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THE EVALUATION OF TELEHEALTH SERVICES DURING THE COVID-19 PANDEMIC ON LEVELS OF PSYCHOLOGICAL GROWTH

COVID-19 PANDEMİSİ SIRASINDA SUNULAN TELESAĞLIK HİZMETİNİN PSİKOLOJİK GELİŞİM DÜZEYLERİ ÜZERİNE DEĞERLENDİRİLMESİ

Sevgi CANBAZ[1], Nuray ÖZGÜLNAR[1], Meryem Merve ÖREN ÇELİK[1], Eliz KUMAN OYMAN[2], Esra KARACA ÜNYILDIZ[1], Duygu Acar KARAGÜL[3], Selma KARABEY[1], Ayşe Emel ÖNAL[1], Şadiye Selin DURUŞ[4], Alpay MEDETALİBEYOĞLU[5], Mustafa Oral ÖNCÜL[6]

[1]Istanbul University, Istanbul Faculty of Medicine, Department of Public Health, Istanbul, Turkiye
[2]Sureyyapasa Chest Diseases and Thoracic Surgery Training and Research Hospital, Istanbul, Turkiye
[3]Kocaeli Provincial Health Directorate, Health Sciences University Derince Training and Research Hospital, Kocaeli, Turkiye
[4]Bilecik Provincial Health Directorate, Bozuyuk District Health Directorate, Bilecik, Turkiye
[5]Istanbul University, Istanbul Faculty of Medicine, Department of Internal Medicine, Istanbul, Turkiye
[6]Istanbul University, Istanbul Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, Istanbul, Turkiye

ORCID IDs of the authors: S.C. 0000-0001-7960-4576; N.Ö. 0000-0002-1948-4194; M.M.Ö.Ç. 0000-0002-3383-7830; E.K.O. 0000-0002-8861-9953; E.K.Ü. 0000-0003-0190-6085; D.A.K. 0000-0003-1173-1506; S.K. 0000-0002-2964-3056; A.E.Ö. 0000-0001-8321-6517; Ş.S.D. 0000-0003-2413-2721; A.M. 0000-0002-5829-9186; M.O.Ö. 0000-0002-1681-1866

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ABSTRACT

Objective: The COVID-19 pandemic is considered a traumatic event. The aim of this study was to examine the effects of telehealth services offered at the Istanbul University, Istanbul Faculty of Medicine to health workers with presumed COVID-19 or close contact with a suspected/confirmed COVID-19 patient on pandemic management, vaccination, and psychological growth at one year after diagnosis.

Materials and Methods: The cohort study included 237 employees with COVID-19/risky contact who were monitored remotely via a telehealth service provided between April 6 and July 31, 2020. First, they were followed up for 21 days with the telehealth service. Second, they were invited by phone to complete an online questionnaire and 94 (39.7%) of them participated. The questionnaire included questions about pandemic-related difficulties experienced during the last year and the Posttraumatic Growth Inventory (PTGI).

Results: Of the 234 employees, 172 (73.5%) and 164 (70.1%) had the first and second doses of the COVID-19 vaccine, re-

ÖZET

Amaç: COVID-19 pandemisi travmatik bir olay olarak kabul edilmektedir. Bu çalışmanın amacı, İstanbul Tıp Fakültesi'nde COVID-19 olduğu varsayılan veya şüpheli/doğrulanmış bir COVID-19 hastası ile yakın temasta bulunan sağlık çalışanlarına sunulan telesağlık hizmetlerinin tanıdan bir yıl sonra pandemi yönetimi, aşılama ve psikolojik gelişim üzerine etkilerini incelemektir.

Gereç ve Yöntem: Kohort tipindeki bu çalışmada, 6 Nisan-31 Temmuz 2020 tarihleri arasında telesağlık hizmeti ile uzaktan izlenen COVID-19/riskli temaslı 237 çalışan dahil edildi. İlk olarak telesağlık hizmeti ile 21 gün boyunca takip edildiler. İkinci olarak, bir yıl sonra çevrimiçi bir anketi doldurmaları için telefonla arandılar. Katılımcıların 94'ü (%39,7) anketi doldurdu. Anket, son bir yılda yaşanan pandemi ile ilgili zorluklar ve Travma Sonrası Büyüme Envanteri (PTGI) ile ilgili soruları içeriyordu.

Bulgular: Çalışmada 234 çalışandan 172'si (%73,5) ve 164'ü (%70,1) sırasıyla birinci ve ikinci doz COVID-19 aşısı yaptırdı. Psikolojik desteğe ihtiyaç duymayan çalışanların benlik algısı ve

Corresponding author/İletişim kurulacak yazar: Sevgi CANBAZ – sevgi.canbaz@gmail.com

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spectively. Employees who did not need psychological support had significantly lower PTGI change in self-perception and total scores than those who did not/could not receive psychological support (p=0.007 and p=0.016, respectively). Employees who used personal protective equipment (PPE) more carefully had a significantly higher PTGI self-perception score (p=0.005), life philosophy (p=0.014), interpersonal relationships (p=0.011), and total score (p=0.004) than employees who reported that they did not change how they use PPE and were sometimes careless.

Conclusion: The results of our study suggest that health workers are showing evidence of posttraumatic growth by seeing the positives as well as the negatives caused by the pandemic.

Keywords: Cohort, COVID-19, psychological growth, telehealth service, vaccination

toplam puanlarındaki PTGI değişimi, psikolojik destek almayan/alamayanlara göre anlamlı derecede daha düşüktü (sırasıyla p=0,007 ve p=0,016). Kişisel koruyucu ekipmanı (KKD) daha dikkatli kullanan çalışanların KKD kullanma şeklini değiştirmediklerini ve bazen dikkatsiz olduklarını bildiren çalışanlara göre; PTGI benlik algısı puanı (p=0,005), yaşam felsefesi (p=0,014), kişilerarası ilişkiler (p=0,011) ve toplam puanı (p=0,004) anlamlı olarak daha yüksekti.

Sonuç: Çalışmamızın sonuçları, sağlık çalışanlarının pandeminin neden olduğu olumsuzlukların yanı sıra olumlu yönlerini de görerek, travma sonrası büyümenin gerçekleştiğini ortaya koymaktadır.

Anahtar Kelimeler: Kohort, COVID-19, psikolojik büyüme, telesağlık hizmeti, aşılama

INTRODUCTION

Due to the rapid spread of the COVID-19 worldwide, millions of people were forced to stay home to prevent its spread (1). In contrast, health workers had to be on the frontlines. The Occupational Health and Safety Administration (OSHA) declared that health workers fall in the group of high and very high-risk jobs during the COVID-19 pandemic (2,3). The adversities brought about by the COVID-19 pandemic have also led to a mental health pandemic. Therefore, as with all pandemics, the COVID-19 pandemic is considered a traumatic event (4).

Many people who have a traumatic experience or witness such an event can later develop problems severe enough to be classified as a psychological disorder (4,5). On the other hand, the alternative understanding that trauma brings about positive development and maturity in some individuals is defined as the concept of posttraumatic psychological growth (6,7). Health workers can also experience posttraumatic growth by saving lives and healing their patients (8).

Telehealth services, which are used as a tool to help provide healthcare without the need for face-to-face contact, became more important during the pandemic due to the transmission and virulence characteristics of SARS-CoV-2 (9-11). This service ensures continuity of medical care and provides psychological support, ensures that people are informed and educated during the interviews, and promotes adherence to treatment and isolation rules (9,10,12).

Although there are many studies evaluating health workers in the COVID-19 pandemic, none has presented long-term follow-up findings and evaluated the effects of the pandemic on psychological growth. The aim of this study was to examine the effects of telehealth services offered at the Istanbul University, Istanbul Faculty of Medicine (IFM) to health workers with presumed COVID-19 or close contact with a suspected/confirmed COVID-19 patient on pandemic management, vaccination, and psychological growth at one year after diagnosis.

MATERIAL and METHODS

The population of this cohort study consists of 237 employees who were diagnosed with COVID-19 and monitored from home or had close contact with a suspected/confirmed patient and received telehealth service provided by the Workplace and Employee Health Outpatient Clinic (WEHOC) of the IFM Department of Public Health between April 6 and July 31, 2020.

Inclusion criteria included being employed in the IFM, being 18 years of age or older, having contact with a patient with suspected or confirmed COVID-19 or being diagnosed with COVID-19, and being managed from home (Figure 1).

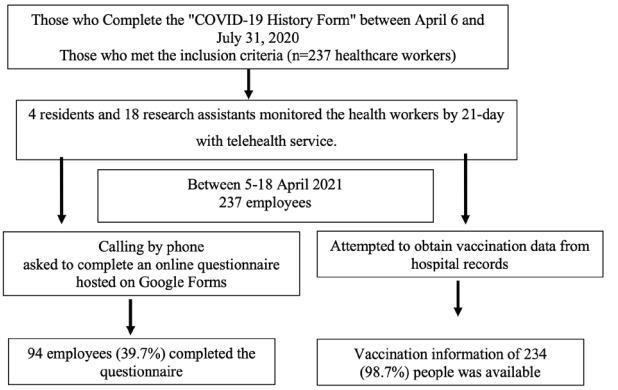

Figure 1. Flow chart of the study

In the first stage of the study, the Chief Physician sent an official letter to all departments asking IFM employees with a confirmed COVID-19 diagnosis who were monitored from home and those with close contact with a

suspected/confirmed patient to complete a COVID-19 History Form. When the IFM employee completes this form online and clicks the "send" button, a copy of the form is sent to their e-mail address and another is sent to the WEHOC institutional e-mail address. As soon as the form reached WEHOC, the IFM employees were contacted by calling the phone number given on their form from a landline phone and a 21-day remote monitoring process was initiated after obtaining their verbal consent. The remote monitoring form included questions about the participant's descriptive and contact information, profession and department, pregnancy status if applicable, COVID-19 contact history, presence of risk factors, regularly used medications, daily symptoms, and compliance with isolation rules. Patients were identified using the case definitions and case management in the "COVID-19 (SARS-CoV-2 infection) Guide" dated March 23, 2020 from the Ministry of Health General Directorate of Public Health (13).

In the second stage of the study, the 237 employees being monitored were contacted by phone between April 5 and 18, 2021 and asked to complete an online questionnaire hosted on Google Forms. Of these, 94 employees (39.7%) completed the questionnaire, which included items about the difficulties experienced during the last year of the pandemic, any loss experienced during this period, the need for psychological support, changes in their use of personal protective equipment (PPE), and the Posttraumatic Growth Inventory (PTGI). Relatives who died due to the pandemic were classified according to their relationship to the health worker as first-degree, second-degree, third-degree, and fourth-degree (14).

The PTGI was developed to measure perceived psychological growth after traumatic experiences (15). It includes 21 items rated on a 6-point Likert-type scale (0-5) and yields a total score ranging from 0 to 105. Items 5, 10-13, 15-19 assess changes in self-perception; items 1-4, 7, 14 assess changes in life philosophy; and items 6, 8, 9, 20, 21 assess changes in relationships with others. Higher scores indicate greater post-traumatic growth. The original form of the tool has five subscales. Cronbach's α coefficients of internal consistency were 0.90 for the 21-item scale and ranged from 0.77 to 0.92 for the subscales. In the Turkish validity and reliability study conducted by Kağan et al., the tool was found to be valid and reliable (16).

In addition, in the second stage of the study, we attempted to obtain vaccination data for the 237 monitored employees from hospital records. Of the 234 employees (98.7%) whose records were available, the first and second doses of COVID-19 vaccine, seasonal influenza vaccine before and during the pandemic, and pneumococcal-13 vaccine were examined.

Approval to conduct this study was obtained from the Ministry of Health, and the IFM Clinical Research Ethics Committee (Date: 17.07.2020, No: 18).

Statistical analysis

Data were evaluated using SPSS version 21.0 package software (IBM Corp, ARMONK, NY). The Kolmogorov-Smirnov test was used to determine whether numerical data were normally distributed. The non-normally distributed variables of age and Post-Traumatic Growth Inventory score also showed normal distribution after transformation to log10 base. The Chi-square test, Mann-Whitney U test, and Kruskal-Wallis test were used in the statistical analysis of the data. The level of statistical significance was accepted as $p<0.05$, with $p<0.017$ considered statistically significant if Bonferroni correction was applied.

RESULTS

The median age of the participants was 35.0 (20.0–65.0) years. After the 21-day follow-up period, 70 employees with confirmed COVID-19 diagnoses fully recovered and returned to work; 67 of those (95.7%) were called to the IFM COVID-19 Follow-up Outpatient Clinic and were placed under long-term follow-up. The sociodemographic characteristics of the employees are presented in Table 1. Neither the health workers themselves nor anyone in their households had a history of travel abroad within 14 days before presentation.

Risky contact was reported by 200 IFM employees (84.4%) at presentation, of which 53 employees (26.2%) had very close contact. Contact occurred most frequently in the Oncology Institute (n=29) and in the neonatal intensive care unit (n=24), followed by the gynecology and obstetrics (n=19), urology (n=18), COVID-19 ward (n=14), and pharmacy (n=10) departments. Although contact was most commonly with patients (n=139, 58.7%), contact with colleagues was reported by 37 employees (15.6%) and with relatives, spouses, and children by 24 employees (10.1%). Another 37 employees (15.6%) did not know who they had contacted.

The distribution of symptoms according to the day of follow-up is presented in Figure 2 and the distribution of compliance with isolation rules is presented in Figure 3.

At final follow-up on day 21, symptoms were completely resolved in 211 (89.0%) of the participants. Comparison of patients with complete recovery and those with persistent symptoms at final follow-up revealed that 33.3% of patients with Hashimoto thyroiditis and 40.0% of those with any cancer diagnosis had persistent symptoms (Table 2).

Table 1. Distribution of socio-demographic characteristics of IFM employees

Socio-demographic characteristics	Number (n=237)	%*
Gender		
Female	153	64.6
Male	84	35.4
Marital status		
Married	143	60.3
Single	94	39.7
Age groups (years)		
≤30	75	31.6
31-50	141	59.5
≥51	21	8.9
Profession		
Nurse	88	37.1
Doctor	59	24.9
Nursing staff, cleaning staff	46	19.4
Technician	16	6.8
Registration staff	10	4.2
Administrative staff	8	3.4
Pharmacist journeyman	4	1.7
Security guard	3	1.3
Other**	3	1.3
PCR result		
Negative	124	52.3
Positive	44	18.6
Not performed***	69	29.1
BT result		
No pathology (normal)	56	23.6
COVID-19 compatible	47	19.8
Not performed	134	56.6
PCR and/or CT results positive comorbidity	70	29.5
0	150	63.3
1	69	29.1
≥ 2	18	7.6
Patient follow-up status		
Working	152	64.1
Home isolation	82	34.6
Home isolation after hospitalization	3	1.3

*: column percentages, **: Midwife, pharmacist, ***: Among those who applied after a positive case of COVID-19 in their department, those who did not have any symptoms

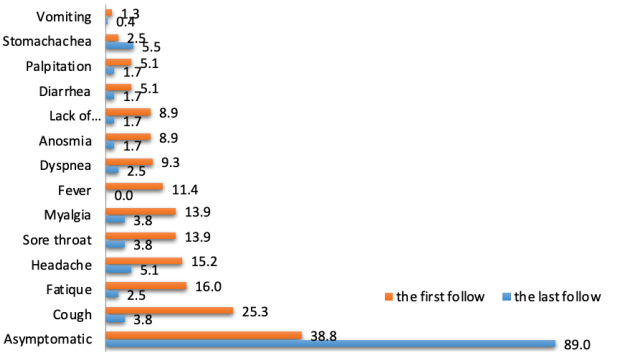

Figure 2. The distribution of symptoms according to the day of follow-up

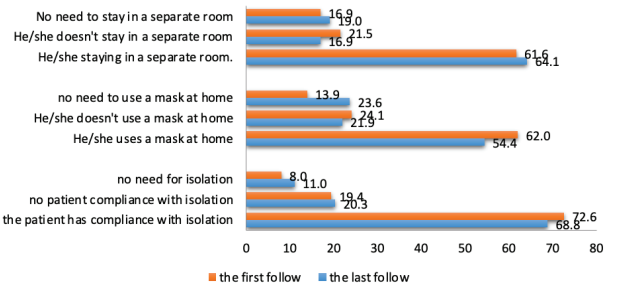

Figure 3. The distribution of compliance with isolation rules

Vaccination status could be determined for 234 of the employees. Of these, 172 (73.5%) had received the first dose of COVID-19 vaccine, 164 (70.1%) had received the second dose of COVID-19 vaccine, and 7 (3.0%) had received the pneumococcal-13 conjugate vaccine. Seasonal flu vaccination was documented in 10 employees (4.3%) before the pandemic, 41 employees (17.5%) during the pandemic, and 5 (2.1%) in both periods. The rate of seasonal influenza vaccination increased significantly during the pandemic period (χ^2=7.625; p=0.006).

After one year, a total of 94 employees (39.7%) completed the online survey. Sixty (63.8%) of the respondents were women, their median age was 36 (20-65) years, and they did not differ significantly from the population in terms of gender or age (p>0.05). Seventy (74.5%) of the participants stated that they had difficulty during the last year due to the COVID-19 pandemic, and none of them had COVID-19 again during that time. The most commonly reported problems are shown in Table 3.

Twenty-eight employees (29.8%) expressed the need for psychological support in the last year; of these, 9 (9.6%) said that they received psychological support, while 19 (20.2%) stated that they did not/could not get support even though they needed it. Barriers to getting psychological support cited in the latter group included not hav-

Table 2. Factors affecting IFM employees' persistence of symptom

		No symptoms at last follow-up (n=211)		There are symptoms at the last follow-up (n=26)		
		Number	%*	Number	%*	χ2, p
Age (year±SD) **		36.9±9.8		38.8±9.1		0.337
Gender (n,%)						
Female		135	88.2	18	11.8	0.597
Male		76	90.5	8	9.5	
Number of comorbidity						
0		137	91.3	13	8.7	
1		59	85.5	10	14.5	0.289
≥2		15	83.3	3	16.7	
Type of comorbidity (n,%)						
Smoking	Yes	38	90.5	4	9.5	0.741
	No	173	88.7	22	11.3	
Cardiovascular diseases	Yes	14	93.3	1	6.7	0.582
	No	197	88.7	25	11.3	
Respiratory	Yes	12	100.0	0	0.0	0.212
	No	199	88.4	26	11.6	
Hypertension	Yes	10	76.9	3	23.1	0.151
	No	201	89.7	23	10.3	
Hashimoto thyroid, hypothyroidism	Yes	8	66.7	4	33.3	**6.4721; 0.011**
	No	203	90.2	22	9.8	
Diabetes	Yes	4	80.0	1	20.0	0.514
	No	207	89.2	25	10.8	
Cancer	Yes	3	60.0	2	40.0	**4.4071; 0.036**
	No	208	89.7	24	10.3	
PCR result ***						
Negative		110	90.2	12	9.8	**7.9496; 0.005**
Positive		32	72.1	12	27.9	

*: Row percentage, **: Student t test, ***: PCR was not performed on 69 employees, only symptom follow-up was performed for 21 days, P values were obtained by Chi-square test.

Table 3. The most commonly reported problems during the one-year COVID-19 process

Conditions	Number (n=70)	%
Working conditions	47	67.1
Inability to support parents	31	44.3
Someone in the family has COVID19	22	31.4
Losses due to COVID-19	22	31.4
Not being with your spouse or children	20	28.6
Other *	5	7.1

* Restriction of social life, perception of health workers as a potential risk, anxiety of infecting others

ing time (n=7, 36.8%), thinking they would overcome the problem on their own (n=4, 21.1%), having a busy work schedule (n=2, 10.5%), believing the problem would resolve by itself (n=2, 10.5%), financial reasons (n=2, 10.5%), the relevant departments being closed at the start of the pandemic (n=1, 5.3%), and attempting to cope with prayer (n=1, 5.3%).

In the PTGI, the participants' median total score was 62.5 (21.0–126.0) and subscale scores were 30.5 (10.0–60.0) for change in self-perception, 19.0 (6.0–36.0) for change in life philosophy, and 13.0 (5.0–30.0) points for change in relationships with others. Comparisons of scale scores according to selected variables are shown in Table 4.

Table 4. Comparisons of scale scores according to selected variables

	Self-perception score	Life philosophy score	Interpersonal relations score	Total scale score
Gender				
Female (n=60)	33.0 (10.0-60.0)	20.0 (6.0-33.0)	13.0 (5.0-30.0)	65.5 (21.0-122.0)
Male (n=34)	26.5 (10.0-60.0)	16.5 (8.0-36.0)	10.0 (5.0-30.0)	54.0 (23.0-126.0)
p	0.073	0.058	0.098	0.059
Marital status				
Married (n=54)	29.0 (10.0-60.0)	18.0 (6.0-36.0)	12.0 (5.0-30.0)	61.0 (21.0-126.0)
Single (n=40)	33.5 (10.0-60.0)	19.5 (8.0-32.0)	14.0 (5.0-30.0)	65.0 (23.0-122.0)
p	0.320	0.448	0.263	0.242
Managing the COVID-19 process				
Forced (n=24)	29.0 (10.0-60.0)	16.0 (6.0-36.0)	10.0 (5.0-30.0)	60.0 (21.0-126.0)
Unforced (n=70)	30.5 (10.0-60.0)	19.0 (7.0-33.0)	13.0 (5.0-30.0)	63.0 (23.0-122.0)
p	0.765	0.236	0.255	0.469
Psychological support during the COVID-19 process				
Not needing (n=66)	27.5 (10.0-60.0)[1]	17.0 (6.0-36.0)	12.5 (5.0-30.0)	58.5[2] (21.0-126.0)
Receiving psychological support (n=9)	33.0 (20.0-48.0)	20.0 (8.0-24.0)	16.0 (7.0-21.0)	66.0 (35.0-85.0)
Not receiving/ unable to receive psychological support (n=19)	39.0 (15.0-60.0)[1]	22.0 (11.0-33.0)	13.0 (5.0-30.0)	76.0 (31.0-122.0)[2]
p	**0.015**	0.076	0.341	**0.041**
Change in PPE use case				
There has been no change, he always uses it carefully (n=40)	30.0 (10.0-60.0)	20.0 (8.0-36.0)	13.0 (5.0-30.0)	62.5 (26.0-126.0)
There has been no change, sometimes it can be careless (n=22)	23.5 (10.0-53.0)[3]	15.0 (8.0-26.0)[4]	10.5 (5.0-22.0)[5]	50.0 (23.0-101.0)[6]
He/She uses it more carefully (n=32)	38.5 (10.0-60.0)[3]	21.0 (6.0-32.0)[4]	14.0 (5.0-30.0)[5]	74.0 (21.0-122.0)[6]
p	**0.017**	**0.026**	**0.037**	**0.012**
1st dose of COVID-19 vaccine				
Yes (n=74)	30.5 (10.0-60.0)	20.0 (6.0-32.0)	13.0 (5.0-30.0)	63.0 (21.0-122.0)
No (n=20)	31.5 (10.0-60.0)	15.0 (8.0-36.0)	12.0 (5.0-30.0)	62.0 (23.0-126.0)
p	0.982	0.122	0.753	0.641
2nd dose of COVID-19 vaccine				
Yes (n=73)	30.0 (10.0-59.0)	20.0 (6.0-31.0)	13.0 (5.0-30.0)	63.0 (21.0-120.0)
No (n=21)	33.0 (10.0-60.0)	15,0 (8.0-36.0)	13.0 (5.0-30.0)	62.0 (23.0-126.0)
p	0.660	0.266	0.917	0.964

1, 2, 3, 4, 5, 6: statistically significant groups. . Values are expressed as median (range).

DISCUSSION

Worldwide, both diagnosis and treatment were complicated processes at the start of the COVID-19 pandemic. The gold standard for the diagnosis of SARS-CoV-2 is real-time polymerase chain reaction (RT-PCR) testing of nasopharyngeal swab samples, in clinical practice the reported sensitivity of this test has varied between 42% and 83% due to numerous factors related to symptom duration, viral load, and test sample quality (17). In

cases of COVID-19 infection, case management in line with clinical, radiological, and other laboratory findings is recommended for these patients (18). In this study, RT-PCR was performed first and computed tomography (CT) was performed in case of uncertainty. According to the RT-PCR results, 18.6% of the patients were diagnosed as confirmed COVID-19, 52.3% as not having COVID-19, and 11.4% as suspected COVID-19. When RT-PCR and/or CT were performed, the definitive diagnosis rate increased to 29.5%.

People with chronic health problems and current smokers are not only at high risk of developing clinically severe COVID-19, but also are at a higher risk of death (19,20). In this study, 33.7% of the patients had at least one comorbid condition. In a meta-analysis study examining comorbidities in COVID-19 patients in a similar age group, the most common comorbidities in 1,786 patients with a mean age of 41 years were hypertension, cardiovascular disease, and cerebrovascular diseases (21). Especially for health workers with chronic diseases, receiving diligent and attentive telehealth service and monitoring their symptoms during this follow-up process may have had a positive impact on their quality of life and coping with the disease.

Health professionals are at risk of encountering many asymptomatic infected individuals during their routine daily work. In the present study, 15.6% of the employees could not identify anyone as a contact. The most frequently reported contact was with patients (58.7%) and colleagues (15.6%), indicating that half of the employees contracted COVID-19 after contact with their patients. Moreover, 26.2% of the employees had very close contact according to the Ministry of Health criteria. This finding increases the importance of PPE use.

When we evaluated PPE use at the 1-year follow-up, 42.6% of the employees stated that there was no change and they always used PPE carefully, 23.4% stated that there was no change and they were sometimes careless about using PPE, and 34.0% stated that they used PPE more carefully since the pandemic. As the early symptoms of COVID-19 are nonspecific, it is not always possible to identify infected individuals, and standard infection measures should be applied consistently and correctly when caring for patients (22). We also determined that 15.6% of the cases in this study were diagnosed after contact with infected colleagues. This finding once again demonstrates the importance of appropriate PPE use in the workplace and compliance with standard infection prevention rules. This is also important in terms of maintaining workplace health and safety and adequate staffing.

Although the COVID-19 patients under home follow-up were health professionals, they were still reminded during phone calls of the importance of isolation measures that should be applied at home. Despite all reminders, only 38.4% of them were in separate rooms at the first follow-up and 35.9% at final follow-up; 38.0% used masks at home at the first follow-up and 45.6% at final follow-up; and 27.4% were having difficulty adapting to isolation at the first follow-up and 31.2% at final follow-up. This shows that noncompliance with infection prevention rules in the workplace continues at home. For health professionals working in real high-risk settings, the perception of infection risk may change after long working hours. A study conducted among health workers in China showed that those working at risk had lower infection anxiety (23).

COVID-19 has a wide range of symptoms and can be confused with many diseases with similar symptomatology (24). The health workers in this study most frequently presented with cough (25.3%), fatigue (16.0%), and headache (15.2%). Fever at disease onset was detected in 11.4% of cases. Similar to the results of a systematic review, a third of the COVID-19 patients in our study were asymptomatic (25). People who are asymptomatic, have atypical symptoms, and some COVID-19 patients without fever pose a risk of transmitting the disease to patients, other health workers, and the community (24). From this point of view, the protection of health workers and early diagnosis of those who are infected are vital in controlling the pandemic.

In this study, 11.0% of the patients reported persistent symptoms at the final follow-up on day 21. The most commonly reported symptoms were stomachache (5.5%) and headache (5.1%). Stomachache is a less expected symptom and its persistence is a notable finding. When we compared patients with persistent symptoms and those with complete resolution at the last follow-up, we found that persistence was significantly associated with Hashimoto thyroiditis, any cancer diagnosis, and positive RT-PCR test at disease onset. Studies show that many people with COVID-19, especially those with comorbid conditions, do not recover to their previous level of health in the long term. According to a nationally representative study by the UK Office for National Statistics, approximately 1 in 10 patients with a positive COVID-19 test result was reported to have persistence of symptoms for 12 weeks or more (26). There is still much uncertainty regarding how COVID-19 affects people over time and the impact of comorbid diseases on "long COVID."

The pandemic has further increased the importance of vaccination and of the cohort in our study, 73.5% of the employees had received the first dose and 70.1% had received the second dose of COVID-19 vaccine at one year. When evaluated according to first dose, the vaccination rate can be considered good. In a systematic review presenting an updated evaluation of COVID-19 vaccine acceptance rates based on an analysis of eight

studies, COVID-19 vaccine acceptance rates were reported to be below 60% on average, with the highest rate among doctors in Israel (78.1%) and the lowest rate among healthcare workers in the Democratic Republic of Congo (27.7%) (28). The rate of pneumococcal vaccination, which is among the routine vaccination recommendations for health workers, was only 3% among the employees in our study, suggesting a serious problem in terms of adult immunization. Although the participants' rate of seasonal influenza vaccination increased significantly during the pandemic, it is still not sufficient. We believe that interventions should be implemented to support this.

As in previous pandemics, health workers have a high risk of psychological effects associated with the COVID-19 pandemic. Health workers' exposure to COVID-19 patients in their centers, being sick and quarantined, fear of infecting themselves and their relatives, and witnessing the death of their patients, relatives, or friends results in the perception of personal danger that increased with the lethality of the virus. In addition, conditions such as sudden rises in in-patient admissions and increased workload, insufficient protection against contamination, and a negative institutional culture can also cause difficulties for health workers. All of these adversities can impair the psychological health of health workers, causing problems that may continue in both the short and long term (29,30). In this study, three quarters of the participants said they had difficulty during the last year due to the pandemic, mostly related to working conditions (67.1%). One in three employees experienced loss during the pandemic period, with 95.5% of those employees saying that losing their patients was difficult for them. These two findings support each other.

Pandemics can trigger generalized mental disorders, including anxiety and depressive disorders, and posttraumatic stress disorder requiring psychological intervention in health workers. However, further research is needed to better assess the short- and long-term psychological consequences of pandemics on healthcare workers and to minimize their impact (26).

One-third of the employees in our study reported needing psychological support during the pandemic. However, a fifth of those who needed psychological support stated that they did not or could not receive support despite being a health worker themselves. In order of frequency, the reasons cited for not getting support were lack of time, thinking they would overcome the problem on their own, heavy work schedule, thinking the problem would go away by itself, financial limitations, closure of the relevant departments at the start of the pandemic, and trying to cope through prayer. This shows that as with vaccination and PPE use, there is a need to support health workers in seeking psychological support and for intervention programs to support and empower the right people for this. As stated by the The Lancet Global Health and Kang et al., providing psychological support using face-to-face or printed resources can also help in this regard (23,31,32).

In studies conducted in other pandemics, it is stated that one-third of those affected in the long term may have permanent psychological problems, develop a tendency toward higher risk behaviors, and encounter problems while leading their daily lives (33). When faced with life-threatening events, people seem to reassess their goals and priorities, perceive improved social relationships, and appreciate life more. These changes, called posttraumatic growth, include greater psychological well-being and correspond to higher functioning in certain areas after trauma. Although many studies have investigated the negative consequences of COVID-19 on mental health, very little is known about the potential positive psychological effects of the pandemic and whether it can induce posttraumatic growth (23,33).

The results of our study suggest that health workers are showing evidence of posttraumatic growth by seeing the positives as well as the negatives caused by the pandemic. Growth is not caused by the event itself, but by the way the event is handled, leading the person to re-evaluate their personal priorities. It promotes growth in three areas: self-perception, interpersonal relationships, and life philosophy (23). In this study, we observed that the self-perception and total scale scores were significantly higher in participants who did not or could not receive the psychological support they needed during the COVID-19 pandemic when compared with those who reported not needing psychological support at all. This finding suggests that those who do not receive psychological support despite feeling the need for it emerge from the pandemic by improving themselves. Similarly, it was found that those who used PPE more carefully had higher self-perception, life philosophy, interpersonal relationships, and total PTGI scores. These last two findings also indicate that individuals with high awareness can emerge from traumatic situations such as pandemics by improving themselves. Evidence suggests that people of all ages who experience various types of traumas can identify positive ways to change their lives and that these changes are associated with improved mental health and well-being. In fact, studies have determined that half of those who experience trauma show some degree of posttraumatic growth (24). Our findings demonstrate the efforts toward areas of posttraumatic growth such as building relationships with others, greater appreciation of life, discovering and embracing new possibilities, and positive mental change. However, further studies with longer follow-up

are needed to confirm these findings, predict who may experience these changes, and determine whether these changes will persist in the future.

This study has some limitations; The most important limitation is the small number of participants who completed the online questionnaire on Google Forms. Therefore, the results cannot be generalized. The second is the lack of randomization in reaching the sample, and the results of a single-center study can not be applied to the general population.

CONCLUSION

The results of this cohort study show that health workers, like other members of the community, had some difficulties obtaining an accurate diagnosis and receiving psychological support at the beginning of the pandemic. Psychological problems due to various stressors are inevitable during and after the pandemic. To overcome these problems, protective community mental health services should be given priority.

It is a remarkable and important finding that the health workers in our study supported COVID-19 vaccination and had a high vaccination rate. However, in terms of other vaccinations, PPE use, and seeking psychological support when necessary, this study revealed an unexpected lack of self-protective behavior and even disregard for risks. These issues are relevant both in routine practice and emergencies such as the COVID-19 pandemic and should be addressed through in-service training programs.

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