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Resilience, Post-Traumatic Stress Symptoms, and Post-Traumatic Growth Status of Nurses Working in the COVID-19 Pandemic

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ABSTRACT:
Purpose: Nurses have always played an important role in the COVID-19 pandemic. However, available data on the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses are limited. This study was conducted to determine the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses working in the COVID-19 pandemic.
Material and Methods: This study designed a cross-sectional and descriptive survey. The study was conducted with 192 nurses. Information Form, Post Traumatic Growth Inventory, Brief Resilience Scale, and Post Traumatic Stress Disorder Checklist were used in the collection of data.
Results: Nurses experienced anxiety (83.3%), burnout (81.8%), depersonalization (55.7%), and 34.9% met the diagnostic criteria for post-traumatic stress disorder. Negatively significant ($p<0.05$) relation between the mean scores of nurses' Brief Resilience Scale and Post Traumatic Stress Disorder Checklist.
Conclusion: While there was a negative correlation between the resilience levels of nurses and post-traumatic stress symptoms, a positive correlation was determined between post-traumatic stress symptoms and post-traumatic growth levels. The working conditions of nurses should be improved, and the factors that will protect their mental health should be increased.
Keywords: *COVID-19, nurse, resilience, post-trauma, post-traumatic growth*

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INTRODUCTION

The SARS-CoV-2 virus, which emerged in 2019 in China, quickly affected the whole world and was declared a COVID-19 pandemic by the World Health Organization (WHO) on March 11, 2020 (Kara, 2021). To date, it has been reported that there are approximately 651 million confirmed cases and more than six million deaths in the world due to the COVID-19 pandemic (WHO, 2022). Due to the high rate of spread of COVID-19, countries have taken various protective measures to prevent contamination, and great changes have occurred in societies' social, educational, working, and economic lives. It is known that such radical daily life changes can affect individuals' social life and mental health (Tanriverdi and Tanriverdi, 2021).

Studies have demonstrated that effects of the COVID-19 pandemic on individuals and societies mental health. It has been reported that in meta-analysis studies, societies experience depression, anxiety, stress, insomnia, and post-traumatic stress symptoms due to the COVID-19 pandemic (Ren et al., 2020; Liu et al., 2021b; Wu et al. al., 2021). It is reported that health workers are among the riskiest groups in terms of experiencing the mental effects of the pandemic (Saragih et al., 2021). Many healthcare professionals fought against COVID-19 during the pandemic process (Gorini et al., 2020; Ekinci and

Ekinci, 2021). Nurses were at the forefront of this struggle and continued to work under challenging conditions (Ekinci and Ekinci, 2021). During the pandemic process, nurses have been affected a lot due to reasons such as increased workload, insufficient number of staff, long working hours, working with infected individuals, the loss of life of the patients who are cared for, and the fear of infecting themselves and their families (Gavin et al., 2020; Olson et al., 2020; Ekinci and Ekinci, 2021). Orrù et al. (2021) emphasized that 41.3% of health workers have secondary traumatic stress, and 56% have burnout symptoms. In a study; It has been reported that female healthcare workers (64.3-82.7%) and nurses (up to 82.7%) experience higher levels of traumatic stress symptoms compared to other healthcare workers (Huecker et al., 2021).

On the other hand, it has been reported that post-traumatic growth occurs in nurses after the traumatic effect of the pandemic (Olson et al., 2020; Huecker et al., 2021; Orrù et al., 2021; Peng et al., 2021). Furthermore, it is seen that some changes occur in the philosophy of life of individuals, and they determine their priorities in life (Huecker et al., 2021). In the literature, it is emphasized that the existence of social support, resilience, and the use of effective coping strategies are the factors that positively affect post-traumatic growth (Benfante et al., 2020; Bilge et al., 2021). Therefore, for nurses to continue to provide quality care during difficult processes such as pandemics, it is recommended to check their mental and physical health status regularly and to provide psychological support to nurses who are negatively affected by this process (Gorini et al., 2020; Peng et al., 2021; Saragih et al., 2021). From this point of view, it is of great importance to examine the mental status of nurses working in the clinic during the pandemic and the factors affecting it (Benfante et al., 2020; Peng et al., 2021). However, there are limited studies on this subject. This study aimed to determine the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses working in COVID-19 pandemic clinics. It is thought that this study will provide important data and shed light on the interventions to be organised for the mental health of healthcare professionals who continue to provide care in crises.

The study sought to answer the following questions:

- How were the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses working in the COVID-19 pandemic?
- Were there any relationships between the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses working in the COVID-19 pandemic?

MATERIAL and METHODS

Purpose and Type of the Study

This study was conducted to determine the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses working in the COVID-19 pandemic**.** The study was designed as descriptive and cross-sectional.

Sampling and participant

The research was carried out in pandemic clinics in a training and research hospital between September 1 and December 31, 2021. Due to the pandemic, 12 pandemic services were created in the hospital. Approximately 200 patients were served in these services. In each service, 12-18 nurses served patients. In addition, 6 COVID-19 intensive care units with a capacity of 58 beds were established in the hospital, and 144 nurses served in these intensive care units.

Sample of the Study

The population of the study consisted of 320 nurses who were actively working in the pandemic clinics of the hospital. The sample of the study was calculated according to the minimum sample size formula of 175 nurses. The research was conducted with 192 nurses. These nurses accepted to participate in the study and met the inclusion criteria.

The inclusion criteria for the study are as follows:

- Working in the pandemic clinic for a month or longer,
- Not having an acute mental illness,
- Volunteered to participate in the study

Data Collection Tools

Information Form, Post Traumatic Growth Inventory,

Brief Resilience Scale, and Post Traumatic Stress Disorder Checklist were used for data collection. Face-to-face interviews were used for collecting the data for the study. The interviews were completed in 20-25 minutes.

Information Form: The form was created by researchers through the relevant literature. The form consists of 25 questions, including demographic information such as age, gender, marital status, the unit and duration of work, and the experience of caring for a COVID-19-positive case (Gorini et al., 2020; Ekinci and Ekinci, 2021; Gavin et al., 2020; Olson et al., 2020).

Post Traumatic Growth Inventory (PTGI): The scale was developed by Tedeschi and Calhoun (1996) to measure perceived psychological growth after traumatic experiences. According to Kagan et al. (2012), it was found that the scale has three factors: "Change in Self-Perception," "Change in Philosophy of Life," and "Change in Relationships with Others." The scores to be obtained from the scale are in the range of 0-105, and high scores from the scale indicate positive psychological changes resulting from negative life events. It was determined that Cronbach's alpha coefficient of the total items was .83 (Kağan et al., 2012). The Cronbach's alpha value of the scale was .95 in this study.

Brief Resilience Scale (BRS): The scale was developed by Smith et al. (2008) to measure the resilience of individuals. The Turkish adaptation of the scale was made by Doğan (2015). The scores to be taken from the scale are in the range of 6-30 points, and high scores from the scale indicate a high level of resilience. The test-retest reliability coefficient was found to be between .62 and .69 (Doğan, 2015). Cronbach's alpha value of the scale was determined as .72 in this study.

Post Traumatic Stress Disorder Checklist (PCL-5): The scale is used in the clinical field to measure PTSD symptoms. The latest adaptation according to the DSM-5 is made by Weathers et al. (2013). The items measure the symptoms of individuals in the last month. The adaptation study of the scale in our country is made by Boysan et al. (2017). The score that can be obtained from the scale is in the range of 0-80, and it is stated that individuals with a total scale score of 47 and above are more likely to meet the PTSD diagnostic criteria (Boysan et al., 2017). In the validity and reliability study of the scale, the Cronbach alpha coefficient was found to be .94. In this study, it was determined as .91.

Statistical Analysis

The data were evaluated with the IBM SPSS for Windows 21 package program. Kolmogorov-Smirnov analysis was used to examine the normal distribution. For comparisons with two groups Mann-Whitney U test was used, and the Kruskal-Wallis H test was used for comparisons with three or more groups since the data were found to be not suitable for normal distribution ($p<0.05$). The relationship between the variables was examined by Spearman correlation analysis. The significance level was accepted as $p<0.05$.

Ethical Approval

Ethical approval and permission were obtained from the scientific research ethics committee of the university (Number: 30/17 Date: 01.10.2021) and the ministry of health for the study. Verbal and written consent was obtained from the nurses who agreed to participate in the study.

RESULTS

Results of the demographic and working characteristics of nurses

The average age of the nurses were 29.30; 72.4% were women. During the pandemic, 62.5% of the nurses worked in the pandemic clinic and cared for an average of 13 patients per shift. The average working year of the nurses in the profession were 6.84 and the average active year in the hospital was 3.90 (Table 1).

Nurses in the study were diagnosed with COVID-19 (43.8%) and 22.6% of them were hospitalized in the pandemic clinic. Relatives of 62% of the nurses caught COVID-19, 84.9% of them continued their treatment using medication at home, and 9.4% of the nurses lost a relative due to COVID-19. It was determined that giving care to COVID-19-positive

patients caused nurses to experience emotions such as anxiety (83.3%), and burnout (81.8%) (Table 2).

Result of the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses

Nurses' mean BRS score was 20.13 (3.31), PCL-5 total score mean was 42.16 (13.10), and PTGI total score mean was 57.83 (24.17) (Table 3). It was also found that 34.9% (n=67) of the nurses met the diagnostic criteria for PTSD.

Result of the relationship between the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses

There was a moderately significant negative correlation ($p<0.05$) between the nurses' mean scores of BRS and PCL-5 and a weak positive correlation ($p<0.05$) between the mean scores of the BRS and change in relationships with others sub-dimension of PTGI.

Table 1. Socio-demographic characteristics of nurses (n = 192)

	n	%
Age group		
20-29 years	116	60.40
30-39 years	60	31.30
40-49 years	16	8.30
Gender		
Female	159	72.40
Male	53	27.60
Marital status		
Married	77	40.10
Single	115	59.90
Graduation Degree		
High school graduate	12	6.30
Bachelor's degree	148	77.10
Graduate degree	27	14.10
PhD graduate	5	2.60
Individuals living with		
Family	126	65.60
Alone	42	21.90
Roommate	24	12.50
Working unit		
Emergency	18	9.40
Clinic	120	62.50
Intensive care	54	28.10
Work Type		
Daytime only	6	3.10
Only night	15	7.80
Shift	171	89.10
Presence of chronic physical illness		
Yes	13	6.80
No	179	93.20
Presence of chronic mental illness		
Yes	5	2.60
No	187	97.40
	X±SD	
The average age	29.30±4.79	
The average of working years in the profession	6.84±4.86	
The average of working years in the institution	3.90±3.17	
The average time worked during the pandemic (months)	11.14±5.58	
The average number of patients cared for per shift	13.37±11.42	

Table 2. Characteristics of nurses regarding COVID-19

	n	%
Status of being diagnosed with COVID-19 positive		
Yes	84	43.80
No	108	56.20
Type of treatment for those diagnosed as COVID-19 positive (n= 84)		
At home and using medication	65	77.40
On the COVID-19 service	19	22.60
Change of workplace after being diagnosed with COVID-19 positive		
Yes	34	17.70
No	158	82.30
A positive diagnosis of COVID-19 in a relative		
Yes	119	62
No	73	38
Treatment type of the relative (n=119)		
Using medicine at home	101	84.90
In the covid service	12	10.10
In intensive care	6	5.00
Loss of a relative due to COVID-19		
Yes	18	9.40
No	174	90.60
Emotions experienced while caring for a COVID-19-positive patient		
Fear	105	54.70
Anxiety	160	83.30
Unwillingness	85	44.30
Burnout	157	81.80
Personal Failure	15	7.80
Depersonalization	107	55.70
Personal Success	7	3.60
Inability to enjoy life	67	34.90
Unhappiness	43	22.40
Hopelessness	56	29.20
No change in mood	2	1.00
The state of being affected by the interaction with the surrounding individuals due to the care of a COVID-19-positive patient		
Affected	168	87.50
Not affected	24	12.50
Changes experienced by those whose interaction with the surrounding individuals is affected (n=168)		
My communication has decreased.	94	56
I was left alone.	5	3
My communication decreased and I was left alone.	65	38.70
People turned away from me, I was stigmatized.	4	2.30

Table 3. Average scores of nurses from BRS, PCL-5, and PTGI Scales

	N	Min.	Max.	Mean	SD.
BRS total	192	6.00	28.00	20.13	3.31
PCL-5 total	192	18.00	74.00	42.16	13.10
PTGI total	192	12.00	96.00	57.83	24.17
Change in self-perception	192	0	50.00	28.64	12.43
Change in the philosophy of life	192	3.00	30.00	18.02	7.97
Change in relationships with others	192	0	21.00	11.17	5.58

Table 4. The relationship between nurses' scores on BRS, PTSDCL, and PTGI Scales

		BRS Total	PCL-5 Total	Change in self-perception	Change in the philosophy of life	Change in relationships with others	PTGI Total
BRS Total	r	1.00	-.46**	-.01	-.08	.15*	.02
	p	.	.00	.80	.25	.03	.78
	N	192	192	192	192	192	19
PCL-5 Total	r	-.46**	1.00	.12	.21**	.15*	.196**
	p	.00	.	.09	.00	.03	.00
	N	192	192	192	192	192	192
Change in self-perception	r	-.01	.12	1.00	.80**	.74**	.93**
	p	.80	.09	.	.00	.00	.00
	N	192	192	192	192	192	192
Change in the philosophy of life	r	-.08	.21**	.80**	1.00	.72**	.91**
	p	.25	.00	.00	.	.00	.00
	N	192	192	192	192	192	192
Change in relationships with others	r	.15*	.15*	.74**	.72**	1.00	.86**
	p	.03	.03	.00	.00	.	.00
	N	192	192	192	192	192	192
PTGI Total	r	.02	.19**	.93**	.91**	.86**	1.00
	p	.78	.00	.00	.00	.00	.
	N	192	192	192	192	192	192

** Correlation is significant at the 0.01 level (2-tailed).

There was a weak positive correlation ($p<0.05$) between the PCL-5 scale and the change in the philosophy of life subdimension of the PTGI scale and change in relationships with others subdimension of the PTGI scale, and the total mean score of the scale (Table 4).

DISCUSSION

Discussion about the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses

This study found that the nurses' resilience levels and post-traumatic growth levels were moderate. In some studies, nurses working in the COVID-19 pandemic resilience levels were found to be moderate (Kılınç and Sis Çelik, 2021), in some studies nurses' levels of resilience were high (Huffman et al., 2021; Labrague and De Los Santos, 2020). It is thought that the increased workload of nurses in pandemic conditions and the fact that they work in a stressful and risky environment may adversely affect their resilience levels during this period. Furthermore, the fact that nurses work more face-to-face with infected patients than other healthcare professionals may also negatively affect their resilience. On the other hand, it is reported in the literature that the resilience of individuals may increase after crisis periods such as COVID-19 (Huffman et al., 2021; Labrague and De Los Santos, 2020). It can be thought that the individual factors of health workers are effective, and attempts should be planned to increase their protective factors. The resilience levels of nurses, who love their job and have high job satisfaction, were found to be higher during the pandemic period (Hoşgör and Yaman, 2022). For this reason, it is understood that especially the working conditions of nurses should be improved, and they should be supported spiritually.

The nurses experienced high levels of burnout, anxiety, and depersonalization, and one-third of them met the diagnostic criteria for PTSD in this study. In a meta-analysis study, it was found that health workers experienced PTSD symptoms at 11.4%, psychological distress at 46.1%, and burnout at 37.4% during the pandemic (Batra et al., 2020). Benfante et al. (2020) reported that nurses have the

highest PTSD symptoms among healthcare workers. In these studies, conducted in different countries, various results have been obtained about the mental status of health workers. Especially in the literature, factors such as being a woman, being young, being a nurse, having less work experience and job satisfaction, working on the front lines and with infected patients, being single, poor social support, difficult access to psychological support, insomnia, burnout are listed as stress and risk factors for PTSD (Chew et al., 2020a; Kang et al., 2020). Post-traumatic stress symptoms are more common in healthcare workers at the forefront of the COVID-19 pandemic (Norhayati et al., 2021). In the literature, it is seen that healthcare workers who show symptoms of COVID-19 (Moon et al., 2021) and whose relatives or colleagues are positive for COVID-19 (Yılmaz Karaman and Yastıbaş, 2021) experience PTSD symptoms more. While studies similar to our study generally found that nurses working in COVID-19 pandemic clinics had moderate post-traumatic growth levels (Peng et al., 2020; Chen et al., 2021; Cui et al., 2021; Zhang et al., 2021); some studies found nurses' post-traumatic growth levels to be high (Mo et al., 2022). Studies have also found that factors such as the presence of social support, receiving psychological help, and having high job satisfaction increase the post-traumatic growth levels of nurses. Post-traumatic growth is a positive process that occurs after the traumatic process. It is thought that nurses who have experienced a traumatic process such as COVID-19 have made some changes in their life philosophy and life priorities to cope with this difficult process. This prevents individuals from being affected negatively in the face of difficulties and even enables them to come out of difficulties by improving. For this reason, it is important to determine the factors that will increase the post-traumatic growth levels of nurses. It has been reported that the increasing age of nurses working in the COVID-19 pandemic (Cui et al., 2020), working time of more than ten years (Cui et al., 2020), and higher education level (Cui et al., 2020; Zhang et al., 2021) social support status (Peng et al., 2021) and being married (Cui et al., 2020) have positive effects on post-traumatic growth levels, while gender is not a predictive factor (Cui et al., 2020; Peng et al., 2021; Zhang et al., 2021). In the study of Chen et al. (2021), it is seen that nurses who care for patients with a positive diagnosis of COVID-19 and work in intensive care clinics have higher post-traumatic growth levels.

Discussion about the relationship between the resilience, post-traumatic stress symptoms, and post-traumatic growth status of nurses

It was determined in this study as the resilience levels of the nurses increased, their PTSD symptoms decreased, and they experienced positive changes in their relations with others. In the international studies conducted during the COVID-19 pandemic, it was reported that health workers with high resilience experience fewer PTSD symptoms, stress, anxiety, and depression (Luceño-Moreno et al., 2020; Huffman et al., 2021) and cope with problems effectively (Chew et al. al., 2020b). Liu et al. (2021a) found that as the resilience of nurses working during the pandemic increased, their post-traumatic growth levels also increased. Resilience is a very important protective factor in the individual's ability to resist difficulties and negativities and even to develop and grow out of these difficulties. As can be seen in the studies, it is understood that people whose resilience levels increase can cope with problems and establish effective interpersonal relationships. The high resilience of the nurse working with a patient group that needs special care, such as COVID-19, shows that she can cope with adverse situations, her relationship with the patient can be more effective, and the quality of nursing care will increase accordingly. Increasing resilience during a crisis such as COVID-19 will help healthcare professionals prevent the emergence of mental problems and establish more effective interpersonal relationships. As nurses' PTSD symptoms increased, their post-traumatic growth levels also increased in this study. Another study, a positive relationship between individuals' PTSD symptoms and post-traumatic growth levels (Jin et al., 2014). This finding suggests that individuals have intrinsic motivation for development and growth, even when faced with difficulties and traumas and seek different ways to achieve positive results even if they experience mental symptoms. Despite experiencing PTSD

symptoms, nurses learned to cope with this crisis, developed new coping skills, and could come out of the pandemic by growing spiritually. This situation suggests that the pandemic should also be evaluated as an opportunity for nurses' spiritual development and growth.

Limitations of our study

The fact that this study was conducted in a hospital in a single province may affect the generalizability of the findings. The limitation of our study is that external factors such as the time elapsed since the nurses lost their relatives due to COVID-19 and the status of receiving a therapeutic intervention were not included in the study.

CONCLUSION

This study determined that nurses working in COVID-19 pandemic clinics experienced high levels of burnout, anxiety, fear, and depersonalization. It was found that the nurses' resilience, PTSD symptoms, and post-traumatic growth levels were at a moderate level. While a negative correlation was found between the resilience levels of nurses and PTSD symptoms, a positive correlation was determined between PTSD symptoms and post-traumatic growth levels. These results show us that the working conditions of nurses should be improved and morally supported. It is thought that the mental health of nurses will be better protected with steps to be taken such as increasing the number of nurses, decreasing the number of patients per nurse, and providing protective equipment. Accordingly, the quality of nurse care will increase, and it will positively affect patient care outcomes. In addition, nurses experiencing burnout, anxiety, fear, and PTSD should be evaluated comprehensively for mental health. It is important to maintain mental support for nurses during and after the pandemic and for hospital administrators to support nurses in this regard.

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Conflict of Interest

The authors declare that there is no conflict of interests.

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