




Influenza, Pneumococcus, Tetanus, and Herpes Zoster Vaccination Status of Patients Aged 65 Years and Over with Respiratory and Cardiac Problems

Solunum ve Kardiyak Sorunları Olan 65 Yaş ve Üzeri Hastaların İnfluenza, Pnömomokok, Tetanoz, Herpes Zoster Aşılama Özellikleri

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ABSTRACT

Objective: This study was conducted to determine the vaccination status and rates among patients aged 65 and over with respiratory and cardiac problems.

Methods: The sample of this descriptive and sectional study consisted of 244 patients aged 65 and over admitted to the chest and cardiology clinic at a state hospital in Turkey between July 2018 and July 2019. The data were collected using the "Structured Questionnaire Form" prepared to determine the sociodemographic, disease, and vaccination status and rates of the patients. Mean, SD, number, percentage, and chi-square tests were used to evaluate the data.

Results: Only 11.1% of patients knew about the vaccines that should be administered to those aged 65 or over. The rates of vaccination at the recommended frequency of the patients who were admitted to the chest outpatient clinics were 26.2% in influenza, 7.4% in pneumococcus, 23.8% in tetanus, and 0.8% in herpes zoster and for those admitted to the cardiology outpatient clinics were 9% in influenza, 3.2% in pneumococcus, 22.9% in tetanus, and 0.8% in herpes zoster.

Conclusion: Influenza, pneumococcus, tetanus, and herpes zoster vaccination rates of the patients were very low. Therefore, it is recommended to monitor patients aged 65 and over with respiratory and cardiac problems in terms of vaccination and organize training programs to increase vaccination rates.

Keywords: Elderly, immunization, vaccination

ÖZ

Amaç: Bu araştırma, solunum ve kardiyak sorunları olan 65 yaş ve üzeri hastaların aşı özellikleri ile aşılama oranlarını belirlemek amacıyla yapıldı.

Yöntemler: Tanımlayıcı ve kesitsel tipteki araştırmanın örneklemini Temmuz 2018-Temmuz 2019 tarihleri arasında bir devlet hastanesinin göğüs ve kardiyoloji polikliniğine başvuran 65 yaş ve üzeri toplam 244 hasta oluşturdu. Veriler, hastaların sosyodemografik, hastalık ve aşılama özellikleri ile aşılama oranlarını belirlemek amacıyla hazırlanan "Yapılandırılmış Soru Formu" ile toplandı. Verilerin değerlendirilmesinde ortalama, standart sapma, sayı, yüzde ve ki-kare testi kullanıldı.

Bulgular: Hastaların sadece %11,1'i 65 yaş ve üzerinde uygulanması gereken aşıları bilmekte idi. Aşılama oranları önerilen sıklıkta aşı yaptıran hastaların göğüs polikliniklerine başvuranlarda; influenza %26,2, pnömokok %7,4, tetanoz %23,8 ve herpes zoster %0,8'dir. Kardiyoloji polikliniklerine başvuranlarda; influenza %9, pnömokok %3,2, tetanoz %22,9 ve herpes zoster %0,8'dir.

Sonuç: Hastaların influenza, pnömokok, tetanoz ve herpes zoster aşılama oranları oldukça düşüktür. Bu nedenle solunum ve kardiyak sorunları olan 65 yaş ve üzeri hastaların aşılama oranlarının artırılması ve aşılama oranlarının arttırılmasına yönelik eğitimlerin düzenlenmesi önerilir.

Anahtar Kelimeler: Yaşlılık, bağışıklama, aşılama

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INTRODUCTION

Although immunization programs for the elderly are carried out in many countries around the world, the lack of a central database in which vaccine administration records of the elderly are registered in many countries makes it difficult to obtain vaccination data for the age group of 65 and over.^{1,2} For example, data on tetanus and diphtheria vaccines included in the adult vaccination program are available only in 5 of 29 European countries.²

Today, infectious diseases with high morbidity and mortality such as influenza, pneumonia, tetanus, and herpes zoster (HZ) develop in the elderly.³ The development of these infectious diseases can be prevented by the vaccine, which is an inexpensive and effective method.⁴ Among the vaccines recommended by the US Center for Disease Control and Prevention (CDC) for people aged 65 and over are 1 dose of influenza vaccine, 1 dose of pneumococcal vaccine, 1 dose of Tdap (tetanus, diphtheria, and pertussis) once a year, and later tetanus or Tdap tetanus-diphtheria toxoid and 1 dose of HZ vaccine every 10 years.¹ A similar vaccination program for people 65 years and older is applied in Turkey. According to this program, pneumococcal, HZ vaccine, and tetanus/diphtheria booster vaccine every 10 years are recommended in addition to the seasonal influenza vaccine once a year.⁵ Although immunization is pivotal in the population aged 65 and over, the target set by the World Health Organization (WHO) for 75% of older adults (> 65 years old) to receive the influenza vaccine by 2014/2015 was not achieved in most countries.^{2,6} In Europe, the highest and the lowest vaccination rate has been reported in England and the Netherlands (over 70%) and Estonia (1%), respectively, but some European countries did not even reach a 10% vaccination rate.^{7,8} While influenza vaccination rates in the population aged 65 and over are 15% in the western part of Turkey, this ratio is 12.3% in Northeast Anatolia.^{9,10} Despite these differences between regions, the rate of influenza vaccination in the population aged 65 and over is the lowest at 5.9%,¹¹ the tetanus vaccination rate was 3.1%,¹² and the HZ vaccination rate was found to be only 0.2%.¹⁰

Although vaccination is one of the important practices of preventive health services, the vaccination of elderly individuals is not given much importance, and most elderly individuals are not vaccinated according to vaccination programs. It is important for the nurse, together with the multidisciplinary team, to raise awareness and inform about adult vaccination, especially of elderly individuals, in terms of increasing adult vaccination rates. Moreover, this current study can be a literature resource for further studies since it is one of the few studies in Turkey revealing influenza, pneumococcal, tetanus, and HZ vaccination rate in patients 65 years and over. It is thought that the results of the study can raise the awareness of the vaccines that should be administered to people aged 65 and over and the associated factors and contribute to health services in the planning of treatment and care for this age group. It is also anticipated that the detailed investigation of this issue in further studies will be beneficial for the development of new suggestions. Therefore, this study aims to determine influenza, pneumococcal, tetanus, and HZ vaccination status and rates of patients aged 65 and over with respiratory and cardiac problems.

METHODS

Study Design and Sample

This study is a descriptive and cross-sectional type. The population of the research included patients aged 65 and over admitted

to the chest for Chronic obstructive pulmonary disease (COPD), pneumonia, influenza, asthma, etc.) and cardiology (for hypertension, coronary artery disease, heart failure, cardiac arrhythmias, etc.) outpatient clinics of a public hospital located in Trabzon province in northeastern Turkey between July 2018 and July 2019. Using the Open Epi statistics program, the sample size was determined as 262 patients among a population of 30.743 patients, with an immunization rate of 22% in those aged 65 years and older, a confidence interval of 95%, and a test power of 80%.¹³ However, the study was completed with 244 patients (122 in the chest clinic and 122 in the cardiology clinic) after the exclusion of 10 patients who could not answer all the questions and 8 patients who did not want to continue the study.

Data Collection

The data were collected using the "Structured Question Form" developed by the researchers by reviewing the relevant literature.^{7,12,14} The "Structured Question Form" was presented to the "expert panel" made up of experienced experts (3 nurse faculty members) to receive their opinions about the content. Five questions were removed in line with their suggestions, and the form was finalized. The Structured Question Form consisted of 26 questions. Using the face-to-face interview technique, the "Structured Question Form" was applied to the patients in a separate room reserved in the outpatient clinic after the examination.

Table 1. Sociodemographic and Disease Characteristics of the Patients (n = 244)

Characteristics	Mean ± SD	Minimum–Maximum	n	%
Age	74.37 ± 7.27	(65–93)		
Gender				
Female			125	51.2
Male			119	48.8
Education level				
Illiterate			96	39.3
Literate			69	28.3
Primary + secondary school			57	23.4
High school and above			22	9.0
Marital status				
Married			210	86.1
Single			34	13.9
Place of residence				
City			97	39.8
Province			71	29.1
Village			76	31.1
The frequency of visiting a health institution				
<6 months			152	62.3
6–12 months			32	13.1
>12 months			60	24.6
The presence of a chronic disease				
Yes			184	75.4
No			60	24.6
Outpatient clinic				
Chest clinic			122	50.0
Cardiology clinic			122	50.0

Table 2. Influenza, Pneumococcus, Tetanus, and Herpes Zoster Vaccination Status of the Patients (n = 244)

Characteristics	n	%
Do you know the vaccines that should be administered at the age of 65 and over?		
Yes*	27	11.1
No	217	88.9
Have you ever been recommended/have had the vaccines that should be administered at the age of 65 and over?		
Recommended and I have received	60	24.6
Recommended but I have not received	18	7.4
Not recommended	166	68.0
Do you know how often influenza vaccination is required for people aged 65 and over?		
Yes, once a year	61	25.0
Yes, once every 2 years	2	0.8
Yes, once every 5 years	3	1.2
No	178	73.0
If you were recommended to get influenza vaccine, would you get it?		
Yes, I would	181	74.2
No, I would not. I do not think it is necessary	40	16.3
No, I would not. I am scared of injections	9	3.7
No, I would not. I don't know about the vaccine	7	2.9
No, I would not. I can heal without vaccination, I'm healthy	7	2.9
Do you know how often pneumococcal vaccination is required for 65 years and older?		
Yes, once a year	2	0.8
Yes, once every 2 years	3	1.2
Yes, once every 5 years	2	0.8
No	237	97.1
If you were recommended to get pneumococcal vaccine, would you get it?		
Yes, I would	180	73.8
No, I would not. I do not think it is necessary	39	16.0
No, I would not. I am scared of injections	13	5.3
No, I would not. I don't know about the vaccine	6	2.5
No, I would not. I don't think the vaccine is healthy	6	2.4
Do you know how often tetanus vaccination is required for 65 years and older?		
Yes, once a year	5	2.0
Yes, once every 5 years	2	0.8
Yes, once every 10 years	6	2.4
Yes, in case of an injury with rusted iron	4	1.6
No, I do not	227	93.0
If you were recommended to get tetanus vaccine, would you get it?		
Yes, I would	203	83.2
No, I would not. I do not think it is necessary	26	10.7
No, I would not. I am scared of injections	11	4.5
No, I have just received it	3	1.2
No, I would not. I don't know about the vaccine	1	0.4
Do you know how often Herpes Zoster vaccination is required for 65 years and older?		
Yes, once every 3 years	1	0.4
Yes, once every 5-10 years	1	0.4
No	242	99.2
If you were recommended to get Herpes Zoster vaccine, would you get it?		
Yes, I would	176	72.1
No, I would not. I do not think it is necessary	43	17.7
No, I would not. I am scared of injections	14	5.7
No, I would not. I don't know about the vaccine	11	4.5

*Influenza, pneumococcus, tetanus, tuberculosis

The questions in the form were asked to the patients by the researcher, and the answers were recorded. Patient names were not included in the form, and the application of the form took approximately 15 minutes. The inclusion criteria of the study were being 65 years of age or over, being admitted to the chest or cardiology outpatient clinic, being able to communicate verbally, and being a volunteer to participate in the study. Those with hearing loss and a diagnosed psychiatric diagnosis and those who did not agree to participate in the study were not included in the study.

Statistical Analysis

The research data were evaluated using the Statistical Package for the Social Sciences (IBM SPSS Corp., Armonk, NY, USA) software for the Windows version 21 program. Continuous variables were presented as mean, SD (minimum–maximum values), and categorical variables were given as numbers (percentage). The chi-square test was used to evaluate the sociodemographic and qualitative data of the diseases of vaccinated and unvaccinated patients. The results were evaluated at the 95% confidence interval, and the significance level was accepted as $P < .05$.

Compliance with Ethical Standards

Ethics committee permission was obtained from Karadeniz Technical University Faculty of Medicine Scientific Research Ethics Committee (Date: June 29, 2018-Number: 24237859-408), and the institutional permit was received from Trabzon Governorship Provincial Health Directorate (Date: June 13, 2018; Number: 14636556-604.01.02). Also, informed consent was obtained from all patients who agreed to participate in the study.

RESULTS

The results showed that the mean age of the patients was 74.37 ± 7.27 , 51.2% were female, 39.3% were illiterate, 86.1% were married, and 39.8% lived in the city. About 62.3% of them visited a health institution in the last 6 months, 75.4% had a chronic disease, 50% were admitted to the chest, and 50% to the cardiology outpatient polyclinic (Table 1).

88.9% of the patients were not aware of the vaccines that should be administered at the age of 65 and over, and these vaccines were not recommended to 68% of them. Besides, the patients did not know when the influenza (73%), pneumococcus (97.1%), tetanus (93%), and HZ (99.2%) vaccines should be received, but they stated that if these vaccines were recommended, they would get influenza (74.2%), pneumococcus (73.8%), tetanus (83.2%), and HZ (72.1%) vaccines. Some of the patients did not believe that influenza (16.3%), pneumococcus (16%), tetanus (10.7%), and HZ (17.7%) vaccines were necessary (Table 2).

While the vaccination rates of patients admitted to the chest and cardiology outpatient clinic were 48.4% and 35.2% in influenza, 14.8%, 5.7% in pneumococcus; 50.8% and 45.1% in tetanus; and 9.8% and 1.6% in HZ respectively, the rates of getting these vaccines at the recommended frequency were 26.2% and 9% in influenza (in the last year); 7.4% and 3.2% in pneumococcus (single dose over 65 years of age); 23.8% and 22.9% in tetanus (in the last 10 years); and 0.8%, 0.8% in HZ (single dose over 60 years old), respectively. The total vaccination rates of the patients and the rates of vaccinated patients at the recommended frequency were found to be as follows: 41.8% and 17.6% in influenza; 10.2% and 4.1% in pneumococcus; 48% and 23.4% in tetanus; and 5.7% and 0.8% in HZ, respectively (Table 3).

Table 3. Influenza, Pneumococcal, Tetanus, and Herpes Zoster Vaccination Rates of the Patients (n = 244)

Vaccines	Chest Polyclinic (n = 122)		Cardiology Polyclinic (n = 122)		Total (n = 244)	
	n	%	n	%	n	%
Have you ever received influenza vaccine?						
Yes	59	48.4	43	35.2	102	41.8
No	63	51.6	79	64.8	142	58.2
When did you receive influenza vaccine?						
	(n = 59)		(n = 43)			
In the last 1 year	32	26.2	11	9.0	43	17.6
2 years and over	27	22.1	32	26.2	59	24.2
Have you ever received pneumococcus vaccine?						
Yes	18	14.8	7	5.7	25	10.2
No	104	85.2	115	94.3	219	89.8
When did you receive pneumococcus vaccine?						
	(n = 18)		(n = 7)			
One dose at the age 65 and over	9	7.4	4	3.2	10	4.1
I do not remember	9	7.4	3	2.5	15	6.1
Have you ever received tetanus vaccine?						
Yes	62	50.8	55	45.1	117	48.0
No	60	49.2	67	54.9	127	52.0
When did you receive tetanus vaccine?						
	(n = 62)		(n = 55)			
In the last 10 years	29	23.8	28	22.9	57	23.4
11 years and over	33	27	27	22.1	60	24.6
Have you ever received Herpes Zoster vaccine?						
Yes	12	9.8	2	1.6	14	5.7
No	110	90.2	120	98.4	230	94.3
When did you receive HZ vaccine?						
	(n = 12)		(n = 2)			
One dose at the age 65 and over	1	0.8	1	0.8	2	0.8
I do not remember	11	9.0	1	0.8	12	4.9

HZ, Herpes Zoster

The vaccination of influenza ($P = .038$), pneumococcus ($P = .020$), and HZ ($P = .006$) was found to be statistically significantly higher in patients admitted to the chest clinic. The tetanus vaccination of those who were married ($P = .002$), living in the city ($P = .015$), and the influenza vaccination of those who knew the vaccines for 65 years and older ($P = .005$) were found to be significantly higher. The pneumococcus ($P = .003$), tetanus ($P = .008$), and HZ ($P < .001$) vaccination of the patients who applied to a health institution for >12 months and influenza ($P < .001$), pneumococcus ($P < .001$), tetanus ($P = .001$), and HZ ($P = .004$) vaccination of those who were recommended/had vaccines that should be administered at the age of 65 and over were found to be statistically significantly higher. Patients' gender, and education level, did not affect influenza, pneumococcus, tetanus, and HZ vaccination rates significantly ($P > .05$) (Table 4).

DISCUSSION

In this study, vaccination status and vaccination rates of patients aged 65 and over with respiratory and cardiac problems were

Table 4. Comparison of Influenza, Pneumococcal, Tetanus, and Herpes Zoster Vaccination According to Some Characteristics of the Patients (n = 244)

Characteristics	Influenza			Pneumococcal			Tetanus			Herpes Zoster		
	Yes n (%)	No n (%)	χ^2 P	Yes n (%)	No n (%)	χ^2 P	Yes n (%)	No n (%)	χ^2 P	Yes n (%)	No n (%)	χ^2 P
Polyclinic												
Chest	59 (48.4)	63 (51.6)	4.313 .038*	18 (14.8)	104 (85.2)	5.393 .020*	62 (50.8)	60 (49.2)	0.805 .370	12 (9.8)	110 (90.2)	7.578 .006*
Cardiology	43 (35.2)	79 (64.8)		7 (5.7)	115 (94.3)		55 (45.1)	67 (54.9)		2 (1.6)	120 (98.4)	
Gender												
Female	49 (39.2)	76 (60.8)	0.714 .398	10 (8.0)	115 (92.0)	1.406 .236	60 (48.0)	65 (52.0)	<.001 .987	6 (4.8)	119 (95.2)	0.417 .519
Male	53 (44.5)	66 (55.5)		15 (12.6)	104 (87.4)		57 (47.9)	62 (52.1)		8 (6.7)	111 (93.3)	
Education level												
Illiterate	37 (38.5)	59 (61.5)	2.030 .566	9 (9.4)	87 (90.6)	0.625 .891	43 (44.8)	53 (55.2)	7.402 .060	8 (8.3)	88 (91.7)	7.121 .068
Literate	28 (40.6)	41 (59.4)		8 (11.6)	61 (88.4)		39 (56.5)	30 (43.5)		6 (8.7)	63 (91.3)	
Primary + Secondary school	25 (43.9)	32 (56.1)		5 (8.8)	52 (91.2)		21 (36.8)	36 (63.2)		0 (0.0)	57 (100.0)	
High school and above	12 (54.5)	10 (45.5)		3 (13.6)	19 (86.4)		14 (63.6)	8 (36.4)		0 (0.0)	22 (100.0)	
Marital status												
Married	91 (43.3)	119 (56.7)	1.450 .228	24 (11.4)	186 (88.6)	2.292 .130	109 (51.9)	101 (48.1)	9.440 .002*	14 (6.7)	196 (93.3)	2.405 .121
Single	11 (32.4)	23 (67.6)		1 (2.9)	33 (97.1)		8 (23.5)	26 (76.5)		0 (0.0)	34 (100.0)	
Place of residence												
City	49 (50.5)	48 (49.5)	5.309 .070	13 (13.4)	84 (86.6)	3.183 .204	56 (57.7)	41 (42.3)	8.419 .015*	8 (8.2)	89 (91.8)	1.880 .391
District	24 (33.8)	47 (66.2)		8 (11.3)	63 (88.7)		34 (47.9)	37 (52.1)		3 (4.2)	68 (95.8)	
Village	29 (38.2)	47 (61.8)		4 (5.3)	72 (94.7)		27 (35.5)	49 (64.5)		3 (3.9)	73 (96.1)	
Knowing the vaccines that should be administered at the age of 65 and over												
Yes	18 (66.7)	9 (33.3)	7.714 .005*	1 (3.7)	26 (96.3)	1.413 .235	13 (48.1)	14 (51.9)	<.001 .983	0 (0.0)	27 (100.0)	1.848 .174
No	84 (38.7)	133 (61.3)		24 (11.1)	193 (88.9)		104 (47.9)	113 (52.1)		14 (6.5)	203 (93.5)	
The frequency of visiting a health institution												
<6 months	67 (44.1)	85 (55.9)	2.842 .241	11 (7.2)	141 (92.8)	11.771 .003*	66 (43.4)	86 (56.6)	9.638 .008*	1 (0.7)	151 (99.3)	37.348 <.001*
6-12 months	9 (28.1)	23 (71.9)		1 (3.1)	31 (96.9)		12 (37.5)	20 (62.5)		0 (0.0)	32 (100.0)	
>12 months	26 (43.3)	34 (56.7)		13 (21.7)	47 (78.3)		39 (65.0)	21 (35.0)		13 (21.7)	47 (78.3)	
Recommended / receiving status of vaccines that should be administered at the age of 65 and over												
Recommended and I have received	41 (68.3)	19 (31.7)	25.347 <.001*	14 (23.3)	46 (76.7)	15.391 <.001*	41 (68.3)	19 (31.7)	13.849 .001*	7 (11.7)	53 (88.3)	11.274 .004*
Recommended but I have not received	9 (50.0)	9 (50.0)		2 (11.1)	16 (88.9)		9 (50.0)	9 (50.0)		3 (16.7)	15 (83.3)	
Not recommended	52 (31.3)	114 (68.7)		9 (5.4)	157 (94.6)		67 (40.4)	99 (59.6)		4 (2.4)	162 (97.6)	

*Chi-square test.

P value < .05 is considered as statistically significant.

examined. Only 11.1% of the patients involved in this study were aware of influenza, pneumococcal, and tetanus vaccines that should be administered at the age of 65 and over. Akman et al¹⁵ asked the participants to evaluate their level of knowledge about the vaccines over the age of 65 on a 10-point Likert scale, and as a result, the percentage of participants who scored 5 points or more out of 10 was found to be 35.6% for the influenza, 10.6% for tetanus, and 6.7% for pneumococcal vaccines. In our study, the influenza vaccination was significantly higher in patients who knew the vaccines that should be administered to those aged 65 years and over. It is thought that the reason for this is the influenza outbreaks that occur in different periods and the frequent coverage of these epidemics in the media, raising awareness about influenza and the availability of influenza vaccine free of charge.

In addition, the literature reports that among the adult vaccines aged 65 and over, the influenza vaccine is the one that is commonly administered.^{10,14,16}

One study suggests that in people over 65 years of age, the reason for not being vaccinated is not their refusal to be vaccinated but the lack of information and persuasion of the target groups.¹⁷ In our study, the patients stated that they did not believe that vaccines were necessary, they were scared of injections, they did not know about the vaccine, and they did not think that the vaccine was healthy. Similarly, in a study conducted in the USA, "not being informed sufficiently by the physician, injection phobia and not believing in the protective effect of the vaccine" were shown as reasons for the participants not to be vaccinated.¹⁸ It was determined that 68% of the patients in our study group

were not recommended to have vaccines that should be received over the age of 65. That physicians do not recommend the vaccines sufficiently has been shown to be the most important reason for not being vaccinated in Western Europe.¹⁹ In our study, it was also seen that when recommended, patients would have influenza (74.2%), pneumococcal (73.8%), tetanus (83.2%), and HZ (72.1%) vaccines. Likewise, Erdoğan and Çatak¹⁰ determined that 84.9% of the participants would be vaccinated if the physician recommended it. In studies published in Canada and America, an increase in vaccination of adults aged 65 and over was observed thanks to the recommendation of the healthcare personnel.^{18,20} In our study, the patients did not know when influenza (73%), pneumococcus (97.1%), tetanus (93%), and HZ (99.2%) vaccines should be received. The fact that the average age of the patients was 74.37 ± 7.27 , they lived in a rural area, and only 9% of them had high school and above education may have caused this situation. In addition, in this study, influenza, pneumococcus, tetanus, and HZ vaccination rates were found to be significantly higher in patients aged 65 and over who were recommended/had vaccines that should be received. Erdoğan and Çatak¹⁰ emphasized that 5.5% of the participants in their study had been informed about any of the vaccines before, and 46.7% of them got at least 1 vaccine (influenza, pneumococcus, or HZ). Schneeberg et al¹⁹ noted that 16.7% of the patients who were not informed about the pneumococcal vaccine by a physician or healthcare professional, and 79.8% of those who were informed were vaccinated in Canada. These findings show that knowing about vaccines affects vaccination rates. One of the most significant results of this study is that the rate of vaccination of the patients increased significantly with the previous recommendation on vaccination. This result is not surprising, and similar studies have also concluded that increased awareness of physicians about vaccination may increase the rate of vaccination against diseases associated with pneumococcus in societies.^{21,22}

In our study, pneumococcal, tetanus, and HZ vaccinations were found to be significantly higher in patients admitted to a healthcare institution for > 12 months. In a study conducted in the USA, it was observed that 61% of vaccinated patients visited a physician several times in the last year.²³ In this study, the rate of having vaccinations at recommended frequencies in the patients who applied to the chest outpatient clinic was higher for all vaccines compared to those admitted to the cardiology outpatient clinic. The rate of influenza, pneumococcal, and HZ vaccinations was also found to be significantly higher in patients who applied to the chest polyclinic. It is thought that the reason for this situation may be that patients who apply to the chest polyclinic generally have respiratory system diseases (COPD, asthma, and chronic bronchitis), have more frequent diseases due to influenza and pneumococcus, and directly benefit from these vaccines. Nitsch-Osuch et al²⁴ evaluated high-risk groups for influenza and found that chronic lung diseases were significantly higher than other groups by 58%. Balbay et al²⁵ determined that the rate of having the flu vaccine in the previous year was 24.6% and the rate of pneumococcal vaccine in the last 5 years was 8.2% in COPD patients admitted to the chest polyclinic. Ciftci et al²⁶ stated that 16.8% and 20.5% of the patients who applied to the chest polyclinic had regular influenza and pneumococcal vaccines, respectively.

In our study, the rates of patients who applied to the chest and cardiology outpatient clinics to have these vaccines at the

recommended frequency were listed from the highest to the lowest as follows; tetanus (23.4%), influenza (17.6%), pneumococcal (4.1%), and HZ (0.8%). The recommended frequency of vaccination after the age of 65 in our study group was found to be quite low. Yuruyen et al¹⁴ and İlhan and Bakkaloğlu¹⁶ found the vaccination rates of patients over 65 years old who applied to the geriatric outpatient clinic as 18%, 8.2% for influenza, and 6%, 0.7% for pneumococcus, respectively. Erdoğan and Çatak¹⁰ found the vaccination rates of individuals over 65 years of age as 12.3% in influenza, 0.9% in pneumococcus, and 0.2% in HZ, which were quite lower than our study. In the study of Bolatkale et al.²⁷ it was determined that 59% of the participants had a tetanus vaccine and 53.2% of them had it in the last 5 years, and the first reason for vaccination was sharp object injuries with 50.6%. Yürüyen et al¹⁴ found the tetanus vaccination rate to be much lower (5%) than our study result, while İlhan and Bakkaloğlu¹⁶ reported that no patients were vaccinated for tetanus and HZ. It is stated that 82% of adults have received the tetanus vaccine in the last 10 years, 65% of those aged 65 and over have received the seasonal influenza vaccine, and 42% have received the pneumococcal vaccine in Canada, which is higher than our study results.²⁸ Because HZ and pneumococci vaccines are not covered by social security institutions in Turkey, vaccination rates are reported to be low.¹⁶

In our study, tetanus vaccination of patients who were married and who resided in the province was significantly higher. The reason for this was that the study was conducted in the city, and spousal support might have facilitated access to health services. In addition, the necessity of receiving tetanus vaccination during military service for men and the birth process for women in Turkey can have a positive impact on the tetanus vaccination rates. Similarly, in a study conducted in the USA, the vaccination rates of unmarried participants aged 65 and over with low socioeconomic status were found to be lower.²⁹ Parallel to our study, Erdoğan and Çatak found that the rate of not being vaccinated in the elderly living in villages and towns was 2.2 times higher than the elderly living in the city and district center, and this situation was considered as a factor influencing vaccination in the elderly. In our study, the vaccination rates of the patients were found to be low, and the tetanus vaccination rate was determined to be the highest vaccination rate, followed by influenza, pneumococcal, and HZ vaccines. In addition, the vaccination rates of the patients who were admitted to the chest outpatient clinic were found to be higher than those in the cardiology outpatient clinic. The type of the outpatient clinic, the state of having knowledge about the vaccines that should be administered at the age of 65 and over, being recommended/having the vaccines that should be administered at the age of 65 and over, the frequency of visiting a health institution, marital status, and the place of residence affected the vaccination rates of the patients significantly.

Patients aged 65 and over with respiratory and cardiac problems should be monitored in terms of vaccination, and regular training programs should be organized for healthcare professionals, nurses who have an important role in preventive health services, and patients to increase the vaccination rates of patients with cardiac problems. It is also recommended to conduct further comparative studies regarding the vaccination statuses of the patients and their sociodemographic and disease-related characteristics.

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