INFLUENZA VACCINATION PREVALENCE AMONG THE ELDERLY AND INDIVIDUALS WITH CHRONIC DISEASE, AND FACTORS AFFECTING VACCINATION UPTAKE

Pınar Korkmaz[1], Türkan Paşalı Kilit[2], Kevser Onbaşı[2], Duru Mıstanoglu Ozatag[1], Onur Toka[3]
[1]Department of Infectious Diseases and Clinical Microbiology, Faculty of Medicine, Dumlupinar University, Kütahya, Turkey
[2]Department of Internal Medicine, Faculty of Medicine, Dumlupinar University, Kütahya, Turkey
[3]Department of Statistics, Hacettepe University, Ankara, Turkey

SUMMARY

Objective: Our aim is to evaluate influenza vaccination rates among the elderly and individuals with underlying chronic disease, and factors that affect vaccination uptake.

Methods: The study comprised individuals aged 18–65 years with underlying chronic diseases, and individuals aged over 65 years. Literature-based questionnaires prepared by the researcher regarding vaccination were completed through face-to-face interviews by the principal investigator.

Results: A total of 818 participants were included in the study, 257 (31.4%) were males. The mean age of participants was 57.47 ± 14.11 years; 274 (33.5%) were aged 65 years and over. One hundred and three (12.6%) participants stated that they received vaccinations against influenza annually, and 144 (17.6%) stated that they had vaccination against influenza in the 2015/16 or 2016/17 season. Fifty-two (19%) participants aged more than 65 years stated that they received vaccinations against influenza annually, 75 (27.4%) stated that they had vaccination against influenza in the 2015/16 or 2016/17 season. The most commonly determined reasons for not receiving vaccination were not knowing that it was necessary (34%) and believing that vaccination was not necessary because they were healthy (26%). Statistically significantly more participants who gained their knowledge from a physician were vaccinated than those whose knowledge came from other sources ($p < 0.05$). Participants who considered that they had sufficient information about influenza were vaccinated more frequently, the results were statistically significant ($p < 0.05$).

Conclusion: Informing target risk groups about influenza vaccination by physicians and increasing awareness about influenza may contribute to increasing vaccination rates.

Key words: influenza, vaccination, elderly people, chronic disease, risk group

Address for correspondence: P. Korkmaz, Department of Infectious Diseases and Clinical Microbiology, Faculty of Medicine, Dumlupinar University, 43100 Kütahya, Turkey. E-mail: drpinarkor@gmail.com

https://doi.org/10.21101/cejph.a5231

INTRODUCTION

Seasonal influenza is an acute viral upper respiratory tract infection caused by influenza viruses. The most efficient way to prevent influenza is through vaccination. Safe and effective vaccines have been used for more than 60 years (1). The Advisory Committee on Immunization Practices recommends annual vaccination for each individual aged over six months (2). The risk for influenza-related complications, influenza-related hospitalization, and mortality associated with influenza is higher in the elderly and individuals with underlying chronic disease. Influenza vaccination may be less effective in preventing disease, but it reduces the severity of the disease, influenza-related complications, and death in the elderly. Vaccination is especially important for people at higher risk of serious influenza complications (1, 3). Therefore, influenza vaccination is recommended by the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) for risk groups (1, 3).

Risk groups, as determined by the Scientific Group on Influenza, for influenza vaccination in our country are as follows: individuals aged over 65 years, children aged < 2 years, pregnant women, residents of long-term care facilities and nursing homes, those with chronic renal failure, asthma, chronic respiratory disease, cardiovascular system disease, diabetes mellitus, neurologic disorders, metabolic disease, chronic liver disease, morbid obesity, immunocompromised people, as well as healthcare workers, and individuals aged 6 months to 18 years who require long-term aspirin use. It is recommended that people in this group should receive a seasonal influenza vaccination (4).

In our country, there are studies indicating influenza vaccination rates for some groups with chronic diseases, but when the studies were scrutinized, it was observed that most of the research was conducted only with individuals in chronic disease groups (5–13). The number of studies in the current literature evaluating influenza vaccination in our country for all chronic diseases is very limited. Also the factors affecting rates of vaccination against

influenza were not considered in the two studies that evaluated elderly people and adults with chronic diseases together (13, 14). The aim of this study was to evaluate influenza vaccination rates among the elderly and younger individuals with underlying chronic disease, and factors that affect vaccination uptake.

MATERIALS AND METHODS

We included individuals aged 18–65 years with comorbid diseases such as diabetes mellitus, hypertension, chronic obstructive pulmonary disease (COPD), cardiovascular diseases, chronic renal failure, chronic neurologic disorders, chronic liver disease, malignancy, immunodeficiency, and morbid obesity. We also included individuals aged over 65 years with or without a comorbid disease. We randomly selected the individuals from our outpatient clinics of infectious diseases and internal medicine. Individuals were included in the study after being informed by the principal investigator and obtaining written informed consent from the subjects. Questionnaires were completed by the principal investigator during face-to-face interviews.

The questionnaire was prepared by the researcher by taking examples from previous related studies (15, 16). The questionnaire included a total of 23 questions: 8 questions for demographic data; 5 questions for influenza disease and influenza vaccination; and 10 questions on the rate of receiving vaccinations, reasons for not receiving vaccinations, the means of obtaining data about influenza, and which subjects they wanted to have more information on. The study was approved by the local ethics committee. The SPSS version 23 statistics program was used for statistical analysis. Frequencies and percentages are indicated for categorical variables of the participants. The differences between the groups in the study were obtained by interpreting Chi-square analyses. Statistical significance was determined as $p < 0.05$.

RESULTS

A total of 818 participants were included in the study, 257 (31.4%) were male. The mean age of participants was 57.47 ± 14.11 years; 274 (33.5%) participants were aged 65 years and over. The demographic data of participants are shown in Table 1. One hundred and three (12.6%) participants stated that they annually have vaccinations against influenza, 144 (17.6%) stated that they had vaccination against influenza in the 2015–2016 or 2016–2017 season. Of the participants aged over 65 years, 52 (19%) stated that they had vaccinations for influenza annually, and 75 (27.4%) stated that they had been vaccinated against influenza in the 2015–2016 or 2016–2017 season. The rate of participants who had never received an influenza vaccine throughout their lives was 68.9% (n = 564). The vaccination rates of participants and their responses to the questions related to influenza are shown in Table 2. The reasons for not getting the influenza vaccine were assessed for the participants who had not received influenza vaccine in the 2015–2016 or 2016–2017 seasons. The most commonly determined reasons for not receiving vaccination were not knowing that the influenza vaccine was necessary (34%), and believing that they did not need the influenza vaccine because they were healthy (26%). The participants' reasons for not receiving influenza vaccines are shown in Table 3.

Table 1. *Demographic characteristics of participants (N = 818)*

Characteristic	Participants	
	n	%
Gender		
Female	561	68.6
Male	257	31.4
Education		
Primary school	587	71.8
Secondary school	60	7.3
High school	65	7.9
University	47	5.7
No education	59	7.2
Occupation		
Housewife	527	64.4
Retired	118	14.4
Worker	62	7.6
Officer	26	3.2
Self-employment	82	10
Student	3	0.4
Marital Status		
Married	674	82.4
Single	37	4.5
Widow	107	13.1
Income		
Low	239	29.2
Medium	505	61.7
Good	74	9
Region		
City centre	649	79.3
Rural	169	20.7
Underlying Chronic Disease		
No	17	2.1
Yes	801	97.9
Diabetes mellitus	438	53.5
Hypertension	368	45.0
Chronic obstructive pulmonary disease	124	15.2
Chronic cardiovascular disease	165	20.2
Chronic renal failure	48	5.9
Chronic neurological disease	13	1.6
Chronic liver disease	75	9.2
Malignancy	19	2.3
Immunodeficiency	5	0.6
Morbid obesity	37	4.5
Rheumatological disease	33	4.0
Chronic metabolic disease	71	8.7
Other	29	3.5

Table 2. *Vaccination rate of participants and their answers for information questions about influenza (N = 818)*

		Participants	
		n	%
İnfluenza is an airborne disease passed via respiratory droplets.	Yes	438	53.5
	No	118	14.4
	I do not know	262	32.1
Handwashing regularly protects against influenza.	Yes	644	78.7
	No	82	10.0
	I do not know	92	11.2
Influenza vaccine should be administered to individuals with chronic diseases and elderly people.	Yes	389	47.6
	No	140	17.1
	I do not know	289	35.3
Influenza vaccine protects against the influenza viruses.	Yes	432	52.8
	No	153	18.7
	I do not know	233	28.5
Influenza vaccine causes influenza illness.	No	307	37.5
	Yes	160	19.6
	I do not know	351	42.9
The influenza vaccine should be repeated every year.	Yes	372	45.5
	No	160	19.6
	I do not know	286	35.0
Influenza vaccine is necessary.	Yes	353	43.2
	No	230	28.1
	I do not know	235	28.7
Received influenza vaccine regularly	Yes	103	12.6
	No	715	87.4
Received influenza vaccine throughout their life	Yes	237	29.0
	No	564	68.9
Received influenza vaccine in 2015–2016 or 2016–2017 season	Yes	144	17.6
	No	674	82.4

Table 3. *Reasons of participants for not getting influenza vaccine (N = 674)*

	Participants	
	n	%
My physician did not state that I had to get vaccinated.	122	18.1
I did not know that I have to get influenza vaccination.	229	34.0
I am afraid of side effects that can develop after vaccination.	87	12.9
I do not think the vaccine gives overall protection against influenza.	107	15.9
I do not think the vaccine is safe.	69	10.2
In general, I am against vaccination.	23	3.4
I do not need to get vaccinated because I am healthy.	174	25.8
Influenza is not a dangerous disease.	34	5.0
I do not have time for vaccination.	37	5.5
Vaccination is expensive. I do not have enough money.	7	1.0
Other	10	1.6

Participants could select more than one reason.

Table 4. *Sources where participants wanted to have information about influenza (N = 818)*

	Participants	
	n	%
Family physician	538	65.8
Physician following me for my chronic disease	461	56.4
Health authority (Ministry of Health)	100	12.2
Television	70	8.6
Internet	18	2.2
Newspaper	8	1.0
Other (pharmacy)	1	0.1

Participants could select more than one source.

When the sources of information about influenza of all participants were assessed, the sources were stated as follows: 359 (43.9%) from physician, 56 (6.8%) from nurse, 437 (53.4%) from television, 45 (5.5%) from newspaper, 35 (4.3%) from the internet, and 35 (4.3%) from others (family, neighborhood, pharmacy, experience), with 15 (1.2%) having no knowledge. One hundred and eighty-six (22.7%) participants believed that they had sufficient information about influenza, 411 (50.2%) believed that they had insufficient information, and 221 (27%) stated that they were not sure.

The participants stated that they wanted to have more information about the following subjects: health problems that can be caused by influenza (46.9%), success rates of influenza vaccines in preventing disease (47.7%), vaccine-associated adverse effects (33.5%), individuals at risk who are recommended to receive the influenza vaccines (24%), other reasons (e.g. how the vaccine is obtained, the contagiousness of the disease, time for vaccination) (0.6%). The sources that participants preferred to use to learn information about influenza are shown in Table 4.

The rates of living in the city centre, being over 65 years old and educated participants who were vaccinated were statistically significantly higher ($p < 0.05$) compared with non-vaccinated and vaccinated uneducated people. It was determined that people with COPD and cardiovascular disease were vaccinated statistically significantly less when we compared vaccinated and unvaccinated people ($p < 0.05$). No statistically significant difference was observed for the other parameters ($p > 0.05$).

The rate of replying to information questions about influenza and the rate of considering the influenza vaccine to be necessary were statistically significantly higher in the participants who received the influenza vaccine ($p < 0.05$). Among the participants who had experience with the influenza vaccine, the rate of receiving the influenza vaccine was statistically significantly higher than in the participants who had never received the influenza vaccine in their lives ($p < 0.05$). Statistically significantly more participants were vaccinated who acquired information from a physician than participants who gained information from the other sources ($p < 0.05$). It was determined that participants who believed they had sufficient information about influenza were vaccinated statistically significantly more than patients who had less conviction about their knowledge ($p < 0.05$) (Table 5).

Table 5. *Comparison of data of vaccinated and non-vaccinated participants (N = 818)*

	Vaccinated (n = 144) %	Non-vaccinated (n = 674) %	p-value
Gender			
Female	68.1	68.7	0.881
Male	31.9	31.3	
Education			
Primary school	66.0	73.0	0.027
Secondary school	5.6	7.7	
High school	9.7	7.6	
University	5.6	5.8	
Lack of education	13.2	5.9	
Occupation			
Housewife	63.9	64.5	0.423
Retired	17.4	13.8	
Worker	4.2	8.3	
Officer	4.2	3.0	
Self-employment	10.4	9.9	
Student	0.0	0.4	
Marital status			
Married	77.8	83.4	0.149
Single	4.2	4.6	
Widow	18.1	12.0	
Income			
Low	25.0	30.1	0.437
Medium	64.6	61.1	
Good	10.4	8.8	
Place of residence			
City centre	86.1	77.9	0.027
Rural	13.9	22.1	
Age			
Younger than 65 years	47.9	70.5	<0.001
Older than 65 years	52.1	29.5	
Underlying chronic disease	96.5	98.2	0.196
Diabetes mellitus	56.9	52.8	0.368
Chronic obstructive pulmonary disease	27.8	12.5	<0.001
Chronic cardiovascular disease	26.4	18.8	0.041
Immunodeficiency	2.8	0.1	–
Chronic renal failure	4.2	6.2	0.339
Chronic liver disease	4.9	10.1	0.048
Malignancy	4.2	1.9	0.106
Rheumatological disease	2.1	4.5	0.190
Chronic metabolic disease	6.3	9.2	0.254
Morbid obesity	4.9	4.5	0.830
Chronic neurological disease	2.1	1.5	0.601
Hypertension	53.5	43.2	0.024

Continued on the next page

Continued from the previous page

Table 5. *Comparison of data of vaccinated and non-vaccinated participants (N = 818)*

	Vaccinated (n = 144) %	Non-vaccinated (n = 674) %	p-value
Influenza is an airborne disease passed via respiratory droplets.	62.5	51.6	0.015
Influenza vaccine should be administered to individuals with chronic diseases and elderly people.	87.5	76.9	0.015
The influenza vaccine does not cause influenza illness.	81.3	46.7	< 0.001
The influenza vaccine should be repeated every year.	60.4	32.6	< 0.001
Is the influenza vaccine necessary? Yes/No	73.6	39.5	< 0.001
The seasonal influenza vaccine protects us against the influenza viruses.	79.2	40.8	< 0.001
Have you ever received an influenza vaccine throughout your life? Yes/No	63.8	1.8	< 0.001
Source of knowledge acquisition			
Physician	64.6	39.5	< 0.001
Nurse	6.9	6.8	0.959
TV	31.3	58.2	0.259
Newspaper	3.5	5.9	0.404
Internet	5.6	4.0	0.218
Do you think that you have sufficient information about influenza?			
Yes	43.1	18.4	< 0.001
No	28.5	54.9	
Not sure	28.5	26.7	

DISCUSSION

The WHO and the European Union (EU) state that the minimum influenza vaccination target for adults is 75%. However, troubles in achieving the targeted vaccination rates are reported by health authorities (17–19). It was disclosed that the 75% target vaccination rate against influenza was reached in only two member states of the EU (the United Kingdom and the Netherlands) (19). In a study performed in Germany related to influenza vaccination in the adult population, vaccination rates were determined as follows: 24% in individuals aged ≤ 60 years with underlying disease, 56% in individuals aged ≥ 60 years with underlying disease, and 53% in individuals aged over 65 years (15).

When Turkish data were assessed, it was determined that the results of certain disease groups were reported in most of the studies investigating influenza vaccination rates. In the first study by Biberoglu et al. (13) that evaluated all relevant risk groups and the elderly together, the influenza vaccination rates in individuals aged over 65 years, individuals with COPD, and those with diabetes mellitus were reported as 5.9%, 14.9%, and 9.1%, respectively. In another study performed by Oncel et al. (14), the authors determined influenza vaccination rates in individuals aged over 65 years and individuals with chronic diseases as 6.7–27.3%. In our study, influenza vaccination rates in the adult population, individuals aged over 65 years, and individuals with diabetes mellitus, COPD, chronic cardiovascular disease, and chronic renal failure were determined as 12.5–32.2%. The results obtained in our study and similar studies show that influenza vaccination rates in risk groups among the elderly and adults are insufficient. Therefore, we think that setting goals for influenza vaccination rates in adults and follow-up vaccination rates in target groups will contribute to increasing vaccination rates.

In a study performed by Bödeker et al. (15) in Germany, the authors evaluated the reasons of participants for not receiving vaccinations against influenza, and they reported these reasons as disbelief in vaccines and believing themselves to be in the low-risk group for influenza. In a study performed in Jordan, adverse effects and insufficient efficacy of the influenza vaccine were reported as reasons for not receiving a vaccination (20). The most frequent reasons for the participants to not receive the influenza vaccine in our study were as follows: not knowing it was necessary to get an influenza vaccine, specifying that it was not necessary to have an influenza vaccine because they were healthy, and not being recommended the vaccine by a physician. Thus, in our study, the reasons for not receiving a vaccination were similar to those reported in the world literature (15, 18, 20, 21). We think that increasing the knowledge level and awareness of the adult population about the risk groups and the efficiency and adverse effects of the vaccine will contribute to increasing vaccination rates.

One of the important results obtained in our study was that the lack of physician recommendation was among the leading reasons for not getting a vaccination. Additionally, the participants in our study were asked about where they wanted to receive information about influenza, and the participants responded that they wanted to be informed first by their family physicians, and second by the physicians who treated them for their chronic diseases. This shows that recommendations for the vaccine by physicians for individuals in risk groups and the elderly could be considered among the most important steps needed to increase the awareness of vaccinations and vaccination rates.

In one study performed to evaluate the factors affecting influenza vaccination, those aged over 60 years, those who graduated from a university, those with health insurance, and those with a health risk were vaccinated significantly more than non-vaccinated individuals (14). In another study, older age, working situation, presence of underlying disease, medical visit within the past year, presence of vaccine recommendation by a healthcare professional, a past history of influenza vaccination, being informed about the influenza vaccine and the influenza disease, and a positive attitude were determined as being significant for acceptance of the influenza vaccine, which is aligned with our results (22).

CONCLUSION

In conclusion, in our study, the knowledge level about influenza, vaccination rates, and factors that affected vaccination

uptake in the elderly and adults with underlying disease were evaluated. Our study provides important information about the need for increasing awareness of influenza and the vaccination of participants. Therefore, physicians informing target risk groups about influenza vaccination and increasing general awareness of influenza may contribute to improving our vaccination rates.

Conflict of Interests

None declared

REFERENCES

1. World Health Organization. Influenza (Seasonal) [Internet]. Geneva: WHO; 2018 [cited 2018 Nov 7]. Available from: http://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal).
2. Grohskopf LA, Sokolow LZ, Broder KR, Olsen SJ, Karron RA, Jernigan DB, et al. Prevention and control of seasonal ınfluenza with vaccines. MMWR Recomm Rep. 2016;65(5):1-54.
3. Centers for Control and Disease Prevention. Recommended ımmunization schedule for adults aged 19 years or older, United States, 2018 [Internet]. CDC; 2018 [cited 2018 Nov 7]. Available from: https://www.cdc.gov/vaccines/schedules/downloads/adult/adult-combined-schedule.pdf.
4. Turkish Republic Health Government. Seasonal influenza [Internet]. 2017 [cited 2018 Nov 7]. Available from: https://www.grip.gov.tr/tr/grip-asisi.html. (In Turkish.)
5. Bülbül Y, Öztuna F, Gülsoy A, Özlü T. Chronic obstructive pulmonary disease in Eastern Black Sea Region: characteristics of the disease and the frequency of influenza-pneumococcal vaccination. Turkiye Klinikleri J Med Sci. 2010;30:24-9.
6. Balbay EG, Tanrıverdi E, Alaşan F, Özmen Süner K. The frequency of vaccination in patients with chronic obstructive pulmonary disease in Düzce. J Duzce Univ Health Sci Inst. 2013;3(2):15-7. (In Turkish.)
7. Balcıoğlu H, Ulus T, Sarı YE, Bilge U, Ünlüoğlu İ. Flu vaccination rates ın the patients with coronary artery disease and motivation. Osmangazi J Med. 2017;39(1):26-30. (In Turkish.)
8. Kaya A, Altınel N, Karakaya G, Çetinkaya F. Knowledge and attitudes among patients with asthma and parents and physicians towards influenza vaccination. Allergol Immunopathol (Madr). 2017 May-Jun;45(3):240-3.
9. Arslan IE, Altınova A, Baloş Törüner F, Yalçın MM, Özkan C, Çakır N, et al. Awareness of hepatitis B, ınfluenza and pneumococcal vaccine among diabetic patients. GMJ 2016;27:115-7. (In Turkish.)
10. Urun Y, Akbulut H, Demirkazik A, Cay Senler F, Utkan G, Onur H, et al. Perception about influenza and pneumococcal vaccines and vaccination coverage among patients with malignancies and their family members. J BUON. 2013;18(3):511-5.
11. Ciblak MA; Grip Platformu. Influenza vaccination in Turkey: prevalence of risk groups, current vaccination status, factors influencing vaccine uptake and steps taken to increase vaccination rate. Vaccine. 2013;31(3):518-23.
12. Aka Aktürk Ü, Görek Dilektaşlı A, Şengül A, Musaffa Salepçi B, Oktay N, Düger M, et al. Influenza and pneumonia vaccination rates and factors affecting vaccination among patients with chronic obstructive pulmonary disease. Balkan Med J. 2017;34(3):206-11.
13. Biberoglu K. Come on adults, lets get vaccinated. Actual Med. 2006;14:18-26. (In Turkish.)
14. Oncel S, Turhan O, Huseyin PH, Yalcin AN. Status of influenza vaccination in patients presenting to two neighborhood primary healthcare clinics in Antalya. Infez Med. 2008;16(2):74-9.
15. Bödeker B, Remschmidt C, Schmich P, Wichmann O. Why are older adults and individuals with underlying chronic diseases in Germany not vaccinated against flu? A population-based study. BMC Public Health. 2015 Jul 7;15:618. doi: 10.1186/s12889-015-1970-4.
16. Evans MR, Watson PA. Why do older people not get immunised against influenza? A community survey. Vaccine. 2003;21(19-20):2421-7.
17. World Health Oganization. Prevention and control of influenza pandemics and annual epidemics [Internet]. Geneva: WHO; 2003 [cited 2018 Nov 7]. Available from: https://apps.who.int/iris/handle/10665/78320.
18. Bof de Andrade F, Sayuri Sato AP, Moura RF, Ferreira Antunes JL. Correlates of influenza vaccine uptake among community-dwelling older adults in Brazil. Hum Vaccin Immunother. 2017;13(1):103-10.
19. European Centre for Disease Prevention and Control. Risk assessment: Seasonal influenza 2012/13 in Europe (EU/EEA countries) [Internet]. ECDC; 2013 [cited 2018 Nov 7]. Available from: https://ecdc.europa.eu/en/publications-data/risk-assessment-seasonal-influenza-201213-europe-eueea-countries.
20. Assaf AM, Hammad EA, Haddadin RN. Influenza vaccination coverage rates, knowledge, attitudes, and beliefs in Jordan: a comprehensive study. Viral Immunol. 2016;29(9):516-25.
21. Tsai YY, Lee JJ, Hsieh WH. Determinants of the public intent to receive the seasonal influenza vaccine and protective behaviors: a population-based study in Taiwan. Vaccine. 2014;32(49):6667-75.
22. Worasathit R, Wattana W, Okanurak K, Songthap A, Dhitavat J, Pitisuttithum P. Health education and factors influencing acceptance of and willingness to pay for influenza vaccination among older adults. BMC Geriatr 2015;15:136. doi: 10.1186/s12877-015-0137-6.

Received October 13, 2017
Accepted in revised form February 7, 2019