** Influenza vaccination coverage in hospital staff was below the desirable levels. Useful interventions, such as the training of the hospital staff concerning the benefits and safety of influenza vaccination before the influenza season and the use of mobile vaccination teams in conjunction with incentives, should be widely implemented. (*J Pediatr Inf 2015; 9: 68-75*)

**Keywords:** Influenza, influenza vaccine, hospital staff, knowledge, opinions

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## Introduction

Seasonal influenza is a self-limited disease affecting people of all ages. Nevertheless, it is important since it causes epidemics, productivity loss and absenteeism and hospitalization and mortality especially in the risk groups (1). As the healthcare workers are the persons that have roles especially in the transmission of the disease, they are considered among the risk groups (2). In order to encourage the vaccination of

healthcare workers, legislative regulations have been passed in many developed countries including the United States of America leading the way. However, the healthcare vaccination rates are not good enough. In this connection, through various training activities, some attempts are made to alter the opinions and attitudes of the healthcare workers towards influenza vaccine. In order to support vaccination by emphasizing the importance of influenza in our country, legislative regulations were passed as of 2004

and since then, healthcare workers given free seasonal influenza vaccination every year.

The most effective way of prevention of the disease and the epidemics is the influenza vaccine (2). Despite a great number studies done in the world on vaccination rates of the physicians and the reasons affecting this situation, there are only few studies on this topic in Turkey. The existing studies have mostly focused on the primary healthcare workers such as physicians and nurses. This particular situation has generated the need to investigate the current level of knowledge and attitudes of the health personnel (such as medical secretary, assistant health personnel, cleaning and food handling personnel) other than the primary healthcare workers about the seasonal influenza vaccine.

The aim of this study was to investigate the current level of knowledge and attitudes of the hospital staff other than the physicians and nurses about the seasonal influenza vaccine.

## Material and Methods

All the healthcare workers (248 people) working at the Pediatric Hospital of Hacettepe University such as medical secretary, assistant health personnel, cleaning and food handling personnel other than physicians and nurses constituted the target population of the study. Four of these personnel were excluded from the study as they worked together with the researcher. The preliminary test was given to 10 people. A total of 234 personnel were asked to participate in the study between 1-19 May, 2014, and 179 accepted to take part in. In this descriptive study, the data was collected through a pre-prepared questionnaire filled in by the healthcare workers. A questionnaire developed in line with the aims of the study by the researcher was used to collect the data. The questionnaire included 33 questions inquiring about some of the sociodemographic data, administration of the influenza vaccination, information about influenza and the influenza vaccine and the existing knowledge and opinions of the participants.

The descriptive variables were age, gender, level of education, number of household, the presence of people under 5 years old and over 65 years of age, the unit and position at the hospital, duration of employment at the hospital, current overall health situation, presence of allergy to egg and whether the participant is a smoker. The identified variables were whether an influenza vaccine was administered in the last year and the participants' knowledge about influenza and the influenza vaccine.

Approvals were received from the Non-invasive Clinical Studies Ethics Committee of Hacettepe University and the

Chief Physicianship of the Pediatric Hospital of Hacettepe University.

The data analysis was performed by using the SPSS 17.0 (Chicago, IL, USA) program. In cases where continuous data was compatible with normal distribution, average  $\pm$  standard deviation was used; and in cases where continuous data was not compatible with normal distribution, median (minimum-maximum) was used, and for the categorical data, numbers (n) and percentages (%) were used. If the lowest expected value was lower than 2, or the value expected to be lower than 5 was a number over 20%, the p value of Fisher's exact chi-square test was used. In cases other than these, the p value of Pearson chi-squared test was used. For the observed statistical differences, the p value, which was lower than 0.05, was considered as significant.

## Results

We aimed to reach the not preliminarily-tested 248 hospital personnel other than the physicians and nurses working at the Pediatric Hospital of Hacettepe University as well as the 234 who did not work at the infectious diseases department; however, a total of 179 personnel (76.4%) agreed to participate in the study. The average age of the participants was  $36.4 \pm 7.43$ , median age 36 (youngest= 23, oldest= 59); 55.3% were females; 79.8% were married, 12.2% single, 7.7% divorced or do not live together. Regarding their level of education; 7.8% were elementary school degree, 14% secondary school degree, 38.5% high school degree, 39.7% university degree. Table 1 illustrates the duty and position at the hospital, duration of employment, history of previous employment and its duration. The participating health personnel other than the physicians and nurses worked at the Pediatric Hospital of Ihsan Doğramacı Hospital on average for  $11.14 \pm 6.57$  years, median 10 years (minimum= 0, maximum= 30 years). 99 of the participants (55.3%) had a previous job; average duration of employment was  $3.97 \pm 3.23$  years, median was 3 years (minimum= 1, maximum= 18 years).

The number of household of the hospital personnel other than the physicians and nurses working at the Pediatric Hospital of Hacettepe University was on average  $3.6 \pm 1.03$  median was 4 (least= 1, highest= 6). The presence of people under 5 years old and over 65 years of age, who were in the risk group in terms of influenza were as follows respectively; 32.4% (n=58) and 13.4% (n=24). 43,6% of the participants reported that they never smoked, 17,9% smoked, but quit, 11.7% occasionally smoked, and 26,8% smoked regularly. Twenty eight and half percent of the participants had a history of a chronic disease. The egg allergy, which was the risk group for the influenza vaccine, was present only in two (1.1%) participants; four

participants (2.2%) reported not to know whether they had egg allergy and 96,6% reported to not have egg allergy. Those who reported to have egg allergy did have influenza vaccine the previous season; one of the four participants who did not know their allergy status has an influenza vaccine and did not have any allergic reaction.

Participants, 81.6%, reported to have some knowledge about influenza vaccine, and 18.4% not to have any information. Among those (n=146) who had previous knowledge about influenza vaccine, 72.6% obtained the information from colleague physicians, 28.7% from media outlets (radio-TV), 25,3% from health-related publications, 22.6% from newspaper and journals, and 21.9 from the internet. When asked who needed to be shot the vaccine, 61.5% said those who frequent has influenza, 60.3% the elderly, 60.3% the children, 58.7% healthcare workers, 48.6 those with chronic disease and 10,6% pregnant women.

In the study, the participants were given some statements about influenza and influenza vaccine such as 'influenza is a simple disease', 'influenza does not heal without antibiotics', 'all health personnel should be vaccinated'; participants' responses to these statements are illustrated in Table 2.

Participants, 18.4% (n=33), had a seasonal influenza vaccine last year; Table 3 illustrates the status of participants' influenza vaccination and its reasons. Out of those who had the vaccine, 10 (34.4%) of those who said "to protect myself" had one person under five years old at home and 4 (13.7%) had a person over the age of 65. 8 (44.4%) of those who said "to protect my family" had one person under 5 years old at home and 3 (16.6%) had one person over the age of 65.

In the study, regarding the measures to be taken by the healthcare workers towards the dimension of getting the influenza vaccine shot, their opinions are illustrated in Table 4.

Based on the demographic characteristics of the participating health personnel, their responses regarding whether they had influenza vaccine in the last year is presented in Table 5. Although the distribution of those who had the vaccine and those did not have had similarities (p=0.285), majority of the personnel were under the age of 40 (68.4% and 57.5% respectively). While females constituted 58.9% of the group who did not have vaccination, 39.3% of those who had vaccination were women, but the difference between them was not statistically significant (p=0.053). In both groups, most of the participants were married (80.1% and 78.7% respectively, p=0.227). There was no difference regarding the level of education between the groups (p=0.222). Education level of 80.1% of those who did not have vaccination and 69.6% of those who had vaccination had high school or university

**Table 1.** Distribution of the some of the characteristics of healthcare personnel other than physicians and nurses regarding the occupational life (HU İhsan Dođramacı Pediatric Hospital-Ankara, 2014)

Characteristics	Number (n)	(%)
Duty at the Hospital (n=179)		
Assistant health personnel	52	29.1
Medical secretary	47	26.3
Cleaning personnel	39	21.8
Food personnel	14	7.8
Other*	27	15.1
Site of duty (n=179)		
Emergency-polyclinic	75	41.9
Inpatient unit	71	39.7
Administrative	16	8.5
Other**	17	9.5
Duration of employment (year) (n=179)		
≤4	25	14.0
5-9	59	33.0
10-14	50	27.9
15-19	19	10.6
≥20	26	14.5
History of previous employment (n=179)		
None	80	44.6
About health	14	7.8
Other institution/organization	85	47.4
Duration of previous employment (year) (n=99)		
≤2 years	44	44.4
3-4 years	24	24.2
≥5 years	31	31.3
*Health technician, dietician, social service specialist		
**Dietician, refectory, formula food kitchen, cashier's desk		

degrees. While the biggest groups of those who did not have vaccination were the medical secretaries (22.9%) and the assistant health personnel (22.3%), of those who had the vaccination, 36.3% were the assistant health personnel, 30,3% were the cleaning personnel; however, the distribution of the duties of these groups were similar (p=0.377). There was no statistical difference between the groups in terms of smoking (p=0.140). While 36.8% of those who did not have vaccination non-smokers, 24.5% were regular smokers. While 36.3% of those who had vaccination never smoked, 12% were regular smokers.

Whereas 83.9% (n=130) of those who thought of influenza as an infectious disease did not have vaccination, 69.1% (n=9) of those who did not think of influenza as infectious did not have vaccination and the difference between them was statistically significant (p=0.039). While 72.7% (n=48) of those who thought that their vac-

**Table 2.** Distribution of the responses of the healthcare personnel other than physicians and nurses regarding the statements about influenza and influenza vaccination (HU İhsan Doğramacı Pediatric Hospital-Ankara, 2014)

	Correct		Incorrect		No idea		No response	
	Number	%	Number	%	Number	%	Number	%
Influenza is a simple disease	22	12.3	141	78.8	7	3.9	9	5.0
Influenza and cold are the same things	38	21.2	118	65.9	13	7.3	10	5.6
Influenza is an infectious disease	155	86.6	13	7.3	3	1.7	8	4.5
Influenza does not heal without antibiotics	38	21.2	95	53.1	32	17.9	14	7.8
When I get the influenza vaccine, I protect the people around me from influenza	66	36.9	67	37.4	32	17.9	14	7.8
Influenza vaccine should be repeated every year	116	64.8	22	12.3	31	17.3	10	5.6
All health personnel should be vaccinated	98	54.7	39	21.8	29	16.2	13	7.3
With its mild course, there is no need for vaccination	30	16.8	98	54.7	39	21.8	12	6.7
One who suffers from influenza does not need to be vaccinated in that year	45	25.1	59	33.0	64	35.8	11	6.25

**Table 3.** Distribution of the healthcare personnel other than physicians and nurses regarding their vaccination status in the previous year and its reasons (HU İhsan Doğramacı Pediatric Hospital-Ankara, 2014)

Vaccination status and its reasons (n=179)	Number (n)	Rate (%)
Vaccinated	33	18,4
Reasons of having been vaccinated*		
To protect oneself	29	87.8
To protect the family members	18	54.5
Not to transmit to the patients	14	42.4
Because one is in the risk group	6	18.1
Because vaccine is free of charge	1	3
Because of chronic disease	1	3
Not vaccinated	146	81,5
Reasons of not having been vaccinated **		
Because one does often suffer from influenza	78	53.4
Because of its side effects	36	24.6
Because one catches influenza after vaccination	24	16.4
Because one thinks vaccine is inefficient	23	15.7
Because one has missed the vaccination season	12	8.2
Because one is unable to access to the vaccine	6	4.1
Because one is afraid of injection	4	2.7
Other***	24	16.4
*Percentages have been calculated based on n=33		
**Percentages have been calculated based on n=146		
***Negligence, do not feel the need, natural defense mechanism		

cination protected the others from influenza, did not have vaccination, 86.6% (n=58) of those who thought that their vaccination did not protect the others from influenza, did

not have vaccination and the difference between them was statistically significant (p=0.006). While only 28.6% (n=28) of those who agreed with the statement "all healthcare workers should be vaccinated", 5.1% of those who did not agree had vaccination and the difference between them was statistically significant (p<0.001). While 31.1% (n=14) those who agreed with the statement "One who suffers influenza does not need to be vaccinated in the same year" had vaccination, 22% (n=13) of those who did not agree had vaccination and the difference between them was statistically significant (p=0.001).

While 93.3% of those who had influenza vaccine last year and 27.3% of those who were not thinking to have vaccination in the next season, 42.0% of those who did not have influenza vaccine last year were not thinking to have vaccination in the next season either; 6.1% of the vaccinated and 30.8% of the non-vaccinated persons responded not to have any idea about this issue; the observed statistical difference was significant (p<0.001). While only 60.4% of those who thought that influenza vaccine should be shot every year, thought of getting vaccinated the next season, 12.5% did not think about getting vaccinated.

## Discussion

Influenza virus is an agent that causes acute respiratory tract infections and has a high mortality and morbidity in the risk groups all over the world. The virus is important since it generates different clinical pictures and causes epidemics. The most efficient way of preventing influenza epidemics is vaccination. Healthcare workers are among the groups that are recommended to be vaccinated. One of the reasons why healthcare workers need to be vaccinated is for them not to transmit the disease the risk groups and other health personnel; and the other

**Table 4.** Distribution of the healthcare personnel other than physicians and nurses regarding their opinions on the measures to enhance vaccination coverage (HU Ihsan Dođramacı Pediatric Hospital-Ankara, 2014)

	Agree		Disagree		No idea		No response	
	Number	%	Number	%	Number	%	Number	%
Healthcare workers should regularly get the influenza vaccine administered every year.	96	(53.6)	41	(22.5)	38	(21.2)	4	(2.2)
Hospital personnel should be informed about the importance of influenza and ways of protection from it.	168	(93.9)	5	(2.8)	3	(1.7)	3	(1.7)
Facilitation of vaccination will increase the number of vaccinated personnel.	134	(74.9)	24	(13.4)	17	(9.5)	4	(2.2)
I am planning to get the seasonal influenza vaccine administered in the next season.	70	(39.1)	60	(33.5)	46	(25.7)	3	(1.7)
*Row percentage								

one is the workforce and economic loss in case of this group is contracting the disease (3). In Turkey as well as other countries, there are limited number of studies about the frequency of the healthcare workers other than the physicians and nurses to get the seasonal influenza vaccines administered and the reasons why those who do not get the vaccine shot do not get it done. Most of the studies in the literature are those in which physicians and nurses are included and about the pandemic influenza A (H1N1) vaccine experience in 2009 (4-8). In this study, the existing level of knowledge and opinions of the health personnel other than physicians and nurses about seasonal influenza vaccine were evaluated. Within the framework of the study, a total of 179 healthcare workers working at the Pediatric Hospital of Hacettepe University were contacted.

The participants in the study were asked if they were knowledgeable about influenza vaccine, 81.6% reported to be knowledgeable about it. As the source of information, the participants stated that they benefited the most from the physicians (72.6%) they worked with together by radio-television (28.7%) and from health-related publications (25.3%). In a study in Diyarbakır on pandemic influenza A/H1N1 vaccine involving 1691 healthcare workers, it was reported that healthcare workers were informed the most from the media (73.3%), the Ministry of Health (54.5%) and the internet (41.7%) (6). Power of the media as the source of influenza and influenza vaccine is considerable. In a study involving university students in Georgia, it was revealed that influenza vaccination increased 30% with the media-support (9). Therefore, the researchers are of the opinion that sharing appropriate and correct information about influenza and influenza vaccine with the public through all the media organs will help to enhance both the existing level of knowledge of the public in general and coverage of vaccination.

Participating healthcare personnel, 18.4%, reported not to have the seasonal influenza vaccine administered last year. In a study in Greece, 28.7% of the healthcare

workers got the seasonal influenza vaccine shot in the 2009 season (10). In five studies done in Germany between 2000 and 2006, it was found that the frequency of the healthcare workers getting seasonal influenza vaccine shot varied between 7-26% (11-15). In a study done in Turkey involving physicians, 30.2% of the physicians reported to have the seasonal influenza vaccine previously. (16). According to a study done in Gazi University in 2007, 36.3% of the physicians and 36.7% of the nurses reported to have the seasonal vaccine administered previously (17). In another study done in Erzurum, 48.6% of the physicians and 5.9% of the nurses reported to have the seasonal vaccine administered (18). As a result of the concerns about the influenza vaccines in the 2009 season all over the world, it was found that in countries such as Germany, Greece and Turkey, the frequency of seasonal influenza vaccine administration was low, and despite all these concerns, in such countries as the USA, Holland and Canada, it was high. Most of the studies in the relevant literature in recent years have been on pandemic influenza A/H1N1 (4-8). In the study Gürbüz et al. carried out on pandemic influenza involving all the healthcare personnel of Dışkapı Yıldırım Beyazıt Training and Research Hospital, whereas they found vaccination coverage 27% among the personnel working at the administrative department and technical personnel described as "other healthcare personnel", it was found 17.6% among cleaning staff, security and reception personnel described as "company workers"(19). The findings of this study and our study are very similar, and the groups included in the study are quite similar as well. Vaccination rates of healthcare workers have very wide variety of ranges in different countries. In fact, this difference in range varies in relation to information campaigns about influenza and influenza vaccine and the vaccination policy at work in those countries.

In this study, when those who were not vaccinated the seasonal influenza vaccine were asked why they did not, more than half of them (53.4%) reported not to catch influ-

**Table 5.** Distribution of some sociodemographic characteristics of the healthcare personnel other than physicians and nurses regarding their status of getting the influenza vaccine administered (HU İhsan Doğramacı Pediatric Hospital-Ankara, 2014)

	Getting the influenza vaccine		p value
	No (n=146) Number (%*)	Yes (n=33) Number (%*)	
Age (year)			0.285
≤29	31 (77.5)	9 (22.5)	
30-34	33 (91.7)	3 (8.3)	
35-39	36 (83.7)	7 (16.3)	
40-44	22 (75.9)	7 (24.1)	
≥45	24 (77.4)	7 (22.6)	
Gender			0.053
Male	60 (75.0)	20 (25.0)	
Female	86 (86.8)	13 (13.1)	
Marital status			0.227
Married	117 (81.8)	26 (18.2)	
Single	20 (90.9)	2 (9.1)	
Other	9 (64.3)	5 (35.7)	
Level of education			0.222
Primary school	10 (71.4)	4 (28.5)	
Secondary /Elementary school	19 (76.0)	6 (24.0)	
High school	54 (78.2)	15 (21.7)	
University/College	63 (88.7)	8 (11.2)	
Duty at the Hospital			0.377
Cleaning personnel	29 (74.3)	10 (25.6)	
Assistant health personnel	40 (76.9)	12 (23.1)	
Food personnel	12 (85.7)	2 (14.2)	
Medical secretary	41 (87.2)	6 (12.7)	
Other	24 (88.8)	3 (11.1)	
Diagnosed disease history			0.476
Present	41 (80.3)	10 (19.6)	
Not present	105 (82)	23 (17.9)	
Smoking history			0.140
Never smoked	66 (84.6)	12 (15.3)	
Smoked before, quit now	21 (65.6)	11 (34.3)	
Smoking occasionally	15 (71.4)	6 (28.5)	
Smoking regularly	44 (91.6)	4 (8.3)	

\*Row percentage

enza often. 24.6% of the participants reported not have been vaccinated because of its side effects, 16.4% because they caught the illness after vaccination, 16.4% because of negligence and did not feel the need, and 15.7% because they found the vaccine ineffective. In a

study carried out in five European countries, on the other hand, it was found that 40.4% of the participants did not need to have the vaccine shot (11). Some healthcare workers stated that they did not have the vaccine because of its side effects and because they were afraid of it (20-22). In a study done at Gazi University, 28.7% of the physicians and 37.2% of the nurses reported not to have the vaccine shot because they found the vaccine ineffective (17). According to the Disease Control and Prevention Center, most of the non-vaccinated healthcare workers play a role in causing epidemics in health institutions (23); therefore, in order to increase the vaccination coverage of the healthcare workers, especially misinformation and misbeliefs about vaccine must be corrected.

The participants were asked who should be vaccinated; the following groups were reported to be the groups that need to be vaccinated: frequent influenza sufferers (61.5%), the elderly and children (60.3%), healthcare workers (58.7%), those with chronic disease (48.6%), and pregnant women (10.6%). In a study in Spain involving 1749 healthcare workers, it was reported that 50.9% of the chronically- ill people, 50.4% of the people aged 65 and over, and 57.1% of pregnant women needed to be vaccinated (24). In this study, although this vaccine could be safely administered to healthy pregnant women, it was found that implementation coverage of the vaccine by the healthcare personnel was very low. Another striking result is that while more than half of the participants stated that healthcare workers needed to be vaccinated, only 18.4% of them got the influenza vaccine administered.

It was stated that in many countries, in order to increase the coverage of getting the influenza vaccine done among the healthcare workers, it would be appropriate to take some measures; even the personnel working in the units that can cause epidemics and those with chronic diseases needed to be vaccinated (3). The healthcare workers in such states as Washington DC and New York in the United States of America are mandatorily administered the seasonal influenza vaccine, many states provide the influenza vaccine to their staff for free (25). In a study reported in Greece, it was emphasized the vaccination coverage would be enhanced if the mobile vaccination teams set up, the vaccine be free of charge and access to the vaccine made easier (26). Therefore, in order to increase the level of influenza vaccination among the healthcare workers at the hospital where the research is carried out, it is thought that organizing meetings to inform before and during the influenza season, setting up mobile teams to apply the vaccines and facilitating the access to the vaccine.

In order to protect both hospital personnel and the patients with who they share the same physical environment, it is clearly important to note that they need to be

vaccinated. Given the reasons of vaccination revealed in this study as well as other studies, it should be emphasized and the healthcare workers need to be informed through training and promotion campaigns that influenza can be a fatal disease in certain situations, the necessity and efficiency of influenza vaccine, the low level of its side effects. At the same time, by tapping in the suggestions of the hospital personnel, new strategies can be developed to transmit the relevant information about the subject. Thus, it will be possible to increase the low level of vaccination rates.

**Ethics Committee Approval:** Ethics committee approval was received for this study from Hacettepe University Noninvasive Clinical Researches Ethical Committee (25.06.2014 - GO14273).

**Informed Consent:** Informed consent has been taken from all participants.

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