

# Depression, anxiety and stress in healthcare workers during the COVID-19 pandemic

## Depresija, anksioznost i stres kod zdravstvenih djelatnika u vrijeme pandemije COVID-19

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### Abstract

**Introduction:** The pandemic of the disease COVID-19 has a tremendous emotional impact on both patients and health workers who are in charge of assisting the infected. The heavy burden on them is further increased by the high and constant risk of exposure to infection and death and separation from their families. The newly created excessive professional demands that the environment around us sets, which cannot be adequately responded to, are the drivers, or stressors, that form the basis for depression and anxiety.

**Methods:** A questionnaire survey (DASS-21) was conducted on 100 employees of the Croatian Hospital "Dr. fra Mato Nikolić" Nova Bila in the period from June to October 2022. The respondents were doctors and nurses who work in intensive care units, the internal department, and the surgery department.

**Results:** All respondents had a certain level of stress (40% extremely severe stress), anxiety (65% extremely severe anxiety), and depression (46% extremely severe depression). There is a significant correlation between stress, depression, and anxiety with concern for the financial situation considering the consequences and impact of the COVID-19 pandemic. There is also a correlation with the claim of concern for one's own mental health, but also with the fear of infection or reinfection with the virus.

**Conclusion:** Healthcare workers who work with patients with COVID-19 are significantly exposed to stress, anxiety, and depression. It is necessary to provide healthcare workers with psychophysical support, especially in crises such as the pandemic caused by COVID-19.

**Keywords:** Pandemic, stress, depression, anxiety, COVID-19, healthcare workers

**Short title:** Mental health during the COVID-19 pandemic

### Sažetak

**Uvod:** Pandemija bolesti COVID-19 ima veliki emocionalni utjecaj kako na pacijente, tako i na zdravstvene djelatnike koji su zaduženi za pružanje pomoći zaraženima. Veliko opterećenje zdravstvenih djelatnika dodatno je povećano visokim i postojanim rizikom od izloženosti zarazi i smrti te odvajanjem od svojih obitelji. Novonastali prekomjerni profesionalni zahtjevi koje okruženje oko nas postavlja, a na koje se ne može primjereno odgovoriti, predstavljaju pokretače, odnosno stresore koji stvaraju podlogu za depresiju i anksioznost.

**Metode:** Istraživanje anketnim upitnikom provedeno je na 100 ispitanika, odnosno zaposlenika Hrvatske bolnice "Dr. fra Mato Nikolić" Nova Bila u periodu od lipnja do listopada 2022. godine. Ispitanici su bili liječnici i medicinske sestre koji rade u jedinicama intenzivne skrbi, internog odjela i odjela kirurgije.

**Rezultati:** Svi ispitanici imali su prisutnu određenu razinu stresa (40 % njih imalo je visoku razinu stresa), anksioznosti (65 % ispitanika imalo je visoku razinu anksioznosti) i depresije (46 % njih imalo je visoku razinu depresije).

Značajna je povezanost stresa, depresije i anksioznosti sa zabrinutošću za financijsku situaciju s obzirom na posljedice i utjecaj pandemije COVID-19, te je značajna korelacija s tvrdnjom o zabrinutošću za vlastito mentalno zdravlje, ali i strahom od zaraze ili ponovne zaraze virusom.

**Zaključak:** Zdravstveni djelatnici koji rade s oboljelima od bolesti COVID-19 značajno su izloženi stresu, anksioznosti i depresiji. Neophodno je zdravstvenim djelatnicima osigurati psihofizičku potporu, osobito u kriznim situacijama poput pandemije uzrokovane bolešću COVID-19.

**Ključne riječi:** Pandemija, stress, depresija, anksioznost, COVID-19, zdravstveni djelatnici

**Kratak naslov:** Mentalno zdravlje za vrijeme pandemije COVID-19

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### Introduction

The coronavirus pandemic COVID-19 spread around the world in December 2019 and changed human life. The consequences of the isolation to prevent the spread of the virus were mostly related to mental health, especially those

who were on the "front line" - healthcare workers. The most common were depression, due to a lack of social contact, and anxiety, due to fear and uncertainty of what lies ahead.

The pandemic has a great emotional impact on both patients and healthcare workers who are in charge of helping the infected. The heavy burden on them is further increased by the high and constant risk of exposure to infection and death, and separation from their families, which can be forced or due to extended work shifts. Seeing daily traumatic images of their seriously ill or dying patients in an overburdened environment with chronically low drug supplies, the constant noise of ventilators, strong lighting in intensive care units, experiencing the hopelessness of great human losses despite all efforts to provide care, managing human bodies, experiencing quarantine, witnessing the death of their colleagues, lack of reinforcements and replacements, fatigue and burnout, are just some of the traumas they have to endure during work. They may be worried, fear infection, and face loneliness and demanding expectations, which can result in anger, anxiety, depression, and stress related to uncertainty [1].

If healthcare workers do not react to stress in time, it can lead to impairment of their mental health and the most common symptoms of anxiety and depression. In some healthcare workers, it can result in secondary traumatization. The aforementioned psychological disorders can have physical manifestations such as rapid fatigue, exhaustion, and headaches.

Exposure to stressful situations causes negative reactions, behavioral changes such as aggression, withdrawal, isolation and self-destructive behavior, smoking, and drug and alcohol consumption. The many unknown facts about the COVID-19 virus further increase the stress with the increasing percentage and number of patients whose condition deteriorates rapidly, regardless of the medical interventions used. Mental health problems lead to the need for support and interventions that are most needed to alleviate or prevent symptoms [2]. The World Health Organization advocates the thesis that the feeling of pressure in the current situation associated with COVID-19 is normal and that taking care of mental health is just as important as taking care of physical health [3]. The British Royal College of Nursing states that "it's okay not to be okay" because this is an unprecedented emergency situation [4].

Health workers who participate at all levels of health care in the immediate care of patients with diseases whose transmission routes, clinical picture, treatment, and prevention are still being researched are in a professional challenge every day, which is a source of stress [5]. It is precisely the newly created excessive professional demands that the environment around us sets and which cannot be adequately responded to, that are triggers, i. e. stressors that form the basis for depression and anxiety [6].

The COVID-19 pandemic can be characterized as one of the most stressful events of recent times. Among the general population, healthcare workers treating patients with COVID-19 are most likely to develop psychological distress and symptoms of post-traumatic stress disorder. This study therefore aimed to investigate the psychological impacts of the COVID-19 pandemic on healthcare workers. The Croatian hospital "Dr. fra Mato Nikolić" Nova Bila in the 1990s during the war was operated on the premises of the Chur-

ch, where the wounded and sick patients were treated. The traumas of that period are still visible in the health workers. Therefore, it is crucial for us to see if the COVID-19 pandemic caused greater consequences on the mental health of health workers in this hospital.

## Methods

The survey was conducted in the Croatian hospital "Dr. Fr. Mato Nikolić" in Nova Bila from June to September 2022 and included 100 respondents. The respondents were doctors and nurses working in intensive care units, the internal medicine department, and the surgery department, who agreed to the research and signed the informed consent. The average age of the respondents was 42 years [Table 1].

The survey was conducted using an anonymous standardized modified survey questionnaire (DASS-21) and was personally delivered by the author of the research.

The questionnaire is divided into the following four groups of questions:

- general information
- questions about the impact of the COVID-19 pandemic on the working environment
- questions about aspects of concern related to the COVID-19 pandemic and the infection of COVID-19
- questions about aspects of depression, anxiety, and stress (DASS-21).

A 5-point Likert scale was used for this group of questions to evaluate the mentioned aspects, in which respondents marked the level of agreement with the stated statement.

In accordance with the ethical principles of the research, all surveyed subjects were informed by an informative letter in the introductory part of the questionnaire about basic information about the research, and about the purpose of making an informed decision about participation, i. e. informed consent.

The research was approved by the ethics committee.

## Statistical analysis

The research was structured as a cross-sectional study. Categorical data are represented by absolute and relative frequencies. Due to the distribution of numerical data that does not follow a normal distribution, the numerical data were described by the median and the limits of the interquartile range, and non-parametric methods were used for testing. The correlation score was given by the Spearman correlation coefficient  $Rho$ . The internal reliability of the scales was expressed by the Cronbach Alpha coefficient 0.91.

## Results

Out of the total number of respondents, 39% of them declared that they had moderately severe depression, 15% had severe depression, and 46% respondents had extremely severe depression [Table 2].

**TABLE 1.** Basic characteristics of the respondents

		Number of respondents	Percentage (%)
Age	18-30	16	16%
	31-40	24	24%
	41-50	31	31%
	51-60	23	23%
	More than 60	6	6%
Marital status	Widow/ er	1	1%
	In a relationship, does not live with partner	2	2%
	In a relationship, lives with a partner	3	3%
	Divorced	4	4%
	Single	8	8%
How many people live in the household of the respondents?	Married	82	82%
	0	1	1%
	6	1	1%
	5	5	5%
	1	6	6%
	2	21	21%
	4	32	32%
	3	34	34%
Does the respondent suffer from some chronic diseases?	More than 6 people	0	0%
	Yes	36	36%
Does the respondent have a close family member who suffers from a chronic disease?	No	64	64%
	Yes	47	47%
	Yes	53	53%

**TABLE 2.** Respondents in relation to the expression of depression, anxiety and stress

		Number of respondents	Percentage (%)
Depression (DASS-21)	Normal (0-9)	0	0
	Faintly expressed (10-12)	0	0
	Moderately expressed (13-20)	39	39.0
	Very expressed (21-27)	46	15.0
	Extremely expressed (28-42)	46	46.0
	<b>Total:</b>	<b>100</b>	<b>100.0</b>
Anxiety (DASS-21)	Normal (0-6)	0	0
	Faintly expressed (7-9)	0	0
	Moderately expressed (10-14)	29	29.0
	Very expressed (15-19)	6	6.0
	Extremely expressed (20-42)	65	65.0
	<b>Total:</b>	<b>100</b>	<b>100.0</b>
Stress (DASS-21)	Normal (0-10)	0	0
	Faintly expressed (11-18)	27	27.0
	Moderately expressed (19-26)	3	3.0
	Very expressed (27-34)	30	30.0
	Extremely expressed (35-42)	40	40.0
	<b>Total:</b>	<b>100</b>	<b>100.0</b>

In the domain of anxiety, 29% of respondents had moderately expressed anxiety, 6% had very expressed anxiety, and 65% had extremely strong anxiety. As for stress, 27% of the respondents declared that they had mildly expressed stress, and 3% moderately expressed stress. Stress was very noticeable in 30% of respondents, while stress was extremely noticeable in 40% of respondents.

The biggest concern was expressed for the fear that older family members could become infected (median 4, interquartile range 2-5) and for the concern that the respondent will transmit COVID-19 to someone in his family (median 4, interquartile range 2-5) [Table 3].

The least concern was expressed for the mental health of one of the family members (median 2, interquartile range 1-3) and for concern about reinfection of the respondent (median 2, interquartile range 1-4).

All correlations were significant ( $P < 0.001$ ) and positive. The strongest connection of stress is with the statement of concern for the financial situation considering the consequences and impact of the COVID-19 pandemic on society as a whole ( $Rho = 0.952$ ) and with the statement of concern for one's own mental health ( $Rho = 0.962$ ).

The correlation of anxiety is very significant with all claims about concern, but the highest correlation with concern for one's own financial situation is the most significant ( $Rho = 0.853$ ). Depression also significantly correlated with all claims of concern.

The highest correlation is with the statement of concern for one's own mental health ( $Rho = 0.925$ ) and with the concern that the respondent could be infected or reinfected ( $Rho = 0.934$ ) [Table 4].

**TABLE 3.** Ratings of individual statements of the scale of concern

	Median	Interquartile range	
I am worried that the younger members of my family might get infected.	3	2	4
I am concerned that an elderly member of my family may become infected.	4	2	5
I am worried that I could get infected or get reinfected.	2	1	4
I feel exposed to infection at my workplace.	3	2	4
I am worried about infecting someone in my family with COVID-19.	4	2	5
I am worried about my mental health.	3	1	5
I notice difficulties in my own functioning at the workplace, now during the pandemic, compared to the time before the pandemic.	3	1	4
I notice difficulties in my own functioning outside the workplace (e. g. at home).	3	1	4
I am concerned about the mental health of one of my family members, and difficulties have arisen during the COVID-19 pandemic.	2	1	3
I am worried about my financial situation considering the consequences and impact of the COVID-19 pandemic on society as a whole.	3	2	5

## Discussion

The research aimed to determine whether there is an impact of the COVID-19 pandemic on the mental health of healthcare workers, i. e. how much the conditions in which these healthcare workers work affect their mental state, i. e. the occurrence of anxiety, depression, and stress, and how they perceive their mental well-being. The results of this research show that all examined health professionals felt anxiety, depression, and stress, varying from mild to extremely severe. The results of this work are in line with research on the impact of the COVID-19 pandemic on mental health, where the significant impact of the pandemic caused by the coronavirus on increasing stress, depression, and anxiety as well as mental illnesses was also shown [7, 8, 9].

A recent study in the Republic of Croatia determined a statistically significant increase in the level of depression, anxiety, and stress during the pandemic caused by the coronavirus [10]. Nevertheless, the results of this work indicate sig-

nificantly high levels of depression, stress and anxiety. Additional research should be done to determine if there are other causes of this result apart from the pandemic itself.

The results show that healthcare workers are very concerned about their mental health, and 68% of them stated that they are all concerned about their family's mental health. That can be interpreted in the way that the disease has been going on for more than two years, while most of the facts about the transmission of the disease and methods of protection are known. However, the majority of respondents are most concerned about not passing the disease on to their family members, which is understandable because, during the pandemic, they spent most of their time at work and with family [11].

A significant correlation of stress, depression, and anxiety with claims, i. e. concerns such as financial concerns and concern for one's own mental health, was observed. That indicates the respondents' awareness of the impact of the

**TABLE 4.** The correlation of worry with depression, anxiety and stress

	Spearman correlation coefficient Rho (P value)		
	Depression	Anxiety	Stress
I am worried that the younger members of my family might get infected.	0.906** ( $<0,001$ )	0.835** ( $<0,001$ )	0.945** ( $<0,001$ )
I am concerned that an elderly member of my family may become infected.	0.894** ( $<0,001$ )	0.821** ( $<0,001$ )	0.917** ( $<0,001$ )
I am worried that I could get infected or get reinfected.	0.934** ( $<0,001$ )	0.831** ( $<0,001$ )	0.909** ( $<0,001$ )
I feel exposed to infection at my workplace.	0.880** ( $<0,001$ )	0.838** ( $<0,001$ )	0.944** ( $<0,001$ )
I am worried about infecting someone in my family with COVID-19.	0.909** ( $<0,001$ )	0.836** ( $<0,001$ )	0.943** ( $<0,001$ )
I am worried about my mental health.	0.925** ( $<0,001$ )	0.841** ( $<0,001$ )	0.962** ( $<0,001$ )
I notice difficulties in my own functioning at the workplace, now during the pandemic, compared to the time before the pandemic.	0.903** ( $<0,001$ )	0.832** ( $<0,001$ )	0.939** ( $<0,001$ )
I notice difficulties in my own functioning outside the workplace (e.g. at home).	0.911** ( $<0,001$ )	0.840** ( $<0,001$ )	0.934** ( $<0,001$ )
I am concerned about the mental health of one of my family members, and difficulties have arisen during the COVID-19 pandemic.	0.903** ( $<0,001$ )	0.834** ( $<0,001$ )	0.945** ( $<0,001$ )
I am worried about my financial situation considering the consequences and impact of the COVID-19 pandemic on society as a whole.	0.910** ( $<0,001$ )	0.853** ( $<0,001$ )	0.952** ( $<0,001$ )

pandemic caused by the COVID-19 virus on their mental health. The impact of the pandemic on financial instability, as well as the impact of financial instability on mental health has been known for a long time [12], so this result is somewhat expected.

Research conducted in the Republic of Croatia shows that health workers in the field of midwifery experienced multiple psychophysical disturbances due to the pandemic caused by the coronavirus, which affected their functioning at the workplace and also in their private life. Of the 240 respondents who participated in the mentioned research, 55% were worried about infecting one of their family members [13]. On the other hand, most respondents felt responsible for their team and dissatisfaction with the quarantine and self-isolation they had to apply when conditions dictated it.

Fear, anxiety and the appearance of depression among healthcare workers was not only caused by the fear of the physical consequences of COVID-19, the possibility of infecting themselves and their loved ones, but it was further enhanced by the unpredictable circumstances that surround them and in which they have to navigate without following established health patterns. Healthcare professionals who encounter unexpected and unpredictable circumstances are more susceptible to stress because they are overworked, exhausted, agitated and suffer from symptoms of "burnout".

Many studies in the USA show that the male population has a higher mortality from the disease, and the female population is more sensitive to the emotional and socioeconomic consequences of the infection. One study states that people who have recovered from COVID-19 have an increased risk of psychiatric consequences. Very similar data have been shown in the countries of Europe [14, 15].

A significant correlation between depression and the respondent's fear of being infected or reinfected was observed. Fear is an integral part of life, but in times of general hysteria, closures and quick panic decisions by crisis headquarters and governments, this fear becomes irrational and turns into anxiety, which significantly contributes to the onset of depression [16]. That is why it is important to provide psychological help to healthcare workers even after the end of the pandemic in order to prevent the development of chronic depression and post-traumatic stress syndrome.

Healthcare workers in the Republic of Croatia who had increased satisfaction with their work during the pandemic or that satisfaction remained the same are more resistant to stress. They are less exhausted and alienated, and their mental health is better compared to those whose job satisfaction was reduced during the pandemic [17]. Research conducted on healthcare workers in Italy during the COVID-19 pandemic showed a higher level of depression symptoms and post-traumatic stress disorder symptoms.

These results were expected considering that healthcare workers are in the first line in the fight against COVID-19 and they struggle daily to keep patients alive. Furthermore, medical health workers are constantly exposed to very risky situations, which can make them feel unsafe at work. Uncontrolled spread of the virus, lack of daily and much-needed rest, constant risk of infection, workload, lack of protective equipment and frequent isolation from family are factors that, in the long term, contribute to a high risk of acute and chronic disorders related to mental health [18].

## Conclusion

Healthcare workers who work with patients with COVID-19 are significantly exposed to stress, anxiety and depression. There is a significant correlation between stress, depression

and anxiety with concern for the financial situation considering the consequences and impact of the COVID-19 pandemic. There is also a significant correlation with the statement of concern for one's own mental health and the fear of infection or reinfection with the virus. Mental health is an important aspect of health, and health professionals should be instructed and educated in order to recognize the early symptoms of mental disorders and seek help in time.

There is a need for additional research studies about the consequences of the COVID-19 pandemic on the mental health of healthcare workers working in COVID-19 wards and ways it can be mitigated during and after the pandemic.

**Authors declare no conflict of interest.**

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