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The effect of the COVID-19 pandemic on the perceived stress levels and psychological resilience of healthcare professionals

Kezban Özcelik Kaynak[1], Barış Öztuna[2]

[1]Bakırcay University, Izmir, Turkey
[2]Department of Labor Economics and Industrial Relations, Faculty of Economics and Administrative Sciences, Karatekin University, Çankırı, Turkey

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ABSTRACT

Aim: It is aimed to contribute to the literature with the broad support of participants actively working in the field during the COVID-19 pandemic in Turkey. This study was conducted to examine the effect of the COVID-19 pandemic on the perceived stress levels and psychological resilience of healthcare professionals.

Material and Method: A total of 856 healthcare professionals, actively working in the COVID-19 pandemic process across Turkey, participated in the research. The data in the study were collected using the "11 Demographic Questions", the "Four-Item Perceived Stress Scale", developed by Cohen and friends, and the "Six-Item Brief Resilience Scale", developed by Smith and friends to measure psychological resilience levels. The statistical analysis of the study was performed by using SPSS 23. The data, which were not normally distributed, were compared using the Mann Whitney U test and the Kruskal Wallis test. Correlation between the variables was examined via Spearman's correlation analysis and the data, which were not normally distributed, were presented as median.

Results: It was found that the mean score of the perceived stress scale was 12.7±2.9 and the mean score of psychological resilience was 17.8±4.9. It was determined that there was a moderately negative significant correlation between perceived stress and psychological resilience (r:-0.542 p:<0.001).

Conclusion: The results suggested that COVID-19, whose impacts have been felt globally, increased the stress level of healthcare professionals and decreased their psychological resilience.

Keywords: Perceived stress, work stress, psychological resilience

INTRODUCTION

The new coronavirus which first emerged in Wuhan city, China in the last days of 2019 and quickly spread across the globe in these days in the middle of 2020, has been announced by the World Health Organization as a pandemic. Putting individuals at risk in the global sense with Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS), COVID-19 poses serious threats for the physical-mental health and life of individuals (1).

The protection of healthcare professionals who are accepted to have the highest risk in terms of infection is evaluated as one of the most important priorities (2,3). It is known that the epidemic causes fear, helplessness, and anxiety in people and these feelings affect people's behavior negatively (5). Doctors, nurses, and all employees in medical institutions who get exposed to the stress of pandemics at the highest level and try to cope with their psychological results to a long time, comprise a group that is mostly affected by all pandemics and has a risk of suffering (6,4).

Today, stress and job stress negatively affect the life of the individual and cause health problems, but also negatively affect the quality of life of the individual and the support needs of each individual vary according to their personality traits (8,9,11,12). A study conducted with firefighters working under high stress such as healthcare workers found that emotional social support in the workplace is related to occupational health (10). On the other hand, the participation of employees is important for managing stress and psycho-social risks, especially in the workplace, and it will increase the general morale and make the precautions adequate and effective (13).

Corresponding Author: Kezban Özcelik Kaynak, kezban.kaynak@bakircay.edu.tr **Received:** 14.11.2022 **Accepted:** 09.01.2023

The Perceived Stress Scale is a short and manageable measure of a person's degree of rating the stressful situations in her/his life. It has been proven to have significant validity and reliability (14,15). Uncontrollable uncertainties of the pandemic period, high-stress and intensive working environment, and the thought that healthcare professionals as well as their relatives also face the risk of infection and incorporate a physical, mental and spiritual imbalance (7). Resilience is directly related to adapting to all these difficult and traumatic conditions and emerges as an individual's ability to continue his life without losing his sense of control over events (17).

Healthcare professionals encounter a heavy virus load the struggle and also their mental health is seriously affected due to working intensely and insecurely missing opportunities under high risk without taking adequate rest (20). Also, the quarantine applications may lead to an increase in stress level and emotional problems (21,22).

MATERIAL AND METHOD

The research questions of the study are as follows;

1. What is the perceived stress level of healthcare professionals during the COVID-19 pandemic?
2. What is the psychological resilience level of healthcare professionals during the COVID-19 pandemic?
3. Is there a relationship between the perceived stress level and the psychological resilience of healthcare professionals during the COVID-19 pandemic?

The study was carried out with the permission of Dokuz Eylül University Non-interventional Clinical Researches Ethics Committee (Date: 01.06.2020, Decision No: 2020/11-41). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

This descriptive and cross-sectional study was conducted between May-June 2020. A total of 856 healthcare professionals could be reached by applying online questionnaires to healthcare services employees (such as doctors, nurses, and health technicians), general administrative services employees (such as clerks, and data record officers) and assisted services employees (such as cleaning staff, caregivers, servants, dead body bathers) working during the pandemic. In this study with many participants, an online questionnaire was chosen because of curfews, social isolation rules, and risk of infection and to reach people working actively across Turkey (23). The questionnaire form link was shared via Whatsapp and other social networks and also by voluntary supporters. With this method, it became possible to reach broad participants working in different institutions across Turkey. A sample group with demographically different qualities voluntarily contributed to the study and spread the study. Data collection difficulties and time hardships of the pandemic period were thus minimized and 856 people were reached.

The data in the study were collected using the "11 Demographic Questions", prepared by the researchers to determine demographic characteristics, the "Four-Item Perceived Stress Scale", developed by Cohen et al. (14); and the "Six-Item Brief Resilience Scale", developed by Smith et al. (18) to measure psychological resilience levels. The reason for applying the short forms of the scales used is to encourage the participants to answer the questions in the shortest time possible. The questionnaire comprises three sections.

1. The section including the personal characteristics of healthcare professionals comprises 11 questions about age, gender, educational level, etc.
2. The section aimed at determining the perceived stress of healthcare professionals comprises four questions.
3. The section aimed at determining the psychological resilience of healthcare professionals comprises six questions.

Developed by Cohen et al. (14), the Perceived Stress Scale comprises a total of 14 items. Along with the 14-item form, the Perceived Stress Scale also has two other forms with ten and four items. The Turkish adaptation of the four-item form of the Perceived Stress Scale, was indicated to have adequate reliability. The internal consistency coefficient was found to be 0.66. The four-item Turkish version of the Perceived Stress Scale was indicated to be useful as a valid and reliable measurement tool for measuring the stress perceptions of individuals in their lives (16).

Developed by Smith et al. (18), the Brief Resilience Scale (BRS) was conducted on a sample comprising university students to examine psychometric properties (18) and to adapt the scale to Turkish. The results acquired as a result of this study showed that the scale was valid and reliable enough to measure the psychological resilience level. In the Turkish adaptation of the Brief Resilience Scale by Dogan (19), the relevant internal consistency coefficient was found to be .83.

To evaluate the data, statistical analyses were analyzed by the researchers via the IBM SPSS V23 in the computer environment and the convenience for normal distribution was examined using the Kolmogorov Smirnov. The data, which were not normally distributed, were compared using the Mann Whitney U test and the Kruskal Wallis test. Correlation between the variables was examined via Spearman's correlation analysis and the data, which were not normally distributed, were presented as median (minimum – maximum). The categorical data were compared using the chi-square test and were presented as frequency (percentage). The significance level was taken as $p<0.050$.

RESULTS

When evaluating the demographic characteristics of the healthcare professionals comprising the sample; 75% of 856 participants were in the age range of 30-50 years, 74.9% were female, and 72.1% were married. When examining the title distribution, 27.8% were nurses, 23.2% were health technicians, 20.4% were doctors, 11.3% were administrative and white-collar workers and 17.3% were support personnel. Among the participants, 36.3% had a professional seniority of 20 years and above, 20.7% 15-19 years, 19.9% 10-14 years, and 11.1% 0-4 years. 83.1% of the participants were employees of the public medical institutions. 82% of them stated that there were patients diagnosed in the institution. 27.6% of the participants often contacted positive patients on duty and 27 healthcare professionals (3.2%) were diagnosed with COVID-19. Among the factors creating stress for the participants during the pandemic period, which were a multiple-choice questions, the most important factor was the fear of not having the family when needed (83.2%), which was followed by the anxiety of infecting the family and immediate circle with the virus (81.3%) and the thought of having a loss in the family (61.9%). Among the participants; 63.6% met their family every day during the pandemic period, but 18% did not (**Table 1**).

Perceived stress varied according to gender (p=0.002). The perceived stress median value was found to be 12 for males and 13 for females. Perceived stress varied according to age groups (p=0.003). The perceived stress score median value was found to be 13 for the age groups of 20-30 and 31-40 years and 12 for the age groups of 41-50 and 51 years and over. The difference was caused by the higher perceived stress level in the age group of 20-30 years compared to the age group of 41-50 and 51 years and over. The age group of 31-40 years was not different from other age groups (mean rank values of 479.1, 444.1, 402.7, and 379.5, respectively). Perceived stress varied according to a title (p=0.006). The perceived stress score was 12 for the doctor group, 13 for the nurse, administrative, and office services, and health technician groups and 12 for other groups. The difference was associated with the lower perceived stress score in doctors compared to the health technician group (mean rank values of 397.2, 418.5, 472.9, 469.7, and 396.7, respectively). Perceived stress varied according to having close contact with COVID-19 patients (p<0.001). The perceived stress median value was found to be 13 for individuals who occasionally and frequently have close contact with COVID-19 patients and 12 for those having no close contact. The perceived stress score was found to be lower for individuals having no close contact than those occasionally and frequently having close contact. Perceived stress varied according to the frequency of meeting the family during the pandemic period (p<0.001). It was found to be 14 for individuals meeting their family every other day, 13 for those meeting their family once a week, 12 for those meeting their family every day, and 13 for those never meeting their family. The perceived stress score was found to be lower for individuals meeting their family every day than those meeting their family every other day and those never meeting their family (mean rank values of 488.2, 431.2, 401.1, and 491.2, respectively). Perceived stress did not vary according to other variables (p>0.050).

Table 1: Nurses' sociodemographic characteristics (n=856)

Characteristics	n	%
Gender		
Male	215	25,1
Female	641	74,9
Age Groups		
20-30 ages	141	16,5
31-40 ages	313	36,6
41-50 ages	331	38,7
51 ages and above	71	8,3
Marital Status		
Single	239	27,9
Married	617	72,1
Title		
Doctor	238	27,8
Nurse	199	23,2
Administrative and White-Collar Worker	175	20,4
Health Technician	97	11,3
Other	147	17,3
Duration of working		
0-4 years	95	11,1
10-14 years	170	19,9
5-9 years	103	12,0
15-19 years	177	20,7
20 years and above	311	36,3
Health institution worked		
University Hospital	365	42,6
Ministry of Health	347	40,5
Other	85	9,9
Private Hospitals	59	6,9
COVID-19 positive diagnosis		
Yes	27	3,2
No	829	96,8
Contact with a COVID-19 patient at close range		
Sometimes	394	46,0
Never	226	26,4
Often	236	27,6
Are there patients diagnosed with COVID-19 in the healthcare institution?		
Yes	702	82,0
No	154	18,0
Frequency of meeting with the family during the pandemic period		
Every other day	75	8,8
Once a week	74	8,6
Everyday	544	63,6
Never meet	163	19,0
Total		
	856	100

Psychological resilience varied according to gender (p=0.002). The psychological resilience median value was found to be 18 both for males and females. The difference was associated with the lower mean rank value in males compared to females (mean rank values of 383.1 and 443.7, respectively). Psychological resilience varied according to age groups (p=0.023). The psychological resilience score median value was found to be 17 for the age group of 20-30 years and 18 for other age groups. The difference was associated with the lower psychological resilience score in the age group of 20-30 years compared to the age group of 41-50 years (mean rank values of 375.1, 426.9, 451.5, and 434.3, respectively). Psychological resilience varied according to a title (p=0.047). The psychological resilience median value was found to be 17 for the health technician group and 18 for the other groups. The difference was caused by a higher psychological resilience score in the doctor group than in the health technician group (mean rank values of 467, 439.9, 412.9, 396.9, and 413.7, respectively). Psychological resilience varied according to the frequency of meeting the family during the pandemic period (p=0.004). It was found to be 16 for individuals meeting their family every other day, 18 for those meeting their family once a week, 18 for those meeting their family every day, and 17 for those never meeting their family. The psychological resilience level was found to be higher for individuals meeting their family every day than those never meeting their family (mean rank values of 384.5, 453.6, 446.7, and 376.5, respectively). Psychological resilience did not vary according to the other variables (p>0.050) (**Table 2**).

It was found that the mean score of the perceived stress scale was 12.7±2.9 and the mean score of psychological resilience was 17.8±4.9. It was determined that there was a moderately negative significant correlation between perceived stress and psychological resilience (r:-0.542 p:<0.001). As the perceived stress scale score of healthcare professionals increased, their psychological resilience score decreased (**Table 3**).

Table 3: The correlation between the mean scores of perceived stress and psychological resilience

	Psychological Resilience (17.8±4.9)
Perceived Stress (12.7±2.9)	r:-0,542 p:<0,001

r: Spearman correlation coefficient

Table 2. Comparisons according to perceived stress and psychological resilience scores (n=856)

	Perceived stress median (min-max)*	Psychological resilience median (min-max)*
Gender		
Male	12 (4-20)	18 (6-30)
Female	13 (4-20)	18 (6-30)
Test statistics	U=78676	U=59059.5
p	0.002	0.002
Age Groups		
20-30 ages	13 (4-20)[a]	17 (6-30)[a]
31-40 ages	13 (5-20)[ab]	18 (6-30)[ab]
41-50 ages	12 (4-20)[b]	18 (6-30)[b]
51 ages and above	12 (5-20)[b]	18 (10-30)[ab]
Test statistics	χ^2=13.741	χ^2=9.528
p	0.003	0.023
Marital Status		
Single	13 (4-20)	18 (6-30)
Married	12 (4-20)	18 (6-30)
Test statistics	U=67642	U=77142.5
p	0.059	0.292
Title		
Doctor	12 (5-20)[a]	18 (6-30)[a]
Nurse	13 (4-20)[ab]	18 (6-30)[ab]
Administrative and White-Collar Worker	13 (4-20)[ab]	18 (6-30)[ab]
Health Technician	13 (4-20)[b]	17 (6-30)[b]
Other	12 (4-20)[ab]	18 (6-30)[ab]
Test statistics	χ^2=14.453	χ^2=9.647
p	0.006	0.047
Duration of working		
0-4 years	13 (4-20)	18 (6-30)
10-14 years	13 (5-20)	18 (6-30)
5-9 years	13 (4-19)	18 (6-30)
15-19 years	12 (4-20)	18 (6-30)
20 years and above	13 (5-20)	17 (6-30)
Test statistics	χ^2=14.288	χ^2=5.414
p	0.050	0.247
Health institution worked		
Private Hospitals	13 (4-18)	18 (6-30)
Ministry of Health	13 (4-20)	18 (7-30)
University Hospital	13 (4-20)	18 (6-30)
Other	13 (6-20)	18 (6-29)
Test statistics	χ^2=8783.5	χ^2=12396.5
p	0.855	0.062
COVID-19 positive diagnosis		
Yes	14 (10-18)	17 (8-26)
No	13 (4-20)	18 (6-30)
Test statistics	U=8783.5	U=12396.5
p	0.055	0.339
Contact with a COVID-19 patient at close range		
Sometimes	13 (4-20)[b]	18 (6-30)
Never	12 (4-20)[a]	18 (6-30)
Often	13 (4-20)[b]	18 (6-30)
Test statistics	χ^2=20.700	χ^2=2.666
p	<0.001	0.264
Are there patients diagnosed with COVID-19 in the healthcare institution?		
Yes	13 (4-20)	18 (6-30)
No	12 (4-20)	18 (6-30)
Test statistics	U=49204	U=55967.5
p	0.079	0.490
Frequency of meeting with the family during the pandemic period		
Every other day	14 (4-20)[b]	16 (6-30)[ab]
Once a week	13 (7-19)[ab]	18 (9-30)[ab]
Everyday	12 (4-20)[a]	18 (6-30)[a]
Never meet	13 (4-20)[b]	17 (6-30)[b]
Test statistics	χ^2=21.858	χ^2=13.382
p	<0.001	0.004

U: Mann Whitney U test, χ^2: Kruskal Wallis test a-b: There is no difference between groups with the same letter, * Median (minimum-maximum)

DISCUSSION

The pandemic period that we experience has included all people within the context of risk groups and has become alarming for the masses. Individuals have begun to worry about themselves, their relatives, and the future. They also suffer from physical and psychological difficulties due to the stress created by uncertainty. Individuals' perception of diseases and the behaviors they display in line with this perception, play a key role in the transmission rate of the pandemic and loss of lives. Therefore, it is crucial to analyze the psychological state of individuals in the struggle against the pandemic and to develop applications accordingly (24). As is known, pandemics create traumatic effects and also increase anxiety and stress levels. In the studies, it has been determined that mood changes related to COVID-19 cause worsening effects on psychological cases to psychiatric cases (25). COVID-19 concern appears as common symptom of anxiety and depression (26).

This study which was conducted with the broad support of participants actively working in the field during the COVID-19 pandemic in Turkey and is considered to make a higher contribution to the literature is important. The fact that a total of 856 healthcare professionals across Turkey could be reached online, is crucial despite the social limitations brought by the COVID-19 pandemic period. It was determined that the participants were usually unable to control important things in their lives and their power of coping with personal problems decreased. They had a sense that things were not right. This is a reflection of the uncontrollable and unpredictable propertiers of pandemic periods. The data aimed at determining the perceived stress level during the pandemic period revealed that the stress means value (12.7±2.9) was high (**Table 3**). Similarly, it was determined that health issues caused by the COVID-19 pandemic and having a higher possibility of resulting in death as well as the limitations imposed by quarantine applications increased depression and anxiety levels and had a risk for permanent problems with psychological crises triggered (27,28).

In the face of the compelling conditions of the pandemic period, individuals have to confront these difficulties and stretch their reactions to pressures. Developing the self by confronting compelling conditions, which is an indicator of the individual's strength is a dynamic structure affected by personal, familial, and environmental features. Healthcare professionals' fear of not being with their family when needed and their anxiety about infecting their family increase their stress levels and reduce their resilience. In their study, Smith et al. (29), found that healthcare professionals had stress due to the possibility of infecting their relatives as much as for them.

In line with the results acquired from the study, gender was found to be effective on perceived stress and psychological resilience. Stress and psychological resilience were found to be lower in males than females, which might be associated with a higher number of female participants than male participants in the study. In regards to age, younger individuals (20-30) had higher perceived stress and lower psychological resilience. The fact that they have faced such a global pandemic risk for the first time and the limitations imposed by the precautions taken explain the psychological outcomes on young people. The life experience of especially individuals above 51 years, has increased their resilience.

Nurses and intermediary medical personnel who professionally take active and intensive charge in the care process also had lower perceived stress levels and higher resilience. It is possible that doctors felt more confident and had lower stress levels and higher resilience thanks to their knowledge level regarding the disease and their conscious behaviors related to preventive measures. On the other hand, healthcare professionals having contact with patients diagnosed with COVID-19 had higher perceived stress levels. In the study conducted by Zhang et al. (30) to determine whether healthcare professionals had psycho-social problems during the COVID-19 pandemic or not they determined that especially healthcare professionals having direct contact with patients had higher anxiety and depression levels than those not having any contact; which compatible with the result of the present study.

Healthcare professionals who meet with their family regularly have lower perceived stress levels and higher psychological resilience, although they fear that they might infect with the virus. The support individuals give to one another and the comfort of socializing will relieve individuals in the face of social isolation difficulties of the pandemic period. In Turkish society; the mother, father, siblings, and other members of a family have an important place and provide social and psychological support for individuals. Controlling stressful situations and knowing not alone in the face of difficulties will enhance the individual's psychological resilience and help her/him embrace life more positively and collect herself/himself more quickly. A family which has a very important place in Turkish culture and Islamic belief as a basis of society, advises individuals to support each other both materially and spiritually at the hardest times (31). The results demonstrated the positive effects of family relationships on the majority of the healthcare professionals who participated in the study from different parts of Turkey.

As the perceived stress scale score of healthcare professionals increased, their resilience score decreased.

The moderately negative significant correlation determined between these two is compatible with studies examining the correlation between psychological resilience and perceived work stress and determining that as the psychological resilience level of nurses decreased, their depression and stress levels increased (32).

CONCLUSION

Infectious diseases threatening human health worldwide such as plague, cholera, AIDS, and influenza, were experienced in the past years and resulted in the death of many people by spreading among the large masses. Uncontrollable aspects of pandemic periods such as unforeseen transmission rate, area of influence, and time of ending affect the physiological and psychological condition of individuals. While individuals over the age of 60 years with chronic diseases are involved in a high-risk groups, it is inevitable for healthy individuals to be affected psychologically due to the risk of getting infected, infecting their relatives, and experiencing loss as well as the changes caused by limitations in the routine.

Healthcare professionals who have non-negligible importance in the struggle against COVID-19 as in other pandemic, are under physical and psychological threat because of their key role. The high responsibility imposed by working during the pandemic period, heavy workload, the obligation of keeping away from the family environment and the threat perceived regarding health caused by infection risk, may cause them to experience symptoms such as stress, anxiety, depression, sleep problems, anger, and fear. Therefore, healthcare professionals must be protected and reinforced for an effective struggle against the pandemic. It will not be possible to stop COVID-19 without protecting healthcare professionals. It is necessary to create an environment where working conditions are safe, personal protective equipment is accessed easily, workload is distributed fairly, the health system is employee-based, deficiency experienced in the family and social circle is supported, and negative effects of the stress that might be caused the pandemic are minimized and resilience is enhanced.

Knowing the effect of the COVID-19 pandemic on the stress and psychological resilience of healthcare professionals and making arrangements in this direction will reinforce the struggle of leading actors in the process and be effective in the continuity of healthcare service delivery.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Dokuz Eylül University Non-interventional Clinical Researches Ethics Committee (Date: 01.06.2020, Decision No: 2020/11-41).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

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