



Examination of Healthcare Workers' Knowledge, Attitudes, and Behaviors Regarding the Pandemic

Sağlık Çalışanlarının Pandemiye Yönelik Bilgi, Tutum ve Davranışlarının İncelenmesi

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ABSTRACT

Aim: This study examined healthcare workers' knowledge, attitudes, and behaviors towards the pandemic.

Material and Method: This descriptive study involved 546 healthcare workers, with data collected through an information form.

Results: The results indicated that most participants engaged in training and information sessions related to the COVID-19 pandemic, utilized trustworthy information sources, and did not consistently receive the influenza vaccine. 41.8% of the participants worked in the health sector during the influenza A (H1N1) pandemic. It was statistically significant that the participants had children getting influenza vaccinations and worked actively during the influenza A (H1N1) pandemic. Those who worked in the healthcare sector during the influenza A (H1N1) pandemic saw themselves as competent in terms of the risks of influenza and COVID-19 pandemics, ways of protection, patient management, had less anxiety during patient management, and influenza vaccine and antiviral treatment statistically significantly reduced anxiety. It was determined that they defined the lack of effective vaccine or antiviral treatment for COVID-19 as a factor that increased their stress during the study.

Conclusion: It was determined that the knowledge, attitudes, and behaviors of the participants towards the pandemic were at an adequate level and that past pandemics, having children, and pandemic treatment were factors affecting the level of knowledge, attitudes, and behaviors. In the pandemic, the continuity of education and supporting the strengths of healthcare workers are recommended, so more comprehensive and qualitative studies on the subject are recommended. Also, It is advised to incorporate pandemic-related topics into training programs.

Keywords: pandemic; healthcare workers; education; knowledge

ÖZET

Amaç: Bu araştırmada, sağlık çalışanlarının pandemiye yönelik bilgi, tutum ve davranışlarının incelenmesi amaçlanmıştır.

Materyal ve Metot: Tanımlayıcı olarak planlanan çalışma, bir eğitim araştırma hastanesinde çalışan 546 sağlık çalışanı ile gerçekleştirilmiştir. Veri toplama aracı olarak sosyodemografik özellikleri ve pandemiye yönelik bilgi, tutum ve davranışları belirlemek amacıyla hazırlanan bilgi formu kullanılmıştır.

Bulgular: Katılımcıların çoğunluğunun COVID-19 Pandemisi'ne yönelik eğitim ve bilgilendirme faaliyetlerine katıldığı, güvenilir bilgi kaynaklarından yararlandıkları, influenza aşısını düzenli yaptırmadığı, katılımcıların %41,8'inin İnfluenza A (H1N1) 2009 Pandemisi'nde sağlık sektöründe çalıştığı saptanmıştır. Çalışmaya katılan sağlık çalışanlarının influenza aşısı yaptırma davranışında, çocuk sahibi olması ve İnfluenza A (H1N1) Pandemisi'nde aktif olarak çalışmış olmaları istatistiksel olarak anlamlı bulunmuştur. İnfluenza A (H1N1) Pandemisi'nde sağlık sektöründe çalışmış olanların, İnfluenza ve COVID-19 Pandemilerinin riskleri, korunma yolları, hasta yönetimi konusunda istatistiksel olarak anlamlı bir biçimde kendilerini yeterli gördükleri, hasta yönetimi esnasında daha az kaygı duydukları, influenza aşısı ve antiviral tedavinin istatistiksel olarak anlamlı biçimde kaygı duymalarını engelleyen birer faktör olarak tanımlandıkları, çalışmanın yapıldığı dönemde COVID-19 için henüz etkili aşı ya da antiviral tedavi bulunamamasını kaygı duymalarını artıran faktör olarak tanımlandıkları belirlenmiştir.

Sonuç: Katılımcıların pandemiye yönelik bilgi, tutum ve davranışlarının yeterli düzeyde olduğu, geçmiş pandemilerde görev almanın, çocuk sahibi olmanın ve pandemiye yönelik tedavinin bilgi, tutum ve davranış düzeyini etkileyen faktörler olduğu saptanmıştır. Bir afet olarak tanımlanan pandemi yönetiminde eğitimin sürekliliği ile sağlık çalışanlarının güçlü yönlerinin desteklenmesi ve zayıf yönlerinin iyileştirilmesi, konuya ilişkin daha geniş katılım ve niteliksel çalışmaların yapılması ve eğitim programlarına pandemiye ilişkin konuların eklenmesi önerilmektedir.

Anahtar kelimeler: pandemi; sağlık çalışanları; eğitim; bilgi

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Introduction

Throughout history, pandemics have had significant regional, national, and global effects, bringing about crucial changes and developments in various aspects of life, including social, educational, economic, and healthcare systems. Pandemics such as Influenza A (H1N1) and COVID-19, known as recent pandemic examples, exhibit essential differences in mortality and fatality rates and rapid global spread, emphasizing the dynamic nature of these events^{1,2}. Predicting when, from which source, or in what form pandemics will emerge is challenging³. Consequently, it is anticipated that a critical characteristic for individuals and professionals following all these pandemics will be their ability to cope with pandemics, as facing pandemics will continue to be a part of the “pandemic future,” necessitating learning to live with it. The experiences from past pandemics, the current situation, and forecasts particularly compel preventive measures and practices to ensure the sustainability of the healthcare system^{4,5}.

For the successful management of the pandemic process, not only does multidisciplinary collaboration play a crucial role, but healthcare workers’ competence is also paramount. The effective management of the COVID-19 Pandemic, described as an “indefinite and prolonged complex emergency,” requires standard solutions and practices outlined by the World Health Organization (WHO) and our country’s Pandemic Influenza Preparedness Plan and COVID-19-related guidelines⁵⁻⁶. Among the most effective strategies is the importance of accurate information management and current, sound education⁸. Reviewing relevant literature reveals that healthcare workers, described as effective crisis managers during pandemics, carry significant risks. It is emphasized that their knowledge, attitudes, and behaviors towards pandemics are crucial. Possessing adequate information about pandemics will support positive perceptions and attitudes. It will also effectively reduce stress, anxiety, or levels of concern⁹⁻¹³. Despite the importance of this issue, some studies indicate that healthcare workers may not have sufficient knowledge about pandemics¹⁴⁻¹⁶. Furthermore, it is noted that research on pandemics will not only guide preventive measures and strategies but also contribute to preparing for future anticipated pandemics¹⁷.

Therefore, with the focal point of healthcare services being the “individual,” the individual and professional responsibilities of healthcare services and healthcare workers gain even more significance during this

process. Despite the increasing research on COVID-19 in all fields, studies on pandemics, in general, are limited, and the conducted studies often separate influenza and COVID-19 for individual examination^{9,18-20}. Considering these factors, it is believed that this study on the awareness levels of healthcare workers regarding pandemics will be crucial due to its biopsychosocial effects and critical role in quality care. It is expected to enhance awareness in the fight against pandemics and shed light on the literature.

Materials and Methods

Study Design

This research, designed as a descriptive and cross-sectional study, aimed to investigate healthcare workers’ knowledge, attitudes, and behaviors regarding the pandemic. The research questions are as follows:

1. What are the knowledge levels of healthcare workers regarding the pandemic?
2. What are the attitudes of healthcare workers towards the pandemic?
3. What are the behaviors of healthcare workers related to the pandemic?
4. What factors influence healthcare workers’ knowledge, attitudes, and behaviors towards the pandemic?

Ethical Considerations

Necessary written permissions were obtained from the Clinical Research Ethics Committee (dated 12.06.2020, no. 2397), the Ministry of Health Scientific Research Platform, and the relevant hospital’s Scientific Committee (dated 13.05.2020, no. 248-05). The principles of the Helsinki Declaration were used to conduct the research. Participants in the study read the informed consent form at the beginning of the questionnaire, stating, “I have been informed about the research and agree to participate,” by selecting “yes” and indicating whether they volunteered.

Population and Sample of the Study

The study population consisted of employees (N: 1,008) actively involved in Yedikule Chest Disease and Thoracic Surgery Training and Research Hospital during the COVID-19 Pandemic, similar to past pandemics. The study did not use sampling; it included healthcare workers who met the inclusion criteria.

Inclusion Criteria: Individuals actively employed at the hospital willing to participate in the study.

Exclusion Criteria: Individuals who decline participation in the study, are illiterate, do not use a smartphone, are on leave, or have a medical report during the study period. The research was completed with 52.6% (n=546) of healthcare workers actively working at the hospital.

Data Collection Tools and Collection of Data:

A questionnaire consisting of 28 questions, developed by the researchers in the light of literature^{9,17-18,21} to determine the sociodemographic characteristics and pandemic-related knowledge, attitudes, and behaviors of the study group, was utilized. Before sharing the form, a pilot study was conducted with 20 healthcare workers from internal and external institutions representing different healthcare professions to test the usability and clarity of the questions. Data from the pilot study were not included in the research. After the pilot study, necessary changes were made, and the final version of the questionnaire was provided through Google Forms. The participants filled out the form between June and September 2020 using snowball sampling via email or social media. The completion of the form took approximately 7–8 minutes. IP and cookie controls were implemented to prevent repeated entries from the same device, and data collection ended when there was no further increase in responses.

Data Analysis and Evaluation

The data obtained was analyzed using the IBM Statistical Package for Social Sciences (SPSS) program version 16. The distribution of qualitative characteristics was assessed in percentages, while numerical data was evaluated using means and standard deviations. Multiple arrangements were compared using chi-square tests. A statistical significance level of $p < 0.05$ was considered. Moreover, three individuals who did not provide age data were excluded from calculating the average age.

Findings

A total of 546 healthcare workers participated in the study. The mean age of the participants was 35.5 ± 9.3 (min: 20, max: 64), and the mean working period was 10.5 ± 8.7 years (min: 2, max: 24). Sociodemographic characteristics of the participants are presented in Table 1. According to Table 1, 55.3% of the participants were

Table 1. Distribution of sociodemographic characteristics of the participants (n=546)

Sociodemographic Characteristics	Average	
Age	35.5±9.3 years (min: 20, max: 64)	
Duration of working	10.5±8.7 years (min: 2, max: 24)	
Sex	n	%
Male	244	44.7
Female	302	55.3
Marital Status		
Single	237	43.5
Married	309	56.5
Spouse's Employment Status in the Health Sector		
Yes	116	37.5
No	193	62.5
Parenthood Status		
Yes	277	50.7
No	269	49.3
Number of Children		
4	3	1.1
3	27	9.8
1	112	40.2
2	135	48.9
Having a relative with a chronic disease and/or over the age of 65 living together		
Yes	153	28.0
No	393	72.0
Occupation		
Other	25	4.6
Security personnel	27	4.9
Health technician	43	7.9
Medical secretary/Data entry	61	11.2
Cleaning staff	102	18.7
Physician	104	19.0
Nurse	184	33.7
Graduation		
Literate	1	0.2
Secondary School Graduate	18	3.3
Primary School Graduate	31	5.7
High School Graduate	90	16.5
Specialization/PhD/Master's degree	104	19.0
Associate degree	118	21.6
Bachelor's degree	184	33.7
Unit of Work		
Operating room	27	4.9
Lab	31	5.7
Intensive care	43	7.9
Policlinic	74	13.6
Emergency room	84	15.4
Other	130	23.8
Inpatient treatment unit	188	34.4
Unit Change During the Pandemic Process		
Yes	195	35.7
No	351	64.3
The unit worked during the change of unit during the COVID-19 Pandemic		
Policlinic	9	1.6
Intensive care	24	4.4
Emergency room	33	6.0
Other	29	5.3
Clinic	102	18.7
Vaccination status with influenza (flu) vaccine		
I have it done regularly every year.	67	12.3
I've had it done before, although not regularly.	113	20.7
I've never had it done.	365	66.7

*More than one option is marked.

Table 2. Sociodemographic characteristics of the participants and their behaviors regarding influenza vaccine administration (n=546)

	I get the influenza vaccine every year, regularly or irregularly		I did not get the influenza vaccine		p-value
	n	%	n	%	
Sex					
Male	70	28.7	174	71.3	0.056
Female	110	36.4	192	63.6	
Parenthood					
Yes	119	43	158	57	0.001
No	61	22.7	208	77.3	
Spouse's Employment Status in the Healthcare Sector					
Yes	46	39.7	70	60.3	0.084
No	134	31.2	296	68.8	
Having a relative with a chronic disease and/or over the age of 65 living together					
Yes	54	35.3	99	64.7	0.470
No	126	32.1	267	67.9	
Working in the healthcare sector during the Influenza A (H1N1) Pandemic					
Yes	124	54.4	104	45.6	0.001
No	56	17.6	262	82.4	
Graduation					
Primary/middle school	43	30.9	96	69.1	0.579
Higher education	136	33.5	270	66.5	

* p<0.05; Chi-square test

female, 56.5% were married, 62.5% had spouses not working in the healthcare sector, 50.7% had children, 89.1% had 1 or 2 children, 72% did not have chronic illnesses or relatives over 65 years old living with them, 33.7% were nurses, 33.7% had a bachelor's degree, and 34.4% worked in inpatient care units. It was determined that 64.3% did not change their unit during the pandemic. Among those who changed units, 18.7% worked in inpatient care units. Only 12.3% of the participants received regular influenza vaccination every year, while 66.7% did not receive influenza vaccination at all.

The comparison of sociodemographic characteristics with vaccination behavior is given in Table 2. In the participants' behavior of receiving influenza vaccination regularly or irregularly, it was observed that having children and actively working during the Influenza A (H1N1) Pandemic had a statistically significant effect (p=0.001).

The distribution of education and information processes during the COVID-19 Pandemic is presented in Table 3. It was found that 60.8% of healthcare workers obtained information about the COVID-19

Table 3. Distribution of education and information processes during the COVID-19 Pandemic (n=546)

	n	%
Information Sources Used for COVID-19 Pandemic*		
Social media (Instagram, WhatsApp, etc.)	39	7.1
Social environment	141	25.8
Official websites (Public Health, Ministry of Health, CDC, WHO, etc.)	183	33.5
Mass media (TV, radio, etc.)	237	43.7
Relevant teams within the institution (such as Infection Control Committee, Occupational Health and Safety)	332	60.8
Frequency of Following Current Information		
None	18	3.3
Occasionally	184	33.7
Constantly	344	63.0
Received Training and/or Information About the COVID-19 Pandemic		
No	12	2.2
Yes	534	97.8
Educator from whom Training and Information Received*		
Training nurse	184	33.7
Distance education lecturer	271	49.6
Infection control committee	511	93.6
Training and Information Type*		
Distance Education System (HES)	290	53.1
Face-to-face education	413	75.6
Training and Information Techniques*		
Practical training	116	21.2
Written information	161	29.5
Verbal information	503	92.1
Monitoring of Official Letters and Information Published on the In-house Web		
None	110	20.1
Constantly	118	21.6
Occasionally	318	58.2
Opinions Regarding Sufficiency of Training and Information		
Insufficient	66	12.1
Partially Sufficient	226	41.4
Sufficient	242	44.3
The Effectiveness Degree of Poster, Video, Brochure, Voice Announcement Applications for Healthcare Professionals		
Not effective at all	98	17.9
Partially effective	140	25.6
Very effective	308	56.4
Effectiveness Degree of Poster, Video, Brochure, and Voice Announcement Applications for Patients/Patient Relatives		
Not effective at all	111	20.3
Partially effective	308	56.4
Very effective	127	23.3
Working in the Health Sector During the Influenza A (H1N1) Pandemic		
Yes	228	41.8
No	318	58.2
Taking an Active Role in the Influenza Pandemic Process		
Yes	113	20.7
No	433	79.3

*More than one option is marked.

Pandemic from internal relevant teams (infection control committee, occupational health, and safety, etc.), 63% continuously followed current details on the COVID-19 Pandemic, 97.8% received education and/or information about the COVID-19 Pandemic, and 93.6% received education and information from the Infection Control Committee. Additionally, 75.6% received face-to-face training, and 92.1% benefited from verbal information techniques. Internal training and information processes were followed by 58.2%, and 85.7% found these processes to be sufficient or partially sufficient. While 56.4% of the participants defined posters, videos, brochures, and voice announcements within the institution as very effective, the same participants described these applications as less effective for patients or their relatives. It was observed that 41.8% of the participants had worked in the healthcare sector during the Influenza A (H1N1) 2009 Pandemic, and 20.7% had worked in areas related to patients infected with the Influenza A (H1N1) virus.

Statistically, those who had worked in the healthcare sector during the Influenza A (H1N1) 2009 Pandemic considered themselves adequately informed about the risks, preventive measures, and patient management of the Influenza Pandemic ($p=0.001$). Additionally, they reported experiencing less anxiety during patient management ($p=0.002$).

Those who had worked in the healthcare sector during the Influenza A (H1N1) 2009 Pandemic defined influenza vaccination and antiviral treatment as factors significantly reducing their anxiety levels ($p=0.001$) (Table 4).

Those who had worked in the healthcare sector during the Influenza A (H1N1) 2009 Pandemic statistically considered themselves adequately informed about the risks, preventive measures, and patient management of the COVID-19 Pandemic ($p=0.001$) and reported experiencing less anxiety during patient management ($p=0.006$). It was found that both those who had and had not worked in the healthcare sector during the Influenza A (H1N1) 2009 Pandemic identified the lack of effective vaccine ($p=0.742$) or antiviral treatment ($p=0.606$) for COVID-19 during the study period as factors increasing their concerns (Table 5).

Discussion

In the effective execution of qualified health services during a pandemic, the protection and empowerment

Table 4. Comparison of knowledge, attitudes, and behaviors regarding the Influenza A (H1N1) Pandemic process according to working status in the healthcare sector during the Influenza A (H1N1) Pandemic

Working status in the healthcare sector during the Influenza A (H1N1) Pandemic		Yes		No		p-value		
		Always / Mostly	Always / Mostly	Occasionally / Rarely	Occasionally / Rarely			
Influenza A (H1N1) Pandemic Process	n							
	%							
1. I am aware of the risks posed by the influenza pandemic to employees and patients.	n	183	192	37	111	8	15	0.001*
	%	80.3	60.4	16.2	34.9	3.5	4.7	
2. I know how to protect myself and my patients from influenza pandemics.	n	191	202	30	104	7	12	0.001*
	%	83.8	63.5	13.2	32.7	3.1	3.8	
3. I consider myself competent in service/care/treatment for patients with influenza infection.	n	166	187	48	116	14	21	0.002*
	%	72.8	58.8	21.1	34.6	6.1	6.6	
4. I do not feel anxious when providing service/care/treatment to patients with influenza infection.	n	147	175	64	128	17	15	0.010
	%	64.5	55	28.1	40.3	7.5	4.7	
5. The fact that influenza is a vaccine-treated disease prevents me from feeling anxious when providing patient service/care/treatment.	n	164	182	49	119	15	17	0.001*
	%	71.9	57.2	21.5	37.4	6.6	5.3	
6. The fact that there is a known effective drug treatment for influenza prevents me from feeling anxious while providing service/care/treatment to patients.	n	171	188	44	116	13	14	0.001*
	%	75	59.1	19.3	36.5	5.7	4.4	

* $p<0.05$; Chi-square test in multi-well layouts.

of healthcare workers and the identification of risks are essential. Undoubtedly, healthcare workers' knowledge, skills, and attitudes play a crucial role in addressing this need¹⁷. Additionally, the uncertainties associated with each pandemic from the past to the present, coupled with the ongoing spread of COVID-19, make it challenging to predict when it will end, emphasizing the increasing importance of this situation.

The majority of participants were found to be in the young or middle-aged group, female, married, with multiple children, nurses, and graduates. In the research

Table 5. Comparison of knowledge, attitudes, and behaviors regarding the COVID-19 Pandemic process according to working status in the healthcare sector during the Influenza A (H1N1) Pandemic

Working status in the healthcare sector during the Influenza A (H1N1) Pandemic		Yes	No	Yes	No	Yes	No	
Covid-19 Pandemic Process		Always / Mostly	Always / Mostly	Occasionally / Rarely	Occasionally / Rarely	Never	Never	p-value
1. I am aware of the risks posed by the Covid-19 pandemic to employees and patients.	n	197	224	23	81	8	13	0.001*
	%	86.4	70.4	10.1	25.5	3.5	4.1	
2. I know how to protect myself and my patients from the Covid-19 pandemic.	n	192	212	30	92	6	14	0.001*
	%	84.2	66.7	13.2	28.9	2.6	4.4	
3. I consider myself competent in service/care/ treatment for patients with Covid-19 infection.	n	149	154	62	142	17	22	0.001*
	%	65.4	48.4	27.2	44.7	7.5	6.9	
4. I do not feel anxious when providing service/care/ treatment to patients with Covid-19 infection.	n	123	146	73	143	32	29	0.006
	%	53.9	45.9	32	45	14	9.1	
5. The fact that there is no known vaccine for Covid-19 yet makes me feel anxious when providing service/care/treatment to patients. **	n	176	244	40	61	12	13	0.742
	%	77.2	76.7	17.5	19.2	5.3	4.1	
6. The lack of a known effective drug treatment for Covid-19 makes me feel anxious when providing service/care/treatment to patients. **	n	180	247	35	57	13	14	0.606
	%	78.9	77.7	15.4	17.9	5.7	4.4	

* p<0.05; Chi-square test in multi-well layouts; ** Questions 5 and 6 relate to the period in which the study was conducted.

conducted by Orhan and Gumus in 2021²⁰, aiming to examine the knowledge, practices, and stress levels of healthcare workers during the COVID-19 pandemic, it was found that most participants were women, nurses, and the young or middle-aged group. Similarly, in Yilmazer's 2021²³ study, which aimed to evaluate healthcare workers' knowledge, perception, and behaviors regarding COVID-19, most participants were identified as women, nurses, and in the young age group. In the study by Cui et al. in 2021²⁴, which aimed to determine the psychological effects of COVID-19 and related factors, the majority were women, nurses, graduates, and the young age group. Gender, parental status, and education were identified as associated factors in these studies. These findings, while showing parallels with the results of our research, highlight the influential factors in behavioral protection levels during pandemics, especially for women, married individuals, and those with children (such as the use of personal protective equipment, hand hygiene, etc.). Notably, these sociodemographic characteristics constitute most of our study. They are essential for research findings, positively influencing knowledge, attitudes, and behaviors.

When examined regarding education and information sources about the COVID-19 pandemic, it was determined that most healthcare workers received training,

primarily benefited from relevant in-house teams, and most frequently received education from the Infection Control Committee. However, it was also found that most participants continuously follow up-to-date information about the COVID-19 pandemic. In-house applications such as posters, videos, brochures, and voice announcements are perceived as highly effective for healthcare workers but less effective for patients or their relatives. A study conducted in Vietnam on healthcare workers' knowledge levels about COVID-19 revealed that the majority had received a good education, with the top three sources being institutional websites, social media, and television (TV)²⁵. Another study in China by Zhou et al. in 2020¹⁶ indicated insufficient knowledge levels among healthcare workers. Yilmazer's study in 2021²³ found that most participants received education and used reliable information sources such as the Ministry of Health and the World Health Organization. Studies with non-healthcare worker groups also identified sources of obtaining information about COVID-19 as social media, the internet, and TV^{26,27}. A study by Genc in 2021²⁸ revealed that individuals who frequently use traditional media and highly trust social media have a more positive attitude toward the COVID-19 vaccine. Salman et al.'s²⁹ research determined that most participants obtained information about COVID-19 from official institutions. A study by Ceyhan and Uzuntarla³⁰ in 2020,

which aimed to determine the knowledge, attitudes, and behaviors of academic staff regarding COVID-19, found that academics had sufficient levels of expertise, the number of family members influenced attitudes in terms of knowledge and behaviors were influenced by gender, age, and status. These findings are in parallel with the results of our study. The definition of “pandemic education,” considered one of the most effective components in pandemic management, as sufficient and healthcare workers accessing reliable sources of information positively affecting knowledge, attitudes, and behaviors, suggests that being a pandemic hospital strengthens this finding. However, it is also considered necessary to provide more support for individuals outside the healthcare profession, such as patients or their relatives, in the correct use of information sources.

The majority of participants were found not to have received the influenza vaccine. However, it was observed that healthcare workers who received the influenza vaccine were significantly influenced by factors such as having children and actively working during the Influenza A (H1N1) pandemic. Although this aligns with the existing literature, showing similarities with the findings of our study, it is well-known that the influenza vaccination rate among healthcare workers is low³¹⁻³³. The importance of vaccination as a significant health-protective intervention and the influential role of factors such as having children and active involvement during the Influenza A (H1N1) 2009 pandemic in influencing healthcare workers' vaccination behaviors are believed to enhance protective behaviors. Considering the individual and professional dimensions of healthcare workers' vaccination status, it is anticipated that activities to increase vaccination rates should be intensified.

The findings of our study reveal that individuals who had experience working in the health sector during the Influenza A (H1N1) 2009 Pandemic considered their experiences as factors that made them feel more competent in understanding the risks, prevention methods, and patient management related to both Influenza and COVID-19 Pandemics. However, during our research, ongoing studies on effective vaccines or antiviral treatments for COVID-19 increased concerns among those who had and had not worked in the health sector during the Influenza A (H1N1) 2009 Pandemic. Research by Imai (2020)³⁴ conducted in Japan on voluntary participation in COVID-19-related work indicated that 28.4% of participants were strongly motivated,

while 14.7% expressed significant hesitation to work. Those hesitant about working cited concerns about infection, potential loss of income in case of disease, and the fear of isolation. Aghili and Arbabi (2020)³⁵ compiled a study exploring what COVID-19 meant psychologically for healthcare workers, particularly frontline workers like nurses, reporting increased anxiety and stress symptoms. They suggested that such conditions would impact during and after the pandemic. However, they did not predict a permanent situation and recommended necessary improvements. However, research on the SARS epidemic has shown that psychological effects are not always short-lived and can lead to severe and persistent mental health issues³⁶. Roy et al. (2020)¹⁸ noted the similarity between Influenza A (H1N1) and COVID-19, emphasizing that each pandemic has unique features. Mishra et al. (2016)⁹ reported that healthcare professionals with a more positive attitude and awareness toward pandemics experienced lower anxiety. All these findings suggest that while previous pandemic experiences among healthcare workers may be effective in managing the process, the uncertainties and inevitable anxiety or stress associated with each pandemic highlight the importance of psychological support.

Our study found that despite healthcare workers having sufficient knowledge and practical levels to combat COVID-19, they still experienced anxiety. Zhong et al. (2020)³⁷ also mentioned that past pandemic experiences were related to effective management and that knowledge and attitude toward the pandemic were associated with psychosocial conditions such as panic and fear. In a study conducted by Roy et al. (2020)¹⁸ on Indian healthcare workers during the COVID-19 pandemic, participants were found to have moderate knowledge about COVID-19, but their anxiety levels were high. Orhan and Gumus (2021)²⁰ similarly discovered that while healthcare workers mostly had sufficient knowledge about COVID-19 management, stress levels were high among them. Barelo et al. (2020)¹⁹ conducted a systematic review of 36 studies, highlighting that healthcare workers frequently worried about their health, feared transmitting the infection to family, friends, and colleagues, and reported issues such as social isolation, uncertainty, fear of stigma, and work reluctance or inability to come to work. They emphasized that high levels of stress, anxiety, and depression symptoms were widespread among healthcare workers. Afzal et al. (2021)³⁸ conducted a study in Pakistan with the general public, revealing that knowledge about COVID-19 was

positively associated with behavioral levels. Devkota et al. (2020)³⁹ also reported positive but weak linear correlations between behavior, knowledge, and attitude. Fikri et al. (2022)⁴⁰ found that while doctors worked diligently in all aspects of the pandemic, they could not update themselves with sufficient in-service knowledge in a rapidly changing situation. They suggested that in-service knowledge flow is crucial in a pandemic with rapidly changing treatment recommendations. Abebe et al.'s (2016)⁴¹ study aimed to determine healthcare workers' knowledge, attitudes, and perceptions about the Ebola virus. The findings revealed that most healthcare workers had insufficient expertise and erroneous beliefs, emphasizing the vital importance of this issue and recommending an intensive education program to deliver quality healthcare services. While these findings are in parallel with the results of our study, they suggest that education and information are supportive factors not only for the effective management of the pandemic but also for individual and professional psychosocial resilience.

The limitations of our study include its single-hospital setting, potential recall bias due to the past occurrence of the Influenza Pandemic, and the unavailability of information regarding whether participants had experienced the relevant infections.

Conclusion

In conclusion, a pandemic, considered a disaster, profoundly affects individuals and society in all dimensions. Pandemics not only entail negative impacts but also contain potential opportunities that can be defined with concepts such as change, empowerment, and post-traumatic growth. The success of this struggle significantly depends on healthcare workers' knowledge, attitudes, and behaviors. It is also known that the emotions of healthcare workers, who are effective crisis managers, can influence and be reflected in the service during this process. Despite the limitations of our study, it provides data on the knowledge, attitudes, and behaviors of healthcare workers in two different pandemic periods and their post-pandemic effects.

Supporting the strengths and improving the weaknesses of healthcare workers, ensuring the continuity of education before, during, and after pandemics, conducting more extensive and qualitative studies on the subject, adding specific training programs to secondary and higher education curricula, especially considering the anticipated future pandemics, are necessary and vital.

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