



## THE PSYCHOLOGICAL IMPACT OF COVID-19 PANDEMIC ON MEDICAL STAFF IN BUCHAREST

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### **Abstract**

*The aim of this research is to analyze the psychological impact of the fourth wave of COVID-19 pandemic on medical staff (both doctors and nurses) from the main medical units in Bucharest and explore the relationship between psycho-emotional impairment (measured by the level of anxiety, depression and stress) and the level of exposure to COVID-19 patients. An online questionnaire was sent to the medical staff from several medical units in Bucharest between November and December 2021. The group of subjects consisted of 111 respondents, both doctors and nurses, divided as evenly as possible according to the main analysis criteria: type of activity (first or second line in the fight against COVID-19). Anxiety, depression, and perceived stress were assessed using the GAD-7, PHQ-9 and PSS-14 scales. The main stressors and the impact of the pandemic on the personal and professional life of the evaluated healthcare professionals were also studied.*

*Results: Healthcare professionals, especially those who worked in the front line, experienced emotional trauma during the COVID-19 pandemic, their levels of anxiety, depression and perceived stress being much higher than the ones of the medical staff from second line. Female professionals experienced a much higher level of stress, anxiety and depression than male staff. At the same time, nurses had a higher level of anxiety and depression comparing to the doctors, while the level of stress was more acute in doctors. Medical seniority had no significant impact on the anxiety, depression or stress perceived by healthcare professionals during the COVID-19 pandemic.*

*Conclusion: Medical staff experienced high levels of anxiety, depression and stress, especially women and nurses. At the same time, the higher the level of exposure to COVID-19, the higher the risk of psycho-emotional distress, suggesting that ongoing monitoring and intervention is needed.*

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**Keywords:** COVID-19, stress, anxiety, depression, psychological impact, medical staff

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### 1. INTRODUCTION

The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020, when infections and deaths began to rise exponentially worldwide.

Healthcare workers have played a vital role in our response to COVID-19 pandemic. Previous studies of epidemics and quarantine have suggested that such an

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extraordinary event has long-term effects on their mental health (Di Trani, Mariani, Ferri, De Berardinis, & Frigo, 2021). Chronic stress, fatigue, fear or guilt of passing on the infection to loved ones, overwork, fear of infection and mortality, lack of breaks or vacations and inflexibility of work schedules can negatively affect their mental health (Sørvold, et al., 2021), generating psychological symptoms of depression, stress, anxiety, anger, fear and lack of sleep. These are increasing as the pandemic persists.

A recent meta-analysis investigating the psychological impact of COVID-19 on healthcare professionals shows that they experience higher levels of anxiety (13.0% vs. 8.5%) and depression (12.2% vs. 9.5%) compared to professionals from other areas (Da Silva & Neto, 2020). At the same time, healthcare workers are at high risk of workplace stress, although work-related stress occurs in all professions. Globally, approximately one-third of employees' experience stress at work, but the unique work environment makes healthcare workers more likely to be affected, even more during outbreaks such as COVID-19. The higher the incidence of COVID-19, the more stressed healthcare workers felt. Not less than 43% of frontline healthcare staff experienced significant levels of stress, with a prevalence of 27% in nurses and 17% in medical doctors (Rimmer, 2021).

This psychological pressure can also have unwanted effects on the medical services offered to patients, leading to a decrease in the quality of care and patient safety. If left untreated, stress, anxiety and depression are likely to have long-term health effects on healthcare workers and prevent them from fulfilling their duties, including those related to the optimal control of the COVID-19 pandemic (Bekele & Hajure, 2021).

The need for this research started from the fact that, in Romania, there was a very limited number of studies to evaluate the psychological impact of the pandemic on employees in the medical field. We wanted to shed more light on the effects of the COVID-19 pandemic, because such analyses are essential for an effective management, with practical implications for both healthcare employees and patients, with major consequences on how the healthcare system responds to current or future outbreaks.

This paper aims to analyze the psychological impact that the fourth wave of the COVID-19 pandemic had on the medical staff (medical doctors and nurses) from the main medical units in Bucharest, and to explore the correlation between the psycho-emotional damage (assessed through the level of anxiety, depression and stress) and their exposure to COVID-19 patients. We consider the incidence of COVID-19 to be a determining factor in the evaluation of psychological symptoms, whose intensity increases proportionally to the number of COVID-19 patients the medical personnel came into contact with. We expect, as shown in previous international studies, to register high levels of emotional impairment among healthcare professionals, and the highest frequencies of anxiety, depression and stress symptoms to be reported by those who worked directly with patients with COVID-19. A secondary analysis consists in studying the relationship between psychological impact and socio-demographic (gender) and professional (years of experience and type of professional activity) characteristics.

Additionally, the need for two more analyzes emerged: (1) the identification of main stress factors that modify the existing psycho-emotional balance of the medical staff in the context of COVID-19 pandemic; (2) assessing the extent to which workplace stress during the COVID-19 pandemic affected the quality of personal life, on one hand, and professional efficiency and medical services, on the other hand. This analysis is important to develop the best individual and organizational interventions which could provide support to medical staff during both COVID-19 and future possible pandemics, as well as in everyday activity.

## **2. OBJECTIVE AND HYPOTHESES**

### **2.1. OBJECTIVE**

O1: establish the correlations between the levels of perceived stress, anxiety and depression encountered by the healthcare workers during the fourth wave of the COVID-19 pandemic.

O2: identify the relationship between the level of emotional impairment (stress, anxiety, depression) and the one of exposure to COVID-19 (expressed by the type of activity performed: front-line employees - who worked directly with COVID-19 patients - and second-line employees - who had a lower exposure).

O3: analysis of the relationship between the psychological impact generated by the COVID-19 pandemic (stress, anxiety, depression) and socio-demographic characteristics (gender).

O4: analysis of the relationship between the psychological impact generated by the COVID-19 pandemic (stress, anxiety, depression) and the main professional characteristics (professional level: nurse, resident doctor, specialist doctor; seniority in the medical field).

### **2.2. HYPOTHESES**

We have several working hypotheses:

H1: We assume that, in the evaluated sample of healthcare professionals, there are correlations of different intensities between the level of perceived stress, anxiety and depression.

H2: We estimate that the level of anxiety, depression and perceived stress is higher among healthcare workers in the first line (COVID activity) than among those in the second line (NON-COVID activity).

H3: We assume that there are statistically significant differences between gender categories regarding the levels of stress, anxiety and depression measured among medical staff in Bucharest during the COVID-19 pandemic.

H4: We estimate that, for the medical staff in Bucharest, there are statistically significant differences in the levels of stress, anxiety and depression depending on seniority in the medical field.

H5: We estimate that nurses have the highest levels of stress, anxiety and depression in the sample of evaluated healthcare professionals.

### **3. METHOD**

#### **Participants:**

111 respondents were selected, who were divided as equally as possible in terms of the main analysis criteria: the type of performed activity (first line - COVID activity 55.9%, n=62; second line - NON-COVID activity 44.1 %, n=49).

Efforts were made to include in this research healthcare professionals with different characteristics and from different backgrounds. Therefore, we have the following distribution: (1) gender: female - the predominant sample 84.7% (n=94), while only 15.3% (n=17) were male respondents; (2) type of professional activity: 48.6% (n=54) of the respondents were specialist doctors, 13.5% (n=15) resident doctors and 37.8% (n=42) nurses; (3) seniority in the medical field - seniority of over 20 years (49.5%, n=55), aspect directly correlated with the number of specialist doctors.

#### **Method and Instruments:**

An online Google Forms survey was distributed among medical staff from Bucharest, between November and December 2021. The questionnaire could be filled in from any electronic device (mobile phone, tablet, laptop) with internet access, lasting, on average, between 15 and 20 minutes. Anxiety, depression and perceived stress were assessed using GAD-7, PHQ-9 and PSS-14 scales. In addition, by applying supplementary questions, the main stressors were also studied, as well as the impact of the pandemic on personal and professional life of the evaluated healthcare professionals.

From the beginning of the questionnaire, the participants were informed about the purpose and conditions of the study; the research complied with international ethical recommendations regarding the absolute confidentiality of the collected data, as well as the anonymity and safety of the participants.

Subsequently, the data was processed in Excel and SPSS v20, using the following: descriptive analysis, along with Kolmogorov-Smirnov normality tests; Pearson correlation analysis; Two independent samples T-test, Mann-Whitney U-test for independent samples, Kruskal-Wallis H-test, One-Way ANOVA with Bonferroni post-hoc analysis.

More than a decade ago, Robert L. Spitzer, Janet B.W. Williams of Columbia University and Kurt Kroenke of Indiana University developed, with support from Pfizer, two easy-to-use scales measuring depression (PHQ-9) and anxiety (GAD-7). They are useful as screening tools, as well as to assess the severity and evolution of symptoms and the response to treatment. At the same time, they are widely used in scientific research.

*PHQ-9 (Patient Health Questionnaire)* is a frequently used self-report scale, created in 2001, which includes 9 items which assess the presence and severity of depressive symptoms during the last two weeks. The 9 items of this scale are based on DSM-IV criteria and include: (1) anhedonia, (2) depressed mood, (3) insomnia or hypersomnia, (4) fatigue or loss of energy, (5) appetite disturbances, (6) guilt or worthlessness, (7) diminished ability to think or concentrate, (8) psychomotor agitation or retardation, and (9) suicidal thoughts. The results are based on the total score as follows: a score of less than 5 points means no symptoms of depression, between 5 and 9 points indicates mild depression, from 10 to 14 points indicates moderate depression, between 15 and 19 points indicates moderate-severe depression, while a score above 20 points means severe depression. The PHQ-9 has the potential to be a dual-purpose instrument that, with the same 9 items, can establish the diagnosis of depressive disorder as well as the level of severity for depressive symptoms. In less than a decade, the PHQ-9 has become a commonly used instrument by both clinicians and researchers. The level of internal consistency of the PHQ-9 is very high, with a Cronbach  $\alpha$  of .89 obtained in the study carried out by the authors in primary care clinics, and .86 in the study carried out in obstetrics-gynecology clinics. Consistently, within the present research, the level of internal consistency is also very high (Cronbach  $\alpha$  = .88)

*Generalized Anxiety Disorder-7 Scale (GAD-7)* is a well-known self-administered instrument used to measure the severity of anxiety symptoms. It was developed in 2006 by the same Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke, and colleagues and comprises seven items developed from the DSM main criteria for generalized anxiety disorder, assessing the following: (1) nervousness, (2) inability not to worry, (3) excessive worry in normal life situations, (4) restlessness, (5) difficulty relaxing, (6) irritability, and (7) fear that something terrible will happen. We identify four severity classes: less than 5 points indicates the absence of anxiety symptoms, between 5 and 9 points shows mild anxiety, from 10 to 14 points results in moderate anxiety, while a score greater than 15 points corresponds to a severe anxiety. In screening for anxiety disorders, a recommended benchmark for further evaluation is a score of 10 points or higher. Although designed primarily as a screening and severity assessment measure for generalized anxiety disorder, GAD-7 has also functional characteristics for other forms of anxiety—panic disorder, social anxiety disorder, and posttraumatic stress disorder. Internal consistency of GAD-7 is excellent (Cronbach  $\alpha$  = .92) (Spitzer, Kroenke, Williams, & Löwe, 2006). In the present research, the level of internal consistency is very high (Cronbach  $\alpha$  = .914), being very close to the one obtained by the authors. There is, therefore, increasing evidence to support the conclusion that GAD-7 is an effective and valid self-report anxiety instrument for subjects in clinical and nonclinical settings.

*PSS-14 - Perceived Stress Scale* is the most widely used psychological tool for measuring stress perception. It is a self-reported questionnaire designed to measure "the degree to which individuals rate situations in their lives as stressful" (Cohen, Kamarck, & Mermelstein, 1983). It is not a diagnostic test. High scores indicate high and prolonged stress, which is a risk factor for disease. The PSS-14 was

designed for use in population samples with at least a high-school education. Both questions and answer alternatives are easily to understand. The questions are about the feelings and thoughts encountered during the past month, and respondents have to note how often they felt that way. Two items refer directly to 'stress', three refer to overload situations, while nine items refer to uncontrollable, difficult to manage or unpredictable situations. The interpretation of the results is based on score intervals: between 0 and 14 points a low stress level is registered, between 15 and 28 points the stress level is moderate, between 29 and 42 points it is high, and between 43 and 54 points the stress level is very high. The level of internal consistency obtained in the present research is high (Cronbach  $\alpha = .80$ ), even higher than that the one obtained by the authors ( $=.75$ ).

#### 4. RESULTS

In accordance to previous studies (Rimmer, 2021) (Batra, Pal Singh, Sharma, Batra, & Schvaneveldt, 2020) (Da Silva & Neto, 2020) (Salazar de Pablo, Brondino, Solmi, & Fusar-Poli, 2020), our analysis by gender showed that women have a higher prevalence of anxiety and depression compared to men (anxiety: 59.6% vs. 29.4%; depression: 51.1% vs. 29.4%). At the same time, it identified higher levels of anxiety and depression among nurses compared to doctors (anxiety: 59.5% vs. 53.7%; depression: 59.5% vs. 33.3%), which may be because nurses have closer and longer contact with patients compared to physicians. Analyzing the prevalence of anxiety and depression according to risk groups, higher levels were identified, as expected, among first-line respondents compared to second-line (anxiety: 69.4% vs. 26.7%; depression: 66.1% vs. 24.6%). The level of perceived stress, although did not register significant differences between groups, was also slightly increased for women, nurses and front-line respondents compared to the other samples (100% female vs. 94.1% male; 100% nurses vs. 96.65% resident and specialist doctors; 100% first line vs. 98% second line).

For *the first hypothesis*, the results obtained from the Pearson correlation test, showed that, between the three analyzed variables, we have statistical significance ( $p=.001$ ) and high intensity correlations (anxiety vs. depression  $r=.792$ ; anxiety vs. perceived stress level  $r=.630$ ; depression vs. stress  $r=.603$ ). The hypothesis is thus confirmed, and we can conclude that the higher the anxiety, the more the work environment is perceived negatively and stressful, a perception that intensifies when a medium or high level of depression is also manifested. At the same time, the respondents showed an increasingly high levels of anxiety and depression as the work and living conditions become more and more stressful.

If we look *at the second hypothesis*, we notice that, following the application of T-Test for two independent samples, the Levene's Test indicated the assumption of homogeneity of variances in the case of perceived stress ( $p=.981$ ) and the non-assumption of equality in the case of anxiety ( $p= .014$ ) and depression ( $p=.001$ ). Analyzing the T-test, we observe statistical significance for the three analyzed constructs, which confirms the research hypothesis. Therefore, we can say that the

healthcare professionals, especially the front-line ones, suffered emotional trauma during COVID-19 pandemic; their levels of anxiety, depression and perceived stress were significantly higher than the ones from the second line.

The results obtained as a result of the non-parametric U Mann-Whitney test confirmed *the third hypothesis* of the research (anxiety:  $U = 466$ ,  $N1 = 17$ ,  $N2 = 94$ ,  $Z = -2.733$ ,  $p = .006$ ; depression:  $U = 456.5$ ,  $N1 = 17$ ,  $N2 = 94$ ,  $Z = -2.811$ ,  $p = .005$ ; stress level:  $U = 514.5$ ,  $N1 = 17$ ,  $N2 = 94$ ,  $Z = -2.335$ ,  $p = .020$ ) and, by inspecting the mean ranks for the two gender groups, we can say that women encountered a higher level of stress (59.03 vs. 39.26), anxiety (59.54 vs. 36.41) and depression (59.64 vs. 35.85) compared to men.

Regarding *the fourth hypothesis*, it is observed that, by using the Kruskal-Wallis H test, no statistical significance is obtained for any of the three analyzed dependent variables (Anxiety:  $\chi^2 = 6.373$ ,  $df = 4$ ,  $p = .173$ ; Depression:  $\chi^2 = 1.039$ ,  $df = 4$ ,  $p = .904$ ; Stress:  $\chi^2 = 2.750$ ,  $df = 4$ ,  $p = .600$ ). The hypothesis is not confirmed, so seniority in the medical field has no influence on the anxiety, depression or perceived stress of healthcare workers during COVID-19 pandemic.

In order to test *the fifth hypothesis*, the One-Way ANOVA test with Bonferroni post-hoc analysis was used for each of the three dependent variables. The results show that there is statistical significance only for Depression (Levene  $p = .031$ ;  $F = 3.105$  and  $p = 0.049$ ), not for Anxiety (Levene  $p = .110$ ) and Stress (Levene  $p = .135$ ). The hypothesis is rejected at the limit. However, from studying the mean values for anxiety, depression and perceived stress, it was observed that nurses were more prone to suffering anxiety and depression than doctors, especially as a result of a higher risk of exposure to COVID-19 patients, while the level of stress was more acute for doctors, as they had to make difficult decisions regarding the patients they treated, especially during the difficult working conditions generated by the pandemic.

Following the results obtained for the five hypotheses detailed above, the following questions were raised: (1) what were the main stress factors that changed the psycho-emotional balance of the medical staff in the context of the COVID-19 pandemic? (2) to what extent did the high levels of stress, anxiety and depression identified by the statistical analysis affect the quality of personal life of healthcare professionals, and professional efficiency and the level of care provided to patients? In order to have a much clearer picture, the need for an additional analysis that also includes this information arose.

(1) Identifying the stressors is important to develop the best individual and organizational interventions that could provide support to healthcare workers, both during the COVID-19 pandemic and during possible future pandemics. It was observed that the highest level of stress was generated by fear of infection (personal and family) (59.46%), closely followed by the overwhelming workload and working conditions (57.66%), lack of social support, discrimination and stigma (55.86%), frequent change of regulations and protocols (54.95%) and patients' death (51.35%).

(2) High levels of stress, anxiety and even depression identified through statistical analysis could have a major impact on the quality of personal and professional life. These aspects have been insufficiently analyzed in similar research.

The quality of personal life was the most affected, in a proportion of 52.3%, while the quality of the medical services provided was impacted to a lower extent (25.2%). The quality of personal life was affected especially by the time spent with the family and friends 61.3%, generating fatigue and sleep disorders 55.0% and irritability 47.7%. The main reason that led to an impairment of professional life (professional efficiency and medical services provided to patients) was a lower level of motivation (25.2%), followed by concentration difficulties (18.9%) and some conflicts arising at the workplace (16.2 %).

## **5. CONCLUSIONS**

The COVID-19 pandemic reminded us, in an acute way, the importance of the work that healthcare personnel do every day.

International studies and meta-analyses show evidence to suggest that a considerable proportion of healthcare professionals have experienced stress, anxiety, depression, sleep disturbances, even burnout and post-traumatic stress during the pandemic, raising concerns about the risks to their mental health.

The results obtained in the present research were consistent with those of international studies (Rimmer, 2021), (Batra, Pal Singh, Sharma, Batra, & Schvaneveldt, 2020), (Da Silva & Neto, 2020), (Salazar de Pablo, Brondino, Solmi, & Fusar-Poli, 2020). It is thus observed that, under the conditions of the COVID-19 pandemic, healthcare professionals experienced high levels of anxiety, depression and stress, especially women and nurses. Also, the higher the probability and intensity of exposure to patients with COVID-19, the higher the risk that medical staff to be affected from a psycho-emotional point of view, suggesting the need for continuous monitoring and proper intervention.

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