

Sağlık Çalışanlarının Ünvanlarına Göre Aşı Reddi ile İlgili Görüş ve Tutumları: Sinop Atatürk Devlet Hastanesi

Healthcare Workers Opinions and Attitudes Toward Vaccine Refusal Based on Their Titles: Sinop Atatürk State Hospital

Zeynep ŞİRİN¹, Yılmaz ALTUNER², Suzan ONUR³

ÖZ

Amaç: Bu çalışma sağlık çalışanlarının ünvanlarına göre aşı reddi ile ilgili görüş ve tutumlarını belirlemek amacıyla yapılmıştır.

Gereç ve Yöntem: Kesitsel tipte hazırlanan bu çalışmanın verileri 15 Kasım 2023-15 Haziran 2024 tarihleri arasında, Sinop Atatürk Devlet Hastanesi'nde çalışan 460 sağlık çalışanı ile gerçekleştirilmiştir. Veri toplama formunda sağlık personellerinin sosyo-demografik özellikleri ile aşı konusunda bilgi ve görüşlerini belirlemeye yönelik 46 soru yer almıştır. İstatistiksel analizler, SPSS 27.0 paket programı kullanılarak yapılmıştır. Çalışmadan elde edilen sürekli veriler ortalama standart sapma; kategorik veriler yüzde dağılım biçiminde özetlenmiştir. Değişkenler arası ilişkilerin değerlendirilmesinde Pearson Ki-kare Testi kullanılmış, istatistiksel anlamlılık sınır değeri $p < 0.05$ olarak kabul edilmiştir.

Bulgular: Sağlık çalışanlarının 257'sini erkek, 203'ünü kadın ve çoğunluğunu (%46.1) 30 yaş altı bireyler oluştururken, %13.3'ü hekim, %27.6'sı ebe, %44.8'i hemşire, %14.3'ü ise sağlık teknisyenidir. Aşı uygulamasının toplum sağlığı açısından gerekli olduğunu ifaden edenler %90.4, güvenli bulaşlar %72.4, aşı reddinin bir halk sağlığı sorunu olduğunu belirtenler %69.45 olarak tespit edilmiş ve aralarındaki fark istatistiksel olarak anlamlı bulunmuştur.

Sonuç: Sağlık çalışanlarının büyük çoğunluğu aşuya karşı olumlu bir tutum sergilemiş ve aşı reddini desteklememiştir. Ancak, ünvanlarına göre kıyaslandığında bu alanda bilgi eksikliklerinin olduğu tespit edilmiştir. Bu eksikliklerin giderilmesi amacıyla, sağlık çalışanlarına yönelik kapsamlı hizmet içi eğitimlerin planlanması ve uygulanmasının önemli olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Aşı; Aşı Reddi; Halk Sağlığı; Sağlık Çalışanı

ABSTRACT

Aim: This study was conducted to determine the healthcare workers opinions and attitudes toward vaccine refusal based on their titles.

Material and Method: The data for this cross-sectional study were collected between November 15, 2023, and June 15, 2024, from 460 healthcare workers employed at Sinop Atatürk State Hospital. The data collection form included 46 questions aimed at identifying the socio-demographic characteristics of healthcare workers as well as their knowledge and opinions on vaccines. Statistical analyses were performed using the SPSS 27.0 software package. Continuous variables obtained from the study were summarized as mean and standard deviation, while categorical data were presented as percentage distributions. The Pearson Chi-square Test was used to evaluate relationships between variables, and the threshold for statistical significance was set at $p < 0.05$.

Results: Among the healthcare workers, 257 were male, 203 were female, and the majority (46.1%) were under the age of 30. Of the participants, 13.3% were physicians, 27.6% were midwives, 44.8% were nurses, and 14.3% were health technicians. It was found that 90.4% believed vaccine administration is necessary for public health, 72.4% considered vaccines safe, and 69.45% regarded vaccine refusal as a public health issue, with the differences between these groups being statistically significant.

Conclusion: The vast majority of healthcare workers demonstrated a positive attitude toward vaccines and did not support vaccine refusal. However, when compared by professional titles, it was identified

Geliş Tarihi/Received: 22.11.2024 **Kabul Tarihi/Accepted:** 19.11.2025 **DOI:** 10.57224/jhpr.1589544

¹ Karabük Üniversitesi, onnzynp@gmail.com, 0009-0009-7821-3034

² Karabük Üniversitesi, ayilmaz@karabuk.edu.tr, 0000-0002-8162-2842

³ Karabük Üniversitesi, suzanonur@karabuk.edu.tr, 0000-0001-8145-6090

Sorumlu yazar/Correspondence: Suzan ONUR

Cite this article as: Şirin Z, Altuner Y, Onur Z. Healthcare Workers Opinions and Attitudes Toward Vaccine Refusal Based on Their Titles: Sinop Atatürk State Hospital. J Health Pro Res 2026:71-83

that there were gaps in knowledge in this area. It was concluded that planning and implementing comprehensive in-service training programs for healthcare workers is important to address these deficiencies.

Keywords: Health Personnel; Public Health; Vaccines; Vaccination Refusal

INTRODUCTION

Vaccination programs are recognized as the most cost-effective method for preventing vaccine-preventable infectious diseases, thereby reducing the morbidity and mortality associated with these diseases and contributing to the development of a healthy society (1). Individual immunity is achieved through vaccination, protecting the person from disease, and as a result, community immunity is established (2). As the number of vaccinated individuals in society increases, the rate at which unvaccinated individuals encounter pathogens decreases, thus reducing the frequency of infectious

diseases in the community (3). When examining the time up to the present, successful vaccination efforts have laid a significant foundation, and immunization rates have increased. This has led to a substantial reduction in the prevalence of vaccine-preventable infectious diseases, as documented in the literature (4).

The World Health Organization (WHO) has established a global immunization program and recommended the use of vaccines. The aim of this program is to protect the community from vaccine-preventable diseases as much as possible (5).

Although there is global consensus on vaccination and immunization practices, the concept of vaccine refusal/hesitancy has emerged in recent years due to various social, political, personal, and/or cultural reasons (6). In 2019, the WHO included vaccine hesitancy/refusal as one of the threats to global health and distinguished between the two terms. Vaccine hesitancy is the delay in accepting or refusal to receive vaccines despite their availability, and it may apply to one or more vaccines. Vaccine refusal, however, refers to the willful decision not to receive any vaccines (7). Along with vaccine refusal, there has been a significant increase in the number of vaccine-preventable diseases (8). Vaccine refusal has gained particular importance during the global coronavirus disease 2019 (Covid-19) pandemic, a period in which efforts were being made to develop a vaccine. Despite the spread rate,

health problems, and societal impacts of Covid-19, people approached vaccination hesitantly due to misinformation or insufficient information from sources such as the internet, television, religious influences, and government policies (9). In a study conducted in Turkey in 2016, 6% of participants expressed anti-vaccine and anti-immunization opinions, citing sources of information like social media, television, and healthcare personnel (10). Healthcare personnel are of great importance in the decision-making process of individuals/parents regarding primary healthcare vaccinations. Whether individuals choose to vaccinate or not, they seek information from healthcare personnel. Recommendations from healthcare workers hold significant value regarding vaccination behaviors, especially for individuals at risk. Studies emphasize the importance of healthcare workers in providing accurate and reliable information (4, 5, 11).

Among the general reasons for vaccine refusal are the high cost of vaccines, the absence of certain vaccines in the national immunization program, the perception that the existing disease is not a significant health problem, difficulties in accessing vaccines, the failure of families or healthcare workers to administer vaccinations on time, the lack of adequate pre- and post-vaccination education by healthcare workers, the absence of vaccination cards, lack of information, and families' concerns about vaccine ingredients (12). Another factor contributing to vaccine refusal is vaccine side effects. For this reason, healthcare workers should be knowledgeable about vaccine side effects, take necessary precautions, and inform families effectively. As an additional measure, they should ask families visiting their institution about their child's vaccination status, identify any missing vaccines, and determine the reasons for non-vaccination (13).

For these reasons, this study was prepared to determine the opinions and attitudes of healthcare workers regarding vaccine refusal.

Artificial intelligence (AI) refers to computer systems and machines that mimic human intelligence, allowing them to perform tasks

that require cognitive functions such as problem solving, learning, language processing, perception, and decision making (1). As AI becomes more integrated into our daily lives, we are also seeing a parallel increase in its use within the healthcare sector. Many healthcare professionals are now utilizing these technologies for clinical decision-making, diagnosis, and patient management (2). AI-based applications in physiotherapy and rehabilitation, including video analysis, robotic devices, virtual assistants, predictive algorithms, and risk assessment tools, have been gaining popularity dramatically (3). The rise of AI-supported healthcare technologies necessitates that healthcare professionals use these tools appropriately and understand their impact on patient care, the healthcare system, and society (2, 4). As AI technology has been evolving, healthcare professionals will inevitably encounter various technologies and applications in clinical settings (4). It is anticipated that health profession students will utilize AI tools as they complete their education and begin their careers. Therefore, educators and administrators must focus on how to effectively incorporate AI technologies into the training of future healthcare professionals (5, 6). Recently, the Council of Higher Education in Turkey highlighted the importance of AI-focused education in its 2024-2028 strategic plans, emphasizing that "Encouraging students to enroll in courses on data science and AI, as well as establishing undergraduate and associate degree programs to provide skills in AI-based technologies."

(<https://www.yok.gov.tr/kurumsal/stratejik-plan>).

As the reliance on AI grows in the healthcare sector, including physiotherapy and rehabilitation, it becomes increasingly important to incorporate AI-based training into the education of healthcare professionals. Examining the factors that influence healthcare candidates' attitudes toward AI and investigating the effects of AI training will be crucial in this context (7-10). However, studies investigating the factors related to AI attitudes of physiotherapy students are scarce. Moreover, to the authors' knowledge, no study has examined the effect of an AI course on attitudes toward AI, AI literacy, and technology tendency in physiotherapy and rehabilitation students. Therefore, we focused on two aims: 1. To

investigate the factors related to the AI attitudes of physiotherapy and rehabilitation students, including AI literacy and technology tendencies. 2. To examine the impact of an AI course on attitudes toward AI, AI literacy, and technology tendencies in physiotherapy and rehabilitation students.

MATERIAL AND METHODS

Type of Study

This study was conducted as a Cross-sectional study.

Location and Date of Study

The study was carried out at Sinop Atatürk State Hospital between November 15, 2023, and June 15, 2024.

Population and Sample of the Study

The population of the study consisted of 686 healthcare workers (Physicians, midwives, nurses, and health technicians) working at Sinop Atatürk State Hospital. The sample size was calculated using the random sampling method based on the 686 healthcare workers, and a minimum of 247 samples was determined to be sufficient with 95% test reliability (5% alpha error) and 95% test power (5% beta error). Random sampling is based on selecting a sample entirely at random from a population with specified characteristics, with a size large enough to statistically represent the population (14). In this study, face-to-face interviews were conducted with 460 healthcare personnel, and data was collected beyond the minimum sample size to increase reliability.

Inclusion Criteria

Employment at Sinop Atatürk State Hospital between November 15, 2023, and June 15, 2024; being a physician, midwife, nurse, or health technician; and willingness to participate in the study.

Exclusion Criteria

Being on leave and/or medical leave between November 15, 2023, and June 15, 2024; not being a physician, midwife, nurse, or health technician; and unwillingness to participate in the study.

Data Collection Tools

The data collection form included 46 questions to determine the socio-demographic characteristics of healthcare workers and their knowledge and opinions about vaccines.

Data Collection Procedure

Prior to starting the study, the necessary approvals were obtained from the Non-Interventional Clinical Research Ethics

Committee of Karabuk University (E-77192459-050.99-298862) and the Sinop Provincial Health Directorate. Administrators of Sinop Atatürk State Hospital were informed, and information on the numbers of doctors, midwives, nurses, and health technicians was obtained from the hospital's personnel department. The purpose of the study was explained to the healthcare workers, verbal consent was obtained from each participant, and the data collection forms were completed face-to-face.

Methods Used in Data Analysis

Statistical analyses were performed using the SPSS 27.0 software package. Continuous data obtained from the study were summarized as mean \pm standard deviation, while categorical

data were presented as percentage distribution. The relationships between variables were evaluated using the Pearson Chi-square Test, and the threshold for statistical significance was set at $p < 0.05$.

RESULTS

While 46.1% of healthcare workers are under 30 years of age, 17.8% are over 45. Among the workers, 76.1% have a university degree, and 18.2% hold a graduate degree. Of the healthcare workers, 60.4% are married, 39.6% are single, 87.2% have a nuclear family, and 76.5% reside in the city center. A total of 57.6% of workers have an income between 22.001-32.000 TL, while 9.8% earn in the lowest income bracket of 12.000-22.000 TL.

Table 1. Demographic Characteristics of Healthcare Workers

Age	n	%
Under 30 years	212	46.1
Between 30-45 years	166	36.1
Over 45 years	82	17.8
Education Level		
High School	26	5.7
University	350	76.1
Postgraduate	84	18.2
Marital Status		
Single	182	39.6
Married	278	60.4
Place of Residence		
Provincial center	352	76.5
District and Village	108	23.5
Family Type		
Nuclear Family	401	87.2
Extended Family	59	12.8
Monthly Income Level		
Between 12.000-22.000 TL	45	9.8
Between 22.001-32.000 TL	265	57.6
Between 32.001-42.000 TL	63	13.7
Between 42.001-52.000 TL	49	10.7
Between 52.001 TL and above	38	8.1
Number of Children		
No children	185	40.2
1-2 children	202	43.9
3 and above children	73	15.8
Title		
Physician	61	13.3
Midwife	127	27.6
Nurse	206	44.8
Health Technician	66	14.3
Duration of Employment at the Institution		
0-5 years	264	57.4
5-10 years	88	19.2
10-15 years	66	14.3
15 and above years	42	9.1
Total	460	100.0

Among the workers, 40.2% have no children, while 43.9% have 1-2 children. Regarding job

roles, 44.8% are nurses, 27.6% are midwives, 13.3% are doctors, and 14.3% are health

technicians. In terms of work experience in the healthcare sector, 57.4% have worked for 0-5 years, 19.2% for 5-10 years, and 14.3% for 10-15 years, while those with 15 and above years or more have the lowest rate at 14.3% (Table 1). The proportion of healthcare workers who consider vaccination necessary for public health is high, with a rate of 88.5% across all professional groups. The highest rate was found among doctors at 98.4%, while the lowest was among midwives at 78.0%. This difference between groups was found to be statistically significant ($p<0.001$) (Table 2).

The percentage of those who state that vaccination is an effective immunization method is also quite high at 83.7%. The highest rate was again in the doctor group at 98.4%, while the lowest was in the midwife group at 78.0%. This difference was found to be statistically significant ($p<0.01$) (Table 2).

The proportion of healthcare workers who believe that effective vaccination can reduce child mortality from preventable diseases was 92.0%, with the highest rate among doctors at 98.4% and the lowest among midwives at 81.1%. This difference was statistically significant ($p<0.001$) (Table 2).

Table 2. Evaluation of Vaccine Implementation from a Public Health Perspective According to the Titles of Healthcare Workers

	Physician (n=61)		Midwife (n=127)		Nurse (n=206)		Health Technician (n=66)		Total (n=460)		p ^a
	n	%	n	%	n	%	n	%	n	%	
The Status of Considering Vaccination Application as Necessary from a Public Health Perspective											
Yes	60	98.4	99	78.0	185	89.8	63	95.5	407	88.5	<0.001***
No	1	1.6	6	4.7	13	6.3	2	3.0	22	4.8	
I am undecided	0	0.0	22	17.3	8	3.9	1	1.5	31	6.7	
The Status of Knowing Whether the Vaccine is an Effective Immunization Method											
Yes	60	98.4	99	78.0	170	82.5	56	84.8	385	83.7	<0.008**
No	1	1.6	10	7.9	19	9.2	2	3.0	32	7.0	
I am undecided	0	0.0	18	14.2	17	8.3	8	12.1	43	9.3	
The Status of Believing that Childhood Deaths Caused by Vaccine-Preventable Diseases Can Be Prevented with Effective Vaccination											
Yes	60	98.4	103	81.1	200	97.1	60	90.9	423	92.0	<0.001***
No	1	1.6	3	2.4	0	0.0	2	3.0	6	1.3	
I am undecided	0	0.0	21	16.5	6	2.9	4	6.1	31	6.7	

a: Pearson Chi-Square Test; *** $p<0.001$; ** $p<0.01$

A total of 69.3% of healthcare workers found vaccines to be safe. This rate was highest among doctors at 88.5%, while it was 65.4% among midwives, 66.0% among nurses, and 69.7% among health technicians. The percentage of those who were undecided was 23.5%, especially higher among nurses and midwives. This difference between groups was found to be statistically significant ($p<0.001$) (Table 3).

The proportion of healthcare workers who believed that the toxic substances in vaccines pose a health threat was 34.1%, with the highest rate among health technicians at 43.9% and the lowest among doctors at 16.4%. The rate of those who disagreed with this view was highest

among doctors at 55.7% and lowest among health technicians at 4.5%. This difference between groups was also found to be statistically significant ($p<0.001$) (Table 3).

A total of 62.2% of healthcare workers stated that vaccination in infancy does not lead to conditions such as autism or infertility. This view was supported most strongly by doctors at 82.0% and health technicians at 80.3%, while it was lowest among midwives at 48%. The proportion of those who were undecided on this issue was 22.8%, with the highest rate among midwives at 29.9%. This difference between groups was statistically significant ($p<0.001$) (Table 3).

Table 3. Opinions and Attitudes of Healthcare Workers Regarding Vaccine Ingredients by Job Title

	Physician (n=61)		Midwife (n=127)		Nurse (n=206)		Health Technician (n=66)		Total (n=460)		p ^a
	n	%	n	%	n	%	n	%	n	%	
The Status of Considering Vaccines Safe											
Yes	54	88.5	83	65.4	136	66.0	46	69.7	319	69.3	<0.001***
No	3	4.9	11	8.7	10	4.9	9	13.6	33	7.2	
I am undecided	4	6.6	33	26.0	60	29.1	11	16.7	108	23.5	
The Status of Believing that the Toxic Substances in Vaccines Threaten a Person's Health											
Yes	10	16.4	45	35.4	73	35.4	29	43.9	157	34.1	<0.001***
No	34	55.7	42	33.1	50	24.3	3	4.5	129	28.0	
I am undecided	17	27.9	40	31.5	83	40.3	34	51.5	174	37.8	
The Status of Believing that Vaccination in Infancy Leads to Diseases such as Autism, Infertility, etc.											
Yes	6	9.8	28	22.0	24	11.7	11	16.7	69	15.0	<0.001***
No	50	82.0	61	48.0	122	59.2	53	80.3	286	62.2	
I am undecided	5	8.2	38	29.9	60	29.1	2	3.0	105	22.8	

a: Pearson Chi-Square Test; ***p<0.001

A total of 69.3% of healthcare workers reported that they believe vaccine refusal is a public health issue. This view was most prevalent among doctors at 90.2%, followed by midwives at 71.7% and nurses at 68.9%. In contrast, only 47% of health technicians considered vaccine refusal a public health problem. This variation highlights the diversity in perspectives on vaccine refusal across job titles, particularly showing that doctors are more sensitive to vaccine refusal. This difference was statistically significant ($p<0.001$) (Table 4).

Among healthcare workers, 84.1% stated that they recommend routine vaccines to their relatives and patients. Health technicians were the most likely to make these recommendations at 89.4%, followed by doctors at 88.5%. However, 3.3% of healthcare workers said they would not make recommendations because they do not believe in the effectiveness of vaccines. Additionally, 4.3% of workers reported that they would not recommend vaccination, as they considered the infections to be unimportant. These findings indicate that the majority of healthcare workers believe in the benefits of vaccines and are inclined to support public health, with statistically significant results ($p<0.05$) (Table 4).

A total of 84.8% of participants stated that the entire community would be affected if vaccination is not carried out. The highest rates of agreement with this view were among doctors at 95.1% and nurses at 89.3%. Among midwives and technicians, however, a higher

proportion believed that only the individual or close contacts would be affected if vaccination is not done (18.9% and 15.2%, respectively). Additionally, 0.7% of healthcare workers believed that no one would be affected if vaccination is not done. This finding suggests that doctors and nurses more strongly embrace the importance of vaccination for public health, and this result was statistically significant ($p<0.001$) (Table 4).

A total of 29.3% of healthcare workers believed that social media should be used in a positive direction to increase knowledge about vaccines; specifically, 26.2% of doctors, 34.6% of midwives, and 32.5% of nurses considered social media an important tool for raising awareness. However, among health technicians, this view was lower at 12.1%. This finding indicates that healthcare workers place importance on using social media for accurate information dissemination about vaccinations, with a significant difference observed between groups ($p<0.001$) (Table 5).

Additionally, 18.9% of participants thought that legal action against those who refuse vaccination could act as a deterrent. This view was strongly supported by doctors (59%), while nurses (16%), midwives (9.4%), and health technicians (9.1%) were less supportive. This result highlights that doctors, in particular, advocate for stricter measures against vaccine refusal, with the difference between groups being statistically significant ($p<0.001$) (Table 5).

Table 4. Opinions and Attitudes of Healthcare Workers Regarding Vaccine Refusal by Job Title

	Physician (n=61)		Midwife (n=127)		Nurse (n=206)		Health Technician (n=66)		Total (n=460)		p ^a
	n	%	n	%	n	%	n	%	n	%	
The Status of Believing that Vaccine Refusal is a Public Health Issue											
Yes	55	90.2	91	71.7	142	68.9	31	47.0	319	69.3	<0.001***
No	6	9.8	22	17.3	50	24.3	9	13.6	87	18.9	
I am undecided	0	0.0	14	11.0	14	6.8	26	39.4	54	11.7	
The Status of Recommending Vaccines from the Routine Immunization Schedule to Relatives and Patients											
-Yes	54	88.5	104	81.9	170	82.5	59	89.4	387	84.1	<0.025*
-No, I don't believe vaccines protect against diseases	4	6.6	4	3.1	7	3.4	0	0.0	15	3.3	
-No, I think the infections prevented by vaccines are insignificant	2	3.3	5	3.9	13	6.3	0	0.0	20	4.3	
The Status of Indicating Who is Affected When Vaccination is Not Administered											
-Only the individual is affected	0	0.0	24	18.9	6	2.9	10	15.2	40	8.7	<0.001***
-Only the close surroundings are affected	3	4.9	8	6.3	16	7.8	0	0.0	27	5.9	
-The entire society is affected	58	95.1	93	73.2	184	89.3	55	83.3	390	84.8	
-No one is affected	0	0.0	2	1.6	0	0.0	1	1.5	3	0.7	

a: Pearson Chi-Square Test; ***p<0.001; *p<0.05

Table 5. Recommendations of Healthcare Workers by Job Title on Preventing Vaccine Refusal

	Physician (n=61)		Midwife (n=127)		Nurse (n=206)		Health Technician (n=66)		Total (n=460)		p ^a
	n	%	n	%	n	%	n	%	n	%	
The Status of Suggestions for Preventing Vaccine Refusal											
I believe that directing social media in the right way would be useful to increase the level of knowledge on this issue.	16	26.2	44	34.6	67	32.5	8	12.1	135	29.3	<0.001***
I think that the Ministry of Health should provide training on vaccination and increase the level of knowledge.	9	14.8	47	37.0	92	44.7	41	62.1	189	41.1	
Imposing financial penalties on those who refuse vaccination could be deterrent.	0	0.0	11	8.7	8	3.9	0	0.0	19	4.1	
Legal actions against those who refuse vaccination could be deterrent.	36	59.0	12	9.4	33	16.0	6	9.1	87	18.9	

a: Pearson Chi-Square Test; ***p<0.001

The percentage of healthcare workers who believed that imposing financial penalties on those refusing vaccination would be a deterrent was relatively low at 4.1%, and the difference was statistically significant (p<0.001). This low percentage suggests that such measures may not be effective in preventing vaccine hesitancy, and healthcare workers seem to prefer more constructive solutions (Table 5).

A total of 41.1% of respondents believed that the Ministry of Health should conduct training on vaccinations; 62.1% of health technicians, 44.7% of nurses, 37% of midwives, and 14.8% of doctors emphasized the importance of this training. These results indicate a consensus among healthcare workers on the need to increase knowledge levels and awareness about vaccinations, with a statistically significant difference between groups (p<0.001) (Table 5).

DISCUSSION

Vaccinations play a critical role in protecting public health and preventing diseases. However, vaccine hesitancy and refusal behaviors pose a significant threat to both individual and societal health. The attitudes of healthcare workers toward vaccinations are among the key factors influencing vaccination rates in the community. In this context, a study conducted at Sinop State Hospital provides valuable insights by examining healthcare workers' perceptions, knowledge levels, and behaviors regarding vaccination.

The study revealed that the demographic characteristics of the healthcare workers were predominantly young, university-educated individuals with middle-income levels and nuclear family structures. The high proportion of young workers reflects the entry of a new generation of professionals into the healthcare workforce, while the lower percentage of experienced personnel might indicate potential gaps in experience. The substantial representation of nurses and midwives suggests that these groups bear a significant workload in providing healthcare services. The high educational level of the healthcare workers implies strong professional competence and knowledge, which could positively influence both public health and the quality of healthcare services. Kader et al. (2022) found that healthcare workers with higher levels of education, such as master's and doctoral degrees, were more inclined to get vaccinated against COVID-19 compared to those with associate or bachelor's degrees (15). Similarly, Bonville et al. (2017) observed a correlation between educational level, relevant training, and attitudes toward vaccination (16). Karafillakis et al. (2016) also reported a relationship between educational level, training on the topic, and knowledge and attitudes toward vaccination (17). Yakşı (2020) observed in their study that healthcare workers with professional or in-service training on vaccine rejection demonstrated more positive attitudes and a good level of knowledge (18). Consistent with the literature, the majority of healthcare workers in this study were university graduates, with some holding postgraduate degrees, and displayed a positive attitude towards vaccination.

In the study, 88.5% of participants stated that vaccination is necessary for public health. These findings indicate that healthcare workers

generally support vaccination practices and acknowledge the importance of vaccination for public health. Similarly, Koçyiğit (2020) reported this percentage to be 97.5% (19). In this study, 92% of respondents believed that effective vaccination could prevent child mortality due to vaccine-preventable diseases, comparable to the 94.9% found in Koçyiğit's (2020) study. Saraç (2019) reported that 66.7% of nurses in primary care, 47.8% in secondary care, and 42.5% in tertiary care believed in the necessity of childhood vaccinations (20). The variation among professional groups found in this study suggests that while physicians strongly support the importance of vaccination for public health, midwives might benefit from increased knowledge about vaccine efficacy and its impact on child mortality. This could be improved through educational programs and/or awareness-raising activities. In a study by Bonville et al. (2017), 95% of family physicians consistently recommended vaccines in childhood vaccination programs, describing it as an effective immunization strategy (16). Likewise, 95.7% of participants in Koçyiğit's (2020) study supported vaccination as an effective immunization method (19). Based on study findings, it can be inferred that as educational levels increase, individuals exhibit significantly greater awareness regarding effective immunization. Additionally, the widespread acceptance of vaccination's impact on public health among healthcare workers contributes to the stronger advocacy for vaccination programs in health policies and the community.

It has been reported that distrust in vaccines is the most frequently cited reason for vaccine refusal in Turkey, with a rate of 14% (21). Similarly, in our study, the rate of those who found vaccines unsafe was 7.2%. In a study by Karafillakis et al. (2016) involving 65 healthcare workers, vaccine hesitancy was found across all examined countries (France, Romania, Greece, Croatia), with major concerns including vaccine side effects, doubts about vaccine safety, and questions about vaccine efficacy (17). Therefore, a high level of trust in vaccine safety could increase public acceptance of vaccines.

Another common reason for vaccine refusal in Turkey is distrust in vaccine content, cited by 30% of respondents (21). Similarly, in this study, 34.1% of participants believed that toxic

substances in vaccines posed a health threat. In Arıcan's (2019) study, 6.9% of participants thought that vaccines contained harmful substances (22). Yakşı (2020) reported that distrust in vaccine content was the primary reason for vaccine refusal, with a notably high rate of 84% significantly above findings in other studies (18). In our study, this rate was highest among health technicians (43.9%) and lowest among physicians (16.4%), suggesting potential knowledge gaps and concerns among technicians. Increasing educational and informational programs could help alleviate these concerns within this group.

Vaccine side effects are another factor contributing to vaccine refusal. In our study, the proportion of those who believed that vaccines could cause conditions such as autism and infertility was quite low (15%). This rate was particularly low among physicians, at 9.8%. Similarly, in Koçyiğit's (2020) study, 86% of participants stated that vaccines administered during infancy do not cause autism or similar conditions (18). In Arıcan's (2019) study, concern about side effects was reported as a reason for vaccine refusal by 12.9% of respondents (22). Organizations like the WHO and GACVS (Global Advisory Committee on Vaccine Safety) have conducted studies affirming that there is no link between autism and vaccines (23). In a descriptive study by Freed et al. (2010), most families believed vaccines were protective, although over half expressed concerns about severe side effects, and 11.5% refused at least one vaccine. Families also reported concerns about some vaccines causing autism (24). In a qualitative study conducted in Turkey, families expressed concerns that mercury in vaccines could cause autism, and some rejected vaccines due to the presence of animal gelatin and egg embryo in vaccine content (25). Despite numerous scientific studies disproving any link between mercury in vaccines and autism, this connection has been highlighted in anti-vaccine discourse. To mitigate vaccine refusal, mercury has been removed from vaccines over the past two decades globally and in Turkey over the past ten years (25-28). Additionally, there is a belief that aluminum and other chemicals accumulate in the body, potentially leading to chronic diseases over time. Some sources in the literature argue that aluminum, as a neurotoxin, may cause neurodevelopmental and autoimmune diseases if administered to infants with developing

brains (29). In Picchio et al.'s (2017) study, 29% of healthcare workers reported not knowing whether thimerosal in vaccines was neurotoxic, 22% were uncertain about aluminum, and 6% believed the MMR (measles, mumps, rubella) vaccine was linked to autism (30). In Bonville et al.'s (2017) study, 14% of participants believed there was a link between vaccines and autism (16). Yakşı (2020) found that 17% of participants were unaware that substances like aluminum and mercury in vaccines are present at non-harmful levels, and 26% believed or were unsure of a link between vaccines and autism (18).

Although a high proportion of participants in this study did not believe that vaccines cause diseases, the number of those who thought otherwise was notable. This may be attributed to media influence and ongoing informational gaps. These findings indicate that while most healthcare workers believe in vaccine safety and do not think that vaccines administered during infancy cause serious side effects, there are still doubts, particularly among midwives and nurses, regarding vaccine safety and content. Awareness-raising educational programs may be needed for these groups. Physicians' more positive outlook on vaccine safety and content may be related to their higher level of information on the subject. Addressing these knowledge gaps among healthcare workers could help increase public trust in vaccines and support efforts to protect public health. As emphasized in Yakşı's (2020) study, there is no evidence linking mercury levels in current vaccines to autism, and it is critical for healthcare professionals to use evidence-based knowledge to counteract misinformation and false beliefs (18).

Findings from this study reveal that healthcare workers attitudes and views on vaccine refusal vary according to their professional titles. While 90.2% of physicians consider vaccine refusal a public health issue, this rate is lower among nurses and midwives, at 68.9% and 71.7%, respectively. Among health technicians, only 47.0% view vaccine refusal as a public health concern. This difference might reflect the greater knowledge and experience physicians possess on health-related matters. The variations in responses among these groups could be attributed to differences in knowledge, sensitivity to the topic, and professional experience.

The majority of healthcare workers recommended vaccines to their relatives and patients, with the highest recommendation rates among physicians and health technicians (88.5% and 89.4%, respectively). This suggests that healthcare workers recognize the benefits of vaccines and could play a critical role in enhancing public health awareness. In a study by Kader et al. (2022), 58% of healthcare workers indicated they would recommend the COVID-19 vaccine to their families. Additionally, the study observed that physicians who were inclined to get vaccinated were more likely to recommend vaccination to their patients. Among these physicians, 77.4% believed in the vaccine's effectiveness, compared to 62.2% of other healthcare workers (15). In our study, 95.1% of physicians stated that failure to vaccinate would affect the entire community, whereas this rate was lower in other groups. This finding is crucial for understanding the impact of vaccines on herd immunity.

The study findings indicate that healthcare workers' recommendations regarding vaccine refusal prevention vary significantly by professional title. None of the physicians considered vaccine refusal justifiable, reflecting a stance grounded in their scientific knowledge and expertise. Although rates were low in other groups as well, health technicians showed the highest rate of agreement with vaccine refusal (16.7%), suggesting they may have less knowledge regarding vaccine importance.

The currency of information regarding vaccination is crucial, as it can boost family confidence and reduce reasons for refusal. Sharing evidence-based and up-to-date information with families is essential, as it also facilitates managing concerns about side effects (31). In cases where parents refuse vaccines for any reason, healthcare workers should communicate effectively with the family. This involves allocating the necessary time for families to express their concerns and planning appropriate interventions (32). In this study, participants across all groups expressed positive views on the role of social media in increasing knowledge levels. Midwives and nurses, in particular, indicated a higher acceptance of social media's influence, which is significant for developing health communication strategies. In a qualitative study by Çapanoğlu (2018), reasons cited by healthcare workers for vaccine refusal included family structure, lack of interest among staff, beliefs, vaccine content,

and social media influence (25). In Arıcan's study, 40% of healthcare workers reported obtaining vaccine-related information from social media, internet sites, television, and radio, and 21.7% indicated that such information negatively impacted their vaccination decisions (33). In Teker's (2019) study, which analyzed vaccine-related news published in online newspapers between 2015 and 2018, it was observed that the rate of anti-vaccine news increased over the years, reaching 36% in 2018. Based on this finding, it was suggested that negative media messages about vaccines could increase vaccine refusal and that positive messages on vaccines should be presented in a clear and understandable language and be more prevalent (34). In Yakşı's (2020) study, anti-vaccine propaganda in the media ranked fourth among reasons for vaccine hesitancy, at 65% (18). Kader's (2022) study also found that healthcare workers who consulted expert opinions and internet sources on the COVID-19 vaccine showed a higher willingness to get vaccinated (15).

When asked about measures to prevent vaccine refusal, 41.1% of healthcare workers expressed that the Ministry of Health should provide training on vaccines and increase knowledge levels. Physicians, in particular, suggested that legal action against individuals who refuse vaccines could serve as a deterrent, which might reflect their support for stricter measures against vaccine refusal. Lower rates among other groups indicate a more moderate approach to vaccine refusal. In conclusion, healthcare workers' views on preventing vaccine refusal vary according to their professional titles, and there is a need for greater awareness in areas such as education and social media use. These findings provide important insights for the development of health policies and educational programs. Most healthcare workers believe that current efforts to address vaccine refusal are inadequate and that further measures are necessary. No findings on this topic were encountered in the literature, making this study a unique contribution.

When families are adequately informed about vaccination, it is expected that the likelihood of vaccine hesitancy and refusal will decrease. Healthcare professionals serve as the most reliable sources of information and the primary advisors for families on vaccination matters. The attitudes of healthcare workers toward vaccines influence the public's views on

vaccination. Therefore, healthcare workers should understand the public health importance of vaccination and raise awareness within the community (35). Our study was designed and conducted in collaboration with healthcare professionals, who play a critical role in shaping public perception of vaccination.

The data obtained in this study provide a basis for discussion on the effects of vaccines on the community, healthcare workers' attitudes towards vaccination, and potential solutions. Some data not found in the literature were discussed in this study, although comparisons were not possible. Therefore, this study could serve as a foundation for developing new and effective strategies to highlight the importance of vaccination and reduce vaccine refusal.

Conclusions

In conclusion, our study observed that healthcare workers generally display a positive attitude toward vaccination, and they advocate for vaccinations as necessary for public health. While the majority consider vaccines to be safe, physicians represented the highest proportion in this regard. Physicians also had the highest percentage of agreement that the chemicals in vaccines do not pose health threats. The belief that vaccines could cause conditions such as autism and infertility was found to be quite low, with the lowest rate observed among physicians. Nearly all physicians, the majority of nurses and midwives, and less than half of the health technicians regarded vaccine refusal as a public health issue. Furthermore, most health technicians indicated the need for the Ministry of Health to provide education on vaccines, while most physicians advocated for legal measures against those who refuse vaccination.

Recommendations

The Ministry of Health should organize regular training programs on vaccines for healthcare workers. These trainings should include up-to-date information about vaccines as well as guidance on correcting misinformation regarding vaccine safety and efficacy.

To counteract media influence on public vaccine perceptions, awareness campaigns should be conducted by the Ministry of Health and relevant institutions. These campaigns should communicate accurate, scientifically-backed information on the importance, safety, and potential side effects of vaccines.

More emphasis should be placed on vaccine research and vaccine safety studies; the results of these studies should be shared with

healthcare professionals and the general public. Efforts to build trust around vaccines should be intensified.

Further research should be conducted to understand the causes of vaccine refusal, and more effective strategies to prevent it should be developed. Monitoring the impacts of vaccine refusal on public health and proposing solutions in this area is essential.

Discussions regarding the legal implications of refusing vaccinations should be undertaken, though with a cautious approach. Initial efforts should focus on increasing public knowledge and awareness.

Implementing these recommendations may positively influence healthcare workers' attitudes toward vaccines and contribute to increasing vaccination rates within the community.

Funding: The authors have stated that they did not receive any financial support during the conduct of this research.

Conflict of interest: All authors, hereby declare to have no conflict of interest.

Acknowledgments: This research has been accepted as a Master's thesis in the Department of Midwifery at Karabuk University in 2024.

Ethical Permission: Ethical approval for this study was received from the Non-Interventional Clinical Research Ethics Committee of Karabuk University (Approval Number: E-77192459-050.99-298862).

Contributor Roles: *Conceptualization:* YA; *Design:* YA, ZŞ; *Supervision:* YA, SO; *Resources:* ZŞ; *Data Collection and/or Processing:* ZŞ; *Analysis and/or Interpretation:* YA, SO; *Literature Review:* YA, ZŞ, SO; *Writing:* SO; *Critical Review:* SO.

References

1. Haverkate M, D'Ancona F, Giambi C, Johansen K, Lopalco PL, Cozza V, Appelgren E. Mandatory and Recommended Vaccination in the EU, Iceland and Norway: Results of the VENICE 2010 Survey on the Ways of Implementing National Vaccination Programmes. *Euro Surveill* 2012;17(22):1–3.
2. Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: influence, impact and implications. *Expert Rev. Vaccines* 2015;14:99–117.

3. Gür E. Aşı Kararsızlığı - Aşı Reddi. Türk Pediatri Arşivi, 2019.
4. Çelik K, Turan S, Üner S, Telatar TG, Bektaş A, Dikmen EŞ ve ark. Çocuk Aşılarında Artan Kararsızlık: Nedenleri farklı aktörlerin deneyiminden anlamak. Hipokrat Yayınları, 2020.
5. Conis E. Vaccine Nation: America's Changing Relationship With Immunization. University Of Chicago Press, Chicago, Il., 2016.
6. Kestenbaum LA, Feemster KA. Identifying and Addressing Vaccine Hesitancy. Pediatric Annals 2015;44(4):E71–E75.
7. Larson HJ, Jarrett C, Schulz WS, Chaudhuri M, Zhou Y, Dube E, et al. The SAGE Working Group on Vaccine Hesitancy. Measuring vaccine hesitancy: The development of a survey tool. Vaccine 2015;33:4165-4175.
8. Mckee C, Bohannon K. Exploring The Reasons Behind Parental Refusal of Vaccines. The Journal of Pediatric Pharmacology and Therapeutics: Jppt: The Official Journal of Ppag 2016;21(2):104–109.
9. Vaccine Adverse Event Reporting System (VAERS). Annual Report. Centers for Disease Control and Prevention, 2014.
10. Türkay M, Ay EG, Aktekin MR. Anti-Vaccine Status in a Selected Groups in Antalya. Akdeniz Medical Journal 2017;3(2).
11. Çağlar M. Üç Tıp Fakültesi Son Sınıf Öğrencilerinin Aşı Karşıtlığıyla İlgili Farkındalıklarının Değerlendirilmesi. Evaluation of Awareness of Vaccine Responsibility of Final Grade Students of Three Medical Faculties, 2021.
12. Arvas A. Çocuklarda Aşılamanın Önemi. Klinik Gelişim Dergisi 2012;25:1-3.
13. Karataş H. Sağlık Personelinin Parenteral Aşı Uygulama Tekniği ve Bölge Seçimi Konusunda Bilgilerinin İncelenmesi. [Yüksek Lisans Tezi]. Dokuz Eylül Üniversitesi Sağlık Bilimleri Enstitüsü Çocuk Sağlığı ve Hastalıkları Hemşireliği, İzmir, 2007.
14. Yıldırım A ve Şimşek, H. Sosyal Bilimlerde Nitel Araştırma Yöntemleri (7. Baskı) Ankara: Seçkin Yayıncılık, 2008.
15. Kader Ç, Erbay A, Demirel MS, et al. Evaluation of attitudes and behaviors of healthcare professionals towards COVID-19 vaccination. Klinik Dergisi 2022;35(1):31-5.
16. Bonville CA, Domachowske JB, Cibula DA et al. Immunization attitudes and practices among family medicine providers. Human Vaccines&Immunotherapeutics 2017;13(11):2646-2653. doi:10.1080/21645515.2017.1371380.
17. Karafillakis E et al. Vaccine Hesitancy Among Healthcare Workers in Europe: A Qualitative Study. Vaccine 2016;34(41):5013-5020. https://doi.org/10.1016/j.vaccine.2016.08.029.
18. Yakşi N. Aile sağlığı merkezi çalışanlarının aşı reddi konusundaki düşünceleri ve davranışlarının değerlendirilmesi. Turk J. Public Health 2020;18(3):143-154. http://dergipark.gov.tr/tjph/ doi:10.20518/tjph.692226
19. Koçyiğit B. Kayseri Şehir Hastanesi Sağlık Personelinin Aşı Bilgisi ve Aşı Reddi Hakkında Tutum ve Davranışlarının Değerlendirilmesi. Yüksek Lisans Tezi. Erciyes Üniversitesi, Sağlık Bilimleri Enstitüsü, Kayseri, 2020.
20. Saraç M. Trabzon ili Ortahisar İlçesi 1., 2., 3. Basamak Sağlık Kuruluşunda Çalışan Hemşirelerin Aşı Yaptırma ile İlgili Bilgi, Tutum ve Davranışları. Master's Thesis. Karadeniz Technical University, Institute of Health Sciences, Trabzon, 2019.
21. Eskioçak DM, Marangoz DB. Türkiye'de Bağışıklama Hizmetlerinin Durumu. Türk Tabipleri Birliği Yayınları, Ankara, 2019.
22. Arıcan MD. Sağlık Çalışanları Arasında Aşılama Genel Bakış, Aşı Kabulü ve Reddini Etkileyen Faktörler. Sağlık Bilimleri Üniversitesi İzmir Tepecik Eğitim ve Araştırma Hastanesi Aile Hekimliği Kliniği. Uzmanlık Tezi. İzmir, 2019.
23. Folb NI et al. Vaccine safety: an overview. Clinical Infectious Diseases 2004;38(6):787-796.
24. Freed GL, Clark SJ, Butchart AT, Singer DC, Davis MM. Parental vaccine safety concerns in 2009. Pediatrics 2010;125(4):654-659.
25. Çapanoğlu E. Sağlık Çalışanı ve Ebeveyn Perspektifinden Çocukluk Çağı Aşılarının Reddi Niteliksel Bir Araştırma. [Yüksek Lisans Tezi]. İstanbul: Acıbadem Mehmet Ali Aydınlar Üniversitesi Sağlık Bilimleri Enstitüsü Biyoetik Anabilim Dalı, İstanbul.
26. Offit PA. Thimerosal and vaccines-a cautionary tale. N Engl J Med 2007;357:1278–9.
27. Miller SA, Hanlon C. The impact of vaccine hesitancy on vaccination programs. The Journal of Immunology 2018;201(4):1207-1215.
28. Türk Tabipler Birliği (TTB). Aşı konusunda yaşanan tereddütler, aşı reddi ve aşı karşıtlığı konusunda etik kurul görüşü, 2019.

http://www.ttb.org.tr/makale_goster.php?Guid=c21adfbce1c4-11e8-b159-336a7b2d6c99
[Erişim Tarihi: 08.10.2024]

29.Miller NZ. Aluminium in Childhood Vaccines Is Unsafe. J Am Physic Surg 2016;21(4):109-117.

30.Picchio CA, Carrasco MG, Sagué-Vilavella M et al. Knowledge, attitudes and beliefs about vaccination in primary healthcare workers involved in the administration of system)atic childhood vaccines, Barcelona, 2016/17. Euro Surveill 2019;24(6):pii=1800117.

31.Bozkurt GEL. Güvenli bağışıklamada ebe ve hemşirelerin sorumlulukları. J.Anatolia Nurs Heal Sci. 2005;8(3):119-126.

32.Argüt N, Yetim A, Gökçay G. Aşı Kabulünü Etkileyen Faktörler. Journal of Child

2016;16(1):16-24.

<https://doi.org/10.5222/j.child.2016.016>

33.Arıcan MD. Sağlık Çalışanları Arasında Aşılarmaya Genel Bakış, Aşı Kabulü ve Reddini Etkileyen Faktörler. Sağlık Bilimleri Üniversitesi İzmir Tepecik Eğitim ve Araştırma Hastanesi Aile Hekimliği Kliniği. Uzmanlık Tezi. İzmir, 2019.

34. Teker AG. Content Review of Vaccines and Vaccination Related News in Internet Newspapers. ESTÜDAM Halk Sağlığı Derg 2019;4(2):105-115.

35.Yüksel GH, Topuzoğlu A. Aşı Redlerinin Artması ve Aşı Karşıtlığını Etkileyen Faktörler. ESTÜDAM Halk Sağlığı Dergisi 2019;4(2):244-58.

<https://doi.org/10.35232/estudamhsd.525983>