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THE EFFECT OF COVID-19 PANDEMIC PROCESS ON COVID-19 PHOBIA, SECONDARY TRAUMATIC STRESS LEVEL AND QUALITY OF SLEEP IN HEALTHCARE PROFESSIONALS: A CROSS-SECTIONAL AND COMPARATIVE STUDY

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ABSTRACT

Purpose: The study was conducted to determine the effect of the pandemic process on COVID-19 phobia, secondary traumatic stress levels and quality of sleep in healthcare professionals working in a primary healthcare institution and a pandemic hospital.
Material and Methods: Thus comparative study was conducted with the participation of a total of 249 healthcare professionals, including 130 from a pandemic hospital and 119 from primary healthcare institutions. The data were obtained using a Personal Information Form, the Coronavirus 19 Phobia (CP19-S) Scale, the Secondary Traumatic Stress Scale (STSS) and the Pittsburgh Sleep Quality Index (PSQI).
Results: It was determined that the mean score in the CP19-S somatic subscale was 10.72±4.76 for the healthcare professionals working in the primary healthcare institutions and 12.18±5.07 for those working in the pandemic hospital, and the difference between the mean scores was statistically significant (p=0.021).The STSS total mean score was 40.86±14.45 in the healthcare professionals working in the primary healthcare institutions and 46.45±16.07 in those working in the pandemic hospital, and the difference between the groups was statistically significant (p=0.004).The PSQI total mean score was 9.48±3.39 in the healthcare professionals working in the primary healthcare institutions and 11.06±3.99 in those working in the pandemic hospital, and the difference between the mean scores was statistically significant (p=0.001).
Conclusion: It was determined that the healthcare professionals working in the pandemic hospital experienced more COVID-19 phobia and secondary traumatic stress and also had worse sleep quality in comparison to the healthcare professionals working in the primary healthcare institutions.

Keywords: medical staff, COVID-19, phobia, sleep, stress disorders, post-traumatic

INTRODUCTION

The World Health Organization has declared COVID-19 as an internationally alarming public health problem and identified it as a global pandemic (1). Past epidemic periods and especially the COVID-19 pandemic we experienced in 2020 onwards have increased the workload and responsibility of healthcare professionals significantly, and healthcare professionals have been more affected by the virus (2).

The COVID-19 pandemic disrupts people's routines, causing anxiety and phobic reactions (3). In a study, non-infected people reported that they were afraid of contacting people infected with COVID-19 (4). This fear may further increase the effect of the disease (3). Unfortunately, the group with the highest risk of being infected by this virus is always healthcare professionals. Midwives, physicians, nurses and all other healthcare professionals working in health institutions not only are exposed to the highest levels of pandemic stress but also try to cope with the psychological consequences of it for a long time (5). In healthcare professionals, fear of virus infection from confirmed or suspected COVID-19 cases may be seen6. COVID-19 has been reported to increase fear and anxiety in healthcare professionals (3,7).

The COVID-19 pandemic may also affect the mental health of healthcare professionals traumatically8. Being isolated, working in positions with high risk and contacting infected people are common causes of secondary trauma for healthcare professionals (9). It was reported that secondary traumatic stress may cause a significant mental difficulty in healthcare professionals (10), and the rate of being exposed to risk associated with secondary trauma in healthcare professionals is very high during the COVID-19 pandemic process (4).

Good sleep quality for healthcare professionals not only helps them work better in the treatment of patients but also protects their optimal immune function to prevent infection. Therefore, sleep quality is an important indicator of health (11). Healthcare professionals are exposed to high levels of chronic stress due to high infection risk and long working hours during the COVID-19 pandemic process. These constant stress factors may affect their sleep and mental health negatively (12). In the literature, it has been reported that healthcare professionals experienced sleep disorders due to COVID-19 and had poor sleep quality (12,13). Additionally, with the rapid increase in the number of patients, healthcare professionals have faced high workloads (14).

In particular, healthcare professionals working in pandemic hospitals experience anxiety (8), stress and fear (15), secondary traumatic stress8, depression and insomnia (16), post-traumatic stress disorder (6), somatization and obsessive-compulsive symptoms, whereas healthcare professionals working in primary care experience insomnia, depression and obsessive-compulsive symptoms (17). In both working conditions, healthcare professionals experience significant difficulties. For this reason, potential problems that healthcare professionals may experience based on their working environment during the pandemic process should be identified, and healthcare professionals should be supported fast by determining priorities. In the literature review, no study was found to comparatively evaluate the effect of the COVID-19 pandemic process on COVID-19 phobia, secondary traumatic stress levels and sleep quality in healthcare professionals. The aim of this study is to comparatively evaluate the effect of COVID-19 on COVID-19 phobia, secondary traumatic stress levels and sleep quality in healthcare professionals working in primary healthcare institutions and a pandemic hospital, who are at the frontlines of the fight against COVID-19.

Research Questions

-Is there a difference between the COVID-19 phobia of healthcare professionals working in a pandemic hospital and healthcare professionals working in primary health care institutions?

-Is there a difference between the secondary traumatic stress levels of the health professionals working in the pandemic hospital and the health professionals working in the primary health care institutions?

-Is there a difference between the sleep quality of healthcare professionals working in a pandemic hospital and healthcare professionals working in primary health care institutions?

MATERIAL AND METHODS

This study was conducted with a comparative design in a State Hospital serving as a pandemic hospital and in institutions providing Primary Healthcare Services in the same province between June and September 2020. The population of the study was

J Basic Clin Health Sci 2022; 6: 722-731

Cihan EG et al. COVID-19 pandemic process

composed of all midwives, nurses and physicians in the specified institutions. There were 417 healthcare professionals (47 midwives, 265 nurses and 105 physicians) at the Pandemic Hospital, and 164 healthcare professionals (55 midwives, 72 nurses and 37 physicians) worked at the institutions providing Primary Healthcare Services (N = 581). When power analysis was performed, the sample size was calculated as at least 232 healthcare professionals with a significance level of 5%, confidence interval of 95% and ability to represent the population of 80% (116 from the primary healthcare service institutions and 116 from the pandemic hospital). The study was completed with 130 healthcare professionals working in the pandemic hospital and 119 healthcare professionals working in the primary healthcare institutions during the data collection dates, and the data obtained from these two groups were compared. The healthcare professionals who agreed to participate in the study were selected from the population using the random sampling method.

Variables of the Study
Independent Variables: These are the independent variables of the institution where health professionals work.
Dependent Variables: The mean scores obtained from the Coronavirus 19 Phobia Scale, the Secondary Traumatic Stress Scale and the Pittsburgh Sleep Quality Index are the dependent variables.
Inclusion criteria: Working full-time in the specified healthcare institutions, not having any psychiatric diagnosis (depression, anxiety, etc.), agreeing to participate in the study voluntarily and providing written consent.
Exclusion criteria: Health professionals other than midwives, nurses and physicians.

Data Collection Tools
The data were obtained using a Personal Information Form, the Coronavirus 19 Phobia (CP19-S) Scale, the Secondary Traumatic Stress Scale (STSS) and the Pittsburgh Sleep Quality Index (PSQI).
Personal information form: The form was prepared by the researchers in line with the information in the literature to determine some individual characteristics of the participants. This form was composed of 12 questions about the descriptive characteristics of the healthcare professionals included in the study and

their work-related characteristics in the pandemic period (18,19).
Coronavirus 19 Phobia scale (CP19-S): CP19-S is a 5-point Likert-type self-report scale developed by Arpacı et al. (2020) to measure phobia that may develop against the novel coronavirus (20). It consists of 20 questions and 4 sub-dimensions. The scale items are evaluated between 1 "I strongly disagree" and 5 "I strongly agree". The scale has four subscales: psychological, somatic, social and economic. Items 1, 5, 9, 13, 17, and 20 psychological sub-dimension; items 2, 6, 10, 14, and 18, somatic subdimension; items 3, 7, 11, 15 and 19 social sub-dimension; items 4, 8, 12, and 16 measure the economic sub-dimension. While the sub-dimension scores are obtained by the sum of the answers given to the items belonging to that sub-dimension; The total CP19-S score is obtained by summing the sub-dimension scores and ranges from 20 to 100 points. High scores refer to high values related to the content measured in the subscales and general coronaphobia20. In this study, the Cronbach's alpha value of the scale was found as 0.91.
Secondary traumatic stress scale (STSS): The Turkish adaptation study of STSS developed by Bride et al (21). was carried out by Yıldırım et al. (22). It is a 17-item, five-point Likert-type assessment tool. The scale has three subscales: intrusion (questions 2,3,6,10 and 13), avoidance (questions 1,5,7,9,12,14 and 17) and arousal (questions 4,8,11,15 and 16). The score that can be obtained in the scale is in the range of 17-85, and high scores indicate a high level of influence (22). In this study, the Cronbach's alpha value of the scale was found as 0.91.
Pittsburgh sleep quality index (PSQI): PSQI is a scale that provides information about the type and severity of sleep disorders and sleep quality within the last month. It was developed by Buyse et al. (23). 19 out of the 24 questions found in the scale that was adapted to Turkish by Agargün et al. are self-report questions (24). The remaining 5 questions are filled by the person's partner or roommate, if any. These questions are used for clinical evaluation and not included in the scoring process. It has 7 sub-dimensions. With 19 questions answered by the individual, 7 components including subjective sleep quality (question 6), sleep latency (questions 2 and 5a), sleep duration (question 4), habitual sleep efficiency (questions 1 and 4), sleep disturbance (question 5b-j), use of sleeping medication (question 7) and daytime dysfunction (question 8-9) are

Table 1. Distribution of the sociodemographic characteristics of healthcare professionals in the primary healthcare institutions and pandemic hospital (n=249)

Variables	Primary Healthcare Institutions (n=119)		Pandemic Hospital (n=130)	
	n	%	n	%
Age (year) (Mean± SD)	33.96 ± 7.08		31.66 ± 7.87	
Gender				
Female	92	77.3	101	77.7
Male	27	22.7	29	22.3
Marital Status				
Married	91	76.5	77	59.2
Single	25	21.0	47	36.2
Divorced	3	2.5	6	4.6
Education Level				
High school graduate	12	10.1	16	12,3
Associate Degree	14	11.8	21	16,2
Bachelor's Degree	75	63.0	73	56,2
Graduate Degree	18	15.1	20	15,3
Occupation				
Midwife	42	35.3	18	13.8
Nurse	45	37.8	87	66.9
Doctor	32	26.9	25	19.3
Unit Worked in Pandemic Hospital				
Clinics	-	-	22	16.9
COVID-19 Service	-	-	15	11.5
Emergency Service	-	-	38	29.2
Intensive Care Units	-	-	30	23.1
Operating room	-	-	2	1.5
Outpatient clinics	-	-	6	4.6
Delivery room	-	-	17	13.1
Current Form of Work				
I work in areas including suspected or confirmed COVID-19 cases such as the pandemic clinic.	30	25.2	41	31.5
I work in the treatment of suspected or confirmed COVID-19 cases indirectly.	34	28.6	35	26.9
I do not work in the treatment of suspected or confirmed COVID-19 cases directly or indirectly.	55	46.2	54	41.5
Status of Being Diagnosed with COVID-19 during pandemic period				
Yes	2	1.7	8	6.2
No	117	98.3	122	93.8
COVID-19 diagnosis status of close colleagues				
Yes	11	9.2	41	31.5
No	108	90.8	89	68.5
Place of residence during COVID-19 period				
House	114	95.8	108	83.1
Guesthouse set up by the institution	3	2.5	13	10.0
Workplace/hospital	1	0.8	-	-
Another house with my friend(s)	1	0.8	9	6.9

evaluated. Each component is evaluated between 0 (no problem) and 3 (severe problem) points. The sum of the scores of the seven components gives the total PSQI score. The total PSQI score varies in the range of 0-21 points. The scale does not show whether or not there is a sleep disorder or the prevalence of sleep disorders. However, it is stated that a total score of 5 or above shows poor sleep quality. In other words, the data are classified as good sleep quality (0-4 points) and poor sleep quality (5-21 points). In this study, the Cronbach's alpha value of the scale was found as 0.78.

Data Collection
After the necessary explanations were made to the participants, their verbal consent was obtained. The

J Basic Clin Health Sci 2022; 6: 722-731

Cihan EG et al. COVID-19 pandemic process

Table 2. Comparison of the C19P-S total and subscale mean scores of the healthcare professionals in the primary healthcare institutions and pandemic hospital (n=249)

C19P-S Subscales	Primary Healthcare Institutions (n=119)	Pandemic Hospital (n=130)	Test* and significance
	Mean± SD	Mean± SD	
Psychological	18.02±6.49	18.97±7.22	t=-1.096 p=0.274
Somatic	10.72±4.76	12.18±5.07	t=-2.326 **p=0.021****
Social	13.41±5.46	14.40±6.09	t=-1.349 p=0.178
Economic	8.93±4.13	9.11±3.77	t=-0.349 p=0.728
C19P-S Total	51.08±19.03	54.65±20.18	t=-1.432 p=0.153

*t: Independent-samples t-test

** p<0.05

data collection tools were prepared on the Google Forms platform and delivered to the healthcare professionals online, after which the healthcare professionals were asked to fill out the form. Before starting to fill the data collection forms, the participants were also asked to sign the consent form sent via Google Forms. No time restriction was imposed on the participants during the data collection phase. The data collection phase lasted for approximately 5-10 minutes for each participant.

Ethical Approval

In order to conduct the study, ethical approval from Inonu University Health Sciences Non-Invasive Clinical Trials Ethics Committee (Decision No: 2020/791) and research permission from the Ministry of Health and the included healthcare institutions (Ministry Permission No: 2020-05-28T00_47_17) were obtained. Additionally, before filling out the data collection forms, the necessary explanations were made for the participants to protect their rights, and their written and verbal consent was obtained with the "Informed Consent Form". The research was conducted in accordance with the principles of the Declaration of Helsinki. Permission was obtained from the authors who developed the scale.

Statistical Analysis

The data were evaluated using the SPSS 25.0 statistical package program. Along with descriptive statistics, independent-samples t-test was used to determine the difference between the groups. The results were evaluated in a confidence interval of 95% and on a significance level of p<0.05.

RESULTS

This study included a total of 249 healthcare professionals (119 in the Primary Healthcare Institutions – 130 in the Pandemic Hospital). The mean age of the healthcare professionals working in the primary health institutions was 33.96±7.08 years. Among the participants working in the Primary Health Institutions, 77.3% were female, 76.5% were married, 63.0% had a bachelor's degree, and 37.8% were nurses. It was determined that 46.2% of these professionals did not work directly or indirectly in the treatment of suspected or confirmed COVID-19 cases, 98.3% were not diagnosed with COVID-19, and the close colleagues of 90.8% were not diagnosed with COVID-19. Additionally, 95.8% stayed at home during the COVID-19 period.

The mean age of the healthcare professionals working in the pandemic hospital was 31.66±7.87 years. 77.7% of the healthcare professionals working in pandemic hospital were female, 59.2% were married, 56.2% had a bachelor's degree, and 66.9% were nurses. It was determined that 29.2% of these professionals were working in the emergency department, 41.5% were not working directly or indirectly in the treatment of suspected or confirmed COVID-19 cases, 93.8% were not diagnosed with COVID-19, and the close colleagues of 68.5% were not diagnosed with COVID-19. Additionally, 83.1% were staying at their homes during the COVID-19 period (Table 1).

It was determined that, while the somatic subscale mean score of the healthcare professionals working in the primary healthcare institutions was 10.72±4.76,

J Basic Clin Health Sci 2022; 6: 722-731

Cihan EG et al. COVID-19 pandemic process

Table 3. Comparison of the STSS total and subscale mean scores of the healthcare professionals in the primary healthcare institutions and pandemic hospital (n=249)

STSS Subscales	Primary Healthcare Institutios (n=119)	Pandemic Hospital (n=130)	Test* and significance
	Mean± SD	Mean± SD	
Involuntary Affection / Intrusion	11.33±4.13	12.45±4.35	t=-2.074 **p=0.039****
Avoidance	16.94±5.93	19.34±6.71	t=-2.973 **p=0.003****
Arousal	12.59±5.35	14.67±6.07	t=-2.874 **p=0.004****
STSS Total	40.86±14.45	46.45±16.07	t=-2.879 p=**0.004****

*t: Independent-samples t-test
** p<0.05

the somatic subscale mean score of those working in the pandemic hospital was 12.18±5.07, and the difference between the mean scores was statistically significant (t=-2.326, p=0.021; Table 2).

It was determined that the STSS mean score of the healthcare professionals working in the primary healthcare institutions was 40.86±14.45, the STSS mean score of the healthcare professionals working in the pandemic hospital was 46.45±16.07, and the difference between the groups was statistically significant (t=-2.879, p=0.004; Table 3).

It was determined that, while the STSS "involuntary affection/intrusion" subscale mean score of the healthcare professionals working in the primary healthcare institutions was 11.33±4.13, the involuntary affection subscale mean score of the healthcare professionals working in the pandemic hospital was 12.45±4.35, and the difference between the mean scores was statistically significant (t= -2.074, p= 0.039). The STSS "avoidance" mean scores were 16.94±5.93 in the healthcare professionals working in the primary healthcare institutions and 19.34±6.71 in the healthcare professionals working in the pandemic hospital, and the difference between the mean scores was statistically significant (t= -2.973, p= 0.003). The STSS "arousal" mean scores were 12.59±5.35 in the healthcare professionals working in the primary healthcare institutions and 14.67±6.07 in the healthcare professionals working in the pandemic hospital, and the difference between the mean scores was statistically significant (t= -2.874, p= 0.004).

While the subjective sleep quality mean score of the healthcare professionals working in the primary healthcare institutions was 1.10±0.97, that of the healthcare professionals working in the pandemic

hospital was 1.48±1.08, and the difference between the mean scores was statistically significant (t=-2.876, p= 0.004; Table 4).

It was determined that, while the sleep latency mean score of the healthcare professionals in the primary healthcare institutions was 1.21±0.84, that of the healthcare professionals in the pandemic hospital was 1.62±0.77. Moreover, the sleep disturbance mean score of the healthcare professionals working in the primary healthcare institutions was 0.98±0.34, while that of the healthcare professionals working in the pandemic hospital was 1.11±0.57. There were statistically significant differences in the sleep latency and sleep disturbance mean scores between the groups of the healthcare professionals in the primary healthcare institutions and the pandemic hospital (t=-4.041; p=0.000), (t=-2.211; p=0.028).

While the mean score of using sleeping medication of the healthcare professionals working in the primary healthcare institutions was 1.48±0.76, the same mean score of the healthcare professionals working in the pandemic hospital was 1.72±0.83, and the difference between the mean scores was statistically significant (t=-2.310; p=0.022).

It was observed that, while the daytime dysfunction mean score of the healthcare professionals working in the primary healthcare institutions was 0.52±0.71, the daytime dysfunction mean score of the healthcare professionals working in the pandemic hospital was 0.78±0.84, and the difference between the mean scores was statistically significant (t=-2.567; p=0.011).

It was ascertained that the PSQI total mean score was 9.48±3.39 in the healthcare professionals working in the primary healthcare institutions and 11.06±3.99 in those working in the pandemic hospital,

Table 4. Comparison of the PSQI Total and Subscale Mean Scores of the Healthcare Professionals in the Primary Healthcare Institutions and Pandemic Hospital (n=249)

PSQI Subscales	Primary Healthcare Institutions (n=119)	Pandemic Hospital (n=130)	Test* and significance
	Mean± SD	Mean± SD	
Subjective sleep quality	1.10±0.97	1.48±1.08	t=-2.876 **p=0.004****
Sleep Latency	1.21±0.84	1.62±0.77	t=-4.041 **p=0.000*****
Sleep Duration	1.16±1.10	1.36±1.22	t=-1.308 p=0.192
Habitual Sleep Activity	3.00±0.00	2.97±0.26	t=0.957 p=0.340
Sleep Disturbance	0.98±0.34	1.11±0.57	t=-2.211 **p=0.028****
Use of Sleeping Medication	1.48±0.76	1.72±0.83	t=-2.310 **p=0.022****
Daytime Dysfunction	0.52±0.71	0.78±0.84	t=-2.567 **p=0.011****
PSQI Total	9.48±3.39	11.06±3.99	t=-3.375 p=**0.001****

*t: Independent-samples t-test
** p<0.05
***p<0.001

and the difference between the mean scores was statistically significant (t=-3.375; p=0.001). On the other hand, when the PSQI sleep duration and habitual sleep efficiency subscale mean scores of the healthcare professionals in the primary healthcare institutions and those in the pandemic hospital were compared, no statistically significant difference was determined between the groups (p>0.05; Table 4).

DISCUSSION
Healthcare professionals have always been profession members showing great sacrifice by working under difficult conditions in epidemics causing deaths that affect the whole world, such as the COVID-19 pandemic. In pandemics affecting the society in the socioeconomic and mental aspects, the physical and mental health of healthcare teams, who have considerable social and work responsibilities, is highly affected by this situation (25).
In this study, it was determined that the healthcare professionals working in the pandemic hospital experienced more somatic fear than their counterparts, and this caused a significant difference between the groups. Considering that healthcare professionals working in pandemic hospitals are the most vulnerable people in direct contact with patients

and their bodily fluids, it is understood that it is inevitable for them to experience more fear of virus infection (26,17). In fact, El- Hage et al. (2020) determined that healthcare professionals were at high risk in terms of experiencing concerns about their own health and fear of transmitting infection to family members or others during the COVID-19 pandemic process (27). In another study, Shigemura et al. determined that healthcare professionals who were infected with COVID-19 and had contact with infected people experienced intense emotional and behavioral reactions such as fear, distress, anxiety and anger (28). Besides, there are also studies indicating that the fear of being infected with COVID-19 dramatically increases mental health problems (28,29).
In this study, it was determined that the secondary traumatic stress levels of the healthcare professionals working in the pandemic hospital were significantly higher in comparison to the healthcare professionals working in the primary care institutions. Similarly, Ornel et al. reported that the prevalence of secondary traumatic stress in healthcare professionals who were constantly at risk of virus infection was high (26). In another study, El-Hage et al. stated that almost half of healthcare professionals experienced post-traumatic stress disorder, and one fourth of them

J Basic Clin Health Sci 2022; 6: 722-731

Cihan EG et al. COVID-19 pandemic process

experienced depression (27). Additionally, it was determined in this study that the healthcare professionals working in the pandemic hospital exhibited attitudes toward avoidance and were affected more by the pandemic involuntarily. This is thought to be caused by their serious concerns about being infected by the virus, as well as the possibility of the virus infecting their families, friends or colleagues (12,30).

According to result of this, the healthcare professionals working in the pandemic hospital experienced more sleep disturbance and had higher sleep latency levels than the healthcare professionals working in the primary healthcare institutions. In parallel with result of this, Beck et al. determined that the sleep complaints of the participants of their study increased in the COVID-19 pandemic period (31). In their study conducted among university students, Marelli et al. found that the sleep quality of young people was negatively affected during the pandemic period (32). In another study, Shigemura et al. determined that people who were infected with COVID-19 and had contact with infected people may experience insomnia (28). Besides, in another study comparing the sleep quality levels of those who spent the pandemic process at home and those who continued their working life, it was determined that the sleep quality levels of the two groups were similar, and there was no significant difference between the sleep times (33,34). We believe that the difference in this study occurred depending on the psychological changes caused by the fear of COVID-19. In fact, there are many studies indicating that fear may also bring about mental health problems (35,28,29). Furthermore, it was stated that the fear felt due to the pandemic increased anxiety and stress levels in healthy individuals (28). It is believed that stress and anxiety in healthcare professionals may be associated with sleep disorders.

CONCLUSION
It was determined that the healthcare professionals working in the pandemic hospital experienced higher levels of COVID-19 phobia and secondary traumatic stress and had worse sleep quality than those working in the primary health institutions.

Recommendations
It should be kept in mind that healthcare professionals may experience many different emotional and physical effects along with negativities such as

phobia, secondary traumatic stress and sleep problems. Accordingly, care should be taken in determining the working and resting hours of healthcare professionals working in the pandemic period. Additionally, supportive services should be provided to maintain the relationships of healthcare professionals working in the COVID-19 pandemic process with their teammates and family members. Screening programs that evaluate psychological health are also recommended.

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J Basic Clin Health Sci 2022; 6: 722-731

Cihan EG et al. COVID-19 pandemic process

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