

## MENTAL HEALTH OF NURSES AS MEASURED BY SCL-90-S DURING COVID-19 PANDEMIC DUŠEVNÉ ZDRAVIE SESTIER MERANÉ POMOCOUCI SCL-90-S POČAS PANDÉMIE COVID-19

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### ABSTRACT

**Objectives:** The aim was to describe consequences of COVID-19 pandemic on nurses' mental health according to the level of exposure to COVID-19, and to assess the effect of socio-demographic factors on mental health of nurses during COVID-19 pandemic.

**Sample and Methods:** A quantitative research strategy using SCL-90-S was chosen, complemented with socio-demographic questions. The research sample comprised of 120 nurses providing care during COVID-19 pandemic. The research group was divided into 3 categories according to the level of exposure to COVID-19. The age span: 20 to 79 years, mean 43.93 and SD 12.68 years. The research group selection was intentional.

**Statistical analysis:** Data were processed using IBM SPSS Statistics Data Editor. One-way ANOVA was used for testing the comparison of the average scores between the 3 categories of workplace and assessing the effect of sociodemographic variables on mental health.

**Results:** The stress related symptoms measured by SCL-90-S in nurses working during COVID-19 pandemic are elevated compared to the norm. The group of nurses with middle exposure showed the best results in mental health. Apart from age, no other socio-demographic characteristic had a significant association with worse results in mental health.

**Key words:** COVID-19 pandemic. SCL-90-S. Nurse. Mental health. Stress related symptoms.

### Abstrakt

**Cíle:** Popsat důsledky pandemie COVID-19 na duševní zdraví sester podle míry expozice COVID-19 a zhodnotit vliv sociodemografických faktorů na duševní zdraví sester během pandemie COVID-19.

**Výzkumný soubor a metody:** Byla zvolena kvantitativní výzkumná strategie pomocí SCL-90-S doplněná sociodemografickými otázkami. Výzkumný soubor tvořilo 120 sester poskytujících péči během pandemie COVID-19. Výzkumná skupina byla rozdělena do 3 kategorií podle úrovně expozice COVID-19. Věkové rozpětí: 20 až 79 let, průměr 43,93 a SD 12,68 let. Výběr výzkumného souboru byl záměrný.

**Statistická analýza:** Data byla zpracována pomocí IBM SPSS Statistics Data Editor. One-way ANOVA byla použita pro porovnání průměrných hodnot mezi 3 kategoriemi pracovišť a hodnocení vlivu sociodemografických proměnných na duševní zdraví.

**Výsledky:** Symptomy související se stresem měřené pomocí SCL-90-S u sester pracujících během pandemie COVID-19 jsou ve srovnání s normou zvýšené. Skupina sester střední expozicí vykazovala nejlepší výsledky v oblasti duševního zdraví. Kromě věku žádná jiná sociodemografická charakteristika neměla významnou souvislost s horšími výsledky v oblasti duševního zdraví.

**Klíčová slova:** Pandemie COVID-19; SCL-90-S. Zdravotní sestra. Duševní zdraví. Symptomy související se stresem.

### INTRODUCTION

Since December 2019, COVID-19 has affected global well-being. It has not only resulted in more than 525 million reported infections with 6.27 million confirmed deaths (by May 2022 – WHO, 2022) but also an exposure to many stressors, such as forced isolation, lack of reliable information, dealing with an unknown pathogen, social and economic challenges (Rachubińska et al., 2022); constant changes in the daily functioning over a short period of time; deep, prolonged stress, and exhausting work conditions (Di Tella et al., 2021; Rajčáni et al., 2022). All these affected mental health.

One of the most affected groups is healthcare workers because of their permanent risk of experiencing COVID-19 transmission (Latifah and Anisa, 2022). In comparison to physicians, nurses are more at risk to develop psychological distress because they are more in contact with COVID-19 patients. The symptoms include worries about contracting COVID-19, depression, anxiety, and post-traumatic symptoms (Di Tella et al., 2021; Johnson et al., 2020).

Despite healthcare workers being trained in experiencing death and dealing with stress (Billings et al., 2021), their mental health was significantly affected by COVID-19. This was because of pro-

longed shifts and lack of consistent information regarding COVID-19 pandemic, dealing with heavier workloads and high expectations from patients (Carpenter et al., 2021), managing the lack of protective equipment, lack of sleep and lack of psychological counselling (Alwani et al., 2021; Arnetz et al., 2020; Cui et al., 2021; Moore et al., 2021; Nanthini and Jeganathan, 2021).

The most reported symptoms among health care workers, were anxiety, insomnia, stress, depression (Latifah and Annisa, 2022); excessive fear of being infected and infecting others (Sampaio et al., 2021); addictive and suicidal behaviour (Osváth, 2021) and posttraumatic symptoms (Benfante et al., 2020).

Mental health issues resulting from the COVID-19 pandemic are not only individual consequences of the pandemic, but also a persistent public health problem (Osváth, 2021).

The main objective of this study is to describe consequences of COVID-19 pandemic on mental health of nurses providing care during COVID-19 pandemic in 3 different categories of workplace according to the level of exposure to COVID-19, and to find out whether other socio-demographic factors such as age, experience, education, or marital status may couple with COVID-19 in worsening mental health of nurses.

## MATERIALS AND METHODS

The research was conducted in accordance with the Ethical Principles of Human Research. Participation was voluntary, confidentiality and anonymity were guaranteed, and informed consent was provided.

A quantitative research strategy using a tool standardized on the Czech population Symptom-Checklist-90-Standard SCL-90-S (Pulkrabková, 2020) was used to assess various psychopathology symptoms. The severity of symptoms was measured by 5-point Likert scale varying from 0 (no symptoms) to 4 (extreme).

SCL-90-S was complemented with socio-demographic questions such as gender, age, years of

experience, department of work during COVID-19 pandemic, marital status, region, and education.

## Research group

120 nurses were selected by quota sampling from the representative sample of 1197 nurses. (37.2 % of nurses worked in the facilities with majority of COVID-19 patients, 15.8 % in primary care, and 47.0 % worked in the facilities without majority of COVID-19 patients.)

The sample was selected based on the parameters constructed with respect to the statistics of Ministry of Health published on 19<sup>th</sup> August 2021 (UZIS, National register of health care workers, 19<sup>th</sup> Aug 2021). The sample size corresponds to the confidence level of 95%, the margin error is 3% (according to Reosoft). The parameters were derived from the population of nurses working in the Czech Republic with respect to their age, sex, and region. The selected 120 nurses are from 9 regions of the Czech Republic who provided health care during the main waves of COVID-19 pandemic; 8 were men, 112 women. The research group was divided into 3 categories according to the level of exposure to COVID-19 at their workplace. Category 3 had the highest risk of infection working in COVID units; category 1 had the lowest exposure. Table 1 shows the frequency of working in the workplaces as defined above.

The age span varied between 20 to 79 years - mean 43.93 and SD 12.68 years. Experience varied between 1 year to 65 years - mean 21.60 and SD 13.49 years. The selection was intentional with the criteria working as a nurse during COVID-19 pandemic. The research took place between March 2022 and June 2022; 130 questionnaires were distributed with the return rate of 92.31%.

## Statistical analysis

Data were processed using IBM SPSS Statistics Data Editor.

**Table 1** The frequency of working in different workplaces with exposure to COVID-19

Workplace	Frequency	Valid percent	Cumulative percent
1 (low exposure)	29	24.2	24.2
2 (medium exposure)	32	26.7	50.8
3 (high exposure)	59	49.2	100.0
Total	120	100.0	-

## RESULTS

The average score and the SD for each of the scales of SCL-90-S were compared with the Czech standardization sample (Pulkrabková, 2020) using the One-sample-*T*-test with 95% confidence interval of the difference. All scores on the 9 scales of SCL-90-S were significantly elevated compared to the general Czech population. The biggest difference appeared on the scales of Compulsion ( $t = 12.810$ ,  $\text{sig} = 0,000$ , mean difference 6.46167), Somatization ( $t = 12.528$ ,  $\text{sig} = 0,000$ , mean difference 6.92833) and Depressivity ( $t = 11.379$ ,  $\text{sig} = 0,000$ , mean difference 8.14667). The items related to insomnia and food problems did not undergo a process of standardization; therefore, it was not possible to compare our data with the norms.

A comparison of the average scores in 9 scales of SCL-90-S between the three categories of workplace according to exposure to COVID-19 was carried out. One-way ANOVA was used for testing statistical significance ( $\alpha = 0.05$ ). The variable "Workplace" was chosen as a grouping variable.

No statistically significant relationship between the severity of symptoms and the category of workplace was found, even though nurses experiencing the lowest exposure to COVID-19 scored the highest average results with comparison to groups "2" and "3", on the following scales: Anxiety ( $M = 5.103$ ,  $SD = 3.913$ ), Depression ( $M = 9.207$ ,  $SD = 7.988$ ), Paranoia ( $M = 3.103$ ,  $SD = 2.425$ ), Psychosis ( $M = 2.345$ ,  $SD = 2.553$ ), Somatization ( $M = 8.517$ ,  $SD = 7.204$ ), and Compulsion ( $M = 7.345$ ,  $SD = 5.347$ ). The highest average results were observed in the items related to insomnia ( $M = 3.172$ ,  $SD = 2.817$ ). Nurses experiencing the highest exposure to COVID-19 scored the highest average results of the three assessed groups only in

2 scales – Phobia ( $M = 1.356$ ,  $SD = 2.041$ ) and Aggressivity ( $M = 2.925$ ,  $SD = 3.034$ ).

### Education and marital status

For assessing statistical significance ( $\alpha = 0.05$ ) of effect of sociodemographic variables on the severity of mental health symptoms, one-way ANOVA was used. There was no statistically significant relationship between the severity of symptoms and education or marital status.

### Age

To assess the association between the age and scores in the scales of SCL-90-S, Pearson correlation was used. Table 2 shows the statistical significance ( $\alpha = 0.05$ ) between the severity of symptoms and age. Age seems to be the strongest predictor of severity of symptoms. The strongest negative correlation with age is in the scale Aggressivity, followed by Anxiety, Social insecurity, Depression, Compulsion, Psychosis, Phobia, and Paranoia, all statistically significant at  $\alpha = 0.05$ .

## DISCUSSION

Lai et al. (2020) examined the prevalence of psychiatric problems in 764 frontline nurses. Non-specific distress symptoms affected 71.5 % of the sample, depressive symptoms 50.4 %, anxiety 44.6 %, insomnia 34.0 %. According to An et al. (2020), the prevalence of depressive symptoms among 1103 nurses in China was 43,6 % (measured using 9-item Patient Health Questionnaire). According to Pappa et al. (2020), prevalence of anxiety in frontline nurses during COVID-19 pandemic was 23 %, depression 22.8 %, and insomnia 38.9 %. Şahin et al. (2020) indicates a high prevalence of depression (77.6 %), anxiety (60.2 %), insomnia (50.4 %), and

**Table 2** Correlation with age

Scale or category	Pearson correlation coefficient	Significance (2-tailed)	df
Anxiety	-0.269	<b>0.003</b>	118
Depression	-0.263	<b>0.004</b>	118
Aggressivity	-0.290	<b>0.001</b>	118
Phobia	-0.208	<b>0.023</b>	118
Paranoia	-0.205	<b>0.025</b>	118
Psychosis	-0.211	<b>0.021</b>	118
Somatization	-0.033	0.723	118
Social insecurity	-0.266	<b>0.003</b>	118
Compulsion	-0.248	<b>0.006</b>	118
insomnia	-0.080	0.384	118
food problems	-0.243	<b>0.007</b>	118

stress symptoms (76.4 %) in 939 healthcare workers during COVID-19 pandemic. The symptoms were greater among females and nurses working directly with people infected with COVID-19.

Our results indicate that the stress related symptoms measured by SCL-90-S are elevated compared to the norm. It is difficult to conclude that these results are only influenced by COVID-19 pandemic since even before COVID-19 outbreak, high prevalence of depression, anxiety, and stress related symptoms (32.4 %, 41.2 % and 41.2 %) among nurses were reported (Maharaj et al., 2018). It is necessary to ask whether it is COVID-19 pandemic which is behind the compromised mental health of nurses. It is probable that long working shifts during COVID-19 pandemic, wearing protective gear, being afraid of infecting the beloved ones could have triggered worsening of any preexisting mental health issues. Impact of isolation precautions and its connection with stress, anxiety, depression, and burnout are mentioned by Demir Dogan et al. (2023) and Salah Ibrahim et al. (2022).

Despite no significant difference found when the severity of symptoms across the three different groups was compared, trends were observed. Nurses working in the workplace with a low exposure to COVID-19 showed the highest average scores in 7 out of 11 observed categories while nurses with the highest exposure showed the lowest average scores in 4 out of 11 observed categories. The nurses with middle exposure showed the best results in mental health. It can be interpreted that nurses exposed to COVID-19 the most, count with that fact and get habituated to the stressful conditions. The quality of attention from their superiors, as well as the training to working in potentially infectious conditions could have a positive effect. Setyawati et al. (2021) reported that out of 125 frontline nurses working with COVID-19 infected patients, 91 respondents did not express any symptoms of anxiety measured by Halmilton Rating Scale for Anxiety, due to prevention and debriefing. On the other hand, neglected psychological care will not only result in significant psychological harm to nurses (Dabou et al., 2022) but also negatively influence their work efficiency and affect the sustainability of the health services in general (Al Thobaity et al., 2020).

Guzelhan (2022) found that psychopathological symptoms in nurses measured by SCL-90-R during COVID-19 pandemic were not significantly different from the symptoms measured in pre-COVID-19

pandemic. According to Petersen et al. (2021), the first wave of COVID-19 pandemic had minor impact on both mental and physical health (measured by SCL-90).

Benfante et al. (2020) investigated the psychological impact of COVID-19 trauma and stress symptoms in nurses. The prevalence ranged from 7.4 % to 35 % depending on the region. The risk factors were being female; younger age; lack of: work experiences, social support and protective equipment; exposure to infected people and insomnia. Zhang et al. (2020) noted a relationship between younger age and working long hours without rest and high levels of stress and burnout symptoms. Dabou et al. (2022) indicate that 78.1 % out of 185 nurses experience moderate levels of stress symptoms with risk factors such as lack of protective gears, lack of time for rest, young age and exposure to people infected with COVID-19.

According to our data, apart from age, no other sociodemographic factor had a statistically significant association with worse mental health assessed by SCL-90-S, Age seems to be the strongest determinant of severity of symptoms measured by SCL-90-S. The role of age is supported by other studies (Al Rasasi et al., 2015; Benfante et al., 2020; Lai et al., 2020; Latifah et al., 2022; Zhang et al., 2020).

We assume the workplaces with highest exposure to COVID-19 prepare the nurses not only to work with infectious patients but also provide them with strong personal support such as distribution of shifts with time to relax. According to our results, psychological interventions and stress management strategies should play a key role in younger nurses. They are more prone to developing symptoms affecting mental health. Intense psychological stress negatively influences wellbeing and work efficiency (Dabou et al., 2022), and has a direct impact on morale at work, absenteeism and causes poor work performance (An et al., 2020).

## CONCLUSION

Hardly any disease has had such an unpredictable development, quickly changed its characteristics, and impacted not only on the human body but also on the society, as has COVID-19. Facing the unpredictability of the course of the pandemic presents a stressor. As such, attention should be aimed at maintaining the mental health of nurses. This would cushion them against the myriad of challenges.

It is important to identify early stages of psychological disorders; and to tailor preventive measures and individual interventions to minimize further impact. If this is not done, it may lead to absenteeism, poor morale at work, poor work performance and negative behaviour towards patients, and low quality of healthcare services.

### Study limits

One limitation is the small sample size of 120 nurses caused by the long time taken to complete the SCL-90-S questionnaire (55 – 75 minutes), as well as the discrepancy between the number of men and women in the research sample, due to the general distribution of men and women in nursing staff in the Czech Republic. No measuring of stress related symptoms in nurses before COVID-19 pandemic was done.

### Ethical approval

This study does not contain any ethically controversial issues. In the course of the study, the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regards to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation) was adhered to. The drafting of human subjects (respondents) into the research was done in line with the Helsinki declaration of 1975 and as revised in 2013. National ethical standards and regulations were also observed.

Respondents were informed, beforehand, about the aim of the study. The study was carried out anonymously. Further, the respondents were informed about the advantages and disadvantages of participating in the study. Participation in the study was voluntary. Respondents gave the consent verbally. The study proposal, just like the entire project under the grant, particularly its research phase, was approved by the ethical committee of the University of South Bohemia, Czech Republic.

### Author contributions

*Conceptualization OS; Data collection OS, SB, ICh, FD, VH; Methodology OS, ICh; Original draft preparation OS; Statistical analysis OS; Review and editing VT, VH, SB, ICh; All authors have read and agreed to the published version of the manuscript.*

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