RESEARCH

IMMUNIZATION STATUS AND FACTORS AFFECTING INDIVIDUALS AGED 65 YEARS AND ABOVE WITH CHRONIC DISEASES WHO ARE REGISTERED WITH FAMILY PHYSICIANS IN BURDUR PROVINCE

Turkish Journal of Geriatrics
DOI: 10.31086/tjgeri.2021.201
2021; 24(1): 71-78

■ Sevinç SÜTLÜ[1]
■ Ayşen TİL[1]

CORRESPONDANCE

[1] Sevinç SÜTLÜ

Burdur Health Directorate, Public Health Services Directorate, Burdur, Turkey

Phone: +905053781458
e-mail: sevincdr@gmail.com

Received: Sep 29, 2020
Accepted: Feb 24, 2021

[1] Burdur Health Directorate, Public Health Services Directorate, Burdur, Turkey

Abstract

Introduction: This study aimed to determine the factors affecting the immunization status of individuals aged ≥65 years with chronic diseases.

Materials and Methods: The population of the study consisted of 24,489 people aged 65 and over with a chronic disease registered to a family doctor in Burdur Province. In order to determine their immunization status, data were collected from 488 people after performing face-to-face interviews by calculating the sample size necessary for 50% prevalence, 5% margin of error, and 97% reliability. The dependent variable of the study was immunization, and socioeconomic status, immunization status, and sociodemographic features were independent variables.

Results: Among those who participated in our study, immunization rates were determined to be 32.8%, 2.7%, and 0.8% for seasonal influenza, pneumococcus, and herpes zoster, respectively. Approximately 34% of subjects had undergone at least one immunization. Factors such as having chronic obstructive pulmonary disorder, financial income, and visiting a family physician or receiving inpatient treatment within the last 3 months affect immunization status.

Conclusion: Immunization levels are insufficient in people aged ≥65 years with chronic diseases. The "Lifelong Immunization Program," which includes childhood immunizations as well as immunization of the elderly, should be developed and implemented by the Ministry of Health. In studies aiming to increase immunization rates, the awareness of physicians, especially family physicians, of old age immunization practices should be increased.

Key Words: Immunization; Aged; Family Physicians

INTRODUCTION

The world population is aging at an unprecedented rate, and it is expected that the proportion of individuals aged ≥60 years worldwide will increase from 12% to 22% between 2015 and 2050(1).

The susceptibility to infectious diseases is increased in people aged ≥65 years. According to 2016 World Health Organization (WHO) data, lower respiratory tract infections are the fourth most common cause of death among men and women (2).

The vaccine is effective in preventing complications and death. It reduces the hospitalization of adults by 50–60%, transfer of elderly people to the intensive care unit by 82%, and their mortality rate by 80% (3).

In the 2019 update of the Adult Immunization Guide of the Infectious Diseases and Clinical Microbiology Specialty Society of Turkey, it is recommended that pneumococcus, influenza, and herpes zoster (HZ) vaccines should be administered to elderly people (4).

Immunization rates in the elderly population vary by country. In 2015, immunization rates in the USA for the population aged ≥65 years were reported to be 73.5% for influenza, 63.6% for pneumococcus, and 34.2% for HZ (5). In Turkey, the influenza vaccination rate was found to be 15.8% in men and 13.0% in women aged ≥65 years, according to a study on chronic diseases and risk factor prevalence. The vaccination rate for pneumococcus was lower and found to be approximately 5% in both sexes (6).

Immunization levels and factors affecting vaccination should be determined, especially in elderly people with chronic diseases, in order to protect and develop the health of the elderly in our province, which has a high rate of elderly population. Therefore, the present study aimed to determine the factors affecting the immunization status of individuals aged ≥65 years with chronic diseases who are registered with a family physician.

MATERIALS AND METHODS

The population of the study consists of 24,489 individuals aged ≥65 years with chronic diseases who are registered with a family physician in Burdur province. The sample size necessary to determine the immunization status was found to be 462 based on 50% prevalence, 5% margin of error, and 97% reliability.

Since the AHBS (Family Physician Information System) was used in the selection of the sample, the number included in the sample was divided by the number of family physicians (FP; 82) who had a non-zero number of registered patients and who had registered patients aged ≥65 years to yield the number of the elderly to be taken from each FP; i.e., 469/82 = 5.6 patients. We decided to choose six people from each FP, and the total number of samples was 492. Six people were determined by randomization. While 488 (99.4%) were contacted, four elderly people could not be reached due to death.

Data collection form

The elderly people were asked about their sociodemographic and socioeconomic levels, knowledge about vaccines and whether they were vaccinated.

Data collection

The data were obtained using a face-to-face interview method from participants who provided verbal consent.

The vaccination status of the elderly with chronic diseases was taken as the dependent variable, and their socioeconomic and sociodemographic features and knowledge of vaccines were taken as independent variables.

The Burdur Mehmet Akif Ersoy University Clinical Trials Ethics Committee approved this study, and verbal informed consent was obtained from each patient.

Statistical evaluation was performed using SPSS version 15.0. (SPSS; IBM Corporation, New York, USA). The analysis of count data was performed using the chi square test; $p<0.05$ was considered statistically significant. Independent variables identified as statistically significant in the chi-square test were included in the logistic regression analysis.

RESULTS

Among the people aged ≥65 years who participated in our study, immunization rates were 32.8%, 2.7%, and 0.8% for seasonal influenza, pneumococcus, and HZ, respectively; the proportion of individuals to whom at least one vaccine had been administered was 34.0%. The awareness of vaccines was found to be similar to the rate of administration (Table 1).

Table 2 describes the effects of demographic and socioeconomic features, level of knowledge about vaccinations, chronic diseases, and healthcare service use status of the study participants on their level of receiving at least one of the following vaccines: influenza, pneumococcus, and HZ vaccines.

Independent variables with a statistically significant difference were included in the logistic regression analysis. Of these parameters affecting the immunization status of study participants, having COPD, household income, and presenting to a family physician or receiving inpatient treatment within the last three months affected immunization status.

Of those who did not get vaccinated, 31.6% stated that they would not get vaccinated even if a doctor recommended it. The reasons for not getting vaccinated are presented in Table 4.

DISCUSSION

Among the participants of our study, immunization rates were 32.8%, 2.7%, and 0.8% for seasonal influenza, pneumococcus, and HZ, respectively; the rate of those who received at least one vaccine was 34.0%. Factors such as having COPD chronic disease, household income, and visiting a family physician or receiving inpatient treatment within the last 3 months affect immunization status.

Influenza vaccination rates in the elderly population vary by country. While the coverage rate recommended by the WHO for influenza vaccination in adults aged ≥60 years was 50% for 2006 and 75% for 2010, only a few countries achieved these goals. In South Korea, 75.8% of the population aged ≥65 years is vaccinated against influenza, while the rates are 70.9% in Australia, 71.5% in the USA, 70.8% in England, 68% in New Zealand, 60% in Canada, and 59% in Ireland (7).

Table 1. Vaccine knowledge and frequency of administration

Name of the vaccine	Number of participants who had heard about the vaccine	Number of participants who had not heard about the vaccine	Numberof participants who were vaccinated
Influenza	436 (89.3%)	52 (10.7%)	160 (32.8%)
Pneumococcus	149 (30.5%)	339 (69.5%)	13 (2.7%)
Herpeszoster	45 (9.2%)	443 (90.8%)	4 (0.8%)
Any of them	437 (89.5%)	51 (10.5%)	166 (34.0%)
Total			488 (100%)

Table 2. Effects of factors such as demographic and socioeconomic features, level of knowledge of vaccinations, chronic diseases, and healthcare use status of individuals aged ≥65 years on being vaccinated against influenza, pneumococcus or HZ

Independent variables		Vaccinated	Not vaccinated	Number (%)	P
		Number (%)	Number (%)		
Place of residence	Village/town	75 (30.6%)	170 (69.4%)	245 (100%)	0.05
	State/province	91 (37.4%)	152 (62.6%)	243 (100%)	
Age (years)	65–74	118 (34.9%)	220 (65.1%)	338 (100%)	0.302
	≥75	48 (32.0%)	102 (68.0%)	150 (100%)	
Sex	Female	95 (31.0%)	211 (69.0%)	306 (100%)	**0.045**
	Male	71 (39.0%)	111 (61.0%)	182 (100%)	
Information about vaccination has been given	Yes	166 (38.0%)	271 (62.0%)	437 (100%)	**0.000**
	No	0 (0%)	51 (100%)	51 (100%)	
Marital status	Single/Widowed	36 (26.9%)	98 (73.1%)	134 (100%)	**0.025**
	Married	130 (36.7%)	224 (63.3%)	354 (100%)	
Education status	Literate/illiterate	39 (25.8%)	112 (74.2%)	151 (100%)	**0.007**
	Elementary school and above	127 (37.7%)	210 (62.3%)	337 (100%)	
House of residence	Rental	11 (50.0%)	11 (50.0%)	22 (100%)	0.117
	Family home	155 (33.3%)	311 (66.7%)	466 (100%)	
Whom the patient lives with	Living alone	23 (27.1%)	62 (72.9%)	85 (100%)	0.140
	With spouse/child	143 (35.4%)	260 (64.6%)	403 (100%)	
Health insurance	Insured	166 (34.2%)	319 (65.8%)	485 (100%)	0.286
	Not insured	0 (0%)	3 (100%)	3 (100%)	
Household income	Insufficient	46 (34.6%)	87 (65.4%)	133 (100%)	**0.045**
	Barely sufficient	58 (28.4%)	146 (71.6%)	204 (100%)	
	Sufficient	62 (41.1%)	89 (58.9%)	151 (100%)	
Smoking status	Smoker	55 (39.6%)	84 (60.4%)	139 (100%)	0.06
	Non-smoker	111 (31.8%)	238 (68.2%)	349 (100%)	
Alcohol consumption	Drinker	2 (20.0%)	8 (80.0%)	10 (100%)	0.281
	Non-drinker	164 (34.3%)	314 (65.7%)	478 (100%)	

Immunization according to the type of chronic disease	HT	Yes	121 (37.5%)	202 (62.5%)	323 (100%)	**0.015**
		No	45 (27.3%)	120 (72.7%)	165 (100%)	
	Heart disease	Yes	71 (37.0%)	121 (63.0%)	192 (100%)	0.155
		No	95 (32.1%)	201 (67.9%)	296 (100%)	
	Stroke	Yes	9 (30.0%)	21 (70.0%)	30 (100%)	0.397
		No	157 (34.3%)	301 (65.7%)	458 (100%)	
	Cancer	Yes	9 (39.1%)	14 (60.9%)	23 (100%)	0.373
		No	157 (33.8%)	308 (66.2%)	465 (100%)	
	DM	Yes	68 (38.4%)	109 (61.6%)	177 (100%)	0.074
		No	98 (31.5%)	213 (68.5%)	311 (100%)	
	COPD	Yes	40 (49.4%)	41 (50.6%)	81 (100%)	**0.001**
		No	126 (31.0%)	281 (69.0%)	407 (100%)	
Immunization status by the medical institution where the patient was examined	Private hospital	Yes	18 (40.0%)	27 (60.0%)	45 (100%)	0.233
		No	148 (33.4%)	295 (66.6%)	443 (100%)	
	University hospital	Yes	19 (35.2%)	35 (64.8%)	54 (100%)	0.479
		No	147 (33.9%)	287 (66.1%)	434 (100%)	
	Public hospital	Yes	166 (34.4%)	317 (65.6%)	483 (100%)	0.124
		No	0 (0%)	5 (100%)	5 (100%)	
	Family practice center	Yes	123 (40.6%)	180 (59.4%)	303 (100%)	**0.000**
		No	42 (22.7%)	143 (77.3%)	185 (100%)	
Inpatient treatment status	Treated		23 (46.0%)	27 (54.0%)	50 (100%)	**0.044**
	No		143 (32.6%)	295 (67.4%)	438 (100%)	

Although many countries are included in the national adult vaccination program, the coverage rate of pneumococcal vaccination appears to be mostly low. While vaccination was applied at levels as high as 70% in England and 76% in Spain, it is observed that it remained at lower levels, such as 36% in Ireland and 18% in adults who are at high risk, 15–30% in Norway, 15% in people in Germany who are at high risk in 2014, and ~5% in France (8).

According to the Chronic Diseases and Risk Factors Survey in Turkey, the influenza immunization rate was found to be 15.8% in men and 13.0% in women aged ≥65 years. The vaccination rate for pneumococcus was lower and found to be approximately 5% in both sexes (6). In the present study, it was thought that the high influenza immunization rate was due to the fact that it was provided to the group with chronic disease. However, it was stated that social awareness of pneumococcal vaccine was insufficient.

The risk of HZ increases significantly with age, and it affects half of all people living up to the age of 85 years and causes long-term morbidity. In the USA, the immunization rate for HZ in adults aged ≥65 years was 14.5% between 2007 and 2013 (9). In Canada, the vaccination coverage rate was 8.4% between 2009 and 2013 (10).

In studies conducted among people with chronic diseases, the immunization rates vary by country. According to CDC data, pneumococcal immunization rate in the population aged ≥65 years with any chronic disease was 63.6% (3). In a study conducted in the USA with people aged ≥65 years with chronic

Table 3. Binary logistic regression analysis results including factors affecting immunization against influenza, pneumococcus and HZ in people aged ≥65 years with chronic diseases

Independent Variables		B	S.E.	Wald	Odds Ratio	95% Confidence Interval	P
Household income	Insufficient	0.444	0.221	4.027	**1.558**	1.010–2.404	0.045
	Sufficient				Reference		
COPD	No	0.787	0.263	8.932	**2.198**	1.311–3.683	0.003
	Yes				Reference		
Visited family physician in the last three months	No	0.607	0.226	7.226	**0.545**	0.350–0.848	0.007
	Yes				Reference		
Inpatient treatment in the last three months	No	0.694	0.333	4.353	**0.449**	0.260–0.959	0.037
	Yes				Reference		

diseases, the rate of vaccination against seasonal influenza was 68% and the rate of pneumococcal vaccination was 51% (11). In a study conducted with people with chronic diseases in Korea, immunization status for seasonal influenza was investigated; it was found to be 91.4% in patients with diabetes mellitus, 91.5% in patients with chronic kidney disease, and 85.7% in patients with asthma (12). In Turkey, these rates are much lower. Of the people aged ≥65 years in Mersin, 30.4% were vaccinated; 28.1% were vaccinated against influenza and 4.2% were vaccinated against pneumococcus. In a study conducted in Kars, the proportion of people aged ≥65 years who had received any one of the three vaccines—influenza, pneumococcal, and HZ vaccines—was 12.5%; this rate was 31.8% in chronic patients, respectively (13,14).

Table 4. Reasons for not being vaccinated despite the doctor's recommendation

Reason	Number (%)
I find it unnecessary	73 (47.4%)
I am afraid of its side effects	60 (39.0%)
I do not have any idea	14 (9.1%)
I take too many medications	7 (4.5%)

The immunization rates determined in the current study are lower than those of developed countries and similar to other studies conducted in Turkey. This may be because the growth of the elderly population started earlier in developed countries, and the relevant vaccination policies developed accordingly.

Immunization rates among COPD patients are higher than those among other chronic patient groups. In a multicenter study of COPD patients conducted in Turkey, the rate of influenza vaccination in the previous year was 37.9%, and the rate of at least one pneumococcal vaccination in a life-

time was 13.3% (15). Similarly, patients with COPD vaccinated more than participants who had other comorbidities (12,16). In the present study, the frequency of influenza and pneumococcus vaccination was higher in COPD patients.

In the present study, the immunization rates were observed to be higher among patients who had been hospitalized within the last three months. The presence of a history of hospitalization was also considered among the factors affecting influenza and pneumococcal vaccination in COPD patients by Özsu et al. (17).

In the present study, the immunization rate in the elderly with high household income was found to be higher, consistent with previous studies in the literature (11,18,19). Vaccination rates are higher in high-income western European countries than in middle/low income eastern European countries (20).

In the present study, the immunization rate was significantly higher in patients receiving healthcare services from family physicians than among those who were admitted to secondary public or private healthcare institutions. Many studies have found that the immunization rate is higher when the vaccination is recommended by doctors or healthcare providers, especially by family physicians, and that physicians play a key role in vaccination (7,11,16,21). After a one-day scientific training program for family physicians in the Denizli province the immunization rate increased by 47.9%, reaching 59.5% by the end of the eighth month. This is a good example showing the influence of family physicians on vaccination (22).

The reasons why those who did not get vaccinated chose not to get vaccinated was found to be similar to the reasons indicated in the literature; 68.4% of those who did not get vaccinated stated that they would get vaccinated if recommended by the doctor (8,16,23).

In conclusion, immunization levels are insufficient in people aged ≥65 years with chronic diseases. The most and least known and administered vaccines are the influenza and HZ vaccines, respectively. The "Lifelong Immunization Program," which includes childhood immunizations, as well as immunization of the elderly, should be developed and implemented by the Ministry of Health. Immunization rates are high in countries that have such a program. Immunization services should be organized at the family practice level to communicate effectively with patients and provide regular healthcare. In studies aiming to increase immunization rates, the awareness of physicians, especially family physicians, of old age immunization practices should be increased.

Conflicts of interest

The authors declare that there are no conflicts of interest.

REFERENCES

1. Dobriansky PJ, Suzman RM, Hodes RJ. Why population aging matters: a global perspective. Department of State. Department of Health and Human Services. Washington DC:2007.[Internet]. Avaible from: https://www.nia.nih.gov/sites/default/files/2017-06/WPAM.pdfAccessed: 10.12.2019.
2. Basic Geriatrics, In: Yeşim G. K. (Eds), Güneş Medical Bookstores, Ankara, Turkey 2007,pp683-94.
3. Centers for Disease Control and Prevention. Epidemiology and Prevention of Vaccine-Preventable Diseases. Hamborsky J, Kroger A, Wolfe S (Eds.) 13th ed. Washington D.C. Public Health Foundation, 2015. [Internet]. Available from: https://www.cdc.gov/vaccines/pubs/pinkbook/Accessed: 20.06.2020.
4. Adult Immunization Guide, 2019. Turkey Infectious Diseases and Clinical Microbiology Specialist Association, Adult Immunization Guide Working Group [Internet]. Available from: https://www.ekmud.org.

tr/haber/264-turkiye-ekmud-eriskin-bagisiklama-rehberi.Accessed: 04.04.2020.

5. Williams WW, Lu P, O'Halloran A, et al. Surveillance of Vaccination Coverage among Adult Populations — United States, 2015. MMWR SurveillSumm 2017;66(No. SS-11):1–28. (PMID: 28472027)

6. Ünal, B., Ergör, G., Horasan, G. D., Kalaça, S., &Sözmen, K. Turkey incidence of chronic diseases and risk factors for work(2020). Ministry of Health Publication No: 909. [Internet]. Available at: https://sbu.saglik.gov.tr/Ekutuphane/kitaplar/khrfat.pdf. Accessed: 17.03. 2020.

7. Smetana J, Smetana J, Chlibek R, et al. Influenza vaccination in the elderly. Hum VaccImmunother 2018;14(3):540-549.(DOI: 10.1080/21645515.2017.1343226.(2-9)).

8. Froes F, Roche N, Blasi F. Pneumococcal vaccination and chronic respiratory diseases. Int J Chron Obstruct Pulmon Dis 2017; 12: 3457–3468. (PMID: 29255353)

9. Zhang D, Johnson K, Newransky C, Acosta CJ. Herpes zoster vaccine coverage in older adults in the US, 2007–2013. Am JPrevMed 2017; 52(1): e17-e23.). (PMID: 28340974)

10. Liu XC, Simmonds KA, Russell ML, Svenson LW. Herpes zoster vaccine (HZV): utilization and coverage 2009–2013, Alberta, Canada. BMC Public Health 2014; 14(1): 1098. (PMID: 25342438)

11. Petersen RL, Saag K, Wallace RB, Doebbeling BN. Influenza and pneumococcal vaccine receipt in older persons with chronic disease: a population-based study. Med Care 1999: 502-509. (PMID: 10335752)

12. Kee SY, Cheong HJ, Chun BC, Kim WJ. Influenza vaccination coverage rate and factors associated with vaccination in people with chronic disease. Infect Chemother 2011: 43(5), 406-411.(DOI:10.3947/ic.2011.43.5.406).

13. Erdoğdu Hİ, Catak B. Influenza, pneumococcal and herpes zoster vaccination rates amongst people aged 65 years and older and related factors. Turk J Geriatr2018; 21(4):498-506.(DOI : 10.31086/tjgeri.2018.54).

14. Bal H, Börekçi G. Investigation of the Adult Vaccination Status and Influencing Factors in People Aged 65 Years and Over Registered in A Family Health Center in Mersin City. İstanbul Med J 2016; 17: 121-130. (DOI: 10.5152/imj.2016.69783).

15. Ozlu T, Yilmaz Bulbul DA, Tatar D, et al. Immunization status in chronic obstructive pulmonary disease: a multicenter study from Turkey. Ann ThoracMed 2019; 14(1): 75. (PMID: 30745939)

16. Yiğitbaş, B. A., Satıcı, C., Tanrıverdi, E., Gündüz, C. Influenza vaccinationfrequency and associated-factors among elderly population, adescriptivestudy. Turk J Geriatr2018; 21(4),490-497. (DOI : 10.31086/tjgeri.2018.53).

17. Özsu, S., Uçar, E., Arslan, Y., Maden, E., Bilgiç, H. The frequency of influenza and pneumococcal vaccination in COPD. Eurasian Journal of Pulmonology 2011; 13(1), 21-25. (DOI: 10.5505/solunum.2011.88155).

18. Langan SM, Smeeth L, Margolis DJ, Thomas SL. Herpes zoster vaccine effectiveness against incident herpes zoster and post-herpetic neuralgia in an older US population: a cohort study. PLoSMed 2013;10(4):e1001420. (PMID:23585738)

19. Baig SA, Hassan M, Ahmed SM, Moazzam W, Inayat A. A cross-sectional study to investigate pneumococcal vaccination in the elderly in a low income county: patient knowledge, awareness, and attitudes of vaccination and prevalence rates by socioeconomic status. Hum VaccinImmunother 2014;10(4):1024-1027. (PMID:24495898)

20. Pernille J. Influenza immunization of older people in Eastern Europe and Middle Income Countries .WHO meeting on Immunization in the elderly Geneva ,22-23 March,2017.[Internet]. Availablefrom:https://www.who.int/immunization/research/meetings_workshops/Adult_flu_immun_PJorgensen.pdf. Accessed:17.01.2020.

21. Kohlhammer Y, Schnoor M, Schwartz M, Raspe H, Schäfer T. Determinants of influenza and pneumococcal vaccination in elderly people: a systematic review. Public Health2007; 121(10): 742-751. (PMID: 17572457)

22. Ünal S, Tanrıöver DM, Taş E, Güner İ, Çetin Ö, Sayar İ. The effects of educating family physicians and getting targets for vaccination on pneumococcal vaccination coverage rates. Flora 2015;20(1):10-15. (in Turkish)

23. Dannetun E, Tegnell A, Normann B, Garpenholt Ö, Giesecke J. Influenza vaccine coverage and reasons for non-vaccination in a sample of people above 65 years of age, in Sweden, 1998-2000. ScandJInfect Dis 2003; 35(6-7): 389-393. (PMID: 12953950)