







Research Article | Araştırma Makalesi

VACCINATION STATUS OF EMPLOYEES AT TRAKYA UNIVERSITY HEALTH CENTER FOR MEDICAL RESEARCH & PRACTICE (HOSPITAL) AND EDİRNE SULTAN 1. MURAT STATE HOSPITAL WITH VACCINES RECOMMENDED FOR HEALTH WORKERS

TRAKYA ÜNİVERSİTESİ SAĞLIK UYGULAMA VE ARAŞTIRMA MERKEZİ'NDE VE EDİRNE SULTAN 1. MURAT DEVLET HASTANESİ'NDE ÇALIŞANLARIN SAĞLIK ÇALIŞANLARINA ÖNERİLEN AŞILAR İLE AŞILANMA DURUMLARI

 Pınar Zehra Davarcı^{1*},  Galip Ekuklu¹,  Fulya Özder Taş¹,  Elif Sultan Bolaç¹,  Ülfiye Çalıklalp¹,  Faruk Yorulmaz¹

¹University of Trakya, Faculty of Medicine, Department of Public Health, Edirne, Türkiye.



ABSTRACT

Objective: Healthcare workers are exposed to vaccine-preventable disease agents due to their contact with patients and their infectious agents. The aim of this study is to determine the status of vaccination of physicians, nurses, midwives, health officers, laboratory workers and health technicians working Trakya University Health Center for Medical Research & Practice (Hospital) and Edirne Sultan 1. Murat State hospitals with the vaccines recommended for healthcare workers.

Methods: The cross-sectional study was conducted with healthcare professionals working in Trakya University Health Center for Medical Research & Practice (Hospital) and Edirne Sultan 1. Murat State Hospital.

Results: A total of 293 questionnaires were analyzed. 37.2% of health workers stated that they did not have at least one vaccine among the vaccines recommended by the Ministry of Health. Vaccination rates of the participants are as follows: 84.7% Hepatitis B, 78.2% Td, 69.4% Measles-Rubella-Mumps (MMR), 68.1% Diphtheria-pertussis-tetanus (DBT), 35.3% Chickenpox, 29.8% Hepatitis A and 10.6% of Meningococcal vaccine. When participants were asked about their lifetime influenza vaccination status, the results showed that 48.8% had never received it, 21.6% had received it once, 26.1% had received it multiple times, and 3.4% received it annually.

Conclusion: The status of health workers to have the recommended vaccinations is lower than expected. Raising awareness of the importance of vaccination due to occupational risks and eliminating hesitations in influenza vaccination may help in improving vaccination rates.

Keywords: Vaccination, Hepatitis B, Influenza, Healthcare workers

Öz

Amaç: Hastalarla ve hastalara ait bulaşıcı maddelerle temasları nedeniyle, birçok sağlık çalışanı aşıyla önlenebilir hastalık etkenlerine maruz kalmaktadır. Bu çalışmanın amacı Trakya Üniversitesi Sağlık Uygulama ve Araştırma Merkezi (Hastane) ve Edirne Sultan 1. Murat Devlet hastanesinde çalışan hekim, hemşire, ebe, sağlık memuru, laboratuvar çalışanı ve sağlık teknisyenlerinin, sağlık çalışanlarına önerilen aşılarla aşılama durumlarını belirlemektir.

Yöntem: Kesitsel nitelikteki araştırma, Trakya Üniversitesi Sağlık Uygulama ve Araştırma Merkezi (Hastane) ve Edirne Sultan 1. Murat Devlet Hastanesi'nde görev yapan sağlık çalışanları ile yürütülmüştür.

Bulgular: Toplam 293 anket analiz edildi. Sağlık çalışanlarının %37,2'si Sağlık Bakanlığı'nın önerdiği aşılar arasında en az bir aşıyı yaptırmadığını belirtmiştir. Katılımcıların aşılama oranları; %84,7 Hepatit B, %78,2 Td, %69,4 Kızamık-Kızamıkçık-Kabakulak (KKK), %68,1 Difteri-boğmaca-tetanoz (DBT), %35,3 Suçiçeği, %29,8 Hepatit A ve %10,6 Meningokok aşıları şeklindedir. Katılımcılara ömür boyu grip aşısı olup olmadığı sorulduğunda %48,8'inin hiç yaptırmadığı, %21,6'sının bir kez, %26,1'inin birkaç kez ve %3,4'ünün her yıl aşı yaptırdığı belirlendi.

Sonuç: Sağlık çalışanlarının kendilerine önerilen aşıları yaptırmaları beklenenden düşüktür. Mesleki riskler nedeniyle aşılamanın öneminin farkındalığı sağlamak ve influenza aşılama tereddütleri gidermek, aşılama oranlarının iyileştirilmesinde yardımcı olabilir.

Anahtar Kelimeler: Aşılama, Hepatit B, İnfluenza, Sağlık Çalışanı

Introduction

Biological products developed by purifying the disease-causing agents like viruses, bacteria that cause diseases in humans and animals or by eliminating the effects of toxins secreted by some microorganisms are called vaccines. The purpose of administering vaccines to at-risk individuals is to protect them and the wider population from diseases and their adverse consequences. Through vaccination, the body recognizes toxins or microorganisms and develops a defense against them.¹

According to the World Health Organization (WHO), one of the two interventions that contribute the most to human health in the world is the availability of vaccines.² With the introduction of the Extended Immunization Program (EIP) into Turkey in 1981, activities on vaccination have been speeded up and continued until today. The purpose of EIP is to ensure that vulnerable age groups are immunized before they become infected, and to prevent illness, disability and death caused by vaccine-preventable diseases.³

Infection risks are of particular importance among the risks and hazards that healthcare professionals (for example, doctors, nurses, emergency medical staff, dentists and students, medical and nursing students, laboratory technicians, hospital volunteers and administrative staff) are exposed to in their work environment. Many healthcare workers are at risk of exposure and possible transmission of vaccine-preventable diseases due to their contact with patients or patient-derived infectious agents. All non-immune healthcare workers should be fully vaccinated with the recommended vaccines due to their occupational risks.¹ Optimum use of vaccination has two-sided benefits in that it both preserves the health of workers and protects patients from exposure to infected HCWs.⁴

Vaccines recommended for health workers by the Ministry of Health of the Republic of Turkey are diphtheria tetanus (Td) (One dose of pertussis-containing vaccine is recommended), Measles-Rubella-Mumps, Seasonal Influenza, Hepatitis B, Chickenpox, Hepatitis A, and Meningococcus (for laboratory personnel working with meningococcus in the microbiology laboratory).⁵ These vaccines are provided free of charge in accordance with the Circular No. 7941 of 13.03.2009 on Extended Immunization Program of the Directorate General of Primary Health Care Services of the Ministry of Health.⁶ Regular immunization programs can significantly reduce the number of susceptible healthcare workers in health-care facilities as well as the risk of transmission of vaccine-preventable diseases to other workers and patients.⁷

The aim of this study is to determine the status of vaccination of physicians, nurses, midwives, health officers, laboratory workers and health technicians working in Trakya University Health Center for Medical Research & Practice (Hospital) (TUHCMRH) and Edirne Sultan 1. Murat State Hospital (ESH) with the vaccines recommended for healthcare workers.

Methods

Study design and patients

The study is a cross-sectional study conducted between 01.08.2021 and 01.11.2021 in the form of a face-to-face survey.

There were a total of 2100 study subjects, including physicians, nurses, midwives, health officers, laboratory assistants and health technicians, working at TUHCMRH and ESH. The sample size was calculated to be 231 by taking an effect size of 0.25, an alpha of 0.05 and a power of 0.85, and the study was conducted with a sample of 293 people, taking into account the possible data losses and the number of people falling into subgroups. In the selection of the participants, stratification was made by organization, gender and profession, and the subjects to be selected from each stratum were randomly selected by stratified sampling method. In this context, it was conducted with a total of 293 subjects, 208 of which were from TUHCMRH and 86 from ESH.

Those who stated that they had at least one dose of vaccination were considered as vaccinated.

The questionnaire, used for data collection, was developed by the researchers based on literature, encompassing socio-demographic characteristics (independent variables are; age, gender, place of birth, place of raised and family type, siblings, presence of chronic diseases, education status, marital status, number of children, whether their children are vaccinated regularly, hospital where they work, time spent in the profession, pregnancy for female employees), the vaccines recommended for healthcare workers by the Ministry of Health and the status of vaccination with them (as a dependent variable), and possible causes of missing or insufficient vaccination (for all recommended vaccines and also for influenza). In addition, the participants were questioned if they ever had antibodies checked.

The protocol for the research project has been approved by the TUHCMRH Non-Invasive Clinical Research Ethics Committee (date: 14-06-2021 and approval number: 2021/272) and written institutional permissions from the TUHCMRH and ESH where the research was conducted were obtained for the research. After explaining the purpose of the research to the subjects, the questionnaire was conducted.

Statistical Analysis

Data analysis was performed using SPSS 22 (SPSS Inc., Chicago, IL, USA). Descriptive statistics (number, percentage, mean) of the data obtained at the end of the research were given and chi-square test was used for discrete variables to reveal the relationship between dependent and independent variables. Statistical significance level was set to $p < 0.05$.

Results

A total of 293 healthcare professionals, including 208 (71%) working at TUHCMRH and 85 (29%) working at ESH, were involved in the study. Participants' gender, age groups, professional fields, marital status, length of time in the profession, the unit they work in and chronic disease status are presented in Table-1. There is a significant difference between hospitals in terms of age groups, marital status and years spent in the profession ($p < 0.05$).

The vaccination percentage of the subjects was 84.7% for Hepatitis B vaccine, 78.2% for Td vaccine, 69.4% for Measles-Rubella-Mumps vaccine, 68.1% for Diphtheria-Pertussis-Tetanus (DPT) vaccine, 35.3% for Varicella vaccine; 29.8% for Hepatitis A vaccine, and 10.6% for the Meningococcal vaccine (Figure 1).

Vaccination percentage by the socio-demographic characteristics and working life data (field of profession, working unit and years spent) of the subjects are presented in Table 2.

In Table 2, the vaccination percentages by gender showed that women had higher rates compared to men, with percentages of 74.4% versus 53.3% for MMR and 40.4% versus 18.6% for Chickenpox, respectively ($p < 0.05$). Additionally, it was observed that participants in the 26-34 age group had a higher hepatitis A vaccination rate compared to participants under the age of 25 ($p < 0.05$).

Only 10.6% of the participants reported having received the meningococcal vaccine. Among them, 20.0% were employees of the microbiology laboratory, while 9.8% were employees of other departments. Considering the health workers' status of having certain vaccinations by the unit they work in, it was observed that the percentage of those working in the microbiology unit who had meningococcal vaccine was higher than those working in other units ($p < 0.05$).

The vaccination status of the subjects is unrelated with the characteristics of the place where they were born and raised, the number of siblings, the number of children they have, the status of having a child, the presence of a chronic disease and their educational background ($p > 0.05$).

When asked if they had ever undergone an antibody test in their lifetime, the participants reported the following percentages: 66.0% for Hepatitis B, 32.1% for Hepatitis A, 8.2% for Chickenpox, 7.5% for Measles, 7.5% for Rubella, and 5.1% for Mumps antibody tests.

Adult Td vaccination status is similar among female healthcare workers by whether they have been pregnant or not ($p > 0.05$).

Table 1. Socio-demographic characteristics and working life characteristics of the subjects by hospitals

Variable	TUHCMRH*		ESH**	
	n	%	n	%
Gender				
Female	147	70.7	67	78.2
Male	61	29.3	18	21.2
Age Groups				
≤25	40	19.2	7	8.2
26-34	105	50.5	28	32.9
35-44	42	20.2	30	35.3
≥45	21	10.1	20	23.5
Healthcare Professions				
Doctor	80	38.5	24	28.2
Nurse	105	50.5	48	56.5
Others	23	11.1	13	15.3
Marital Status				
Married	114	54.8	63	74.1
Single	94	45.2	22	25.9
Years in occupation				
≤1 year	32	15.4	5	5.9
1-10 years	114	54.8	31	36.5
11-20 years	35	16.8	22	25.9
≥20 years	27	13.0	27	31.8
According to unit				
Internal Medicine	123	59.1	43	50.6
Surgical Medicine	52	25.0	27	31.8
Basic Medicine	33	15.9	15	17.6
Chronic disease				
Yes	35	16.8	23	27.1
No	173	83.2	62	72.9
Total	208	71.0	85	29.0

*: Trakya University Health Center for Medical Research Practice (Hospital)

**.: Edirne Sultan 1. Murat State Hospital

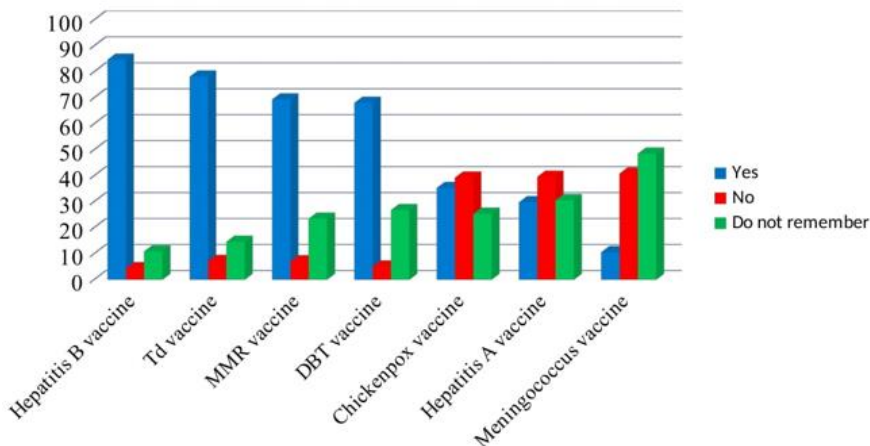


Figure 1. Percentage of vaccinated subjects by vaccines recommended to healthcare workers.

Among healthcare workers, the percentage of those who have received Td vaccine in the last 10 years was 65%. The status of Td vaccination in the last 10 years varies by the hospital. 70% of TUHCMRH employees and 56.1% of ESH employees have received Td vaccine in the last 10 years ($p < 0.05$).

37.2% (n=109) of the healthcare workers participating in the study stated the reason why they have not had any vaccination, and the most frequently cited reasons were lack of vaccination and screening programs (64%, n=82), neglect-lack of time (22%, n=28), and side effects of vaccine (7%, n=9).

All of those who have children expressed that they always have their children vaccinated regularly.

When the life-long influenza vaccination status of the subjects is examined, 48.9% of them affirmed that they never had it done, 21.6% of them once, 26.1% of them several times, and only 3.4% got vaccinated every year.

When the status of being vaccinated against influenza is evaluated by years, in the season, 15.8%, 11.4% and 18.7% of the subjects had influenza vaccination in the season of 2018-2019, of 2019-2020, and of 2020-2021, respectively (Figure 2).

The percentage of those who received influenza vaccination among doctors was higher than those among nurses and other healthcare personnel ($p < 0.05$). Lifelong influenza vaccination status was similar in terms of gender, age groups, hospital, working unit and having a chronic disease and years spent in profession ($p > 0.05$).

The reasons why the subjects get vaccinated against influenza included self-protection (38%, n=130), protecting relatives (18%, n=64), recommendations by health authorities (16%, n=53), and encouragement of vaccination (10%, n=41) in the unit where they work.

The reasons why the subjects did not get vaccinated against influenza included mutation of the virus (21%, n=50), preferring other ways of protection (17%, n=42), thinking that influenza is not a serious and risky disease (16%, n=39) and not being at risk for influenza (12%, n=29). When the subjects' occupations and the reasons for getting vaccinated against influenza were examined, of 33 participants who stated "to protect my patients" as the reason, 48.5% were non-physician healthcare staff and 51.5% were doctors, which was statistically significant ($p < 0.05$).

Table 2. Vaccination percentages by socio-demographic and working life characteristics

Variable	Hepatitis B Vaccine (%)	Td Vaccine (%)	MMR Vaccine (%)	DTaP Vaccine (%)	Varicella Vaccine (%)	Hepatitis A Vaccine (%)	Meningococcal Vaccine (%)
Gender							
Female	87.1	80.2	74.4*	71.6	40.4*	31.4	11.6
Male	76.9	71.9	53.3*	57.1	18.6*	25.0	7.4
Marital status							
Married	84.1	80.1	65.1	65.8	30.3	25.9	8.8
Single	85.5	75.2	75.2	71.3	42.1	35.3	13.1
Age Groups							
≤25 years	86.0	74.4	71.1	65.1	38.6	17.1*	7.5
26-34 years	85.3	75.6	70.4	66.7	39.8	39.8*	13.8
35-44 years	83.3	82.1	71.4	74.6	29.1	21.8	7.8
≥45 years	83.3	85.7	58.6	65.6	23.3	19.2	7.1
Chronic Disease							
Yes	90.6	74.5	71.7	73.5	33.3	26.1	7
No	83.3	79.0	68.9	66.8	35.8	30.7	11.5
Healthcare Professions							
Doctor	84.5	76.3	71.6	69.7	31.8	39.1	13.3
Nurse	86.0	80.0	69.2	68.5	38.1	23.0	9.2
Other	77.8	75.0	62.5	60.0	32.0	34.8	9.1
According to unit							
Internal Medicine Science	86.3	79.6	71.8	69.9	36.8	32.9	10.6
Surgical Medicine Science	80.6	75.8	66.2	64.7	36.9	19.0	11.1
Basic Medicine Science	85.4	76.3	64.5	66.7	25.7	36.4	9.7
Years in Occupation							
≤1 year	84.4	67.6	63.6	60.6	33.3	22.6	9.7
1-10 years	83.7	75.7	71.0	67.2	38.8	36.4	11.3
11-20 years	90.6	84.4	74.4	75.6	37.8	26.7	9.3
≥20 years	81.3	87.0	63.4	68.9	22.5	16.2	10.8
Total	84.7	78.2	69.4	68.1	35.3	29.8	10.6

*:p<0.05

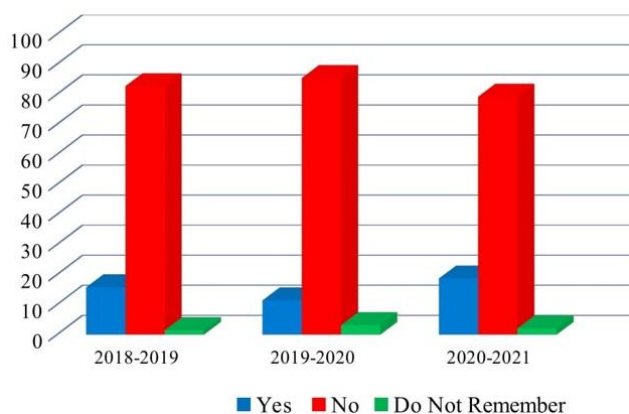


Figure 2. Influenza vaccination status of the subjects by year

Discussion

In this study conducted at TUHCMRH and ESH, the vaccination status of healthcare workers against vaccine-preventable infectious diseases was investigated. We found healthcare workers were vaccinated with Hepatitis B vaccine at the highest rate (84.7%), followed by Measles (69.4%), Diphtheria Pertussis Tetanus (68.1%), Chickenpox (35.3%), Hepatitis A (29.1%) and Meningococcal (10.6%) vaccines. In a study conducted in 250 medical assistants by Mir et al. in Paris in 2012 vaccination rates were 100% for Hepatitis B vaccine, 62.8% for Measles vaccine, 65.2% for Pertussis vaccine, 62.9% for Varicella vaccine, and 49.6% of Hepatitis A vaccine.⁸ Although there are differences between the vaccination rates, it is illustrated that Hepatitis B vaccine is made the most, Chickenpox and Hepatitis A vaccines are made less frequently, and the findings are consistent with the literature. The possible reason for some of the differences with this study may be the differences in the vaccination schedules of the countries (These vaccines were later included in the childhood vaccination calendar applied in our country; Hepatitis B 1998, Hepatitis A 2012, Chickenpox 2013). Regardless of the reason, the low rate of vaccination is a significant problem in terms of preventing the spread of diseases among vulnerable health workers and preventing hospital epidemics.⁹

In a study conducted by Dannetun et al. in Sweden in 2006, it was determined that 79% of healthcare workers were vaccinated with at least one dose of HBV vaccine, while only 40% were fully vaccinated.¹⁰ In a study conducted in healthcare workers by Yousafzai et al. in Pakistan in 2014, the rate of full-dose vaccination with HBV vaccine was found to be 40%.¹¹ In a study conducted in Diyarbakir State Hospital employees (secretary, cleaning staff, nurse, health technician) by Ahsen Öncül et al. in 2009, 468 of 503 participants answered questions about their hepatitis B vaccination status, and 40.2% of 468 participants were vaccinated against hepatitis B and reporting an antiHBs seropositivity.¹² In a study conducted in healthcare workers at Maltepe University Medical Faculty Hospital, in 2020, the percentage of HBV vaccination was found to be 71%.¹³ In our study, the rate

of those who stated that they were vaccinated with at least one dose of HBV vaccine is consistent with some studies and is higher than others. It is a remarkable finding that lower HBV vaccination is observed in surgical clinics where the risk of stab wounds is higher.

In a study in Egypt in 2017, having varicella vaccine was found to be statistically significantly higher in women than in men.¹⁴ In a study by Caterina Ledda et al. in Italy in 2018, it was reported that female healthcare workers received significantly more measles, mumps, rubella, varicella, and hepatitis B vaccines than male healthcare workers.⁹ Our study is also similar to the literature, and the status of measles and varicella vaccination is statistically significantly higher in women. The reason why these vaccines are more common in women may be that infections during pregnancy cause morbidity and mortality in both mother and fetus. For this purpose, it is recommended that measles, rubella, mumps, tetanus, diphtheria, polio and varicella vaccines, which are included in the childhood vaccination calendar, should be completed before pregnancy in all women of childbearing age.¹⁵ In this context, it is important to inform women in the pre-pregnancy period and to review the necessary vaccines to protect them.

In the study of Sari et al., it was determined that only 5 (4.3%) of the healthcare professionals had influenza vaccination, and 59 (51.3%) of them had never had influenza vaccination in their lifetime.¹⁶ In a study conducted in Italy, the rate of getting the flu vaccine was 32.5%¹⁷ while another study conducted in Oman found it to be 60%.¹⁸ In the study of Öztürk et al.¹⁹, 17% was the percentage of those who received the flu vaccine among all healthcare workers while it was 10.4% in the study of Solay et al.²⁰ Our findings were similar to or higher than those of the studies conducted in the country, but lower than those of the studies conducted abroad. The reason for the higher rate of vaccination in the last year, as suggested by this study, may be the anxiety caused by the Covid-19 pandemic. Although influenza vaccination rates by occupational groups were reported to be higher in nurses in some studies, vaccination rates in physicians were found to be higher in other studies, as in this study.¹⁹ Due to the educational level of physicians, the high vaccination rates are generally expected.

When the rate of vaccination by the years in the profession is looked into, influenza vaccination rate in the employees working for more than 10 years was found to be significantly higher than the employees with a working period of less than 1 year and 1 to 10 years.¹⁹ In this study, no significant difference was found between the years spent in the profession and the vaccination rates. Considering the low vaccination rates, it has been observed that there has not been enough awareness about vaccination over the years among participants.

In a study at three university hospitals in Catania, Messina and Palermo in Sicily, healthcare workers reported that they were vaccinated in order to protect patients.²⁰ The most frequently cited reason in our study was self-protection. 51.5% of those who stated that they were

vaccinated to protect patients were doctors, and a statistically significant difference was observed when compared to non-physician healthcare workers. Emphasizing the importance of vaccination of healthcare workers not only for personal protection, but also for the prevention of in-hospital outbreaks may be effective in eliminating this difference.

We found that there were also vaccine hesitancy problems for influenza vaccine among healthcare professionals in accordance with the literature. In a study, the reasons for not getting the flu vaccine were determined to be not believing that it is scientifically beneficial (43%), neglect (18%), workload (7%), negative news in the press (7%), and other reasons (24%).¹⁹ In the study of Sarı et al.¹⁶, the most important reasons for not being eager to get vaccinated against influenza are disbelief in the necessity of the vaccine (64.5%), preferring other protection methods (40.9%), fear of the side-effect profile (39.1%) and insufficient vaccination of the vaccine and thinking that it has not been tried enough. Similarly, in the study of Solay et al.²¹, 28.6% of the subjects did not believe that the vaccination protected. The reasons for not getting vaccinated against influenza as found in our study were mutation of the virus, preferring other ways of protection, believing that influenza is not a risky and serious disease, and not being at risk for influenza. It is important to eliminate vaccine hesitancy and ensure full immunization of healthcare workers, who are in the highest risk group in terms of biological risks.

The EIP in Turkey includes vaccines recommended for healthcare workers.⁶ Despite this, inadequate vaccination /screening programs and neglect were the most common reasons for not being vaccinated in our study. This may be because participants are not sufficiently aware of the scope of the program.

The main limitation of the study is; based on self-reported vaccination status and so subject to recall bias. Also, for some vaccines, a single dose may be insufficient. Another limitation is the participants are only from two public hospitals in a city center, so the results cannot be generalized to all healthcare professionals.

In conclusion, a significant proportion of the health workers participating in this study are not aware of their vaccination status regarding occupational infectious diseases, and their immune status was not determined by antibody control.

Regular vaccination programs can reduce both the number of vulnerable healthcare workers in healthcare facilities and the risk of transmission of vaccine-preventable diseases to other workers and patients.

The vaccination rates we found in this study are not sufficient in terms of preventing the spread of diseases among healthcare workers and preventing hospital outbreaks. In order to increase vaccination rates; increasing awareness would make an important contribution. In this regard, establishing Occupational Health Centers in all health institutions or making existing centers more functional, constituting a regular registration and follow-up system for vaccination and

antibody level measurement, conducting training activities for employees and conducting risk analyses to reduce existing risks are among the first suggestions that come to mind.

Main Points

Healthcare workers are at risk of transmission of vaccine-preventable diseases.

Regular vaccination programs can reduce the risk of transmission of vaccine-preventable diseases to other workers and patients.

Increasing awareness is important to reach sufficient vaccination rates.

Compliance with Ethical Standards

The protocol for the research project has been approved by the TUHCMRH Non-Invasive Clinical Research Ethics Committee (date: 14-06-2021 and approval number: 2021/272)

Acknowledgements

None

Conflict of Interest

The authors have not conflict of interest to declare.

Author contributions

PZD: Concept; PZD, GE, FY: Design; PZD, GE, FY: Supervision; FÖT, ESB, ÜÇ: Resources; FÖT, ESB, ÜÇ: Materials; FÖT, ESB, PZD: Data Collection and/or Processing; PZD, FÖT, ESB, GE, ÜÇ: Analysis and/or Interpretation; PZD, FÖT, ESB, GE, ÜÇ: Literature Search; PZD, FÖT, ESB, GE, ÜÇ: Writing Manuscript; GE, ÜÇ, FY: Critical Review

Financial Disclosure

The authors declared that this study has received no financial support.

References

1. T.R. Ministry of Health, General Directorate of Public Health. Vaccine Portal. Available at: <https://asi.saglik.gov.tr/genel-bilgiler>. Accessed August 11, 2021.
2. World Health Organization. Global Vaccine Action Plan 2011–2020. Available at: <https://www.who.int/publications/i/item/global-vaccine-action-plan-2011-2020>. Accessed August 20, 2021.
3. Şimşek Orhon F. Genişletilmiş Bağışıklama Programına Her Yönüyle Bakış. *Osmangazi Tıp Dergisi Sosyal Pediatri Özel Sayısı*. 2020:6-14.
4. CDC. Immunization of Health-Care Workers: Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC). Available at: <https://www.cdc.gov/mmwr/preview>. Accessed August 11, 2021.
5. T.R. Ministry of Health, General Directorate of Public Health. Vaccination due to Occupational Risks. Available at: <https://asi.saglik.gov.tr/asi-kimlere-yapilir/>. Accessed August 11, 2021.

6. T.R. Ministry of Health. Extended Immunization Program Circular (2009). Available at: <https://www.saglik.gov.tr/TR,11137/genisletilmis-bagisiklama-programi-genelgesi-2009.html>. Accessed August 11, 2021.
7. CDC. Guidelines for infection control in health care personnel, 1997: recommendations of the Hospital Infection Control Practices Advisory Committee. Available at: <https://www.cdc.gov/infectioncontrol/guidelines/healthcare-personnel/index.html> Accessed August 10, 2021.
8. Mir O, Adam J, Gaillard R, et al. Vaccination coverage among medical residents in Paris, France. *Clin Microbiol Infect.* 2012;18:137-139. doi:10.1111/j.1469-0691.2012.03788.x
9. Ledda C, Rapisarda V, Maltezou HC, et al. Coverage rates against vaccine-preventable diseases among healthcare workers in Sicily (Italy). *Eur J Public Health.* 2020;31:52-56. doi:10.1093/eurpub/ckaa179
10. Dannetun E, Tegnell A, Torner A, Giesecke J. Coverage of Hepatitis B vaccination in Swedish healthcare workers. *J Hosp Infect.* 2006;63:201-204. doi:10.1016/j.jhin.2006.01.014
11. Yousafzai MT, Qasim R, Khalil R, Kakakhel MF, Rehman SU. Hepatitis B vaccination among primary health care workers in Northwest Pakistan. *Int J Health Sci (Qassim).* 2014;8:67-76. doi:10.12816/0006073
12. Öncül A, Aslan S, Pirinççioğlu H, Özbek E. Diyarbakır Devlet Hastanesi çalışanlarında HBV, HCV, HIV, VDRL seropozitifliğinin ve aşılanma oranlarının belirlenmesi. *J Exp Clin Med.* 2012;29:280-284. doi:jecm.omu.29.04.006
13. Apaydın H, Demir Ş, Karadeniz A. Bir Tıp Fakültesi Hastanesi Sağlık Çalışanlarında Hepatit A, Hepatit B, Hepatit C Seroprevalansı ve Aşılanma Durumu. *Sakarya Tıp Dergisi.* 2021;11:360-365. doi:10.31832/smj.806090
14. Hemida E, Momen M, Fotouh AA, Boulos D. Susceptibility and Vaccination Coverage of Vaccine Preventable Diseases among Health Care Workers in a Paediatric Tertiary Hospital, Egypt. *The Egyptian Journal of Community Medicine.* 2020;38:42-50. doi: 10.21608/EJCM.2020.68619
15. Ak F. Aile Hekimliği ve Gebelikte Enfeksiyonlar. *Türkiye Klinikleri J Fam Med-Special Topics.* 2014;5:881-894.
16. Sarı T, Temoçin F, Köse H. Attitudes of Healthcare Workers Towards Influenza Vaccine. *Klimik Dergisi.* 2017;30:59-63. doi:10.5152/kd.2017.15
17. Panatto D, Lai PL, Mosca S, et al. Influenza Vaccination in Italian Healthcare Workers (2018-2019 Season): Strengths and Weaknesses. Results of a Cohort Study in Two Large Italian Hospitals. *Vaccines (Basel).* 2020;8:119. doi:10.3390/vaccines8010119
18. Awaidy STA, K Al Mayahi Z, Kaddoura M, et al. Influenza Vaccination Hesitancy among Healthcare Workers in South Al Batinah Governorate in Oman: A Cross-Sectional Study. *Vaccines (Basel).* 2020;8:661. doi:10.3390/vaccines8040661
19. Öztürk R, Ilgar T, Cesur S, Şahan S, Gür N, Şanal L. Sağlık çalışanlarının grip aşısı hakkındaki bilgi düzeyleri ve aşıya karşı yaklaşımlarının değerlendirilmesi. *Anadolu Güncel Tıp Dergisi.* 2020;2(1):13-18. doi:10.38053/agtd.656445
20. Costantino C, Ledda C, Squeri R, et al. Attitudes and Perception of Healthcare Workers Concerning Influenza Vaccination during the 2019/2020 Season: A Survey of Sicilian University Hospitals. *Vaccines (Basel).* 2020;8:686. doi:10.3390/vaccines8040686
21. Haykır Solay A, Uzar H, Acar A, et al. Üçüncü basamak sağlık hizmeti veren bir merkezde sağlık çalışmalarının influenza aşısına yaklaşımı, aşılanma oranları ve nozokomiyal influenza sıklığı. *ANKEM Derg.* 2020;34:6-12. doi:10.5222/ankem.2020.006