

A Double-Sided View to Adult Vaccination: The Opinions and Attitudes of Patients and Health Workers

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Abstract

Objective: Although there are adult vaccination schemes in our country, there are serious deficiencies in the way that doctors direct the patients to this vaccination, but also patients have to make and demand these vaccinations. The aim of our study is to identify the shortcomings in this area and draw a roadmap for what arrangements should be made in terms of physicians and patients in order to increase adult immunization rates in primary care. **Method:** We conducted a two-phase, multicentered, descriptive clinical trial between October and December 2017. The first phase of the trial was carried out with patients from 3 Family Health Centers in Antalya, Istanbul and Osmaniye. Patients to be interviewed were selected voluntarily among Family Health Center's applicants. The second phase of the trial was carried out with health workers, who were participated to trial from 26 different provinces of Turkey. In the process, a questionnaire of 19 questions was applied to primary health care workers by the internet. **Results:** 490 patients were included in the study. There was a significant difference between gender, age, education level and guideline follow-up and vaccination status of patients [$p < 0.05$]. 794 primary health care workers participated in the survey. There was a statistically significant difference between gender, age groups, education and follow-up of guidelines and vaccination status [$p < 0.05$]. **Conclusion:** As a result of the studies including our study about adult vaccination, only 10% - 20% of the targeted groups in adults can be vaccinated. However, just like in childhood during adulthood, vaccinations protect individuals from diseases and provide economic benefits. Firstly, the knowledge level of physicians on adult immunization should be updated with in-service trainings, they should

first be convinced to vaccinate because they are in risk group and then they should be recommended vaccination to patient to increase the vaccination rates.

Keywords

Adult Vaccination, Health Workers, Patients

1. Introduction

One of the most effective and safe preventive health services in preventing communicable diseases and protecting against infectious diseases is being vaccinated. In countries with high vaccination rates under the Extended Immunization Program [EIP], the incidence and mortality of vaccine-preventable diseases have been reduced and these diseases have been brought to the elimination point [1].

Although adulthood is considered as the most healthy life period, infectious diseases are less common in this age group than other age groups. In addition, continuation of immunization services during the adult and elderly periods is very important due to the fact that some vaccine protections in childhood do not last for a lifetime, susceptibility to vaccine-preventable diseases increases when cannot be vaccinated during childhood and people stay face to face with vaccine-preventable diseases in working and social environments.

A study conducted in adults aged 18 years and over in our country reported that 65% of the participants in the study had diphtheria, 69% had tetanus, 90% had pertussis seronegativity and 78% of the participants need tetanus vaccination, 90% need pertussis vaccination and 96% need diphtheria vaccination [1]. Another study conducted in our country in 2017 showed that 32.5% of tetanus patients who were hospitalized were died and 17% of the survivors developed sequelae [2]. This number is predicted to decrease as adult vaccination rates increase.

However preparations and accessibility to vaccination in adulthood period are not enough as childhood period. In recent years adult vaccination has attracted more attention.

Adults have a number of vaccines recommended in relation to age, previous vaccination status, current health status, lifestyle, working conditions, immunosuppressive drugs and treatments and travel [3] [4] [5] [6]. Vaccination recommendations and doses in adults according to 2016 adult immunization Schedule are shown in **Table 1**.

Within the scope of the Adult Vaccination Program in our country, social mobilization activities have been planned with the slogan of “Come on adults to vaccination” and it is aimed to increase the applications of the people in the target group to make necessary vaccinations for health institutions and organizations. In this context, influenza vaccinations are paid each year and pneumococcal

Table 1. Vaccination recommendations and doses in adults.

vaccine	19 - 26 ages	27 - 36 ages	37 - 59 ages	60 - 64 ages	≥65 ages
Td/Tdap	A booster dose every 10 year				
Influenza	1 dose every year				
PCV13	1 dose				1 dose
PPSV23	2 dose [5 years apart]				1 dose
Hepatitis B	3 dose [0, 1.6 months]				
Hepatitis	2 dose [0.6 months]				
Zoster					1 dose
Varicella	2 dose [1 year apart]				
MMR	1 or 2 dose				
Meningococcus	1 dose				
Hib	3 dose [4 weeks apart]				
HPV	3 dose [0.1 - 2.6 months]				

Td: Tetanus-diphtheria; Tdap: Tetanus-diphtheria-acellular pertussis; Hib: Haemophilus influenzae type b vaccine; HPV: Human papilloma virus vaccine; KKK: measles-rubella-mumps vaccine; PCV13: Conjugated pneumococcal vaccine; PPSV23: Polysaccharide pneumococcal vaccine. Application to all adults is recommended. It is advisable to apply to adults with a risk factor or indication. It is not a special proposal but can be applied at the request of the patient and the physician.

vaccinations are paid every five years in order to have a medical report documenting these cases of high-risk people [7].

Although there are adult vaccination schemes in our country, there are serious deficiencies in the way that doctors direct the patients to this vaccination, but also patients have to make and demand these vaccinations.

The aim of our study is to identify the shortcomings in this area and draw a roadmap for what arrangements should be made in terms of physicians and patients in order to increase adult immunization rates in primary care.

2. Material-Method

We conducted a two-phase, multicentered, descriptive clinical trial between October and December 2017.

The first phase of the trial was carried out with patients from 3 Family Health Centers in Antalya, Istanbul and Osmaniye. The sample selected did not represent the whole population. Patients to be interviewed were selected voluntarily among Family Health Center's applicants. Survey was conducted by researchers using face-to-face interview techniques. A questionnaire contained demographic information of patients and 22 questions prepared for assessing the information, attitudes and behaviors of the patients about the adult periodic vaccinations.

The second phase of the trial was carried out with health workers, who were participated to trial from 26 different provinces of Turkey. The sample selected represents the whole population. In the process, a questionnaire of 19 questions was applied to primary health care workers by the internet. The questions con-

sist of sociodemographic characteristics of primary health care workers and their thoughts about adult immunization.

The survey was conducted in accordance with the Helsinki Declaration criteria. Prior to the trial, the etical approval was taken from Clinical Investigations Ethics Committee of Faculty of Medicine of Kahramanmaraş Sütçü İmam University [ethics committee 2017/14 decision no: 11]. As a result of our research, the obtained data has been transferred to the computer environment.

3. Statistical Analysis

In the statistical evaluation of intermittent data, Kikare analysis and Exact test were used. Ratios and frequencies are used as statistical parameters. Statistical significance was accepted as $p < 0.05$. Statistical evaluation of the data was performed using the IBM SPSS 22 [IBM SPSS for Windows version 22, IBM Corporation, Armonk, New York, United States] package program.

4. Results

4.1. The First Phase

490 patients were included in the study and 62.9% of the patients were female; 74.4% are in the age group of 50 years and over. 64.7% are married, 41% are primary school graduates and the income level of 74.2% is between 0 - 1999 TL. All of the patients were living in urban areas and 94.9% of them have general health insurance and 43.5% are housewives. Knowledge levels of the patients about adult inoculation and chronic disease states are shown in **Table 2**.

When the sociodemographic characteristics of the patients were compared with their attitudes about adult vaccination, statistical difference was found between having knowledge about vaccination and education level [$p = 0.001$] and occupation [$p = 0.046$]. There was a statistically significant difference only between information-acquired vaccine and education level [$p = 0.001$]. The sociodemographic characteristics and vaccination relationship showed in **Table 3**.

There was a significant difference between thinking that adult vaccination was beneficial and gender and educational level, and women and primary school graduates were believe more in the benefit of vaccination [$p < 0.05$].

Table 2. Knowledge levels of patients about adult vaccination.

		n	%
Do you have any chronic diseases?	Yes	384	78.4
	No	106	21.6
If you have any chronic illness [you can select more than one option]?	Other Diseases	76	19.8
	Diabetes [Diabetes]	42	10.9
	Hypertension	242	63.0
	Heart Disease	24	6.3
Do you have any information about adult vaccinations?	Yes	416	84.9
	No	74	15.1

Continued

Which vaccinations do you have information about?	Other	3	0.6
	None	49	10.0
	Influenza [grip]	420	85.7
	Rabies	8	1.6
	Pneumococcus [pneumonia]	2	0.4
	Tetanus	8	1.6
Where would you like to receive information?	Family Medicine physicians	421	85.9
	Does Not Want to take information	15	3.1
	Brochures	3	0.6
	Other Physicians	17	3.5
	Pharmacy	1	0.2
	Internet	4	0.8
	Public Spots	29	5.9
Did you get vaccinated during the adult period?	Yes	294	60.0
	I do not remember	10	2.0
	No	186	38.0
Which vaccinations have you done?	Other	10	2.0
	None	189	38.6
	Influenza [influenza]	205	41.8
	Pneumococcus [pneumonia]	19	3.9
	Tetanus	67	13.7
	Other	50	21.2
If not, why? [You can select more than one option.]	Not knowledge about vaccination	81	34.3
	Fear of vaccination	60	25.4
	Not believing in the efficacy of vaccination	45	19.1
	Other	50	21.2
Are adult vaccines beneficial for you?	Yes	353	72.0
	No idea	125	25.5
	No	12	2.4
If you think it is useful, who do you think should be vaccinated?	Other	40	10.3
	To be bitten by an animal	77	19.8
	pregnant	76	19.6
	People with chronic illness	195	50.3
	Other	11	2.8
Which diseases can be prevented by adult vaccination?	Influenza [influenza]	137	35.2
	Rabies	111	28.5
	Pneumonia [pneumonia]	130	33.4
	Other	11	2.8

Table 3. Sociodemographic characteristics-Vaccination relationship.

		Which vaccinations have you done?										p
		None		Influenza		Pneumo-coccus		Tetanus		Other		
		n	%	n	%	n	%	n	%	n	%	
Gender	Male	73	38.6	87	42.4	4	21.1	14	20.9	4	40.0	0.015*
	Female	116	61.4	118	57.6	15	78.9	53	79.1	6	60.0	
Age	18 - 29	9	4.8	3	1.5	0	0.0	11	16.4	0	0.0	0.001*
	30 - 39	13	6.9	15	7.4	0	0.0	19	28.4	2	20.0	
	40 - 49	24	12.7	11	5.4	0	0.0	16	23.9	2	20.0	
	50 and up	143	75.7	175	85.8	19	100.0	21	31.3	6	60.0	
Marital status	Living separate	5	2.6	3	1.5	0	0.0	1	1.5	0	0.0	0.190
	Single	17	9.0	14	6.8	0	0.0	10	14.9	0	0.0	
	Divorced	10	5.3	10	4.9	0	0.0	3	4.5	1	10.0	
	Widow	37	19.6	52	25.4	4	21.1	4	6.0	2	20.0	
	Married	120	63.5	126	61.5	15	78.9	49	73.1	7	70.0	
Education	Primary school	73	38.6	95	46.3	8	42.1	20	29.9	5	50.0	0.048*
	High school	46	24.3	37	18.0	2	10.5	19	28.4	2	20.0	
	No reading and writing	19	10.1	15	7.3	4	21.1	5	7.5	1	10.0	
	Middle School	20	10.6	11	5.4	2	10.5	8	11.9	0	0.0	
	University	18	9.5	36	17.6	0	0.0	13	19.4	2	20.0	
	College	13	6.9	11	5.4	3	15.8	2	3.0	0	0.0	
Residence	Urban	189	100.0	205	100.0	19	100.0	67	100.0	10	100.0	-
	Rural	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
Occupation	Not working	7	3.7	7	3.4	0	0.0	2	3.0	0	0.0	0.001*
	Retired	60	31.7	88	42.9	4	21.1	9	13.4	3	30.0	
	Housewife	83	43.9	83	40.5	14	73.7	29	43.3	4	40.0	
	Worker	34	18.0	18	8.8	1	5.3	20	29.9	3	30.0	
	Officer	5	2.6	8	3.9	0	0.0	6	9.0	0	0.0	
	Student	0	0.0	1	0.5	0	0.0	1	1.5	0	0.0	
Chronical disease	Yes	143	75.7	185	90.2	19	100.0	31	46.3	6	60.0	0.001*
	No	46	24.3	20	9.8	0	0.0	36	53.7	4	40.0	

Kikare test; Exact test; Frequency distributions of a: 0.05* groups were statistically significant.

When compared to the sociodemographic characteristics of patients with who should be vaccinated, sex, age, marital status, level of education, occupation and presence of chronic illness were found statistically significant [p <0.001]. Sociodemographic characteristics-thought about who should be vaccinated relationship showed in **Table 4**.

Table 4. Sociodemographic characteristics-thought about who should be vaccinated relationship.

		If you think it is useful, who do you think should be vaccinated?								
		To be bitten by an animal		Pregnants		Cronical disease presenters		Other		P
		n	%	n	%	n	%	n	%	
Gender	Male	30	39.0	11	14.5	83	42.6	14	35.0	0.001*
	Female	47	61.0	65	85.5	112	57.4	26	65.0	
Age	18 - 29	2	2.6	9	12.0	5	2.6	2	5.0	0.001*
	30 - 39	5	6.5	31	41.3	6	3.1	3	7.5	
	40 - 49	15	19.5	15	20.0	12	6.2	2	5.0	
	50 and up	55	71.4	20	26.7	172	88.2	33	82.5	
Marital status	Living separate	3	3.9	1	1.3	2	1.0	1	2.5	0.016*
	Single	7	9.1	10	13.2	17	8.7	3	7.5	
	Divorced	6	7.8	7	9.2	7	3.6	0	0.0	
	Widow	14	18.2	3	3.9	49	25.1	8	20.0	
	Married	47	61.0	55	72.4	120	61.5	28	70.0	
Education	Primary school	29	37.7	17	22.4	90	46.2	22	55.0	0.001*
	High school	28	36.4	18	23.7	40	20.5	4	10.0	
	No reading and writing	1	1.3	2	2.6	18	9.2	3	7.5	
	Middle School	5	6.5	7	9.2	11	5.6	3	7.5	
	University	9	11.7	29	38.2	21	10.8	8	20.0	
	College	5	6.5	3	3.9	15	7.7	0	0.0	
Residence	Urban	77	100.0	76	100.0	195	100.0	40	100.0	-
	Rural	0	0.0	0	0.0	0	0.0	0	0.0	
Occupation	Not working	1	1.3	6	7.9	6	3.1	2	5.0	0.001*
	Retired	23	29.9	11	14.5	77	39.5	16	40.0	
	Housewife	31	40.3	24	31.6	89	45.6	19	47.5	
	Worker	18	23.4	23	30.3	21	10.8	2	5.0	
	Officer	4	5.2	11	14.5	2	1.0	1	2.5	
	Student	0	0.0	1	1.3	0	0.0	0	0.0	
Chronical disease	Yes	53	68.8	36	47.4	177	90.8	32	80.0	0.001*
	No	24	31.2	40	52.6	18	9.2	8	20.0	

Kikare test; Exact test; Frequency distributions of a: 0.05* groups were statistically significant.

Statistically significant difference was found between the knowledge about the diseases prevented with adult vaccination and the level of education [$p = 0.001$] and the presence of chronic illness [$p = 0.01$]. The most of patients believe in-

fluenza [35.2%] and pneumococcus [33.4%] can be prevented with vaccination. The biggest part of primary school graduates believe that vaccination can prevent only influenza, while the biggest part of patients with chronic illnesses believe that pneumonia and influenza can be prevented by vaccination.

The relationship between vaccination and having information about vaccination showed in **Table 5**.

92.5% of patients who have vaccinated during adulthood want to receive information from family medicine and 94.2% of them were vaccinated. These values were also statistically significant [$p < 0.001$].

4.2. The Second Phase

794 primary health care workers participated in the survey and 82.5% [655] were female. 38.9% of the participants are in the age group of 25 - 34, 38.1% are in the age group of 35 - 44. 72.4% are married, 52.4% are midwives and nurses, and 41% are family physicians. 79.8% of the participants are working in the urban area and 37.6% of them are studying since 0 - 9 years. The health workers' attitudes towards adult vaccination are shown in **Table 6**.

A statistically significant difference was found between vaccination suggestion and education in this subject [$p = 0.017$]. 51% of those recommending vaccination are midwives and nurses, while 42.6% are family practitioners, 48.9% of primary health care workers who those who are educated in this regard were suggesting vaccination.

There was a statistically significant difference between gender, age groups, education and follow-up of guidelines and vaccination status [$p < 0.05$]. In females,

Table 5. The relationship between vaccination and having information about vaccination.

		Did you get vaccinated during the adult period?						p
		Yes		Don't remember		No		
		n	%	n	%	n	%	
Where do you want to get your information?	Family Medicine physicians	272	92.5	7	70.0	142	76.3	0.001*
	Does Not Want to take information	3	1.0	2	20.0	10	5.4	
	Brochures	3	1.0	0	0.0	0	0.0	
	Other Physicians	10	3.4	0	0.0	7	3.8	
	Pharmacy	1	0.3	0	0.0	0	0.0	
	Internet	0	0.0	0	0.0	4	2.2	
	Public Spots	5	1.7	1	10.0	23	12.4	
Do you have any information about adult vaccinations?	Yes	277	94.2	7	70.0	132	71.0	0.001*
	No	17	5.8	3	30.0	54	29.0	

Kikare test; Exact test; Frequency distributions of a: 0.05* groups were statistically significant.

Table 6. Health workers' attitudes towards adult vaccination.

		n	%
Have you ever been trained in adult vaccination before?	Yes	380	47.9
	No	414	52.1
If you did not receive training, would you like to study in this subject?	Yes	545	83.6
	No	107	16.4
Do you follow the guidelines on vaccination?	Yes	643	81.0
	No	151	19.0
Do you think you have enough information about adult vaccination?	Yes	273	34.4
	No	211	26.6
	Undecided	310	39.0
If yes to the previous question, where did you get this information?	From vaccination guidelines	253	71.7
	From educations	72	20.4
	From social platforms	16	4.5
	other	12	3.4
Do your adult patients recommend vaccination?	Yes	751	94.6
	No	43	5.4
If so, which patient group do you recommend?	pregnant	41	5.5
	People with chronic illness	608	81.3
	Those with suspicious contact stories	44	5.9
	other	55	7.4
Which vaccinations do you recommend for your adult patients?	hepatitis B	0	0.0
	influenza	552	73.4
	meningococcal	0	0.0
	Pneumococcal	57	7.6
	Tetanus	127	16.9
	Other vaccines	16	2.1
If your adult patients do not recommend vaccination, what is the reason?	Do not believe in the efficacy of vaccinations	8	7.5
	Pay for vaccinations	29	27.1
	I cannot find time due to my busy work	61	57.0
	other	9	8.4
Are you getting yourself vaccinated?	Yes	678	85.4
	No	116	14.6
If you got yourself a vaccine, which vaccinations did you make?	Hepatitis B	59	8.5
	Influenza	309	44.5
	Tetanus	313	45.0
	other	14	2.0
If you do not, what is the reason?	Not believing in the efficacy of vaccination	18	17.1
	Unnecessary sight	4	3.8
	I cannot find time due to my busy work	60	57.1
	Other	23	21.9

the 25 - 34 age group, people who have previously been trained in vaccination and people who follow guidelines for vaccination has higher rates of vaccination.

The comparison between the socio-demographic characteristics of health workers and vaccination status is given in **Table 7**.

Table 7. The relationship of the socio-demographic characteristics of health workers and vaccination status.

		Are you getting vaccination yourself?				P
		Yes		No		
		n	%	n	%	
Gender	Male	110	16.2	29	25.0	0.022*
	Female	568	83.8	87	75.0	
Age group	18 - 24	31	4.6	8	6.9	0.048*
	25 - 34	272	40.3	36	31.0	
	35 - 44	259	38.4	42	36.2	
	45 and upper	113	16.7	30	25.9	
Duration of vocation	0 - 9	243	37.6	42	37.8	0.976
	10 - 19	224	34.6	38	34.2	
	20 - 29	164	25.3	29	26.1	
	30 and upper	16	2.5	2	1.8	
Marital status	Living separate	5	0.7	0	0.0	0.714
	Single	138	20.4	26	22.4	
	Divorced	38	5.6	6	5.2	
	Widow	6	0.9	0	0.0	
	Married	491	72.4	84	72.4	
Place of vocation	Rural	547	80.7	87	75.0	0.159
	Urban	131	19.3	29	25.0	
Occupation	Family medicine	264	39.5	57	50.0	0.208
	Other specialist	31	4.6	5	4.4	
	Midwife-nurse	360	53.8	50	43.9	
	Other health care worker	14	2.1	2	1.8	
Have you ever been trained in adult vaccination before?	Yes	341	50.3	39	33.6	0.001*
	No	337	49.7	77	66.4	
Do you follow the guidelines on vaccination?	Yes	562	82.9	81	69.8	0.001*
	No	116	17.1	35	30.2	
If yes to the previous question, where did you get this information?	From vaccination guidelines	230	72.3	23	65.7	0.829
	From educations	63	19.8	9	25.7	
	From social platforms	14	4.4	2	5.7	
	other	11	3.5	1	2.9	

Kikare test; Exact test; Frequency distributions of a: 0.05* groups were statistically significant.

5. Discussion

In the literature, adult vaccination has generally been considered in terms of patients or health care workers. Our study is different from others because it is a study that deals both together. In addition, in the literature mostly influenza vaccination has been conducted and adult vaccinations have not been evaluated in general. Our study evaluates all adult vaccines.

In our study, adult vaccination rate is 60%. When we examine other studies conducted in our country, it is seen that this ratio changed between 30.4% and 41%, but most of these studies were done in individuals over 65 years old. The target group of our study is adult individuals over 18 years of age, and when we are grouped by age, our vaccination results in our group over 50 years are much more pleasant. Compared with these results, it is possible to say that the rate of vaccination in our study is high. But the patients who do not have regular vaccination and who only get once vaccination were included in our results. This can be attributed to the increasing recognition of the importance of the condition of the patients over the years and to the further recommendation of adult vaccination by primary caregivers [8] [9] [10].

When the vaccine distributions of the vaccinated recipients were examined, it was found that most of them had an influenza vaccine [68.1%]. This rate is higher than the other studies done in the primary care in our country, but it is low in a family medicine outpatient clinic of an education research hospital in Istanbul. Influenza outbreaks that have recently been seen at different times, and the awareness of influenza in these individuals, especially in those who have frequent involvement in the media, and the free provision of vaccine may have contributed to this [8] [9] [10].

The influenza vaccination rates in the World are 51.4% in Germany; 19.5% in Poland; 44.8% in America; 25.1% in Spain and those rates are lower than our country. However, there are differences in the studies carried out and in some studies seasonal influenza vaccination has been questioned [11] [12] [13] [14]. In our work, such a separation has not been done.

Although the influenza vaccination rates in our study are good, it is not possible to say the same for other vaccines. Our pneumococcal immunization rates are significantly lower than other studies in the world [3.9%]. While these rates are between 11.5% and 56% in the world while they are in the range of 3.4% - 10% in our country, our results are similar to the studies done in our country but far behind the world countries. In another study conducted in Canada with adults aged 65 years and over, pneumococcal vaccination rates were found to be 49.8%. 43.4% of the vaccinated people are in the 75 - 84 age group [8] [9] [13] [14] [15] [16].

Another poor outcome in terms of vaccination rates in our study also occurred in tetanus vaccines. The rate of tetanus immunization in our study was 13.7% and far behind the rate of tetanus inoculation in both our country and the world. In Germany, tetanus immunization rates among participants were very

high [95.4%]. The tetanus vaccination campaigns made by the Ministry of Health in Turkey should be more effective [2] [6] [7]. The fact that the tetanus vaccine contained in the vaccines to be done in the adult population is not performed by patients in a large scale may be due to lack of knowledge of the patient and physician or ignoring the tetanus vaccine as much as the influenza vaccine.

There are many factors that influence vaccination rates. In our study, it was observed that the vaccination status was influenced by sociodemographic factors such as age, gender, education, occupation and chronic illness. Women, 50 and older age groups, primary school graduates, housewives and people with chronic illnesses were found to highly vaccinated in our study. Different from our study, the trial conducted in primary care of Poland there are statistically significance between marital status, occupation, presence of chronic illness, previous influenza vaccination, previously informed about the vaccination by physician and vaccination status.

Vaccination rates were found to be higher in married people, in retired, in chronic illness presenters, in those who were previously vaccinated, when the physician was informed about the vaccine, when the physician was informed about where the vaccine would be taken, and if the infection was considered dangerous for health and life.

In a study, unlike our study, only a significant relation was found between the level of education and the status of vaccination and it was observed that people with higher education levels were more vaccinated [17]. In a study conducted by Hamidi and colleagues in Istanbul, the attitude towards pneumococcal and tetanus vaccination and the need for tetanus vaccination was found to be significantly higher in the high income group [15].

However, in our study, no relation was established between income level and vaccination rates.

In our study we found that women and primary school graduates vaccinated especially with pneumococcus and tetanus, all of the 50 and older age group vaccinated with pneumococcus, the biggest part of vaccinated people with pneumococcus and tetanus were house wives and the biggest part of vaccinated people with influenza were retired people, all of the pneumococcus vaccinated people and the biggest part of influenza vaccinated people had chronic disease and all these results were statistically significant. These results are different from study of Mutlu and his friends.

In our study, there was a statistically significant difference between having knowledge about vaccination and level of education and profession [$p < 0.05$], different from Asık and his friends. No relationship between knowledge of vaccination and higher education level was found. It has been seen that most of those who say that having knowledge about the vaccine were primary school graduates. Housewives and retirees constitute a large part of those who have knowledge as a profession. This can be due to the fact that primary school gra-

duates and housewives are using healthcare services much more and they have acquired the knowledge in this way [13].

According to our study, the most knowledgeable vaccine is influenza vaccine and is compatible with the work of Asik and his colleagues. In our study, knowledge of influenza, pneumococcus and tetanus vaccination was 85.7%; 0.4% and 1.6% respectively, whereas in the study of Hamidi *et al.* 90.3%; 43.5% and 83% respectively [15]. The level of knowledge about the vaccines in our study is low than this study; this may be due to our study being done in the primary health care facility instead of the hospital.

In our study, patients were asked if they believed they were benefiting from adult vaccination, and 72% of the patients indicated that they believed benefited from the vaccine, however their immunization levels were below this rate. In our study, the benefits of vaccinations were not individually questioned, but were generally addressed.

The inability of individuals to access health services due to limited economic opportunities and the lack of knowledge related to health affect vaccination rates negatively [17] [18] [19].

34.3% of the patients in our study group were not vaccinated due to lack of information and this result is consistent with the literature [8]. Among our reasons for not vaccinating in our study, the first reason to not vaccinating was not have knowledge about the vaccine, followed by afraid of vaccination and not believing in the efficacy of vaccination. In many studies, the most common reasons for not vaccinating are that there are no suggestions for vaccination and that they are not aware of the risks that may result from vaccination [20] [21] [22].

In a study, it has been stated that most of the patients in the target group to be vaccinated are not aware of influenza and pneumococcal vaccination [23] and these result is in agreement without study. Based on this, it can be said that how important it is for physicians and patients to be aware of patients about vaccinations.

One of the most important result of our study was that patients want to get information about vaccinations from primary care, which is the first point of contact. This shows that a great deal of work has been done to primary health care providers in informing about adult vaccinations. The second of the places where the participants want to be informed is the public spots, which shows us that the media has an important place in our lives and that the patients are more influenced by the information on the media.

Influenza vaccination rates among health care workers in Turkey is 8.8 to 28.5%. In a study conducted in health workers in a hospital in Konya, the rate of health personnel who had influenza vaccination was 16.7%, our study is much higher than those rates [44.5%] [24]. Studies conducted at the primary care showed higher influenza vaccination rates [23]-[29]. The reasons of this may that; the primary care is the primarily responsible from vaccines, the primary care workers may be more sensitive to this issue or they see themselves at much

more risk. In a similar study conducted in Poland with both patients and physicians and in our study, 82% of physicians were vaccinated for influenza. Most of the vaccinated physicians were physicians working in the family medicine unit [5]. In a study conducted by James *et al.* in Africa, very low rates of influenza vaccination [6.5%] were found, which was largely due to low awareness of influenza [21]. In a study conducted in Australia, 70% of influenza vaccination rates were found and that primary care staff had more influenza vaccination than the healthcare staff in the hospitals [22]. Our work also supports this result.

In a study conducted in the United States with family physicians regarding pneumococcal vaccinations, pneumococcal immunization rates ranged from 37 to 47% in that area. In this study, vaccination rates of physicians who have been professed longer were found to be less vaccinated, in accordance with our study [25].

In a study conducted in Ege University, hepatitis vaccination rate was found 43.3%, tetanus vaccination rate was found 32% [26]. Our rates were lower than Hepatitis B rates, higher than tetanus rates. This may be due to the fact that health care workers working in tertiary care may see themselves at greater risk for Hepatitis B and tetanus.

In the study conducted by Mistik and his colleagues, 83% of physicians believe that adult vaccination is important and 90% believe that adults should be vaccinated, but only 9.2% of them recommend vaccination to their adult patients [23]. 31% of the physicians were not vaccinated. In our study recommendation and vaccination rates of physicians were higher.

6. Conclusions

As a result of the studies including our study about adult vaccination, only 10% - 20% of the targeted groups in adults can be vaccinated. However, just like in childhood during adulthood, vaccinations protect individuals from diseases and provide economic benefits. However, the achievement of these successes depends on the plan, program, leadership, coordination and continuity in practice.

Due to the above reasons, immunization services for adults and elderly people should be provided. In order to provide these services, an immunization program covering not only childhood but all life spans is needed. This program can be called "Lifelong Immunization Program". In the framework of this program, it should recommend that immunization services that start in childhood should continue uninterruptedly in adult and old age. Immunization services to be carried out under this program can be maintained by being organized and monitored at the level of family medicine. Adequate immunization rates in adults and the elderly are not possible when vaccination is left to requesting of person. It is very important that family physicians, who are the primary preventive and curative physicians of adult health, should develop and update their knowledge about immunization and train these patients in the field.

Firstly, the knowledge level of physicians on adult immunization should be

updated with in-service trainings, they should first be convinced to vaccinate because they are in risk group and then they should be recommended vaccination to patient to increase the vaccination rates.

If enough motivation is provided for adult vaccination in family physicians who have achieved great success by keeping vaccination rates at high levels in childhood vaccinations, it is obvious that the targets will also be achieved in adult immunization rates.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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