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The psychological resilience and perceived stress of the frontline heroes in the pandemic in Turkey: A descriptive study of the COVID-19 outbreak-mutations-normalization triad

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Abstract

Aim: To determine the psychological resilience and perceived stress levels of healthcare workers in COVID-19 intensive care units.

Methods: The study was conducted with 418 physicians and nurses in Turkey between July and August 2020. The data were collected with an online survey consisting of a personal information form, the Brief Resilience Scale, and the Perceived Stress Scale.

Results: The study sample comprised 32.5% physicians and 67.5% nurses. Fear of transmission of COVID-19 from the patients in their care was stated by 92.6% of the physicians and 95.7% of the nurses. Almost all of the participants (99.3%) were afraid of transmitting COVID-19 to their families. The psychological resilience level of the physicians (18.42 ± 2.25) participating in the study was higher than that of the nurses (17.88 ± 2.00), and the perceived stress level was lower. It was determined that most physicians and nurses strengthened their team/work friendship bonds during the pandemic, but the motivation to work decreased.

Conclusion: The study results suggest that frontline intensive care workers should be closely monitored as a high-risk group for psychological problems. The provision of better personal protective equipment, together with on-going monitoring and provision of psychological support, and strong family support will increase the resilience of frontline healthcare workers.

KEYWORDS

COVID-19 outbreak, intensive care workers, perceived stress, psychological resilience

1 | INTRODUCTION

Coronaviruses cause various infections in many living organisms, including humans (Temizkan & Alkan, 2021). In recent years, coronaviruses have gained importance among zoonotic viruses following the SARS-coronavirus (SARS-CoV) and MERS-CoV infections, and more recently, the COVID-19 outbreak caused by the novel coronavirus, SARS-coronavirus-2 (SARS-CoV-2) (Temizkan & Alkan, 2021). SARS-CoV-2 first manifested as an increase in unexplained pneumonia cases in Wuhan, China (Rajkumar, 2020), then quickly reached epidemic levels and spread across all countries of the world. COVID-19 was officially declared a global

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pandemic by the World Health Organization (WHO) in March 2020 (WHO, 2020). Despite great advances in science, industry, medicine, and technology, the COVID-19 pandemic now occupies the global agenda as a problem that even the well-developed systems of the modern age have not yet been able to resolve (Bacha, 2021). The pandemic has taught countries how small the world is, that a person's illness due to the virus can turn into a crisis that affects the whole world, and the importance of health (van Oosterhout, Hall, Ly, & Tyler, 2021). While the infection was initially particularly aggressive in the elderly, the virus has now gone through mutations and is affecting all age groups and all segments of society, resulting in an increased number of patients requiring intensive care treatment (Chang, Xu, Rebaza, Sharma, & Dela Cruz, 2020). Several new strains of SARS-CoV2, the causative agent of COVID-19, have emerged in the spring months of 2021 and the number of confirmed cases of all ages, even children, is steadily growing in Turkey, as in all countries because of these mutations (van Oosterhout et al., 2021; Vilar & Isom, 2021). Mutations provide this virus with the mechanisms to increase the transmissibility, modify pathogenicity, and evade host immunity, shifting the antigenic response and causing resistance to therapeutics (Vilar & Isom, 2021). Variants of SARS-CoV2 have developed a higher transmission rate compared to the original strain, which makes control of the virus and the disease even more challenging in Turkey, just as in other countries (Aydemir et al., 2021; van Oosterhout et al., 2021). With the multiple variants resulting from mutation, COVID-19 is a rapidly spreading disease that can affect all age groups and genders, causing serious complications and death (Chang et al., 2020; Vilar & Isom, 2021). Although the societal normalization process has begun in Turkey, the pandemic is still a threat to public health and the number of positive cases continue to increase daily because of the variants (Ministry of Health of Turkish Republic, 2021; Koçak Tufan & Kayaaslan, 2020).

Undoubtedly, the most promising event of the normalization process is the increase in vaccination studies. Never have new vaccine technologies been implemented into practical use more rapidly, nor production capacities for billions of vaccine doses generated so effectively from scratch (Heinz & Stiasny, 2021). Although an impressive number of COVID-19 vaccines have now been authorized in many countries and used for mass vaccination campaigns, a large proportion of the population is still waiting for vaccination and more vaccine production is needed (Heinz & Stiasny, 2021; Temizkan & Alkan, 2021). The numbers of new cases have escalated rapidly and reached approximately 50,000 daily cases in Turkey (as of April 8, 2021).

Those at the highest risk of contracting the disease are healthcare workers who are on the frontline fighting the pandemic (Zhang & Li, 2020). The increase in COVID-19 cases has caused hospitals to become overcrowded and intensive care units to reach capacity (Chang et al., 2020). Under these conditions, it has been stated that many healthcare professionals will contract this highly contagious disease, some will barely survive, and some will lose their lives (Z. Wu & McGoogan, 2020). The healthcare personnel working in intensive care units (ICU) are extremely strongly affected by the pandemic as they are witnessing the life struggles of patients with a severe disease course, have long-term interaction with infected patients, suffer from inadequate supplies of protective equipment and from the risk of infection, are separated from their homes/families, and have intense working hours (Barranco & Ventura, 2020; Chang et al., 2020; Wang, Zhou, & Liu, 2020). Healthcare workers generally experience high levels of stress, irregular work schedules, and frequent work shifts, leading to increased sleep disturbances and psychological problems, and variants resulting from mutation have increased morbidity and mortality rates, thereby increasing the workload of healthcare workers (Qi et al., 2020). In this process, intensive care workers not only experience stress due to their increased workload but also fear infection and transmitting the virus to their homes/families (Walton, Murray, & Christian, 2020).

Although people in most countries were advised to stay at home within the scope of quarantine measures, healthcare workers were away from their homes and could not even see their families for days or possibly weeks (Barranco & Ventura, 2020). Considering that healthcare workers exposed to the virus who showed symptoms and had positive test results should enter a quarantine process, it is known that individuals who are already exhausted due to long working hours will become lonelier with quarantine (Walton et al., 2020; Z. Wu & McGoogan, 2020; Zhang & Li, 2020). Therefore, determining the psychological resilience and perceived stress levels of intensive care workers caring for COVID-19 patients during the pandemic will be the first step in the psychological strengthening of these important healthcare staff.

It is essential to determine the psychological health of intensive care workers, who can successfully overcome adverse conditions such as the pandemic and adapt to new situations (Doğan, 2015; Du et al., 2020; Z. Wu & McGoogan, 2020). The aim of this study was to determine the psychological resilience and perceived stress levels of frontline healthcare personnel during the COVID-19 pandemic who treat patients presenting a severe disease

course and work in environments with the highest viral load.

2 | METHOD

2.1 | Participants and sampling

This descriptive study was prepared according to STROBE guideline. The study was conducted with 418 physicians and nurses working in COVID-19 intensive care units in two state hospitals in Turkey between July and August 2020. The data were collected with a survey consisting of a personal information form (PIF), the Brief Resilience Scale (BRS), and the Perceived Stress Scale (PSS). The study inclusion criteria were the following: (i) not having COVID-19 infection, (ii) not showing COVID-19 symptoms, and (iii) working in intensive care units where COVID-19 patients were hospitalized. A total of 452 physicians and nurses were reached within the scope of the study, and 12 physicians and 22 nurses did not complete the survey. The survey response rate was 92%.

2.2 | Instruments

The study data were collected with the PIF, BRS, and PSS, prepared by the researchers with reference to the literature. The PIF included questions about the respondent's profession, age, gender, marital status, number of children, time worked in intensive care, types of intensive care, and work experience in intensive care including with COVID-19 patients.

The BRS was developed by (Barranco & Ventura, 2020; Smith et al., 2008) to measure the psychological resilience of individuals. The scale is a self-report, six-item measurement tool using a five-point Likert scale. After adjustment of the reverse-coded items in the survey, high scores obtained indicate a high psychological resilience level. In the Turkish validity and reliability study, the internal consistency coefficient (Cronbach's alpha) was found to be 0.83 (Doğan, 2015). In the current study group, the Cronbach's alpha value of the scale was 0.73 (Table 2).

The PSS was developed by Cohen, Kamarck, and Mermelstein (1983). The PSS, consisting of 14 items in total, is designed to measure how a person perceives stressful situations in his/her life. Each item is evaluated on a five-point Likert scale ranging from "Never (0)" to "Very often (4)". Seven items containing positive statements are reverse coded. The scale item-total scores range from 0 to 56, with a high score indicating an excessive perception of stress. In the Turkish validity and reliability study, the internal consistency coefficient was found to be 0.84 (Eskin, Harlak, Demirkiran, & Dereboy, 2013). In the current study group, Cronbach's alpha value of the scale was 0.85 (Table 2).

2.3 | Statistical analysis

The data were analyzed with the SPSS v24 software program. Central distribution measures (arithmetic mean, median, mode), kurtosis–skewness coefficient, extreme value screening, and Kolmogorov–Smirnov tests were performed to determine the appropriateness of the total scores of the BRS and PSS to normal distribution. Bivariate analysis was applied to evaluate the difference between the groups. For bivariate analysis, an independent samples t test was used to determine the mean scores when the independent variable had two groups, and one-way analysis of variance (post hoc Scheffe test) was applied when there were more than two groups. Homoscedasticity was evaluated using a Levene's test. The Pearson's correlation coefficient was calculated to determine whether there was a statistically significant relationship between the BRS and PSS.

2.4 | Ethical approval

Ethical approval for the study was obtained from the Kahramanmaras Sutcu Imam University Faculty of Medicine Clinical Research Ethics Committee (ref.nr: 2020/03). Consent was obtained from the study participants with an online voluntary informed consent form, and the study was conducted in accordance with the Helsinki Declaration principles.

3 | RESULTS

3.1 | Descriptive statistics

The study sample comprised 32.5% physicians and 67.5% nurses. The mean age of the physicians was 33.29 ± 8.09 years, while the mean age of the nurses was 29.71 ± 6.45 years. Women constituted 47.8% of the physicians and 84.0% of the nurses. Of the physicians, 55.1% were married and 42.6% had children, while 47.2% of the nurses were married, and 29.4% had children. The duration of intensive care experience was between 1 and 5 years for 47.1% of the physicians and 57.1% of the nurses (Table 1).

According to the study results, 92.6% of the physicians and 95.7% of the nurses stated they had a fear of transmission of COVID-19 from the patients they cared for. Almost all participants (99.3%) were afraid of transmitting the COVID-19 infection to those in their immediate environment (family, spouse, children, etc.). A total of 89.7% of the physicians and 88.3% of the nurses stated that working in COVID-19 intensive care increased humanitarian/conscientious values. According to 93.4% of the physicians and 86.2% of the nurses, the pandemic process strengthened team/colleague bonds. Wearing personal protective equipment while working was felt to be a psychological burden by 85.3% of the physicians and 93.6% of the nurses. Of the total sample, 89.7% of the physicians and 94.0% of the nurses stated that the hospital environment negatively affected their psychological health during the pandemic. A decrease in motivation to work during the pandemic was reported by 89.0% of the physicians and 88.7% of the nurses. Feeling more tense, angry, and intolerant in their daily lives during the pandemic was stated by 66.2% of the physicians and 78.0% of the nurses. It was found that 58.8% of the physicians and 77.7% of the nurses experienced physical fatigue, and 74.3% of the physicians and 30.5% of the nurses stated that they became lonely during the pandemic. Of the whole sample, 85.3% of the physicians and 83.3% of the nurses stated that they stayed somewhere other than home after starting to work with COVID-19 suspected/positive patients (Table 1).

3.2 | Independent *t* test and analysis of variance

The psychological resilience level of the physicians (18.42 ± 2.25) participating in the study was determined to be higher than that of the nurses (17.88 ± 2.00), and the perceived stress level was lower (Table 1). The mean total BRS score was 17.81 ± 1.92 for female physicians working in intensive care, and 19.04 ± 2.53 for male physicians ($t = -3.516$; $p < 0.001$). Gender was not seen to have any effect on the psychological resilience of nurses ($p > 0.001$). There was no significant relationship between gender and the perceived stress level in physicians and nurses ($p > 0.001$). For both physicians and nurses, being married did not affect the perceived stress and psychological resilience during the pandemic ($p > 0.001$). The mean BRS total score of the respondents with children was 18.50 ± 2.41 for physicians and 18.22 ± 2.09 for nurses. While having children did not affect the perceived stress level in physicians ($p > 0.05$), it increased the perceived stress level in nurses ($p < 0.05$) (Table 3).

A statistically significant relationship was found between the time worked in intensive care and psychological resilience ($p < 0.05$). According to the results of the Scheffe test, which was applied to determine from which group the difference originated, the mean BRS score of physicians with more than 10 years of work in the intensive care unit ($\bar{X} = 22.00$, SD = 0.69) was higher than the score of those with less than 1 year of work in the intensive care unit ($\bar{X} = 19.17$, SD = 3.13). No statistically significant relationship was determined between the time worked in intensive care and the perceived stress level in physicians, whereas nurses working in intensive care units for 10 years or more showed the highest levels of stress (49.00 ± 6.60; $p < 0.05$; Table 3).

While the mean BRS score of the physicians experiencing fear of infection from COVID-19 patients was lower, the perceived stress level was higher ($p < 0.05$). In nurses, it was observed that fear of infection from the patients they cared for had no effect on psychological resilience and perceived stress. The psychological resilience level of the physicians and nurses with a fear of transmitting the COVID-19 infection to their immediate environment (family, spouse, children, etc.) was found to be low, and the perceived stress level was high ($p < 0.05$). Physicians who stated that working in COVID-19 intensive care had increased their humanitarian/conscientious values had a lower mean BRS (17.98 ± 2.13) score than those who stated no change (20.03 ± 1.95), and the mean PSS score was found to be higher (41.32 ± 7.55, 35.86 ± 4.77, respectively) ($p < 0.05$). The mean psychological resilience score of nurses who stated that working in the COVID-19 intensive care unit increased humanitarian/conscientious values was higher (18.91 ± 1.97) than that of those who stated that it did not change (17.74 ± 1.97) ($p < 0.05$). In the physicians and nurses who stated that their team/colleague bonds were strengthened during the pandemic process, the psychological resilience level was determined to be increased and the perceived stress level decreased ($p < 0.05$; Table 3).

Physicians who felt psychologically burdened by working with protective equipment had a lower mean BRS score (18.27 ± 2.20) and a higher mean PSS score (41.26 ± 7.06; $p < 0.05$). The psychological resilience level of the nurses who regarded protective equipment as a psychological burden was lower and the perceived stress level was higher ($p < 0.05$). Both physicians and nurses who stated that the hospital environment negatively affected their psychological health, that their motivation to work decreased, that they were more tense, angry, and intolerant in daily life, and that they felt physically weak, were found to have low psychological

TABLE 1 Summary of study data collected with the Brief Resilience Scale, Perceived Stress Scale, and personal information form

	Physicians ($n = 136$)		Nurses ($n = 282$)		Total ($n = 418$)	
Participant characteristics	**Mean ± SD**					
Age	33.29 ± 8.09		29.71 ± 6.45		30.87 ± 7.21	
Brief Resilience Scale score	18.42 ± 2.25		17.88 ± 2.00		18.06 ± 2.10	
Perceived Stress Scale score	40.15 ± 7.38		43.93 ± 8.28		42.70 ± 8.19	
Participant characteristics	n	%	n	%	n	%
Gender						
Female	65	47.8	237	84.0	302	72.2
Male	71	52.2	45	16.0	116	27.8
Marital Status						
Married	75	55.1	133	47.2	208	49.8
Single	61	44.9	149	52.8	210	50.2
Children						
Yes	58	42.6	83	29.4	141	33.7
No	78	57.4	199	70.6	277	66.3
Working period in intensive care						
Less than 1 year	23	16.9	45	16.0	68	16.3
1–5 years	64	47.1	161	57.1	225	53.8
6–9 years	25	18.4	46	16.3	71	17.0
10 and over	24	17.6	30	10.7	54	12.9
Fear of getting infected from a COVID-19 patient						
Yes	126	92.6	270	95.7	396	94.7
No	10	7.4	12	4.3	22	5.3
Fear of transmitting COVID-19 infection to the immediate environment (family, spouse, children, etc.)						
Yes	134	98.5	281	99.6	415	99.3
No	2	1.5	1	0.4	3	0.7
The impact of working in a COVID-19 intensive care unit on humanitarian/conscientious values						
Increased	107	89.7	249	88.3	356	85.2
Decreased	29	10.3	33	11.7	62	14.8
The impact of the pandemic on team/colleague bonds						
Strengthened	127	93.4	243	86.2	370	88.5
Weakened	9	6.6	39	13.8	48	11.5
Working with protective equipment feels like a psychological burden						
Yes	116	85.3	264	93.6	380	90.9
No	20	14.7	18	6.4	38	9.1
The impact of the hospital environment on psychological health during the pandemic						
Negative	122	89.7	265	94.0	387	92.6
Did not affect	14	10.3	17	6.0	31	7.4
Change in motivation to work during the pandemic						
Decrease	121	89.0	250	88.7	371	88.8

(Continues)

TABLE 1 (Continued)

Participant characteristics	Physicians ($n = 136$)		Nurses ($n = 282$)		Total ($n = 418$)	
	Mean ± SD					
Increase	15	11.0	32	11.3	47	11.2
Being more tense, angry and intolerant in daily life during the pandemic						
Yes	90	66.2	220	78.0	310	74.2
No	46	33.8	62	22.0	108	25.8
Feeling physically weak						
Yes	80	58.8	219	77.7	299	71.5
No	56	41.2	63	22.3	119	28.5
Thoughts of loneliness during the pandemic						
Yes	101	74.3	86	30.5	316	75.6
No	35	25.7	196	69.5	102	24.4
Staying somewhere other than home after starting to work with COVID-19 suspected/positive patients						
Yes	116	85.3	235	83.3	67	16.0
No	20	14.7	47	16.7	351	84.0

TABLE 2 The Brief Resilience Scale and the Perceived Stress Scale

Scales	Cronbach's alpha (α)	Mean (M)	Std. Dev. (SD)	Correlations (r^2)	
				BRS	PSS
BRS	0.73	18.06	2.10	1	
PSS	0.85	42.70	8.19	0.764**	1

Note: ** = significant at the 1% level.
Abbreviations: BRS, Brief Resilience Scale; PSS, Perceived Stress Scale.

resilience and a high perceived stress levels ($p < 0.05$; Table 3).

No statistically significant change was determined in the psychological resilience and perceived stress levels of physicians who thought that they became lonely during the pandemic ($p > 0.05$), whereas for nurses it was determined that psychological resilience decreased while the perceived stress level increased ($p < 0.05$). Staying somewhere other than home after starting to work with COVID-19 suspected/positive patients was not found to affect the psychological resilience and perceived stress level of physicians ($p > 0.05$). Although the total BRS scores of nurses who stayed or did not stay in their own home during the pandemic were close to each other, the difference was statistically significant ($p < 0.05$; Table 3).

The overall mean BRS score of physicians and nurses working in the intensive care unit was 17.87 ± 2.01, and the mean PSS total score was 43.93 ± 8.28. In the groupas a whole, the inadequate self-esteem perception dimension of the PSS was 23.09 ± 2.95, and the stress/discomfort perception dimension was 23.65 ± 3.26. There was found to be a low-level ($r = 0.352$, $p < 0.01$) significant relationship between the PSS and the BRS item-total score mean values, and a high and significant relationship between the PSS total item score and dimension scores ($r > 0.90$, $p < 0.01$; Table 2).

4 | DISCUSSION

As in many countries, the Ministry of Health in Turkey has also taken several measures to reduce the workload on hospitals and the physical and psychological burden on healthcare workers (Sungur, Karaaslan, Tomak, Turgut, 2020; Turkey Public Sector Consulting Services, 2020). These measures include postponing non-emergency elective surgical procedures and paying

TABLE 3 The total mean scores of the Brief Resilience Scale and the Perceived Stress Scale, by participants' responses on the personal information form

Sociodemographic characteristics	Physician				Nurse				Total group			
	BRS mean ± SD	Statistics	PSS mean ± SD	Statistics	BRS mean ± SD	Statistics	PSS mean ± SD	Statistics	BRS mean ± SD	Statistics	PSS mean ± SD	Statistics
Gender												
Female	17.74 ± 1.67	$t = -3.516$	40.54 ± 8.23	$t = 0.579$	17.83 ± 1.99	$t = -1.009$	44.95 ± 7.94	$t = 4.899$	17.81 ± 1.92	$t = -3.952$	43.99 ± 8.19	$t = 5.384$
Male	19.04 ± 2.53	***p = 0.001***	39.80 ± 6.55	$p = 0.56$	18.16 ± 2.06	$p = 0.314$	38.60 ± 8.12	***p < 0.001***	19.70 ± 2.39	***p < 0.001***	39.34 ± 7.19	***p < 0.001***
Marital status												
Married	18.49 ± 2.30	$t = 0.425$	40.19 ± 7.35	$t = 0.056$	18.08 ± 2.22	$t = 1.555$	43.03 ± 8.14	$t = -1.735$	18.23 ± 2.25	$t = 1.661$	42.00 ± 7.96	$t = -1.740$
Single	18.33 ± 2.20	$p = 0.671$	40.11 ± 7.47	$p = 0.955$	17.70 ± 1.77	$p = 0.121$	44.74 ± 8.36	$p = 0.084$	17.89 ± 1.92	$p = 0.097$	43.40 ± 8.36	$p = 0.083$
Children												
Yes	18.50 ± 2.41	$t = 0.360$	39.45 ± 7.19	$t = -0.962$	18.22 ± 2.09	$t = 1.836$	42.19 ± 8.95	$t = -2.295$	18.33 ± 2.22	$t = 1.941$	41.06 ± 8.36	$t = -2.948$
No	18.36 ± 2.14	$p = 0.719$	40.68 ± 7.52	$p = 0.338$	17.74 ± 1.95	$p = 0.067$	44.66 ± 7.89	***p = 0.022***	17.91 ± 2.02	***p = 0.050***	43.54 ± 7.98	***p = 0.003***
Time worked at an intensive care*												
Less than 1 year	19.17 ± 3.13[a]		39.74 ± 7.69		17.20 ± 1.76		45.98 ± 7.47		17.87 ± 2.48		43.87 ± 8.06	
1–5 years	18.39 ± 2.25	F = 3.478	42.47 ± 8.29	F = 2.123	18.32 ± 1.96	F = 2.985	44.27 ± 9.17	F = 3.368	18.34 ± 2.03	F = 1.023	43.75 ± 8.93	F = 2.876
6–9 years	18.25 ± 1.62	***p = 0.006***	41.52 ± 6.93	$p = 0.067$	17.59 ± 2.41	$p = 0.112$	40.74 ± 7.50	***p = 0.006***	17.82 ± 2.12	$p = 0.403$	41.01 ± 7.23	***p = 0.014***
10 years and above	22.00 ± 4.69[a]		38.25 ± 3.30		17.14 ± 1.56		49.00 ± 6.60		18.22 ± 3.17		46.61 ± 7.51	
Fear of getting infected from a COVID-19 patient												
Yes	18.28 ± 2.25	$t = 2.521$	40.59 ± 7.31	$t = -2.659$	17.87 ± 1.97	$t = -0.360$	43.95 ± 8.29	$t = 0.185$	18.00 ± 2.07	$t = -2.286$	42.88 ± 8.13	$t = 1.919$
No	20.20 ± 1.23	***p = 0.013***	34.60 ± 6.17	***p = 0.009***	18.08 ± 2.68	$p = 0.719$	43.50 ± 8.46	$p = 0.854$	19.05 ± 2.36	***p = 0.023***	39.45 ± 8.62	***p = 0.046***
Fear of transmitting COVID-19 infection to the immediate environment (family, spouse, children, etc.)												
Yes	17.85 ± 1.68	$t = 2.354$	40.93 ± 7.39	$t = 2.064$	18.18 ± 2.12	$t = 0.797$	43.83 ± 7.09	$t = 1.680$	19.28 ± 2.85	$t = 3.881$	43.41 ± 7.89	$t = 4.352$
No	20.89 ± 3.33	***p = 0.001***	36.11 ± 6.62	***p = 0.031***	20.08 ± 1.73	***p = 0.045***	41.98 ± 10.02	***p = 0.018***	17.98 ± 2.07[a]	***p = 0.021***	40.52 ± 7.78	***p = 0.013***
The impact of working in a COVID-19 intensive care unit on humanitarian/conscientious values												
Yes	17.98 ± 2.13	$t = -4.686$	41.32 ± 7.55	$t = 3.693$	17.74 ± 1.97	$t = -3.196$	44.67 ± 8.02	$t = 4.232$	18.20 ± 2.09	$t = 3.176$	42.51 ± 8.20	$t = -1.088$
No	20.03 ± 1.95	***p < 0.001***	35.86 ± 4.77	***p < 0.001***	18.91 ± 1.97	***p = 0.002***	38.36 ± 8.23	***p < 0.001***	17.32 ± 2.01	***p = 0.002***	43.69 ± 8.10	$p = 0.277$
The impact of the pandemic on team/colleague bonds												
Strengthened	18.54 ± 2.23	$t = 2.301$	40.02 ± 7.51	$t = -0.822$	18.02 ± 2.00	$t = 2.907$	43.41 ± 8.08	$t = -2.687$	18.19 ± 2.10	$t = 3.838$	42.24 ± 8.04	$t = -3.226$
Weakened	16.78 ± 1.86	***p = 0.023***	42.11 ± 5.13	$p = 0.412$	17.03 ± 1.80	***p = 0.004***	47.21 ± 8.91	***p = 0.008***	16.98 ± 1.79	***p < 0.001***	46.25 ± 8.53	***p = 0.001***

(Continues)

TABLE 3 (Continued)

Sociodemographic characteristics	Physician				Nurse				Total group			
	BRS mean ± SD	Statistics	PSS mean ± SD	Statistics	BRS mean ± SD	Statistics	PSS mean ± SD	Statistics	BRS mean ± SD	Statistics	PSS mean ± SD	Statistics
Working with protective equipment feels like a psychological burden												
Yes	18.27 ± 2.20	$t = -1.915$	41.26 ± 7.06	$t = 4.491$	17.86 ± 2.03	$t = -0.507$	44.26 ± 8.38	$t = 2.547$	17.99 ± 2.09	$t = -2.110$	43.34 ± 8.11	$t = 5.200$
No	19.30 ± 2.36	$\mathbf{p = 0.048}$	33.75 ± 5.91	$\mathbf{p < 0.001}$	18.11 ± 1.57	$p = 0.613$	39.17 ± 4.74	$\mathbf{p = 0.011}$	18.74 ± 2.09	$\mathbf{p = 0.035}$	36.32 ± 5.98	$\mathbf{p < 0.001}$
The impact of the hospital environment on psychological health during the pandemic												
Negative	18.25 ± 2.22	$t = -2.713$	40.88 ± 7.30	$t = 3.510$	17.86 ± 1.97	$t = -0.630$	44.35 ± 8.25	$t = 3.379$	17.98 ± 2.06	$t = -2.533$	43.25 ± 8.11	$t = 4.989$
Did not affect	19.93 ± 2.02	$\mathbf{p = 0.008}$	33.86 ± 4.74	$\mathbf{p = 0.001}$	18.18 ± 2.51	$p = 0.539$	37.47 ± 6.00	$\mathbf{p = 0.001}$	18.97 ± 2.43	$\mathbf{p = 0.012}$	35.84 ± 5.68	$\mathbf{p < 0.001}$
Change in motivation to work during the pandemic												
Decrease	18.26 ± 2.25	$t = -2.443$	40.70 ± 7.53	$t = 2.508$	17.73 ± 1.99	$t = -3.527$	44.66 ± 8.34	$t = 4.219$	17.90 ± 2.09	$t = -4.247$	43.37 ± 8.28	$t = 4.774$
Increase	19.73 ± 1.87	$\mathbf{p = 0.016}$	35.73 ± 3.88	$\mathbf{p = 0.013}$	19.03 ± 1.64	$\mathbf{p < 0.001}$	38.28 ± 5.17	$\mathbf{p < 0.001}$	19.26 ± 1.73	$\mathbf{p < 0.001}$	37.49 ± 4.90	$\mathbf{p < 0.001}$
Being more tense, angry and intolerant in daily life during the pandemic												
Yes	18.67 ± 2.26	$t = -2.610$	41.42 ± 7.84	$t = 2.877$	17.69 ± 1.92	$t = -3.022$	45.42 ± 8.13	$t = 6.038$	17.80 ± 2.03	$t = -4.297$	44.26 ± 8.23	$t = 6.957$
No	19.11 ± 2.08	$\mathbf{p = 0.010}$	37.67 ± 5.69	$\mathbf{p = 0.005}$	18.55 ± 2.16	$\mathbf{p = 0.003}$	38.65 ± 6.52	$\mathbf{p < 0.001}$	18.79 ± 2.13	$\mathbf{p < 0.001}$	38.23 ± 6.17	$\mathbf{p < 0.001}$
Feeling physically weak												
Yes	17.94 ± 2.46	$t = -3.076$	41.89 ± 2.46	$t = 3.399$	17.68 ± 2.03	$t = -3.088$	45.59 ± 8.16	$t = 6.737$	17.75 ± 2.15	$t = -4.794$	44.60 ± 8.32	$t = 8.058$
No	19.11 ± 1.70	$\mathbf{p = 0.003}$	37.68 ± 5.15	$\mathbf{p = 0.001}$	18.56 ± 1.76	$\mathbf{p = 0.002}$	38.17 ± 5.80	$\mathbf{p < 0.001}$	18.82 ± 1.75	$\mathbf{p < 0.001}$	37.94 ± 5.49	$\mathbf{p < 0.001}$
Thoughts of loneliness during the pandemic												
Yes	18.21 ± 2.28	$t = -1.877$	40.56 ± 7.63	$t = 1.101$	17.77 ± 2.04	$t = -1.689$	45.27 ± 7.82	$t = 5.083$	17.91 ± 2.13	$t = -2.534$	43.77 ± 8.05	$t = 4.807$
No	19.03 ± 2.06	$p = 0.063$	38.97 ± 6.55	$p = 0.273$	18.24 ± 1.83	$p = 0.092$	39.63 ± 8.32	$\mathbf{p = 0.000}$	18.51 ± 1.94	$\mathbf{p = 0.012}$	39.40 ± 7.73	$\mathbf{p < 0.001}$
Staying somewhere other than home after starting to work with COVID-19 suspected/positive patients												
Yes	18.35 ± 2.32	$t = -0.819$	39.75 ± 7.53	$t = -1.547$	18.00 ± 1.96	$t = 2.443$	43.88 ± 8.19	$t = -0.254$	18.12 ± 2.09	$t = 1.507$	42.51 ± 8.20	$t = -1.089$
No	18.80 ± 1.79	$p = 0.414$	42.50 ± 6.09	$p = 0.124$	17.23 ± 2.11	$\mathbf{p = 0.015}$	44.21 ± 8.81	$p = 0.800$	17.70 ± 2.13	$p = 0.132$	43.70 ± 8.08	$p = 0.277$

Abbreviations: BRS, Brief Resilience Scale; PSS, Perceived Stress Scale.

*The difference between groups with the same letter for each variable was significant ($p < 0.05$).

attention to indication-level compliance in the use of intensive care units (Sungur et al., 2020). Measures to improve the healthcare system and healthcare sector were implemented, and overtime payments to healthcare personnel working in pandemic clinics were made above the normal ceiling rates (Turkey Public Sector Consulting Services, 2020).

According to Turkish Ministry of Health data, 54% of healthcare workers contracted COVID-19 despite the protective measures (Anadolu Agency, 2020). Understanding the psychological impact of the COVID-19 pandemic on healthcare workers is crucial in guiding policies and interventions to maintain their psychological well-being (Tan et al., 2020). This study was planned to determine the resilience and perceived stress levels of intensive care nurses and physicians who continued to work on the frontline due to the increasing case numbers despite the transition to the normalization process in Turkey.

Intensive care workers caring for patients with COVID-19 are at high risk of contracting the infection because of aerosol-generating procedures, such as non-invasive ventilation, high-flow nasal cannula, bag-mask ventilation, and intubation (Cheung, Ho, Cheng, Cham, & Lam, 2020). Although personal protective equipment may protect healthcare workers from virus contamination, it cannot protect them from the psychological effects of the pandemic (Spoorthy, Pratapa, & Mahant, 2020). The results of this study showed that 85.3% of physicians and 93.6% of nurses felt working with protective equipment to be a psychological burden. Physicians who feel a psychological burden of working with protective equipment have lower psychological resilience and higher perceived stress levels than those who do not feel burdened. Kang et al. (2020) reported that the degree of contact of healthcare workers with confirmed or suspected cases and access to physical/psychological resources and equipment were related to the extent of mental health disorders. The current study results determined that access to personal protective equipment was not sufficient. Moreover, the need to change clothes with every patient could also be perceived as a psychological burden for healthcare personnel during these conditions and employees should be supported psychologically.

It has been stated that healthcare workers are at high risk of anxiety, stress, and depression in pandemics (Spoorthy et al., 2020; K. K. Wu, Chan, & Ma, 2005). The risk of a sudden change from the role of caregiver to care receiver can lead to psychological problems in healthcare professionals, such as disappointment, helplessness, adaptation problems, and fear of change (Rana, Mukhtar, & Mukhtar, 2020). Liang, Chen, Zheng, and Liu (2020) determined that there was no relationship with respect to anxiety and depression between healthcare professionals working with COVID-19 patients and those working in other departments. In contrast, Lai et al. (2020) determined that the frontline healthcare workers experienced anxiety, insomnia, and depressive symptoms. In the current study, 92.6% of physicians and 95.7% of nurses who cared for COVID-19 patients stated that they had a fear of contamination. While the psychological resilience level of physicians with a fear of contamination from patients was lower than those who did not experience anxiety, the perceived stress level was found to be high. In nurses, the fear of contamination from patients was not determined to have any effect on psychological resilience and perceived stress.

Xiao, Zhang, Kong, Li, and Yang (2020) determined that social support increased self-efficacy and decreased anxiety and stress levels in healthcare workers. During the pandemic, 74.3% of physicians and 30.5% of nurses stated they thought they became lonely. In the current study, 85.3% of the physicians and 83.3% of the nurses reported that they started to stay somewhere other than their home after starting to work with COVID-19 suspected/positive patients. According to Cai et al. (2020) personal safety concerns, concerns for families, and increased morbidity and mortality are critical factors that trigger stress in healthcare professionals. Moreover, the current study results showed that the psychological resilience level of both physicians and nurses who had a fear of transmitting the COVID-19 infection to the immediate environment (family, spouse, children, etc.) was found to be low and the perceived stress level high. Lai et al. (2020) determined that nurses dealing with COVID-19 experienced more stress, anxiety, and depression than physicians. Similarly, in the current study it was found that nurses experienced more stress and that their psychological resilience level was lower than that of physicians.

The current study results showed low psychological resilience and a high level of perceived stress in physicians and nurses working in the intensive care unit where COVID-19 patients were hospitalized and who themselves felt physically weak. Kang et al. (2020) determined that healthcare workers who perceived themselves as physically weak had higher rates of mental health problems. The current study finding supports the literature.

This study had some limitations. The study data were collected in two different geographic regions (the Mediterranean and Central Anatolia), and therefore, the research results cannot be generalized for the whole population. In addition, the study was planned as a cross-sectional study. Repeated application of measurement tools at different stages of the pandemic may help

determine the change in the psychological resilience and stress levels of healthcare professionals. According to the results of this study, we would like to suggest that the reorganization and improvement of the working conditions (e.g. shorter working hours, increasing the number of workers, occasional time to see their families, flexible role sharing, etc.) of the health personnel working in the pandemic intensive care units will have positive effects on the psychological well-being and perceived stress levels of the nurses and physicians.

5 | CONCLUSION

The findings of this study revealed that physicians and nurses on the frontline in the fight against the COVID-19 pandemic need psychological care. Although most of the physicians and nurses in this study strengthened their team/work friendship bonds during the pandemic, their motivation to work decreased. The safety of the family, effective measures to prevent the disease, the positive attitude of colleagues, and social and psychological support services have been determined to have an important role in reducing stress during the pandemic (Cai et al., 2020). Health authorities should establish regional and national multidisciplinary psychological support units for healthcare workers who are adversely affected by the pandemic.

CONFLICT OF INTEREST

The authors declare no conflicts of interest related to this paper. No funding has been received for this paper.

AUTHOR CONTRIBUTIONS

Maruf Boran, Omer Faruk Boran, Oznur Korukcu and Meltem Özkaya contributed to the design and implementation of the research and to the writing of the manuscript. Maruf Boran and Omer Faruk Boran collected the data. Oznur Korukcu and Meltem Özkaya conducted the analysis of the results.

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