



ORIGINAL RESEARCH

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## Psychological and biochemical Impact of Covid-19 pandemic on health workers in Siirt, Turkey

Naci Omer Alayunt<sup>1</sup>, Osman Ozudogru<sup>2</sup>, Ergul Cakan<sup>3</sup>

<sup>1</sup>Siirt University, Faculty of Medicine, Department of Medical Biochemistry, Siirt, Turkey

<sup>2</sup>Siirt Education and Research Hospital, Clinic of Internal Diseases, Siirt, Turkey

<sup>3</sup>Siirt Education and Research Hospital, Clinic of Mental Health and Diseases, Siirt, Turkey

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### Abstract

The aim of this study was to analyze the anxiety level of health care workers at the forefront of the fight against Covid-19 and to determine the prevalence of psychiatric symptoms of factors contributing to psychological stress and to identify risks and preservatives. To determine the anxiety levels of healthcare workers and the factors that contribute to psychological stress in the fight against Covid-19. After receiving ethical and legal permissions Necessary Siirt, a total of 150 people working in training and Research Hospital Covid-19 pandemic 50 to 100 active employee in the service of medical personnel and medical personnel outside the service running status among sociodemographic trait anxiety (Beck anxiety scale and the impact of Event Scale), a survey study was conducted with the questions the reasons. In this study, the effect scores of events in the pandemic service were found to be different at  $p < 0.001$  level compared to non-pandemic. At the same time, anxiety scores in the pandemic service were found to be different at the level of  $p < 0.001$  compared to non-pandemic. It was consistent with previous studies on the biochemical findings of healthcare workers who contracted Covid-19. In this context, administrators' attentive behavior towards psychological, psychological and psycho-social needs, stabilization of anxiety, and programs that teach relaxation techniques can help healthcare professionals develop self-help skills during periods of increased stress.

**Keywords:** Anxiety, biochemistry, Covid-19, health workers, pandemic, psychiatry

### Introduction

A novel coronavirus pandemic has emerged in Wuhan, China, and the number of cases of 2019 coronavirus disease (Covid-19) has reached 12 million and 600 thousand deaths from Covid-19 from December 2019 to mid-July 2020. These figures are growing exponentially and the effects of this crisis on the world are being explored by scientists. The Covid-19 epidemic is an internationally concerned public health emergency and poses a challenge to psychological resilience. Research data are needed to develop evidence-based strategies to reduce negative psychological effects and psychiatric symptoms during the outbreak. Since the epidemic spread rapidly, the medical workforce of healthcare professionals has played an indispensable role in the Covid-19 pandemic, a major public health condition. Covid-19 pandemic has become a global public health problem that can be transmitted very quickly [1].

The high number of infections associated with increased mortality brings extreme stress and psychological effects in humans.

However, taking measures such as social restraint by states brings anxiety, depression and psychological stress in people. In studies conducted, it is said that Covid-19 pandemic affects mental health negatively [2].

Mental health and psychiatric conditions of healthcare personnel are threatened because healthcare workers are exposed to stress with Covid-19 treatment, with an increased risk of infection and disease, and increased mortality. Low morale in healthcare workers increases both physical and psychological pressure. Supporting the mental health of these employees is one of the duties of public health. Challenges for staff are not only the increased workload of such outbreaks, but also their continuing work with concerns such as protecting themselves and their families from contamination are the most psychologically important challenges. Working with personal protective equipment and keeping up with the often changing protocols is a very difficult situation. Besides caring for colleagues who are infected, caring for patients who are very ill and deteriorating rapidly, traumas such as witnessing deaths can

\*Corresponding Author: Naci Omer Alayunt, Siirt University, Faculty of Medicine, Department of Medical Biochemistry, Siirt, Turkey  
E-mail: [nacialayunt@hotmail.com](mailto:nacialayunt@hotmail.com)

overwhelm health care workers' mental health. Previous studies have shown that survivors of acute infectious diseases such as SARS can lead to anxiety, depression, stress and post-traumatic stress disorder [3-5]. However, there are very few studies on mental health caused by stress, with the physical and psychological effects of serious infectious disease outbreaks on healthcare personnel, especially with increased workload and risk of infection. In the Covid-19 outbreak, healthcare professionals may need to treat several patients at the same time [6]. This requires them to perform new practices in abnormal ways [7]. It is said that staff often feel guilty psychology when they die while at the head of the patient [8]. These traumas and the fear of catching infectious disease make the staff unhappy. Fear of being quarantined also causes a separate trauma. Those exposed or showing symptoms to enter quarantine will usually require them to be away from their families [9]. They also suffer from boredom, fatigue and loneliness, as they often work as part of a close-knit team. They may also be anxious or reluctant to return to work after quarantine. As healthcare workers will usually need to work longer hours and stay away from home, in Covid-19 treatment, rest breaks and days off leave make employees more unhappy.

The aim of this study is to analyze the level of anxiety and related variables experienced by healthcare professionals who are at the forefront of the fight against Covid-19 during this pandemic. This study aims to determine the prevalence of psychiatric symptoms of factors that contribute to psychological stress, to identify risks and protectors, as well as to determine the status of protective measures for occupational health and safety. Obtaining data that can help government agencies and healthcare will guide experts to protect the psychological well-being of society against Covid-19.

## Materials and Methods

Research has been carried out according to the international and national guidelines and regulations (including the Declaration of Helsinki). This cross-sectional study started to work between June-July 2020 after the approval of the Siirt University Non-Interventional Clinical Research Ethics Committee (16.04.2020 date and number: 04) and the Ministry of Health. After giving information about filling the questionnaire to a total of 150 people working in Siirt Training and Research Hospital, necessary illumination has been made by obtaining consent of the volunteers. Questionnaires including questions about the causes of socio-demographic status and persistent anxiety (Beck Anxiety Scale and Impact of Events Scale) were distributed among 100 healthcare professionals working in the Covid-19 pandemic service and 50 healthcare professionals working outside the pandemic service. Data of the study; Using these questionnaire forms, a total of 150 people were obtained with the self-report method.

## Tools Used

In this study, it aims to determine the status of protective measures for occupational health and safety in addition to the factors that contribute to psychological stress in health personnel through survey applications made to Siirt Training and Research Hospital employees. Using the Beck Anxiety Inventory [10] and the Impact of Events Scale [11] scales, we cover many topics to provide participants with tips and general information about their psychological state. It will be a questionnaire study, where the

results we will obtain with the psychological test applications that you can get the evaluation of immediately will not be a diagnosis or a psychological evaluation, but only for tips and general information. We aim to analyze some symptoms experienced by healthcare professionals when they are anxious or anxious. Participants; They marked one of 4 options: None, Mild, Moderate and Serious.

Siirt Education and Research Hospital, which has Covid-19 case findings [12], will focus on the survey parameters that will be worked in working healthcare personnel, and obtain the data that can help state institutions and health services will guide the experts to protect the psychological well-being of society against Covid-19.

## Statistical Evaluation

SPSS statistical software (America, New York, IBM SPSS Version 22.0) was used to evaluate the data. Spearman correlation test was used to determine the relationship between the data. The paired comparison of the pandemic service and out-of-service groups was done by independent sample t-test analysis. If the p value is less than 0.05, the differences between the groups are considered statistically significant.

## Results

104 (69.3%) of the healthcare staff in the study group are women and 46 are men (30.7%), 60% are between the ages of 18-29, 36% are between the ages of 30-39, 4% are between 40-49. age range. Considering the marital status, 73 people (48.7%) were married, 77 people (51.3%) were single. It was seen that 92 people (61.3%) and 58 children (38.7%) did not have children (Table 1). According to the educational status; 11 high school graduates (7.3%) were 139 people (92.7%) who completed their undergraduate education. 22 of the participants stated that they smoke (14.7%) and 128 of them do not smoke (85.3%). The number of participants with alcohol use habit was 4 (2.7%) and the number of participants without alcohol use habit was 146 (97.3%). The number of participants with a history of psychiatric illness was 5 (3.3%) (Table 1).

In the pandemic service, the effect scores of the events were found to be different at the level of  $p < 0.001$  compared to those outside the pandemic. In the pandemic service, anxiety scores were found to be different at  $p < 0.001$  when compared to non-pandemic (Table 2).

While there is a strong positive correlation ( $r = 1$ ,  $p < 0.01$ ) between the staff working in the pandemic service and intervention, auditory testimony ( $r = 0.797$ ,  $p < 0.01$ ), visual testimony ( $r = 0.898$ ,  $p < 0.01$ ) and the effect of events ( $r = 0.680$ ,  $p < 0.01$ ) and a moderate positive correlation was detected between the study in the pandemic service (Table 3). A weak positive correlation was found between the staff working in the pandemic service and meeting the dead ( $r = 0.257$ ,  $p < 0.01$ ) and anxiety ( $r = 0.354$ ,  $p < 0.01$ ).

41 of the 150 healthcare workers included in the study had Covid-19 and their biochemistry parameters were recorded retrospectively. Ferritin ( $241.12 \pm 47.44$  ng/mL), CRP ( $11.24 \pm 4.88$  mg/L), Lactate ( $1.41 \pm 0.33$  mmol/L), CK ( $195.51 \pm 57.61$  u/L), lymphocyte ( $1.33 \pm 0.46$ ), white blood cell ( $5.50 \pm 1.10$ ), neutrophil ( $3.82 \pm 1.12\%$ ), platelet ( $168.12 \pm 41.11$ ) and D-Dimer

(603.15±168.33 ng/mL) increase. The characteristic findings were consistent with previous studies [12]. Decrease in hemoglobin (13.33±1.55), hematocrit (45.55±3.96), ALT (25.54±11.48 u/L), sodium (136.55±1.66 mEq/L), potassium (4.05±0.35 mEq/L)

levels and Biochemically similar covid-19 picture was observed with the increase in AST (30.22±11.58 u/L), troponin (4.87±3.69), LDH (225.45±72.35) levels [12].

**Table 1.** Socio Demographic Data

Demographic Variable	Pandemic Service		Non-Pandemic Service		
	frequency	percent	frequency	percent	
Age ranges	18-29	58	58	32	64
	30-39	38	38	16	32
	40-49	4	4	2	4
Gender	Female	64	64	40	80
	Male	36	36	10	20
Marital status	Single	51	51	26	52
	Married	49	49	24	48
Do you have children	Available	38	38	20	40
	Not available	62	62	30	60
Education status	Undergraduate	92	92	47	94
	Secondary school	8	8	3	6
Smoking status	Available	15	15	7	14
	Not available	85	85	43	86
Alcohol status	Available	4	4	0	0
	Not available	96	96	50	100
Intervention to Covid-19 Patient	Available	100	100	0	0
	Not available	0	0	50	100
Psychiatric Disease History	Available	5	5	0	0
	Not available	95	95	50	100

Demographic data are given as frequency and percentage.

**Table 2.** Data on The Effects of Events and Anxiety Effect Surveys

Effects of Surveys	Pandemic Service	Non-Pandemic Service	P
The effect of events	39.39±1.58***	13.24±1.41	<0.001
Anxiety effect	15.78±1.37***	6.33±0.87	<0.001

Data are shown as mean ± standard error.

\*\*\*p<0.001 express the statistical significance of the differences in the comparison of the data in the same line with the control group.

**Table 3.** Spearman Correlation Test For Pandemic Service and Non-Pandemic Service Health Personnel

Spearman Correlation Test Data	Age	Pandemic service	Smoking status	Alcohol status	Marital status	Having a child	Education status	Psychiatric disease	Auditory testimony	Image testimony	Intervention status	With dead Encounter	Of events effect	Anxiety
<b>Gender</b>	-0.076	0.172*	0.296**	0.249**	-0.040	-0.142	0.035	0.038	0.112	0.238*	0.172*	0.081	-0.049	0.141
<b>Age</b>		-0.044	0.019	0.028	-0.664**	-0.603**	0.121	-0.036	-0.088	-0.098	-0.044	0.095	0.213**	0.181*
<b>Pandemic Service</b>			0.019	0.119	-0.005	-0.037	0.040	0.133	0.797**	0.898**	1.000**	0.257**	0.680**	0.354**
<b>Smoking Status</b>				0.165*	-0.064	-0.058	-0.044	0.133	0.019	0.019	0.019	0.149	0.012	0.045
<b>Alcohol Status</b>					-0.078	-0.131	0.112	0.200*	0.095	0.107	0.119	0.071	-0.160	-0.104
<b>Marital Status</b>						0.815**	-0.018	0.042	0.093	-0.017	-0.005	-0.180*	-0.139	-0.178*
<b>Having A Child</b>							-0.013	0.005	0.010	-0.030	-0.037	-0.197*	-0.151	-0.178*
<b>Education Status</b>								0.233**	-0.017	0.013	0.040	0.061	0.013	0.017
<b>Psychiatric Disease</b>									0.106	0.120	0.133	0.051	-0.158	-0.198*
<b>Auditory Testimony</b>										0.752**	0.797**	0.205*	-0.599**	-0.351**
<b>Image Testimony</b>											0.898**	0.230**	-0.612**	-0.292**
<b>Intervention Status</b>												0.257**	-0.680**	-0.354**
<b>With Dead Encounter</b>													-0.234**	-0.189*
<b>Of Events Effect</b>														0.710**

\*\* Correlation is significant at the 0.01 level.

\* Correlation is significant at the 0.05 level.

## Discussion

This study was planned to evaluate the anxiety levels of Covid-19 outbreak employees of Siirt Training and Research Hospital, which served as a pandemic hospital in the Covid-19 pandemic process. It is observed that psychiatric disorders such as anxiety disorders, the effects of events and anxiety, which are emerging against the common disease threat, especially epidemic diseases, are not neglected in our daily lives. According to the Parasite Stress Theory, outbreaks that pose a risk of death bring along negative behaviors such as 'inward closure' and distance between external groups [13]. The health business, known to be one of the most risky business lines in terms of health and safety, always handles the necessary measures to be protected from infectious diseases. Healthcare professionals are the business line where current risk rises to the highest levels against infectious diseases. When these risks include physical, chemical, biological factors and psychosocial structure that may arise from the work environment, it causes oxidative stress by disrupting the oxidant-antioxidant balance of our body [14]. In its most general sense, oxidative stress can also be evaluated as an environmental factor and an individual perceived component of this environmental factor. The service expected from the healthcare professionals and the ability of the employees to meet the expected service determine the stress or tension levels of the employees. As healthcare professionals have direct human health responsibilities due to their jobs, they may experience the stress caused by the work environment more intensely. It is an undeniable fact that the Covid-19 pandemic is an infectious disease that frightens more than other pandemics, which will increase this responsibility and stress more and more on healthcare workers. In addition, there are studies in the literature that working with shifts and shifts negatively affect the physiological and psychological health, social life, personal occupational safety and patient safety of employees [15-17]. It is thought that occupational difficulties of healthcare workers are among the factors that increase anxiety. Healthcare professionals may have to work outside of routine working hours. Healthcare workers; It is a group that takes life threatened duties and responsibilities and works under pressure of work, stress and time. While expecting individuals working in the healthcare business to fulfill their social roles such as society, motherhood, paternity and being a partner; On the other hand, these individuals have different responsibilities both at home and at work (Table 1). They are in the risk group in terms of mental complaints brought about by different social roles and responsibilities they undertake while working under this pressure [16].

In this study, the effect of Covid-19 pandemic was found to be higher in healthcare workers' anxiety levels than in the literature and in similar studies [18, 19]. In a study carried out, health workers who worked intensively during the Covid-19 epidemic had depression, anxiety and stress states were found to be affected [20]. In our study, the effect scores of events in pandemic service were found to be different at the level of  $p < 0.001$  when compared to non-pandemic. At the same time, anxiety scores in pandemic service were found to be different at  $p < 0.001$  when compared to non-pandemic (Table 2). In order to understand the relationship better, it will be sufficient to look at Figure 1. In this case, the patients with pandemic Covid-19 long hours in complete contact with health workers and social roles of family ties in Turkey also

occurs more strongly connected. While there is a strong positive correlation ( $r = 1$ ,  $p < 0.01$ ) between the work of the healthcare staff in the pandemic service and intervention, auditory testimony ( $r = 0.797$ ,  $p < 0.01$ ), visual testimony ( $r = 0.898$ ,  $p < 0.01$ ) and the effect of events (A moderate positive correlation was found between  $r = 0.680$ ,  $p < 0.01$ ) and study in the pandemic ward. A weak positive correlation was found between working with the pandemic service and meeting the dead ( $r = 0.257$ ,  $p < 0.01$ ) and anxiety ( $r = 0.354$ ,  $p < 0.01$ ) (Table 3). There was also a difference between the states of Covid-19 and those who had direct contact with those who did not have direct contact, and their state of state anxiety. This situation can be considered as an explanatory relationship between the effects of epidemics and events, which is one of the aims of the study, and anxiety status. A high level of anxiety is a public health problem that needs to be investigated as it negatively affects the success and efficiency of the person and brings more important psychological and social problems. The anxiety experienced by the health personnel is also an important problem, especially in terms of being at the forefront during the epidemic. In order to cope with this problem, it is necessary to come up with solutions by researching both the causes of this problem and the psychosocial or demographic causes. We believe that one of the most important tools in dealing with stress is the family life of the person and that the family's social support will be helpful in dealing with stress.

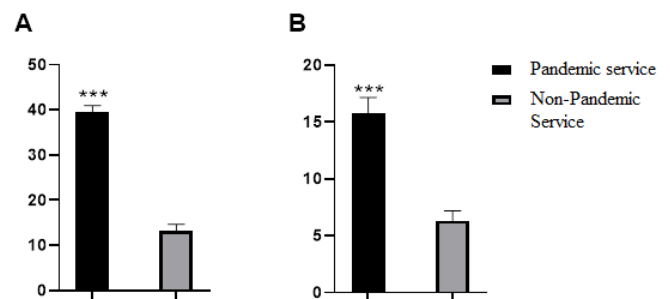


Figure 1. A. Effect of Events and B. Anxiety Effect

## Conclusion

In this context, administrators, attentive to the psychological, psychological and psycho-social needs of healthcare professionals, the implementation of programs that teach stabilization of anxiety and relaxation techniques can help healthcare professionals develop their self-help skills during periods of stress. Health personnel should be provided with the necessary personal protective measures and full support should be provided to deal with the pandemic to secure their physiological-psychological health and social lives. With Covid-19, it will be possible to prevent the occurrence of burnout and related problems by controlling the state anxiety against the state of anxiety with the Effect of Events.

## Conflict of interests

The authors declare that they have no competing interest.

## Financial Disclosure

The authors received no financial support for this study.

## Ethical approval

The study was conducted in Siirt Training and Research Hospital with the approval of the Siirt University Non-invasive Clinical Research Ethics Committee and the approval of the Ministry of Health.

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