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Awareness, Attitudes, and Behaviors of Adults About Vaccination in the North Cyprus

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Abstract

BACKGROUND/AIMS: Epidemics of vaccine-preventable diseases (VPDs) are a growing concern worldwide; they have a significant and pervasive impact on individuals, as well as on public health and healthcare systems and the economy. People of all ages are affected by VPDs. Despite awareness and relatively good vaccination rates (VCR) in childhood, adult VCR are insufficient in our country, as in many countries.

MATERIALS AND METHODS: In this manner, we conducted a comprehensive population-level cohort study to evaluate the awareness, attitudes, and behaviors of a population aged over 18 years of age about adulthood vaccination. This is a cross-sectional, survey-based study that was conducted between July 2023 and September 2023 using a structured questionnaire and was carried out in Nicosia, the North Cyprus. A total of 960 surveys were analyzed, of which 67.92% were female and 32.08% were male.

RESULTS: It was determined that there was a statistically significant difference in the rates of adulthood vaccination according to the participants' age groups, gender, place of birth, professions, marital status, health status, and continued medication use ($p<0.05$). Adulthood VCRs of those aged ≤25, females, high-school graduates, and single were low, whereas those of Turkish citizens, healthcare workers, people with comorbidities, and who constantly use medication were high. Furthermore, it was statistically significant that knowledge about recommended adulthood vaccination and the protection provided by those vaccinations was high among those working in healthcare services ($p<0.05$).

CONCLUSION: The awareness level regarding adulthood vaccinations is insufficient. With vaccination, the incidence and mortality of VPDs in adults can be reduced and even reached the point of elimination, as observed for some childhood diseases. Reasons for non-vaccination should be addressed, and effective measures should be determined and taken to overcome these obstacles.

Keywords: Adult, vaccine, vaccination, awareness, North Cyprus

INTRODUCTION

A vaccine is a suspension of weakened viruses, bacteria, or their antigenic fragments that is given to the body primarily to prevent diseases by conferring active and passive immunity.[1]

Immunization with vaccines is one of the best health investments, saving millions of lives each year. It is the main defense against serious, preventable, and sometimes fatal, contagious diseases. It is safe and cost effective.[2-5]

People of all ages are affected by vaccine-preventable diseases (VPDs);[6] however, most vaccination policies target infants and children.[3] More than 100 million children worldwide are vaccinated each year; despite this awareness and relatively good vaccination rates in childhood, adult vaccination rates (VCR) are insufficient.[3-9]

Outbreaks of VPDs are a worldwide growing concern; they have a marked and widespread impact on public health as well as on individuals and thus on healthcare systems and the economy.[10,11] Globalization causes

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the quicker spread of infectious diseases because of the rapid mobility of people across borders.[5] Life expectancy increases logarithmically,[9] as morbidities increase with aging, and adults become more susceptible to infectious diseases; complications and mortality also increase with age too.[6,7,12] The immunity provided by childhood vaccination decreases (immunoscence). We should also take into account low vaccination coverage and the possibility of incomplete vaccination programs in childhood. There is a clear need for developing and implementing protective strategies[13] for aging. The coronavirus disease-2019 (COVID-19) pandemic has highlighted that preventive measures should be lifelong.[6]

The benefits of vaccination exceed those for those who are vaccinated to those who cannot (because of immune deficiencies, age or contraindications, etc.) by reducing the chance of physical contact between infected and vulnerable (herd immunity).[2,14] Furthermore, vaccination not only decreases transmission but also reduces the number of deaths, hospitalizations, incidence among risky groups of the population, functional losses, disabilities, antimicrobial resistance, socioeconomic issues, and the labor force.

Studies generally focus on adults aged over 65 years. Even if it is not enough, VCRs over 65 years have improved; however, younger adults who are at risk remain low. In our country, as in many others, most adults have not been vaccinated against adult VPDs.[6] It is important to understand the reasons for low uptake and barriers to effective vaccination, and awareness of the need for adult vaccination should be raised to make it a part of routine care.

In this manner, we conducted a comprehensive, population-level cohort study to evaluate the awareness, attitudes, and behaviors of the population aged over 18 years about adulthood vaccination. The secondary objective was to assess the impact of the COVID-19 pandemic on vaccination awareness and rates.

MATERIALS AND METHODS

This was a cross-sectional, survey-based study that was conducted between July 2023 and September 2023 using a structured questionnaire aiming to determine vaccination coverage, knowledge, and behaviors regarding adulthood vaccination. The referent population included healthcare professionals (doctors, dentists, nurses) and adults aged >18 years.

The questionnaire consisting of 27 questions was distributed both as an online questionnaire and a printed version; participants were carefully instructed to complete it only once. The self-report questionnaire was administered using Google Forms and disseminated using instant messaging apps (e.g., Whatsapp, Viber), social media (e.g., Facebook, Instagram), and institutional emails to doctors, nurses, and dentists currently working in the Turkish Republic of North Cyprus (TRNC). A printed version of the questionnaire was offered to patients admitted to Near East University Hospital as outpatients to the Department of Internal Medicine. The questionnaire was a self-administered questionnaire that captured information under the following sections: 1) demographic characteristics, 2) knowledge regarding adulthood vaccinations, routinely recommended vaccines in the guidelines before and after the COVID-19 pandemic, beliefs about vaccination, 3) vaccination status, and reasons for choosing to get vaccination or not.

Ethical approval for this study was obtained from the Scientific Research Ethics Committee of Near East University (approval number: YDU/2022/108-1663, date: 30.11.2022). Informed consent was obtained from all participants.

Statistical Analysis

The Statistical Package for the Social Sciences 26.0 software was used to statistically analyze the data obtained in this study. The distribution of participants according to their sociodemographic characteristics, general health and smoking status, information, awareness, and attitudes about adulthood vaccination were determined by frequency analysis. The chi-square test[2] was used for the univariate analysis of the effect of each factor on the vaccination status of the participants. Descriptive statistics were generated for each question in the survey. The confidence intervals with a p value of less than 0.05 were considered for inclusion in the multivariable logistic regression model.

RESULTS

A total of 960 surveys were analyzed in our study. 652 (67.92%) of the participants were female, and 308 (32.08%) were male. In the 960 surveys, the socio-demographic characteristics of the participants (Table 1), their distribution according to their health status and smoking status (Table 2), the distribution of some characteristics regarding information on adult vaccines are shown (Table 3), and Table 4 shows the participants included in the study. Pearson X^2 test results are given to compare the adult vaccination status according to the sociodemographic characteristics of the participants. It was determined that there was a statistically significant difference between the rates of vaccination in adulthood according to the participants' age groups, gender, place of birth, profession, marital status, health status, and continuous medication use ($p<0.05$). It was observed that the adult vaccination rates of those aged 25 years and under, women, high school graduates, and single individuals were low. Turkish citizens, healthcare workers, people with chronic diseases, and people who constantly use medication had high adult vaccination rates.

Table 1. Sociodemographic characteristics of the participants

	Number (n)	Percentage (%)
Gender		
Female	652	67.92
Male	308	32.08
Place of birth		
TRNC*	597	62.19
TR**	304	31.67
Others	59	6.15
Education		
Primary	43	4.48
High-school	144	15.00
University	773	80.52
Marital status		
Single	314	32.71
Married	604	62.92
Widow	42	4.38

In Figure 1, participants' awareness about adult vaccines and vaccine protection is compared according to their professions. According to our study, it was statistically significant that knowledge about recommended adulthood vaccination and the protection provided by those vaccinations was found to be higher for those who work in healthcare services ($p<0.05$).

DISCUSSION

In this study, we aimed to reveal the awareness, attitudes, and behaviors of adults living in TRNCs regarding adult vaccination. This is the first time such a study has been conducted in the general population living in the study area. As in other studies conducted for the same purpose

Table 1. Continued

	Number (n)	Percentage (%)
Having children		
Yes	569	59.27
No	391	40.73
Working status		
Yes	692	72.08
No	268	27.92
Profession		
Not working	202	21.04
Student	100	10.42
Dentist	16	1.67
Doctor	94	9.79
Nurse	97	10.10
Other healthcare workers	98	10.21
Other professions	353	36.77
Insurance status		
Yes	918	95.62
No	42	4.38

*TRNC: Turkish Republic of North Cyprus, **TR: Turkish Republic

Table 2. General health conditions and smoking status of participants

	Number (n)	Percentage (%)
Chronic systemic disease		
Yes	268	27.92
No	692	72.08
Regular medication		
Yes	339	35.31
No	621	64.69
Regular check-ups		
Yes	463	48.23
No	497	51.77
Any contraindications for vaccination		
Yes	20	2.08
No	845	88.02
Don't know	95	9.90
Smoking		
Yes	277	28.85
No	683	71.15

Table 3. Participants' characteristics regarding adulthood vaccinations

	Number (n)	Percentage (%)
Information about adulthood vaccination		
Have information	442	46.04
Do not have the necessary information	518	53.96
Time to get information about adulthood vaccination (n=442)		
Before pandemics	367	83.03
After pandemics	75	16.97
Source of information about adulthood vaccination (n=442)*		
Doctor	231	52.26
Social media	105	23.76
Professional knowledge	115	26.02
Friend	35	7.92
TV	17	3.85
Family	9	2.04
COVID-19 vaccination		
Yes	931	96.98
No	29	3.02
Vaccination status after 19 years (non-COVID)		
Yes	450	46.88
No	401	41.77
Not sure	109	11.35
Vaccines received after the age of 19 (except for COVID) (n=450)		
Tetanus	299	66.44
Flu (influenza)	193	42.89
Hepatitis B	173	38.44
Hepatitis A	42	9.33
Pneumonia (pneumococcus)	35	7.78
Human papilloma virus	23	5.11
Measles-mumps-rubella	5	1.11
Meningitis (meningococcus)	3	0.67
Shingles (varicella-zoster)	1	0.22
Considering oneself at risk in terms of vaccine-preventable diseases		
Yes	237	24.69
No	368	38.33
No idea	355	36.98
Reasons for not getting vaccinated		
Lack of knowledge	297	30.94
Do not consider themselves at risk	132	13.75
Fear of side effects	63	6.56
Do not believe in vaccine protection	15	1.56
Believing that harm outweighs benefits	27	2.81
Out of time	30	3.13
Information about possible side effects of vaccines		
Have information	210	21.88
Partially know	473	49.27
No information	277	28.85
Ideas about the protection provided by vaccination		
Protective	206	21.46
Partially protective	312	32.50
Not protective	13	1.35
No idea	429	44.69

*More than one answer can be given. TV: Television, COVID-19: Coronavirus disease-2019.

Table 4. Comparison of adult vaccination status according to participants' sociodemographic characteristics

	Adulthood vaccination							
	Yes		No		Don't remember		X^2	p
	n	%	n	%	n	%		
Age group								
25 years and younger	51	29.48	95	54.91	27	15.61	54,136	0.001*
26-35 years	91	41.18	88	39.82	42	19.00		
36-45 years	119	51.07	95	40.77	19	8.15		
46-55 years	114	55.07	79	38.16	14	6.76		
56 years and older	75	59.52	44	34.92	7	5.56		
Gender								
Female	290	44.48	293	44.94	69	10.58	8,437	0.015*
Male	160	51.95	108	35.06	40	12.99		
Place of birth								
TRNC	259	43.38	273	45.73	65	10.89	11,878	0.018*
TR	164	53.95	105	34.54	35	11.51		
Others	27	45.76	23	38.98	9	15.25		
Education Level								
Primary school	18	41.86	21	48.84	4	9.30	8,271	0.082
High-school	53	36.81	72	50.00	19	13.19		
University	379	49.03	308	39.84	86	11.13		
Profession								
Non-healthcare	285	39.09	351	48.15	93	12.76	73,874	0.001*
Healthcare	165	71.43	50	21.65	16	6.93		
Marital status								
Single	116	36.94	151	48.09	47	14.97	21,453	0.001*
Married	316	52.32	232	38.41	56	9.27		
Widowed	18	42.86	18	42.86	6	14.29		
Chronic disease								
Yes	145	54.10	94	35.07	29	10.82	8,230	0.016*
No	305	44.08	307	44.36	80	11.56		
Regular medication								
Yes	183	53.98	120	35.40	36	10.62	10,991	0.004*
No	267	43.00	281	45.25	73	11.76		

*P<0.05. TRNC: Turkish Republic of North Cyprus, TR: Turkish Republic.

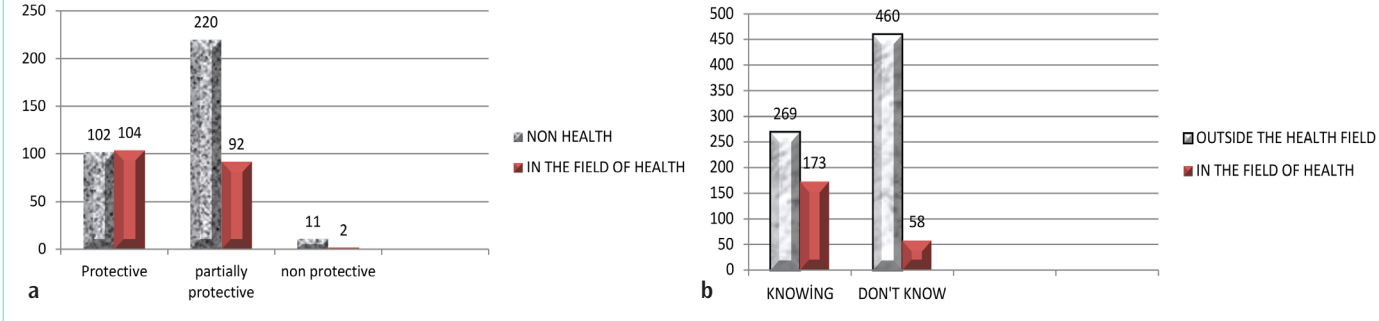

Figure 1. Comparison of participants' knowledge about adult vaccines and vaccine protection according to profession (a, b) p<0.05.

in various countries, adult VCRs were not found satisfactory. In a study published by Uthoff et al.[14] in 2023, annual influenza vaccination rates were far from the recommended rates, and the rates for pneumococcal, Herpes Zoster, and other available vaccines were even lower. In this study, we found that 96.98% of the participants received the COVID-19 vaccine, 46.88% received another vaccine other than COVID after age 19, 66.44% received tetanus, 42.89% received influenza, and 38.44% received hepatitis B vaccine. The pneumococcal vaccination rate was very low and ranked 5th (7.78%).

Only ¼ of the participants in our study considered themselves at risk for diseases requiring adult vaccination. A total of 21.46% of people had an opinion about the protection of adult vaccines. Adult VCR was found to be high in risk groups such as those working in the healthcare field, those with chronic diseases, and those who constantly use medication, as expected. However, although awareness of adult vaccination among healthcare workers was generally high, the vaccination rate was not at the desired level. Thus, in their study among healthcare professionals in 2019, Evren et al.[13] found that although the level of knowledge about influenza and pneumococcal vaccines was high, vaccination rates were low.

Vaccination is the most effective and safe preventive health service for preventing infectious diseases, and it is reported that VPD are becoming more common in adults, with an increase in both relative and real cases. The main reasons for this are explained by the decrease in immunity to vaccines over time, the lack of recommended booster vaccine doses in adults, and the existence of people who were incompletely vaccinated or never vaccinated during childhood. In addition, susceptibility to infectious diseases increases with the weakening of the immune system because of both aging and the increase in chronic diseases in adults.[15] However, interest in adult vaccinations and vaccination rates is quite low. E.g. none of the participants in Aşık et al.'s[16] study received all adult vaccinations. Only 59% have received any adult vaccination at some point in their life. In North Cyprus, according to our study, 46.8% of people have received an adult vaccine other than the COVID vaccine, where the application rates of childhood vaccines are very high both in Türkiye and in our country.[17] Likewise, while the rates of childhood vaccinations are very high in Western countries, those in adults are quite low for reasons such as knowledge gaps, fear of side effects, concerns about their effectiveness, and the perception of not being in the risk group.[18,19]

According to our study, the most common reasons for the low rates of adult vaccinations can be listed as the rates of those who had information about side effects and vaccine protection were low (21.8-21.4%), and only 24.6% of our participants considered themselves at risk for diseases that can be prevented by adult vaccination. Although the adult vaccination rates of people with a chronic disease who constantly take medications and healthcare workers were higher than those of others, they were generally low. In many countries, adult vaccination is inadequately administered, similar to our results. It has been reported that even in developed countries, the VCRs for adults are low. However, immunization services must be continued in adulthood because adults are highly exposed to VPD in their working and social environments. In a study conducted on adults and elderly people aged over 18 years in Türkiye, it was found that 65% of the participants were susceptible to diphtheria, 569 were susceptible to tetanus, and 90% were susceptible to whooping cough. It was reported that 78% of the study participants needed a tetanus vaccine, 90% a whooping cough vaccine, and 96% a diphtheria vaccine.[20] In our study, less than half of the participants had received another vaccine other than COVID-19 after the age of 19 years, and we found that 66.44% of them had had tetanus.

As is is known, flu can lead to common and serious diseases and even serious complications such as secondary bacterial pneumonia. Additionally, flu vaccination plays an indirect role in preventing invasive pneumococcal infection, which tends to occur during flu season.[21] However, among healthcare professionals, the rate of flu vaccination is not at the desired level. The flu vaccination rate among all participants was 42.8%.[13]

According to the CDC survey, 20% of people aged 65 years and older had received a flu vaccine and never received a pneumococcal vaccine. Some European countries have reported approximately 50% coverage for pneumococcal vaccination in high-risk populations. Most countries do not even report these rates. Some studies have shown that the most important obstacle to vaccination is that most high-risk patients are not even aware of it. This study also showed that advice from healthcare professionals is the most important factor for being vaccinated.[22]

Therefore, healthcare providers play a critical role in informing patients about vaccination.[23] Several studies have shown that the provision of vaccines by healthcare professionals is an independent predictor of pneumococcal and influenza vaccine uptake in the elderly.[24] These data demonstrate that the education of healthcare professionals indirectly refers to the education of society. The vaccination rate of healthcare workers in the United States is over 75%, but in many European countries it is below 30%.[25]

Vaccination has been an important issue among both the public and healthcare professionals since March 2020, when the COVID-19 outbreak was declared a pandemic by the World Health Organization.[26] TRNC is a defection-dependent republic with a population of 350,000, located in the Eastern Mediterranean. After the first case of COVID-19 was identified in March 2020, a combination of precautions taken on time by the country's council of ministers depending on science board decisions helped TRNC successfully control the first wave of the pandemic, and the country became COVID-19-free for about 2.5 months.[29] During the period when we planned our study, our participants' awareness, knowledge, and attitudes about the disease were quite good, thanks to the early and reliable information provided by both social media and healthcare professionals about COVID-19 infection. In our study, it was determined that 96.98% of the participants were vaccinated against COVID-19, whereas the percentage of participants who knew about adulthood vaccinations was 83.03% before the pandemic. Similar rates of COVID-19 have been reported in studies from other countries. The general level of knowledge about both the symptoms of the disease and ways to prevent it is quite high, and awareness and vaccination rates were found to be even higher, especially among hospital employees.[7, 27, 28]

Most of those who received adult vaccinations were men between the ages of 36-45. Adult vaccination rates were found to be high for those who were T.R. nationals, had higher education levels, were constantly taking medications, and were working in healthcare services.

Study Limitations

There are some limitations to our study: firstly, most of the participants were reached through an online survey; most of them were living and working in the city center. We did not have the opportunity to reach

people with different educational and social statuses in rural areas. Therefore, it may not be appropriate to generalize the results to the entire population. Second, only awareness and attitudes about adult vaccination were investigated. Application and methods to prevent diseases were not examined. Third, since the period in which our study was conducted was during the COVID-19 epidemic, all attention was focused on the epidemic; other adulthood vaccines or preventable diseases were more in the background. The study results may have differed if it was conducted before pandemic.

CONCLUSION

Adulthood immunization is a current and important issue all over the world. We tried to show that adulthood vaccination awareness among the adults living in TRNC is not enough, similar to many countries, even in healthcare facilities, and is not taken into account as needed. In our study, we demonstrated that education is crucial for awareness and continuation. In order to be protected from preventable diseases, it is necessary to develop immunization programs with an understanding of lifelong immunization, activate public resources to finance this service, and provide regular active training to raise awareness among healthcare professionals and the public. Moreover, the issue of vaccine hesitancy and even vaccine rejection, which is increasing all over the world, should be handled carefully, and protecting public health should be a high-level goal. With vaccination, the incidence and mortality of preventable diseases in adults can be reduced, and these diseases can be brought to the point of elimination, as in some childhood diseases. Reasons for non-vaccination should be addressed, and effective measures should be determined and taken to overcome these identified obstacles.

MAIN POINTS

- Increase of awareness attract attention to the importance of vaccination among adults.
- Vaccination may provide a decrease in the incidence and mortality of VPDs in adults as in some childhood diseases.
- Addresing the reasons for non-vaccination help to overcome the obstacles thus leading to an increase in the vaccination rates.

ETHICS

Ethics Committee Approval: Ethical approval for this study was obtained from the Scientific Research Ethics Committee of Near East University (approval number: YDU/2022/108-1663, date: 30.11.2022).

Informed Consent: Informed consent was obtained from all participants.

Authorship Contributions

Surgical and Medical Practices: D.G.S., G.B., M.T., N.D.Ö., Concept: D.G.S., G.B., M.T., N.D.Ö., Design: D.G.S., G.B., M.T., N.D.Ö., Data Collection and/or Processing: D.G.S., G.B., M.T., N.D.Ö., Analysis and/or Interpretation: D.G.S., G.B., M.T., N.D.Ö., Literature Search: D.G.S., G.B., M.T., N.D.Ö., Writing: D.G.S., G.B., M.T., N.D.Ö.

DISCLOSURES

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REFERENCES

1. Bekis Bozkurt H. An Overview of Vaccine Rejection and Review of Literature. Kafkas J Med Sci. 2018; 8(1): 71-6.
2. Eiden AL, Barratt J, Nyaku MK. A review of factors influencing vaccination policies and programs for older adults globally. Hum Vaccin Immunother. 2023; 19(1): 2157164.
3. Eiden AL, Barratt J, Nyaku MK. Drivers of and barriers to routine adult vaccination: A systematic literature review. Hum Vaccin Immunother. 2022; 18(6): 2127290.
4. Prieto-Campo Á, García-Álvarez RM, López-Durán A, Roque F, Herdeiro MT, Figueiras A, et al. Understanding Primary Care Physician Vaccination Behaviour: A Systematic Review. Int J Environ Res Public Health. 2022; 19(21): 13872.
5. Ozisik L, Tanriover MD, Rigby S, Unal S; European Federation of Internal Medicine ADVICE Working Group. ADVICE for a healthier life: Adult Vaccination Campaign in Europe. Eur J Intern Med. 2016; 33: 14-20.
6. Uzuner A, Arabacı Ş, Yüceel Aİ, Kocatürk AC, Kaynar E, Khan A. Erişkinlerin Erişkin Aşıları Hakkındaki Bilgi, Tutum ve Davranışları. TJFMPC. 2018; 12(3): 215-25.
7. Redondo Margüello E, Trilla A, Munguira ILB, López-Herce AJ, Cotarelo Suárez M. Knowledge, attitudes, beliefs and barriers of healthcare professionals and adults ≥ 65 years about vaccine-preventable diseases in Spain: the ADult Vaccination drIverS and barriErs (ADVISE) study. Hum Vaccin Immunother. 2022; 18(1): 2025007.
8. Ates Bulut E, Badak SO, Aksoy H, Fadiloglu A, Isik AT. The Awareness and Attitude of Physicians to Older Adult Routine Vaccination Scheme. Clin Interv Aging. 2022; 17: 1581-8.
9. Davarcı PZ, Ekuklu G, Özder Taş F, Bolaç E, Çelikkalp Ü, Yorulmaz F. Vaccination Status of Employees at Trakya University Health Center for Medical Research & Practice (Hospital) and Edirne Sultan 1. Murat State Hospital with Vaccines Recommended for Health Workers. Acta Med Nicomedia. 2023; 6(3): 327-33.
10. Kolobova I, Nyaku MK, Karakusevic A, Bridge D, Fotheringham I, O'Brien M. Vaccine uptake and barriers to vaccination among at-risk adult populations in the US. Hum Vaccin Immunother. 2022; 18(5): 2055422.
11. Woodward M, Ramasubramanian V, Kamarulzaman A, Tantawichien T, Wang M, Song JY, et al. Addressing Unmet Needs in Vaccination for Older Adults in the Asia Pacific: Insights from the COVID-19 Pandemic. Clin Interv Aging. 2023; 18: 869-80.
12. Vora A, Di Pasquale A, Kolhapure S, Agrawal A, Agrawal S. The need for vaccination in adults with chronic (noncommunicable) diseases in India - lessons from around the world. Hum Vaccin Immunother. 2022; 18(5): 2052544.
13. Evren H, Evren EÜ, Özcem Bardak S, Özer Yazgan Z, Argun Barış S, Yıldız F. The Knowledge Level of Hospital Staff about Influenza and Pneumococcal Vaccination. Cyprus J Med Sci. 2019; 4(3): 220-4.
14. Uthoff SAK, Zinkevich A, Franiel D, Below M, Splieth H, Iwen J, et al. A complex intervention on vaccination uptake among older adults (≥60 years) in Germany - a study protocol with a mixed methods design. BMC Prim Care. 2023; 24: 148.
15. Türkiye Enfeksiyon Hastalıkları Ve Klinik Mikrobiyoloji Uzmanlık Derneği Erişkinbağışıklamaçalışmagrubu Erişkin Bağışıklama Rehberi, 2019.
16. Aşık Z, Çakmak T, Bilgili P. Knowledge, attitudes, and behaviours of adults about adult vaccines. Türk Aile Hek Derg. 2013; 17(3): 113-8.
17. Başara BB, Güler C, Eryılmaz Z, Tentür GK, Pulgat F. T.C. Sağlık Bakanlığı Sağlık İstatistikleri Yıllığı 2011. Sağlık araştırmaları Genel Müdürlüğü. Ankara. T.C. Sağlık Bakanlığı; 2012.

18. Bellia C, Setbon M, Zylberman P, Flahault A. Healthcare worker compliance with seasonal and pandemic influenza vaccination. Influenza Other Respir Viruses. 2013; 7(Suppl 2): 97-104.

19. Barbadoro P, Marigliano A, Di Tondo E, Chiatti C, Di Stanislao F, D'Errico MM, et al. Determinants of influenza vaccination uptake among Italian healthcare workers. Hum Vaccin Immunother. 2013; 9: 911-6.

20. Tanriover MD, Soyler C, Ascioglu S, Cankurtaran M, Unal S. Low seroprevalence of diphtheria, tetanus and pertussis in ambulatory adult patients: the need for lifelong vaccination. Eur J Intern Med. 2014; 25(6): 528-32.

21. Gilchrist SA, Nanni A, Levine O. Benefits and Effectiveness of Administering Pneumococcal Polysaccharide Vaccine with Seasonal Influenza Vaccine: An Approach for Policymakers. Am J Public Health. 2012; 102(4): 596-605

22. Song JY, Cheong HJ, Heo JY, Noh JY, Seo YB, Kim IS, et al. Outpatient-Based Pneumococcal Vaccine Campaign and Survey of Perceptions about Pneumococcal Vaccination in Patients and Doctors. Yonsei Med J. 2013; 54(2): 469-75.

23. Schneeberg A, Bettinger JA, McNeil S, Ward BJ, Dionne M, Cooper C, et al. Knowledge, attitudes, beliefs and behaviours of older adults about pneumococcal immunization, a Public Health Agency of Canada/ Canadian Institutes of Health Research Influenza Research Network (PCIRN) investigation. BMC Public Health. 2014; 14: 442.

24. Nichol KL, Mac Donald R, Hauge M. Factors associated with influenza and pneumococcal vaccination behavior among high-risk adults. J Gen Intern Med. 1996; 11(11): 673-7.

25. Black CL, Yue X, Ball SW, Donahue SM, Izrael D, de Perio MA, et al. Influenza vaccination coverage among healthcare personnel - United States, 2014-15 influenza season. MMWR Morb Mortal Wkly Rep. 2015; 64(36): 993-9.

26. World Health Organization. Coronavirus disease (COVID-19) Situation Report– 51. World Health Organization 2020. Available at: https://www.who.int/docs/default-source/coronaviruse/ situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn= 1ba62e57_10

27. Argun Barış S, Ünal Evren E, Evren H, Şahinoğlu E, Selvi G, Boyacı H, et al. Awareness and Knowledge of COVID-19 Among Health Care Workers in Early Phase of COVID-19 Pandemic. Turk Thorac J. 2022; 23(1): 38-44.

28. Shaikhain TA, Al-Husayni FA, Alhejaili EA, Al-Harbi MN, Bogari AA, Baghlaf BA, et al. COVID-19-related knowledge and practices among health care workers in Saudi Arabia: cross-sectional questionnaire study. JMIR Form Res. 2021; 5(1): e21220.

29. Sultanoglu N, Baddal B, Suer K, Sanlidag T. Current situation of COVID-19 in Northern Cyprus. East Mediterr Health J. 2020; 26(6): 641-5.