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Original Scientific Paper

THE IMPACT OF THE COVID-19 PANDEMIC ON THE MENTAL HEALTH OF WORKERS IN PRIMARY HEALTH CARE

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SUMMARY – The aim of this research was to investigate the impact of COVID-19 on the mental health of primary health care workers. This prospective research included 107 medical (51.5%) and non-medical (48.5%) employees of Health Center (HC) Mostar. Data were gathered using a questionnaire that contained the depression, anxiety and stress scale (DASS-21) and a validated short questionnaire of human mental health (MHI-5) during the COVID-19 pandemic. Most respondents were < 45 years of age. There was no statistically significant difference between medical and non-medical staff on both the DASS-21 and MHI-5 scales. Also, no statistically significant difference was found in the subcategorization of medical staff. The prevalence of stress in the subjects was 30%, anxiety 54% and depression 31%. A multivariate logistic regression model found that age > 45 years (OR = 0.509; *P* = 0.016) and opiate use (OR = 0.203; *P* = 0.023) were positively associated with depression (*P* = 0.042). The overall crisis related to the COVID-19 pandemic has led to various psychological difficulties in the general population, but also in a significant percentage of healthcare workers at all levels of healthcare. Therefore, new approaches are necessary in the treatment of the mentioned mental health problems.

Keywords: *COVID-19; mental health; healthcare workers*

Introduction

Considering the global damage the coronavirus has done, the prevention of its further spread has become the top priority of many governments and state institutions responsible for protecting people's health around the world[1]. In the last two decades, three threats of coronaviruses were recorded (SARS 2002-2003, MERS 2012, COVID-19), but COVID-19 is the only one that took on pandemic characteristics in the 21st century[2]. The disease caused by the coronavirus is very serious, often fatal and very contagious due to the speed with which it spreads. Taking into account the

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severity of the situation at a global level at that time, in January 2020 the World Health Organization (WHO) declared the outbreak of the SARS-CoV-2 infection to be a public health emergency of international importance[3,4], and in March 2020 it already estimated that COVID-19 can be characterized as a pandemic[5].

Unfortunately, shortly after the emergence of the SARS-CoV-2 virus in Wuhan, the global epidemic worsened and the virus spread throughout Europe[6,7].

Bosnia and Herzegovina was also affected by the epidemic; the first case of infection with COVID-19 in the Federation of Bosnia and Herzegovina was recorded on March 9, 2020, and by April 9, 2020, a total of 816 infected people were recorded – as many as 35 with a fatal outcome. The first case of infection with the corona virus in Mostar was recorded on March 16, 2020[8].

The world-wide public opinion is that the coronavirus pandemic has affected not only physical health, but also mental health and human well-being[9]. The appearance of the global, highly contagious coronavirus epidemic itself had a significant impact on people's mental health, and even on their behavior, which further caused fear and uncertainty. Therefore, contemporary psychiatry has been given the opportunity to consider the impact of this historically important event on the mental health of the world population. In order to suppress the spread of the COVID-19 virus and therefore protect the health of the population, extraordinary preventive measures were introduced. These same preventive measures also triggered great stress, depression and anxiety in the general population all over the world. Such events could lead to impaired mental health for some people, which can last significantly longer than the threat to physical health itself[10]. The new measures that people had to adapt to, such as self-isolation and quarantine, affected the daily life of the world population. A lack of usual activities and life routines has influenced the increase of certain psychological conditions, such as loneliness, anxiety, depression, insomnia, opiate abuse, self-harm and suicidal behavior. Quarantines were introduced to prevent the spread of infection, but social distancing from family and community left a strong impact on mental health. Also, self-isolation and quarantine led to an increase in cases of domestic violence where the victims had no way to escape[11].

The COVID-19 pandemic strongly affected the mental health not only of the general population and sick patients, but also of healthcare workers who took care of infected patients[12-14].

Healthcare workers were exposed to twice as much stress due to the greater influx of suspected and confirmed cases of infection, and the existence of a high possibility of workers going into isolation due to greater exposure to infection and not using adequate protective equipment. Due to the lack of knowledge about the disease, its mode of transmission, the speed at which the virus spread, definitive treatment protocols and vaccination options, health professionals had to be ready for a transformation of the health system during a pandemic and had to act as multidisciplinary public health teams[15]. For this reason, healthcare workers were exposed to a higher risk of getting sick and developing psychological trauma during the COVID-19 pandemic. The aim of this paper was to investigate the impact of COVID-19 on the mental health of workers in primary health care.

Subjects and methods

The cross-sectional research included 107 members of medical and non-medical staff of HC Mostar who had been employed for at least 12 months before the study. All respondents were over 18 years of age and voluntarily participated in the survey. The exclusion criterion in the study was a previous diagnosis of mental illness before the outbreak of the pandemic. In order to determine the impact of COVID-19 on the mental health of the employees of HC Mostar, the medical group of respondents was divided into doctors and nurses/technicians. Before the research started, the subjects were familiarized with the aim and purpose of the research, and they were guaranteed complete anonymity.

As a research method, we used a study questionnaire that contained demographic characteristics (age, sex, place of residence), professional differences (doctor or nurse, non-medical worker), use of opiates (cigarettes, alcohol, antidepressants), the DASS-21 scale and a short mental health questionnaire (MHI-5). The DASS 21 self-assessment questionnaire consists of 21 questions distributed in three subscales

(7 items per subscale of similar content) where the emotional states of depression, anxiety and stress are measured. The results of the DASS 21 questionnaire are calculated by summing the scores for the relevant items. Patients are asked to rate each item on a scale from 0 (does not apply to me at all) to 3 (applies to me at all times). Cutoff scores of > 14 for stress, > 7 for anxiety and > 9 for depression were obtained by multiplying the final score by two. The DASS-21 stress subscale score was divided into mild (15-18), moderate (19-25), severe (26-33) and extremely severe stress (34-42). The anxiety subscale score was rated as mild (8-9), moderate (10-14), severe (15-19) and extremely severe anxiety (20-42). On the depression subscales, scores of 10-13 were considered mild, 14-20 moderate, 21-27 severe and 28-42 extremely severe depression[9].

MHI-5 is a widely used and validated questionnaire for the screening of people with mental health problems. The five items assess the frequency of anxiety and mood symptoms during the past month. Each item is rated on a six-point Likert scale ranging from (1) 'all the time' to (6) 'never'. The scores for each item were summed and the scale values transformed in the range from 0 to 100, where higher scores indicated a more favorable state of mental health.

This prospective study was approved by the Ethics Committee of the Faculty of Health Studies of the University in Mostar in accordance with the Helsinki Declaration.

Statistics

Statistical analysis was performed using MedCalc software (MedCalc Statistical Software Version 14.8.1, Oostende, Belgium). Statistical processing included descriptive statistics of the data group. The Kolmogorov-Smirnov test was used to test the normality of distribution. The non-parametric Mann-Whitney test was used for comparing the difference in medians between two independent variables. Categorical variables were examined using the chi-square test or Fisher's exact test. Multivariate logistic regression analysis was used to determine the extent to which different dependent variables, which are categorical and dichotomous, independently predict the probability of stress, anxiety, depression and mental state. The predictors included in the regression analysis were age, sex, professional differences, place of residence and addiction. All results were interpreted at a level of statistical significance of $P < 0.05$.

Results

The DASS-21 and MHI-5 questionnaires were filled out by 107 employees of HC Mostar; 51.5% were medical staff (doctors and nurses/technicians) and 48.5% non-medical staff. Basic demographic data are presented in Table 1. In the total sample, a larger number of respondents were younger than 45 years

Table 1. Basic characteristics of respondents

		Total N (%)	Doctors	Medical nurses/ technicians	Non-medical staff
Number of respondents		107 (100)	19 (17.7)	36 (33.6)	52 (48.5)
Sex	Male Female	22 (20.5) 85 (79.4)	4 (21.0) 15 (78.9)	2 (5.5) 34 (94.4)	16 (30.7) 36 (69.2)
Age	< 45 years > 45 years	92 (85.9) 15 (14.0)	15 (78.9) 4 (21.0)	31 (86.1) 5 (13.8)	46 (88.4) 6 (11.5)
Place of residence	City Countryside	57 (53.2) 50 (46.7)	15 (78.9) 4 (21.0)	20 (55.5) 16 (44.4)	22 (42.3) 30 (57.6)
Opiate abuse	YES NO	57 (53.2) 50 (46.7)	11 (57.8) 8 (42.1)	18 (50.0) 18 (50.0)	28 (53.8) 24 (46.1)

($P < 0.0001$), but there was no statistically significant difference in age between medical and non-medical staff. There was also no statistically significant difference expressed by the chi-square test or Fisher's exact test in the categories of depression, anxiety and stress among medical and non-medical staff. The same results were obtained when the medical staff was divided by profession into doctors and nurses/technicians. The prevalence of stress was 30%, anxiety 54% and depression 31%. Since no cut-off point was defined for the MHI-5 questionnaire, a score of 60 was set as a cut-off value, which is widely used and provides the best sensitivity and specificity for defining moderate to poor mental health[16,17]. Values lower than the cut-off indicated a worse state of mental health (Table 2). A multivariate logistic regression model according to age, sex, occupation, place of residence and use of opiates (cigarettes, antidepressants and alcohol), age > 45 years ($P = 0.016$) and opiate use ($P = 0.023$) was positively associated with depression ($P = 0.042$) (Table 3).

Discussion

The COVID-19 pandemic was a major public health problem in the world and has caused great global health concern. Namely, this pandemic was unique due to the rapid spread of the virus, the heavy burden on health institutions at all levels of health care, large numbers of patients in the general population and health workers

Table 2. The prevalence of different levels of depression, anxiety and stress with the median of DASS-21 and the obtained values for MHI-5 at a cut-off of 60 in the assessment of mental health among employees of HC Mostar

values		**Normal N (%)**	**Mild N (%)**	**Moderate N (%)**	**Severe N (%)**	**Very severe N (%)**	**median min-max**
DASS-21	Depression DASS21	76 (71.0)	10 (9.3)	17 (15.8)	2 (1.8)	2 (1.8)	4 (0-40)
	Anxiety DASS21	53 (49.5)	12 (11.2)	32 (29.9)	6 (5.6)	4 (3.7)	8 (0-40)
	Stress DASS21	77 (71.9)	16 (14.9)	11 (10.2)	2 (1.8)	1 (0.9)	12 (0-38)
DASS-21	MHI-5	mentally healthy > cut-off N (%)		mentally unhealthy < cut-off N (%)		median (min-max)	
	cut-off 60	59 (55.1)		48 (44.8)		68 (16-100)	

Table 3. Multivariate logistic regression model for DASS-21 and MHI5

		Depression		**Anxiety**		**Stress**		**MHI-5**	
		OR	***P*-value**	**OR**	***P*-value**	**OR**	***P*-value**	**OR**	***P*-value**
Age	<45 >45	0.509	**0.016**	0.222	0.353	0.254	0.242	-0.277	0.246
Sex	Male Female	0.107	0.352	0.018	0.885	0.166	0.161	-0.133	0.304
Occupation	Medical Non-medical	0.030	0.739	-0.092	0.372	-0.099	0.334	0.003	0.999
Place of residence	countryside city	-0.115	0.199	-0.042	0.671	-0.156	0.093	0.082	0.416
Addiction (cigarettes, antidepressants, alcohol)	NO YES	0.203	**0.023**	0.017	0.861	0.120	0.187	-0.138	0.169

alike, and inadequate or insufficient equipment and medicines in health institutions. Furthermore, heavy workloads, work in unfavorable conditions (protective suits), exhaustion, separation from family, fear for family, the feeling of providing inadequate support and help for patients, large numbers of deaths, media pressure and general panic are risk factors for the emergence and development of psychological complaints and symptoms of mental health disorders[18]. Therefore, this unexpected situation put great pressure both on the general population and on health workers (medical and non-medical staff) at all levels of health care.

There are numerous studies in the literature whose results confirm that medical workers have developed symptoms of stress, depression and anxiety due to the COVID-19 pandemic[17-20].

Research was also conducted in Bosnia and Herzegovina with the aim of determining the level of stress, depression and anxiety of medical workers in different clinical hospitals[21-23].

However, this preliminary research is the first one performed on descriptive data on the prevalence of depression, anxiety and stress levels in medical workers at the level of primary health care (family medicine) in the city of Mostar (Bosnia and Herzegovina). Namely, doctors and medical staff (technicians and nurses) as well as non-medical staff in the family medicine team had to quickly solve the needs of patients and families.

Our results were obtained from 107 subjects — 17.7% were doctors, 33.6% nurses/technicians and 48.5% non-medical staff — and are consistent with other studies reporting a high prevalence of mental health problems. Namely, these results confirmed that the COVID-19 pandemic, like any stressful situation caused by disaster, fear and uncertainty, had an impact on various types of psychological problems such as anxiety and mood disorders, with a focus on depression and stress[24,25]. Our results showed the prevalence of depression was 31%, stress 30% and anxiety 54% in the examined population. This is comparable to a study by Daryanti Saragih *et al.*[26] who, based on 38 studies, estimated the prevalence of mental health problems among healthcare workers during the COVID-19 pandemic. They reported a prevalence of mental health problems for PTSD, anxiety, depression and stress of 49% (95% CI: 22–75%), 40% (95% CI: 29–52%), 37% (95% CI: 29–45%) and 37% (95% CI: 25–50%), respectively. This is consistent with a study by Vlah Tomičević and Bralić Lang[27], but they observed a higher prevalence of anxiety.

Our results and results from similar research are explained by the fact that healthcare workers around the world were faced with excessive psychological pressure due to the burden of the COVID-19 pandemic on the healthcare system and poor mental preparedness for such a unique pandemic. Additionally, we would like to point out that our national health care system lacks not only good communication between government representatives, with occasional negative comments directed towards primary health workers, but also organizational support.

It is interesting that the relatively high rates of symptoms of psychological disorders in the general population are actually comparable to the results for the population of health professionals in this research. Research results in the general population show symptoms of: anxiety (6.3% to 50.9%), depression (14.6% to 48.3%), post-traumatic stress disorder (7.0% to 53.8%), psychological stress (34.4% to 38.0%) and stress (8.1% to 81.9%) in China, Spain, Italy, Iran, USA, Turkey, Nepal and Denmark. Risk factors included female sex, younger age groups (≤ 40 years), presence of chronic/psychiatric diseases, unemployment and frequent exposure to social media/news about COVID-19[28].

Unlike the research performed by Shen *et al.*[29], who determined that a higher risk of both anxiety and depression was observed in older doctors, our research showed that only the risk for depression is higher in subjects over 45 years of age. The development of depression in older doctors is expected, because they feel greater responsibility and psychological pressure as they have to teach their younger colleagues, and they themselves actually face such a multi-factorial crisis.

Also, in this study, respondents who consumed opiates (alcohol, cigarettes and antidepressants) had a higher risk of depression, which is also expected.

Unlike the study by Lai J and associates[30], whose results showed that nurses had more serious degrees of depression, anxiety and stress than doctors, this study did not show a statistically significant difference between doctors and nurses in the mentioned categories. However, it should be noted that the study by Lai *et al.*[30] was carried out in 34 hospitals in several regions of China, while respondents in our survey were

employees of the primary medical service, which has a different system of operation and work. Examinations for all adults who were suspected or positive for COVID-19 were carried out in the isolation ward in Rodoč, which is a few kilometers away from HC Mostar, so the doctors and nurses included in this study were not on the first line of defense and were not directly involved in the treatment and provision of medical care to patients with suspected or confirmed COVID-19, as opposed to the respondents in the study by Lai and associates[30]. However, despite this, the doctors involved in our study had other "sources" of stress. Namely, doctors from primary health care referred instructions to symptomatic and asymptomatic patients via telephone and electronic means and informed their patients on whether X-ray examinations, saturation measurements and laboratory processing of findings in the isolation ward were necessary. These doctors, whose key tool in practice is non-verbal communication and physical examination of the patient, were forced to assess health problems and make decisions over the phone without examining the patient, which also created additional pressure and stress for the doctor. Namely, such an indirect way of providing care to patients was largely inappropriate for a profession in which the doctor's relationship of trust with the patient needs to be intact. Additionally, doctors faced difficulties in solving everything over the phone: the dilemma whether chest pains are the result of COVID-19 or some other health problem, assessing whether the condition of patients with COPD is worsening and whether diabetes is still under control, and whether the medication prescribed to patients several days ago is effective or whether a change in therapy is needed[31]. All of this has led to an increased prevalence of depression and stress, and especially anxiety, among the employees of HC Mostar.

Interestingly, a statistically significant difference in the categories of depression, anxiety and stress among the medical and non-medical staff of HC Mostar was not found. Therefore, it is very important to recognize mental health problems in order to provide services to strengthen mental health and implement effective psychological interventions for both medical and non-medical staff[32].

We should point out that even non-medical workers in the primary health care system were exposed to increased pressure (in addition to the general crisis caused by the COVID-19 pandemic) due to increased amounts of administrative work in the form of answering health questionnaires, sick leave, keeping record quarantine sheets for 14 days and issuing the necessary isolation decisions.

Studies from previous epidemics, such as SARS, Ebola or MERS, showed that a high percentage of healthcare workers developed psychological disorders, especially anxiety, and were under increased stress. Similar risk factors are mentioned during the COVID-19 pandemic, as well: quarantine, social isolation, treatment of sick colleagues, fear of infection, stress at work, experience of stigma and concern for the well-being of their family[33]. Such a sudden occurrence of an unknown disease with a high mortality rate affected the mental health of health workers[34].

Therefore, studies from previous pandemics should have been taken into account and their data used for preventive purposes at the very beginning of the pandemic. However, the rapid spread of the SARS-CoV-2 virus was not expected. No one could predict how fast the spread of COVID-19 would reach the global level and what kind of threat it would cause. Therefore, the demanding nature of the profession exposed healthcare workers to a greater risk of developing negative mental states, such as depression, anxiety and stress.

This is the reason why the poor mental health of healthcare workers can not only be harmful to the healthcare workers themselves, but can also hinder their professional performance, thereby worsening the quality of care provided to the patient[35].

Research evaluating direct neuropsychiatric consequences and indirect effects on mental health is necessary to improve treatment, mental health care planning and preventive measures during possible subsequent pandemics.

Conclusion

Medical and non-medical healthcare workers employed in primary health care were susceptible to the development of psychological disorders (depression, anxiety, stress) due to the complex situation both at their workplace and at home caring for their own family during the COVID-19 pandemic. However, it is evident that during the pandemic very little or no

care was provided for the mental health of healthcare workers. Therefore, it is very important to recognize problems related to the mental health of healthcare workers and to implement mental health protection planning during possible future pandemics. Namely, it is clear that poor mental health of healthcare professionals can threaten the quality of care provided to patients. With regard to the post-pandemic period, organizations will need to develop an integrated administrative and psychosocial response to the professional and psychological challenges caused by possible future outbreaks of pandemics of this or a similar nature.

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Sažetak

UTJECAJ PANDEMIJE VIRUSA COVID-19 NA MENTALNO ZDRAVLJE DJELATNIKA PRIMARNE ZDRAVSTVENE ZAŠTITE

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Cilj ove studije bio je istražiti utjecaj pandemije bolesti COVID-19 na mentalno zdravlje djelatnika primarne zdravstvene zaštite. Ova prospektivna studija obuhvatila je 107 ispitanika medicinskog (51,5 %) i nemedicinskog (48,5 %) osoblja Doma zdravlja (DZ) Mostar. Kao metoda istraživanja korišten je upitnik koji je sadržavao skalu depresije, anksioznosti i stresa (DASS-21) i validirani kratki upitnik mentalnog zdravlja ljudi (MHI-5) tijekom pandemije bolesti COVID-19. Većina ispitanika bila je mlađa od 45 godina. Nije postojala statistički značajna razlika između medicinskog i nemedicinskog osoblja kako na DASS-21 tako ni na MHI-5 skali. Također, nije utvrđena statistički značajna razlika u raščlambi medicinskog kadra. Prevalencija stresa među ispitanicima iznosila je 30 %, anksioznosti 54 % i depresije 31 %. Modelom multivarijatne logističke regresije nađeno je da su dob > 45 godina (OR = 0,509; P = 0,016) i konzumiranje opijata (OR = 0,203; P = 0,023) bili pozitivno povezani s depresijom (P = 0,042). Cjelokupna kriza vezana uz pandemiju bolesti COVID-19 dovela je do raznih psihičkih poteškoća u općoj populaciji, ali u znatnom postotku i kod djelatnika u zdravstvu na svim razinama zdravstvene zaštite. Stoga su neophodni novi pristupi u liječenju te samom tretiranju navedenih problema u mentalnom zdravlju.

Ključne riječi: *COVID-19; mentalno zdravlje; djelatnici u zdravstvu*