

**Original Article**

# Approaches of the healthcare staff in a tertiary healthcare service providing hospital for seasonal influenza vaccination



Üçüncü basamak sağlık hizmeti veren hastane çalışanlarının mevsimsel grip aşısına yönelik yaklaşımları

İlknur Esen Yıldız<sup>a</sup>, Ayten Yılmaz Yavuz<sup>b</sup>

<sup>a</sup>Recep Tayyip Erdogan University, School of Medicine, Department of Infectious Diseases and Clinical Radiology, Rize, Turkey

<sup>b</sup>Recep Tayyip Erdogan University, Vocational School of Health, Department of Public Health Nursing, Rize, Turkey

**ABSTRACT**

**Introduction:** Seasonal influenza had many epidemics and pandemics throughout history and caused millions of people getting sick with severe progress and even death in the risk group. Having the influenza vaccination is essential for healthcare staff to protect their health as well as other individuals of the society. The present study aimed to determine the approaches of all healthcare personnel and candidates in Rize Training and Research Hospital providing tertiary healthcare services and to analyze their causes for not having the vaccination.

**Methods:** The present cross-sectional research was carried out in Rize (Turkey). A questionnaire applied to 898 volunteers among 2200 hospital staff.

**Results:** It was detected that the median age of the participants is 25 years; 61.0% of the participants are female; 59.8% of them are single; 69.8% do not have any children and 38.0% have a graduate degree. The rate of having vaccination once within lifetime was detected as 41.6% and the highest rate was observed in the physician group whereas the lowest rate was observed in the nursing student group. The causes for avoiding to have the vaccination included the considerations about the ineffectiveness of the vaccination, having influenza and the delay of arrival of the vaccination to the hospital. However, the rate of having vaccination was determined as 2.6% within all healthcare staff for this year. The majority of the participants who had the vaccination consisted of the nurses who consider themselves within the risk group.

**Conclusions:** A significant decrease was detected in the vaccination rates of the healthcare staff when compared with previous years. The awareness should be increased to increase the vaccination rates. For this purpose, training should be organized, and the sustainability of such training should be provided.

**Keywords:** Medical staff, student, influenza vaccination

**ÖZ**

**Giriş:** Mevsimsel grip tarih boyunca birçok epidemiy ve pandemiler yapmış olup milyonlarca insanın hastalanmasına; risk grubu olanlarda ise hastalığın daha ağır geçmesine hatta ölümlere yol açmıştır. Sağlık çalışanlarının hem kendi sağlıkları hem toplumun diğer bireylerinin sağlığının korunması açısından grip aşısını yaptırmaları son derece önemlidir. Bu çalışmada üçüncü basamak sağlık bakım hizmeti veren Rize Eğitim ve Araştırma Hastanesinde hastanemizde sağlık hizmeti veren tüm personel ve adaylarının mevsimsel grip aşısına yönelik yaklaşımlarının belirlenmesi ve aşı yaptırmama nedenlerinin irdelenmesi amaçlanmıştır.

**Yöntem:** Kesitsel nitelikteki bu araştırma, Rize ilinde (Türkiye) yürütüldü. Hastanede çalışan 2200 kişiden gönüllü 898 kişiye anket yoluyla uygulandı.

**Bulgular:** Katılımcıların ortanca yaşının 25, %61,0'nın kadın, %59,8'inin bekar, %69,8'inin çocuğunun olmadığı, %38,0'nın lisansüstü eğitim seviyesinde olduğu belirlendi. Çalışmada ömründe bir kez aşı yaptırmama durumu %41,6 olup en yüksek oranda doktor grubunda, en düşük ise hemşirelik öğrenci grubunda görüldü. Yapıtmama nedeni olarak aşının etkisiz olduğunu düşünmek, gripi geçirmiş olmak, aşının hastaneye gelişinde gecikme en sıklıkla verilen cevaplardı. Ancak tüm sağlık çalışanları için bu yıl aşı yapılma oranı %2,6 olarak bulundu. Aşı yaptıranların çoğunluğunu risk grubunda olduklarını düşünen hemşireler oluşturmaktaydı.

**Sonuç:** Sağlık çalışanlarının aşılanma oranlarının daha önceki yıllara oranla belirgin azalma gösterdiği görüldü. Aşılanma oranlarımızın artırılması için farkındalığın sağlanması gerekmektedir. Bu amaçla eğitimler planlanmalı ve eğitimin sürekliliği sağlanmalıdır.

**Anahtar kelimeler:** Sağlık çalışanı, öğrenci, grip aşısı

Received	Accepted	Published Online	Corresponding Author	E-mail
December 25, 2018	February 28, 2019	August 29, 2019	Ilknur Esen Yıldız, MD	<a href="mailto:iesenyildiz61@gmail.com">iesenyildiz61@gmail.com</a>
<b>Correspondence</b>	Ilknur Esen Yıldız. Islampasa Mahallesi, Sehitler Cd. No:74, 53020 Rize, Turkey			

## Introduction

Seasonal influenza has caused many epidemics and pandemics; and sickness of millions of people throughout history. It has led to severe progression and deaths in the risk group [1, 3, 4, 6]. The infection attack rate of the healthcare personnel which is involved in the risk group is considerably higher [5]. Therefore, healthcare personnel plays a critical role in the case of a seasonal influenza epidemics. Protection of the staff working in healthcare institutions from influenza is essential to protect their health as well as other individuals of the community including their families and other patients by avoiding disease spread. Therefore, one of the most important steps of being protected from influenza infection is vaccination of the healthcare personnel [1, 2, 4]. Achieving immunization would prevent loss of labor power and provide sustainability of healthcare services [5, 7]. In Centers for Disease Control and Prevention (CDC) (2020) project in the United States, complete eradication of the diseases that may be prevented by vaccination is aimed by increasing the vaccination rates up to 90% [8]. In our country, vaccination rates of the healthcare personnel are meager despite all efforts of the Ministry of Health. The present study aimed to determine the approaches of the hospital staff for seasonal influenza vaccination and to analyze the causes for avoiding to be vaccinated in Recep Tayyip Erdogan University (RTEU) hospital providing tertiary healthcare services.

## Methods

### Study Design and Setting

The present cross-sectional study was carried out in the Easter Black Sea region of Turkey. The population of the research consisted of 2200 individuals including the staff providing tertiary healthcare services in a training-research and medical faculty hospital, medical school students and students in vocational health school within March and April 2018. The sample size was calculated as 898 participants with a confidentiality level of 99.99%, at a significance level of 0.05 and a sample representing the capacity of 80% (<http://www.openepi.com>). The number of participants that will be obtained from the hospital and vocational health school was determined in proportion to the weights of the institutions in the population, and they were selected through a stratified sampling method. The individuals who accepted to participate in the research were selected through improbable random sampling method.

### Data collection

The data were gathered through personal interview method by a questionnaire form within 10 to 15 minutes.

### Instruments

The questionnaire form including 24 questions were designed to determine socio-demographic characteristics and the opinions about seasonal influenza vaccination. The form consists of sociodemographic questions about age, gender, the institution, profession, employment/education period, department, marital status as well as some questions about influenza vaccination such as having influenza vaccination before, last vaccination time, vaccination-induced side effects, having influenza-like symptoms after vaccination and the causes for having or not having the influenza vaccination.

### Data analysis

The study data was evaluated through SPSS (SPSS Inc; Chicago, IL, USA) 23.0 for Windows. Compliance of the variable to a normal distribution was assessed through Kolmogorov-Smirnov test. Descriptive statistics, t-test, and chi-square test analyses were used to determine the approaches to influenza vaccination as well as identifying characteristics of the participants. The statistical significance level was accepted as  $p < 0.05$ .

### Ethical consideration of study

Before the onset of the study, written consent from the institution and approval of the Ethical Committee for Non-Invasive Clinical Researches within Recep Tayyip Erdogan University (Resolution No:40465587-149) were obtained. Furthermore, the participants were informed about the study, and it was mentioned that the personal information would be kept confidential; after this information, the volunteers were enrolled in the

## Results

It was found that the median age of the participants is 25.00 years; 61.0% of the participants are female; 59.8% of them are single; 69.8% do not have any children; 38.0% have a graduate degree; 22.7% of the participants attend a medical school. It was found that 16.8% of the participants work in internal medicine clinics and median period of employment was 5.00 (min:1, max:35) years; 86.4% of the participants do not have any systemic diseases.

When identifying characteristics and seasonal influenza vaccination status of the participants were reviewed, a significant association was determined between age, gender, marital status, having a child, profession, department, existence of any systemic diseases and having seasonal influenza vaccination ( $p < 0.05$ ). The rate of seasonal influenza vaccination was found higher in elder ages, female participants, those without any children, in the physician group, those who work in ambulatory units such as polyclinics and the participants without any systemic diseases. The rate of healthcare personnel who had vaccination once in life was found to be 41.6% whereas having the vaccination in the current year was detected as 2.6% (Table 1).

**Table 1.** Distribution of descriptive characteristics and seasonal influenza vaccination status (n:898)

Descriptive Characteristics*	Seasonal influenza vaccination status		Test and p value
	Being vaccinated ( $\bar{X} \pm SD$ ) / (n/%)	Not being vaccinated ( $\bar{X} \pm SD$ ) / (n/%) (n/%)	
<b>Age</b>	28.93±8.00	27.73±8.07	t=2.196, p=0.028
<b>Employment period</b>	7.81±6.01	7.11±6.08	t=1.700, p=0.089
<b>Gender</b>			
Female	207/56.7	341/64.0	X <sup>2</sup> =4.808 p=0.028
Male	158/43.4	192/36.0	
<b>Marital status</b>			
Married	176/48.2	185/34.7	X <sup>2</sup> =16.448 p=0.000
Single	189/51.8	348/65.3	
<b>Having children</b>			
Yes	133/36.4	138/25.9	X <sup>2</sup> =11.438 p=0.001
No	232/63.6	395/74.1	
<b>Educational level</b>			
Elementary school graduate	43/11.8	60/11.3	X <sup>2</sup> =9.319 p=0.054
High school graduate	63/17.3	71/13.3	
Undergraduate	110/30.1	210/39.4	
Graduate	149/40.8	192/36.0	
<b>Profession</b>			
Physician	75/20.5	68/12.8	X <sup>2</sup> =26.892 p=0.000
Nurse/midwife	63/17.3	67/12.6	
Student (Medical School)	72/19.7	132/24.8	
Student (Nurse)	36/9.9	100/18.8	
Janitor	46/12.6	76/14.3	
Other	73/20.0	90/16.9	
<b>Department</b>			
Internal medicine clinics	47/18.3	104/4.6	X <sup>2</sup> =21.413 p=0.001
Surgical clinics	54/21.0	42/14.0	
Emergency service	47/18.3	52/17.3	
Intensive Care Unit	31/12.1	24/8.0	
Administrative Units	11/4.3	8/2.7	
Other (polyclinic, laboratory etc.)	67/26.1	71/23.6	
<b>Systemic Disease</b>			
Yes	60/16.4	62/11.6	X <sup>2</sup> =4.262 p=0.039
No	305/83.6	471/88.4	

\*Percentage of the column was obtained.

A statistically significant difference was found between frequency of seasonal influenza, seasonal vaccination status, being vaccinated in previous years but not in the current year, having influenza-like symptoms after being vaccinated, vaccination-induced side effect, being trained about seasonal influenza vaccination before and the occupation groups (p<0.05) (Table 2).

When the distribution of information that the participants have about seasonal influenza vaccination was reviewed, it was found that the physician group has influenza once a year by 48.3% and such group had influenza vaccination in previous years but not in the current year by 46.2%. Among the physicians who had the vaccination, the local side effect was detected in 39.9% of this group. It was found that the medical school students do not remember when they had influenza vaccination most by 63.9% according to the seasonal influenza vaccination period. The nursing student group had repetitive influenza most by 68.3% despite being vaccinated. Furthermore, it was detected that 82.4% of nursing students did not have any training on seasonal influenza vaccination.

When the participants' opinions about seasonal influenza vaccination were examined, the cause for being vaccinated according to the groups revealed that nurses had vaccination by 18.2% since they consider themselves in the risk group. Medical school students do not have vaccination most by 10.6% since they believe that the vaccination is ineffective. The cause for those who were vaccinated in the previous years but not in this year was the belief on the ineffectiveness of the vaccination in the physician group by 8.3% (Table 3). In addition to the questions about not having the influenza vaccination, some staff reported that their natural immunity is better and the vaccinations are manufactured for commercial benefits.

**Table 2.** Distribution of the participants about information on seasonal influenza vaccination

	Physician n/%	Nurse/ midwife n/%	Student (Medical School) n/%	Student (Nurse) n/%	Janitor n/%	Other n/%	Test / p-value
<b>The frequency of seasonal influenza</b>							
Never	46/32.2	35/27.1	52/25.7	25/18.4	43/35.2	43/26.4	X <sup>2</sup> =22.789 p=0.012
Once a year	69/48.3	53/41.1	79/39.1	55/40.4	43/35.2	69/42.3	
Twice and more annually	28/19.6	41/31.8	71/35.1	56/41.2	36/29.5	51/31.3	
<b>Seasonal influenza vaccination status</b>							
Being vaccinated in this year	9/6.3	10/7.7	1/0.5	-	2/1.6	1/0.6	X <sup>2</sup> =51.591 p=0.000
Being vaccinated in previous year not in this year	66/46.2	53/40.8	71/34.8	36/26.5	44/36.1	72/44.2	
Never being vaccinated	68/47.6	67/51.5	132/64.7	100/73.5	76/62.3	90/55.2	
<b>Time of seasonal influenza vaccination n=355</b>							
One year ago	24/34.8	23/41.8	20/27.8	-	23/51.1	28/38.4	X <sup>2</sup> =113.995 p=0.000
Two years ago	8/11.6	13/23.6	3/4.2	-	7/15.6	10/13.7	
Two years and more than two years	22/31.9	12/21.8	3/4.2	7/17.1	11/24.4	12/16.4	
I do not remember	15/21.7	7/12.7	46/63.9	34/82.9	4/8.9	23/31.5	
<b>Having influenzae despite seasonal influenza vaccination</b>							
Yes	6/8.7	9/16.4	5/6.9	28/68.3	2/4.4	14/19.2	X <sup>2</sup> =131.326 p=0.000
No	52/75.4	46/83.6	67/93.1	13/31.7	43/95.6	59/80.8	
Viewless	11/15.9	-	-	-	-	-	
<b>Vaccination-induced local side effect status</b>							
Appeared	57/39.9	42/32.3	65/31.9	4/2.9	45/36.9	52/31.9	X <sup>2</sup> =58.186 p=0.000
Not appeared	86/60.1	88/67.7	139/68.1	132/97.1	77/63.1	111/68.1	
<b>Information about influenza vaccination</b>							
Yes	77/53.8	63/48.8	63/31.3	24/17.6	55/45.1	64/39.3	X <sup>2</sup> =51.526 p=0.000
No	66/46.2	66/51.2	138/68.7	112/82.4	67/54.9	99/60.7	

\*Percentage of the column was obtained.

**Table 3.** Opinions of the participants about seasonal influenza vaccination

Seasonal influenza vaccination status		Physician n/%	Nurse/midwife n/%	Student (Medical School) n/%	Student (Nurse) n/%	Janitor n/%	Other n/%
Cause for not being vaccinated before this year	Consideration of being in the risk group	51/47.2	49/67.1	65/56.5	15/25.4	37/56.1	41/48.8
	The concern about influenza complications	16/14.8	5/6.8	14/12.2	15/25.4	4/6.1	6/7.1
	The concern about spreading the disease to others	12/11.1	15/20.5	18/15.7	16/27.1	15/22.7	28/33.3
	Being informed about the vaccine	11/10.2	2/2.7	8/7.0	9/15.3	8/12.1	7/8.3
	The thought to serve as an example to others	18/16.7	2/2.7	10/8.7	4/6.8	2/3.0	2/2.4
	Delayed vaccine	6/4.8	7/5.6	7/3.2	4/1.8	9/7.8	13/7.3
	Having influenza before	4/3.2	8/6.4	24/11.0	38/17.3	28/28.1	17/9.6
	Consideration of not being under risk	19/15.2	16/12.8	28/12.8	47/21.4	13/11.2	20/11.2
	Being afraid of the side effects	18/14.4	26/20.8	27/12.3	37/16.8	14/12.1	37/20.8
	Not being afraid of the disease	38/30.4	22/17.6	24/11.0	40/18.2	20/17.2	20/11.2
	The belief on the ineffectiveness of the vaccine	37/29.6	42/33.6	80/36.5	32/14.5	20/17.2	56/31.5
	Having a fear of injection	3/2.4	4/3.2	14/6.4	10/4.5	6/5.2	8/4.5
	Being affected by friends/relatives	-	-	-	2/0.9	1/1.09	1/0.6
	Being affected by the media	-	-	11/5.0	8/3.6	2/1.7	5/2.8
Having a disease that prevents vaccination	-	-	4/1.8	-	1/0.9	1/0.6	
Vaccine expenses	-	-	-	2/0.9	2/1.7	-	
The cause for having the vaccination before but not this in this year	Delayed vaccine	3/6.8	5/1.6	1/1.7	3/5.5	-	3/6.0
	Having influenza before	1/2.3	4/9.3	10/17.2	11/20.0	5/19.2	4/8.0
	Consideration of not being under risk	3/6.8	4/9.3	9/15.5	14/25.5	6/23.1	5/10.0
	Being afraid of the side effects	1/2.3	5/11.6	12/20.7	7/12.7	3/11.5	12/24.0
	Not being afraid of the disease	15/34.1	10/23.3	5/8.6	6/10.9	5/19.2	5/10.0
	The belief on the ineffectiveness of the vaccine	18/40.9	12/27.9	15/25.9	6/10.9	6/23.1	18/36.0
	Having a fear of injection	3/6.8	3/7.0	4/6.9	1/0.8	-	1/2.0
	Being affected by friends/relatives	-	-	-	2/3.6	-	1/2.0
	Being affected by the media	-	-	-	5/9.1	1/3.8	1/2.0
Having a disease that prevents vaccination	-	-	2/3.4	-	-	-	

## Discussion

Seasonal influenza infection affects everybody at any age; the disease may cause severe progress and death for the individuals in the risk group. Vaccination is one of the most effective methods to be protected from influenza and to prevent epidemics with a conservation rate between 70% and 90%. Vaccination is among the most important intervention methods to prevent infectious diseases and to reduce mortality and morbidity in case of disease [1, 2, 3, 4]. The attack rate is about 5% to 10% in the community; such rate is considered to be 11% to 59% among healthcare staff. Vaccination allows continuation of work by preventing the decrease in labor performance. A study conducted in Canada found that absenteeism of the employees who do not have the vaccination is two-fold [23].

CDC recommends the vaccination for healthcare staff every year [1]. Although Ministry of Health has procured the vaccination as free of charge upon request in our country since 2002, influenza vaccination rates of the healthcare staff, as well as their attitudes and behaviors, are not at the desired level.

The vaccination rate was found lower by 2.6% in healthcare staff in the present study for this year. The considerations about the ineffectiveness of the vaccination, abstaining from the side effects, not being afraid of the influenza are the most common answers. In the review of the studies conducted worldwide, vaccination rates were found as 9% to 92% in a meta-analysis of 20 articles published between 2005 and 2011 whereas another meta-analysis revealed such rate as 7.5% to 63% between 2009 and 2011 [9-10]. It is observed that the higher rates of vaccination in the meta-analyses were detected in the countries where influenza vaccination is obligatory. The vaccination is upon request in Turkey. Different studies conducted in our country focused on rates and causes of vaccination. Vaccination rate was reported as 18.4% in the study conducted by Karadag et al.; the reasons for not having the vaccination were not having influenza by 53.4% and abstaining from the side effect profile by 24.6% [11]. The vaccination rate was found to be 14.5% in the study of Donmez et al. and the most significant reason for not having vaccination was time constraint of the physicians [12]. Since risk perception of vaccination rates is higher in pandemics periods, Sevencan et al. found the rates 36.4% whereas Ormen et al. detected the rates up to 40.0% [13, 14]. The reason for lower rates of vaccination in similar studies conducted worldwide is similar to the reasons detected in our country [15, 16, 17]. The most common reasons for rejection of the vaccination include being afraid of side effects of the vaccine, not believing the effectiveness of the vaccine and not considering the vaccine safe [18].

When vaccination at least once in life was reviewed according to the professional groups, the highest rate was detected in the physicians; this was followed by the group including medical secretary and technical staff. The highest rate was detected in the physicians in the studies conducted in our country and other countries. The vaccination rates were detected as 51.4%, 42.3% and 82.3% in the studies conducted in Burdur by Gurbuz et al. and Lee et al., respectively [19, 20, 21]. The reason for having the vaccination at least once in life in the physician group may be associated with the fact that the physicians have the highest level of information about influenza vaccination. However, it was determined that the vaccination rates of the physicians decreased to 6.3% in the current year. Although the physicians should present the most conscious behavior about vaccination and be a model for other healthcare personnel, the lower rates of vaccination in physicians are noticeable. We believe that this may be related to lack of an exact consensus among the physicians and the efforts against vaccination [22]. In the present study, the most significant reasons for not having the vaccination were the belief in the ineffectiveness of the vaccination by 8.3% and not being afraid of the disease by 6.9%. In the study of Unver et al., the dominant reason was the belief on the ineffectiveness of the vaccination by 41.9% whereas Erkin et al. determined the consideration on the ineffectiveness of the vaccination as the reason with the highest rate by 13.3% [24, 25].

The group who had the fewest vaccination was nursing school students by 9.9%; and none of these students did not have the vaccination. The most common answers given for not having the vaccination had influenza, abstaining from the side effects of the vaccination and the delay in distribution of the vaccination in the hospital. Within this context, it is considered that early procurement of the vaccine would increase the vaccination rates. Having influenza, despite influenza vaccination, was at the highest level by 68.3% in nursing school students; and this may be connected with lower rates of vaccination. It is detected in the study of Savaser et al. in our country that nursing school students do not have vaccination by 93.0% and they preferred other methods of protection [26].

In the present study, vaccination rates are lower in medical school students; and such group was detected as the least vaccinated group by 0.5%. The most common causes of not having vaccination did not believe the effectiveness of the vaccine, the concerns about the side effects of the vaccine and having an influenza infection. Since the influenza virus is exposed to mutation every year, the inclusion of previous strains causes the consideration that the vaccine is ineffective against the new virus. Insufficient level of information about influenza infection in both medical school and nursing school students may be the cause of such lower rates. Within this context, the organization of training and providing sustainability may be suggested.

## Limitations

The study included the staff of a hospital providing tertiary healthcare services, medical school and nursing school students in Rize, a province located in the Eastern Black Sea region of Turkey. Single-centered design of the study may be considered as a limitation.

## Conclusion

It is noticeable that vaccination rates significantly reduced in our hospital. Perception of the healthcare personnel about influenza infection as personal risk, misunderstandings about the importance of the disease, information pollution about the vaccine and concerns about the necessity of the vaccination are detected. However, it should be considered that hospital staff may be carriers even they are asymptomatic. Vaccination of all



healthcare staff is essential for the protection of themselves, other hospital personnel as well as hospitalized patients in case of a seasonal influenza epidemic. Therefore, the organization of training and receiving feedbacks, increasing introduction activities and planning studies to eliminate lack of information are recommended. Furthermore, the present study reveals the necessity of the studies that would organize informational convergence and reach a clear consensus.

**Conflict of interest:** None.

**Financial support:** None.

## References

1. Seasonal Influenza (Flu): Influenza vaccination information for health care workers (Internet). Atlanta, GA ABD: Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/flu/healthcareworkers.html> (Access Date: March 18, 2019)
2. Duran N. Seasonal Influenza and Immunization. *Turk J Immunol* 2010;15:20-38.
3. Kurt H, Gundes S, Geyik MF. Enfeksiyon hastalıkları. [Infectious diseases](in Turkish) Istanbul, Nobel Tip 2013;231-6
4. Epidemiology and prevention of Vaccine- Preventable Diseases (internet). Atlanta, GA: Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/vaccines/pubs/pinkbook/index.html> (Access Date: March 18, 2019)
5. Salgado CD, Farr BM, Hall KK, Hayden FG. Influenza in the acute hospital setting. *Lancet Infect Dis* 2002;2(3):144-55. [https://doi.org/10.1016/S1473-3099\(02\)00221-9](https://doi.org/10.1016/S1473-3099(02)00221-9)
6. Fiore AE, Bridges CB, Cox NJ. Seasonal influenza vaccines. *Curr Top Microbiol Immunol* 2009;333:43-82. [https://doi.org/10.1007/978-3-540-92165-3\\_3](https://doi.org/10.1007/978-3-540-92165-3_3)
7. Lester RT, McGeer A, Tomlinson G, Detsky AS. Use of, effectiveness of and attitudes regarding influenza vaccine among house staff. *Infect Control Hosp Epidemiol* 2003;24(11):839-44. <https://doi.org/10.1086/502146>
8. National Health Interview Survey (NHIS) (Internet), CDC/NCHS. Available at: <http://www.healthypeople.gov/2020/topicsobjectives2020> (Access Date: March 18, 2019)
9. Aguilar-Diaz Fidel C, Jimenez-Corona ME, Ponce-de-Leon-Rosales S. Influenza vaccine and health care workers. *Arch Med Res* 2011;42(8):652-7. <https://doi.org/10.1016/j.arcmed.2011.12.006>
10. Premantuge C, Corace K, McCarthy A, Nair RC, Pugsley R, Garber G. Factors influencing pandemic influenza vaccination of healthcare workers-a systematic review. *Vaccine* 2012;30(32):4733-43. <https://doi.org/10.1016/j.vaccine.2012.05.018>
11. Oncel EK, Buyukcam A, Cengiz AB, Kara A, Ceyhan M, Dogan BG. The Evaluation of Knowledge, Opinions, and Attitudes of Hospital Staff Except Physicians and Nurses Regarding Seasonal Influenza Vaccine. *J Pediatr Inf* 2015; 9: 68-75. <https://doi.org/10.5152/ced.2015.2009>
12. Polat HH, Yalcin AN, Oncel S. Influenza vaccination; rates, knowledge and the attitudes of physicians in a university hospital. *Turkey Klin J Med Sci* 2010; 30:48-53. <https://doi.org/10.5336/medsci.2008-8117>
13. Sevencan F, Ertem M, Ozcullu N, Dorman V, Kubat NK. The evaluation of the opinions and attitudes of healthcare personnel of the province Diyarbakır against influenza A and the vaccination. *Hum Vaccin* 2011;7(9):945-51. <https://www.tandfonline.com/doi/abs/10.4161/hv.7.9.16368>
14. Ormen B, Turker N, Vardar I, Kaptan F, Sibel EI, Ural S et al. Attitudes and side effects related to pandemic influenza A (H1N1) vaccination in healthcare personnel. *Mikrobiyol Bul.* 2012;46(1):57-64. <https://www.ncbi.nlm.nih.gov/pubmed/22399172>
15. Giannattasio A, Mariano M, Romano R, Chiatto F, Liguoro I, Borgia G, et al. Sustained low influenza vaccination attitude? A survey among health care worker after H1N1 pandemic: a cross sectional study in an Italian health care setting for at-risk patients. *BMC Infect Dis* 2015;15:329-35. <https://doi.org/10.1186/s12879-015-1090-x>
16. Brandt C, Rabenau HF, Wickers S. Attitudes of influenza vaccinated health care workers toward masks to prevent nosocomial transmission of influenza. *Influenza Other Respir Viruses* 2011;5(1):61-6. <https://doi.org/10.1111/j.1750-2659.2010.00174.x>
17. Rashid H, Yin JK, Ward K, King C, Seale H, Booy R. Assessing interventions to improve influenza vaccine uptake among health care workers. *Health Aff (Millwood)* 2016;35(2):284-92. <https://doi.org/10.1377/hlthaff.2015.1087>
18. Salgado CD, Giannetta ET, Hayden FG, Farr BM. Preventing nosocomial influenza by improving the vaccine acceptance rate of clinicians. *Infect Control Hosp Epidemiol* 2004;25(11):923-8. <https://doi.org/10.1086/502321>
19. Sokel KS, Onal O. Recognition of the seasonal influenza vaccine at the adult immunization by the primary care health staff and specification of their approach in this regard. *Konuralp Med J* 2016;8(1):41-46.
20. Gurbuz Y, Tutuncu EE, Sencan I, Sendag E, Callak F, Sevinc G et al. Study on the willingness of health care workers to receive an influenza vaccination during the 2009 Influenza A (H1N1) pandemic. *Pamukkale Med J* 2013, 1: 12-7.
21. Lee CS, Lee KH, Jung MH, Lee HB. Rate of influenza vaccination and its adverse reactions were seen in health care personnel in a single tertiary hospital in Korea. *Jpn J Infect Dis* 2008;61(6):457-60. PMID: 19050354.
22. Ahmed F, Lindley MC, Allred N, Weinbaum CM, Grohskopf L. Effect of influenza vaccination of healthcare personnel on morbidity and mortality among patients: systematic review and grading of evidence. *Clin Infect Dis* 2014;58(1):50-7. <https://doi.org/10.1093/cid/cit580>
23. Van Buynder PG, Konrad S, Kersteins F, Preston E, Brown PD, Keen D et al. Healthcare worker influenza immunization vaccinate or mask policy: strategies for cost effective implementation and subsequent reductions in staff absenteeism due to illness. *Vaccine* 2015;33(13):1625-8. PMID: 25678243.
24. Ulusoy Unver T, Tanyel E. Knowledge Levels, Perceptions, Attitudes, and Behaviors Regarding Flu, Common Cold, Influenza Vaccine and Antimicrobial Usage Among Physicians Working at a University Hospital. *Klimik J* 2017;30(2):71-7. <https://doi.org/10.5152/kd.2017.18>
25. Erkin O, Ozsoy S. Validity and reliability of health belief model scale on prevention of influenza. *Acad Res Int.* 2012;2(3):31-40. [http://www.savap.org.pk/journals/ARInt/Vol.2\(3\)/2012\(2.3-03\).pdf](http://www.savap.org.pk/journals/ARInt/Vol.2(3)/2012(2.3-03).pdf)

26. Savaser S, Canbulat N, Sahin S, Cantemir D. Awareness Stages of Nursing Students about Influenza A (H1N1) and It's Vaccine. Florence Nightingale Journal of Nursing 2011;19(3):122-8. <https://dergipark.org.tr/download/article-file/95076>