Annals of Agricultural and Environmental Medicine 2024, Vol 31, No 4, 616–625
www.aaem.pl

ORIGINAL ARTICLE



# Strategies for coping with stress used by nurses during the COVID-19 pandemic

**Bożena Baczewska**[1,A-B,D-F], **Bożena Muraczyńska**[2,B,D-F], **Maria Malm**[3,C-F]✉, **Katarzyna Wiśniewska**[4,B,E-F], **Krzysztof Leśniewski**[5,D-F]

[1] *Department of Internal Medicine and Internal Medicine in Nursing, Medical University of Lublin, Lublin, Poland*
[2] *University of Siedlce, Faculty of Medical and Health Sciences, Siedlce, Poland*
[3] *Department of Medical Informatics and Statistics with E-Health Lab, Medical University of Lublin, Lublin, Poland*
[4] *Faculty of Health Sciences, Radom Higher School, Radom, Poland*
[5] *Department of Orthodox Theology, The John Paul II Catholic University, Lublin, Poland*
*A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation, D – Writing the article, E – Critical revision of the article, F – Final approval of the article*

Baczewska B, Muraczyńska B, Malm M, Wiśniewska K, Leśniewski K. Strategies for coping with stress used by nurses during the COVID-19 pandemic. Ann Agric Environ Med. 2024; 31(4): 616–625. doi: 10.26444/aaem/193617

## Abstract

**Introduction and Objective** The subject of the article are the strategies used by nurses working in COVID-19 hospital units for coping with stress. The aim of the study was to make a comparative analysis between the styles, strategies and behaviours practiced by nurses working in COVID units and the nurses working in conservative treatment and surgical units.

**Materials and Method.** For the study we used the Polish adaptation of Ch. S. Carver's standardized "Inventory for Measuring Coping with Stress Mini-COPE" (Brief-COPE), created by Z. Juczyński and N. Ogińska-Bulik. The research was carried out in 2021 on a group of 225 nurses working in different hospital units.

**Results.** The results showed that in the COVID-19 units, avoidance and humor were used as coping strat-egies significantly more often than in the surgical and conservative treatments units. The observed strategies included planning, positive revaluation, use of psychoactive substances, preoccupation with other activities, denial, emotional discharge, and humor. Factors such as age, sex, marital status, education or place of residence turned out to have an influence on the ways of coping practiced by particular nurses.

**Conclusions.** There is a clear distinction between the strategies, styles and behaviours observed among nurses working in COVID-19 units, and the ways of coping practiced by nurses working in non-COVID-19 units (conservative treatment and surgical). Nurses working in COVID-19 units were more likely to deny facts, distract themselves with different activities, or downplay the seriousness of the situation by joking and treating the situation with fun and humor, but also to use planning and positive reevaluation to cope with stress.

## Key words

adaptation, nurses, occupational stress, COVID-19, pandemics, hospital units

## INTRODUCTION AND OBJECTIVE

Stress is a natural reaction of the body to events that disrupt its equilibrium, or that exceed its ability to cope effectively. Coping with stress is most often described as a process, strategy, or style [1–3]. The process of coping with stress serves two purposes: an instrumental purpose (resolving a stressful situation or reducing the effect of stressors), and a regulatory purpose (moderating and neutralizing negative emotions) [4–7]. This process can be very complicated, depending on the nature of the source of stress, its duration and intensity, as well as on the personality of the individual, and his or her ability to minimize the negative effects of stress. Lazarus and Folkman [8] pointed to two types of coping strategies for dealing with stress based on their orientation, i.e.: task-based and emotional, while Endler and Parker [9] distinguished between task-focused, emotion-focused and avoidance-focused styles. Moreover, Carver, Scheier, and Weintraub [10, 11] indicated situational and dispositional strategies for coping with stress.

✉ Address for correspondence: Maria Malm, Department of Medical Informatics and Statistics with E-learning Lab, Medical University of Lublin, Poland
E-mail: maria.malm@umlub.pl

Received: 16.07.2024; accepted: 23.09.2024; first published: 29.10.2024

The outbreak of the global coronavirus pandemic (COVID-19) has affected the work, health and family life of most people. The range of stress factors impacting the operability, efficiency and psychophysical condition of medical personnel providing care to the sick, including nurses [12–14], broadened during the pandemic. The need to isolate and at the same time provide proper medical attention to COVID-19 patients led, through government legislation, to the establishment of temporary hospitals and COVID units. For nurses working in these units, new sources of stress emerged, including: the potential and real risk of becoming infected with SARS-CoV-2 and contracting COVID-19 – even with fatal consequences [15]. The risk of transmitting the virus to immediate family members — spouses, children, or elderly parents, as well as coworkers from other units — became a serious danger [1, 16, 17]. An additional stress-inducing circumstance was the need to quickly adapt to completely new treatment procedures that differed from the medical practices used previously [16]. These changes aimed to reduce the risk of infection for the medical staff working in COVID units. For nurses, including before the pandemic, the most acutely experienced source of stress was the responsibility for the health and lives of their patients [18–20]. During the pandemic, dominated by the

high risk of death and an atmosphere of uncertainty, health care workers were further burdened by working with patients suspected of being infected or infected with the SARS-CoV-2 virus, making working conditions even more dangerous. Nurses assigned to work in COVID units had to face a highly contagious infectious disease of pandemic proportions. [17, 21]. The need to make accurate decisions and react quickly in the face of difficult-to-predict events, the constant possibility of the sudden deterioration of a patient's condition, the performance of many activities simultaneously, and the fear of making a mistake, were all significant stress factors [19, 22, 23]. These factors were compounded by medical management procedures made necessary by the pandemic, which had not previously been practiced [16].

Sources of stress connected with the organization of work in COVID units included: quantitative and qualitative work overload (lack of personnel), and insufficient amounts of medical apparatus (lack of ventilators and other materials) [16, 24]. The increased bureaucracy and irregularities in shifts, various types of employment contracts used and temporary assignments to COVID units, resulted in high rates of turnover among staffs [25, 26]. Although even before the pandemic nursing was already considered one of the most stressful professions, it was further burdened by these new sources of stress generated by the peculiarity of COVID units and hospitals [26–28].

The constancy and intensity of the mentioned stress factors affected the quality of both the personal and professional lives of the nurses, as well as their health condition. When caring for patients with COVID-19, nurses are under great emotional and physical strain due to working in a high-risk environment. As a result, this may lead to deterioration of physical and mental health, as well as professional burnout [29]. Studies indicate that proper coping skills can protect nurses from the destructive effects of stress, such as the deterioration of mental and physical health [16, 30] and professional burnout [27, 31]. Given the negative impact that the COVID-19 pandemic had on the work of nurses, the aim of this study was to gain insight into the strategies used by the nursing staff of hospitals to cope with stress when working with patients suspected of infection or who were infected with SARS-CoV-2, by conducting a survey among nurses working in COVID, conservative treatment, and surgical units.

## MATERIALS AND METHOD

The subject of this research were the ways of coping with stress during the COVID-19 pandemic by the nursing staffs of COVID, surgical and conservative treatment units. The purpose of this research was to analyze and compare styles, strategies and behaviours in regard to coping with stress during a very difficult time for medical personnel. The main question was: 'What were the ways of coping with stress practiced by the nursing staff employed in COVID units, compared to nurses employed in conservative treatment and surgical units during the pandemic?' Taking into account the stress coping styles and strategies distinguished by Ch. S. Carver, the additional questions were formulated: 1) Do the strategies, styles and behaviours practiced by nurses working in COVID units in stressful situations differ from those used in conservative treatment and surgical units? 2) What socio-demographic factors constitute relevant indicators of the ways of coping with stress during the pandemic among nurses?

The research tool was the standardized 'Inventory for the Measurement of Coping with Stress, Mini-COPE' (COPE) by Ch. S. Carver [32] in the Polish adaptation by Z. Juczynski and N. Ogińska-Bulik [11], which is a shortened version of the 'Multidimensional Inventory for the Measurement of Coping with Stress COPE' by Ch. S. Carver. The inventory consists of 28 behaviours, grouped into 14 strategies for coping with stress. Two statements are assigned to each strategy. These strategies are part of 7 stress-coping styles distinguished by the authors: I – Active Coping: Active Coping, Planning, Positive Values; II – Helplessness – Substance Use (Psychoactive Substances), Cessation of Action, Self-Blaming; III – Seeking Support, Instrumental Support, Emotional Support; IV – Avoidance, Preoccupation with Other Activities, Denial, Emotional Discharge; V – Turning to Religion; VI – Acceptance; VII – Sense of Humour.

The survey was conducted in 2021 through the use of Online forms made available to groups of Polish nurses. Respondents were given the task of responding to one of the four possible statements, by marking a scoresheet with the appropriate number: 0 – I almost never do this, 1 – I rarely do this, 2 – I often do this, 3 – I almost always do this [11]. Scores ranged from 0 – 3; theoretical average –was 1.5. The higher the score, the more popular a particular strategy among the nurses [11].

Table 1 below is a collection of data about the study group – the nursing staff. The survey was conducted among 225 nurses working in diverse hospital units in Poland. All of them gave consent to participate in the study and were informed about its purpose and the confidentiality of their personal data. They were also given instructions on how to respond properly to the questions.

The age of the respondents varied, with 29.78% aged between 41 50 years old, 27.11% between 20 – 30 years old, 23.55% between 31 – 40 years old, and 19.56% between 51 – 60 years old. Women (84.0%) and urban residents (60.89%) were the

**Table 1.** Characteristics of the study group

| Variables | | N | % |
|---|---|---|---|
| Gender | Woman | 189 | 84.0% |
| | Male | 36 | 16.0% |
| Age | 20-30 | 61 | 27.11% |
| | 31-40 | 53 | 23.55% |
| | 41-50 | 67 | 29.78% |
| | 51-60 | 44 | 19.56% |
| Place of residence | City | 137 | 60.89% |
| | Village | 88 | 39.11% |
| Education | Secondary | 37 | 16.44% |
| | Bachelor's degree | 123 | 54.67% |
| | Master's degree | 65 | 28.89% |
| Marital status | Single | 48 | 21.33% |
| | Married | 108 | 48.0% |
| | After divorce, widow, widower | 33 | 14.67% |
| | In a partnership | 36 | 16.0% |
| Place of work | Conservative treatment unit | 127 | 56.45% |
| | Surgical unit | 61 | 27.11% |
| | COVID unit | 37 | 16.44% |

most prominent groups. Nurses were most likely to have a Bachelor's degree (54.67%), slightly less likely to have a Master's degree (28.89%), and least likely to have only secondary education (16.44%). Almost half of the respondents were married (48.0%), one-fifth were single (21.33%), 16.0% were in a civil partnership, and 14.67% were divorced or widowed. More than half worked in conservative treatment units (56.45%), 27.11% in a surgical units, and 16.44% in COVID units.

In the statistical analysis of the results of the entire study, non-parametric tests had to be applied due to the non-parametric distribution of the results in the study groups. This assumption was later confirmed by conducting the Shapiro-Wilk test. Descriptive statistics were used, with the weighted mean being an 'M', the standard deviation – SD', median – 'Me', minimum – 'Min', maximum – 'Max', as well as Kruskal-Wallis', Dunn's *post-hoc*, and Mann-Whitney U's tests. Significance was determined when $p \leq 0.05$. The results of the study were processed using STATISTICA 13.3 software[1].

## RESULTS

The study showed that nurses working in COVID units most often coped with stress using Problem-Focus (M = 2.05), Acceptance (M = 1.99), Support-seeking (M = 1.97) and Avoidance Behavior (M = 1.81) (Tab. 2, Fig. 1).

In contrast, nurses working in the surgical units during the pandemic coped with stress using Acceptance (M = 1.84), and secondly by Focusing on the Problem and Seeking Support (M=1.76). The Avoidant Behaviour style (M = 1.41) was the third most popular. In the conservative treatment units, the answers were also different. Here, the most common stress management style was Acceptance (M = 1.94), followed by Focusing on the Problem (M = 1.88) and Seeking Support (M = 1.81) in third. In COVID units, the least popular style of coping with stress was Helplessness (M = 1.12), Turning to Religion (M = 1.31) and using a Sense of Humour (M = 1.43). In the surgical unit these were Helplessness (M = 0.98), Turning to Religion and a Sense of Humor (M = 1.07). In the conservative treatment units the least used style was Helplessness (M = 0.86), after which came a Sense of Humour (M = 0.92) and Turning to Religion (M = 1.12).

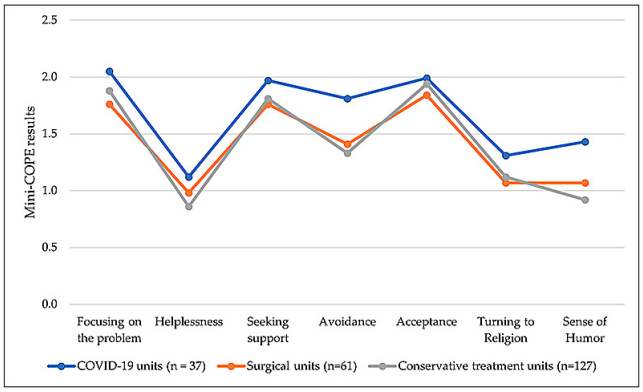


**Figure 1.** Stress coping styles during the COVID-19 pandemic among respondents - using the Mini-COPE test, which illustrates the results of Table 2

Analyzing the results led to the observation that only two styles were notably different: Avoidance and a Sense of Humour (p = 0.001; p = 0.004). These two styles were used significantly more in COVID units. In other words, nurses in COVID units tended to avoid confronting problems and tried to help themselves with a sense of humour (referred to as 'dark humor' in situations of stress overload). Its purpose was to lower anxiety when one feels like one is losing control of the situation, and also to accommodate oneself to that which is unavoidable.

The difference in results for nurses working in COVID units compared to surgical and conservative treatment units are presented in Table 3 and Figure 2.

The most frequently used strategy was Planning (M = 2.11) and *ex aequo*: Positive Revaluation and Preoccupation with Other Activities (M = 2.04), as well as Seeking Emotional Support (M = 2.03), Active Coping (M = 2.0) and Acceptance (M = 1.99) and Emotional Discharge (M = 1.97). A slightly different combination of strategies could be observed in the surgical units. Here, three strategies were most prominent: Active Coping, Seeking Emotional Support and Acceptance (all with M = 1.84). Other strategies included Planning (M = 1.76) and Preoccupation with Other Activities and Positive Revaluation (M = 1.68). In the conservative treatment units, however, the most common strategies were Active Coping (M = 1.96) and Acceptance (M = 1.94). The third and fourth spots were taken by Seeking Instrumental Support (M = 1.81) and Seeking Emotional Support (M = 1.80).

Meanwhile, in COVID units, the least used strategies were the Use of Psychoactive Substances (M = 0.93) and Cessation of Action (M = 0.95), followed by Turning to Religion (M = 1.31). In the surgical and conservative treatment units, the answers were different, with the Use of Psychoactive Substances (M = 0.60 and 0.44), Cessation of Action (M = 1.06 and 0.90) and Denial (M = 0.98 and 0.91) being least popular.

1 TIBCO Software Inc. (2017). Statistica (data analysis software system), version 13. http://statistica.io.

**Table 2.** Styles of coping with stress during the COVID-19 pandemic among respondents using the Mini-COPE test

| STYLE | Place of work | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | COVID unit (n=37) | | | Surgical unit (n=61) | | | Conservative treatment unit (n=127) | | | Kruskal-Wallis test | |
| | M | SD | Me | M | SD | Me | M | SD | Me | H | p |
| Focusing on the problem | 2.05 | 0.54 | 2.0 | 1.76 | 0.68 | 1.83 | 1.88 | 0.55 | 1.83 | 3.622 | 0.164 |
| Helplessness | 1.12 | 0.74 | 0.83 | 0.98 | 0.56 | 1.0 | 0.86 | 0.57 | 0.67 | 4.405 | 0.111 |
| Seeking support | 1.97 | 0.66 | 1.75 | 1.76 | 0.70 | 2.0 | 1.81 | 0.74 | 2.00 | 0.869 | 0.648 |
| **Avoidance** | 1.81 | 0.61 | 1.83 | 1.41 | 0.55 | 1.50 | 1.33 | 0.50 | 1.33 | 21.721 | **0.001** |
| Acceptance | 1.99 | 0.70 | 2.0 | 1.84 | 0.61 | 2.0 | 1.94 | 0.68 | 2.00 | 1.444 | 0.486 |
| Turning to Religion | 1.31 | 1.04 | 1.50 | 1.07 | 0.90 | 1.0 | 1.12 | 0.94 | 1.00 | 1.303 | 0.521 |
| **Sense of Humor** | 1.43 | 0.86 | 1.50 | 1.07 | 0.74 | 1.0 | 0.92 | 0.71 | 1.00 | 11.278 | **0.004** |

**Table 3.** Stress coping strategies practiced by nurses according to their place of work, measured using the Mini-COPE survey

| STRATEGIES | Place of work | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | COVID unit (n=37) | | | Surgical unit (n=61) | | | Conservative treatment unit (n=127) | | | Kruskal-Wallis test | |
| | M | SD | Me | M | SD | Me | M | SD | Me | H | p |
| (1) AC | 2.0 | 0.72 | 2.0 | 1.84 | 0.79 | 2.0 | 1.96 | 0.64 | 2.0 | 0.798 | 0.671 |
| **(2) P** | **2.11** | **0.68** | **2.0** | **1.76** | **0.70** | **2.0** | **2.03** | **0.66** | **2.0** | **5.937** | **0.051** |
| **(3) PR** | **2.04** | **0.75** | **2.0** | **1.68** | **0.83** | **2.0** | **1.66** | **0.80** | **1.50** | **7.926** | **0.019** |
| **(4) PS** | **0.93** | **1.12** | **0.50** | **0.60** | **0.83** | **0.0** | **0.44** | **0.78** | **0.0** | **7.046** | **0.030** |
| (5) CA | 0.95 | 0.84 | 1.0 | 1.06 | 0.63 | 1.0 | 0.90 | 0.69 | 1.0 | 3.093 | 0.213 |
| (6) SB | 1.47 | 0.74 | 1.50 | 1.27 | 0.74 | 1.50 | 1.25 | 0.81 | 1.0 | 2.992 | 0.224 |
| (7) SIS | 1.92 | 0.71 | 2.0 | 1.68 | 0.69 | 2.0 | 1.81 | 0.75 | 2.0 | 1.740 | 0.419 |
| (8) SES | 2.03 | 0.74 | 2.0 | 1.84 | 0.80 | 2.0 | 1.80 | 0.83 | 2.0 | 1.484 | 0.476 |
| **(9) PwOA** | **2.04** | **0.80** | **2.0** | **1.70** | **0.73** | **2.0** | **1.69** | **0.78** | **1.50** | **7.034** | **0.030** |
| **(10) D** | **1.42** | **0.95** | **1.50** | **0.98** | **0.74** | **1.0** | **0.91** | **0.72** | **1.0** | **9.401** | **0.009** |
| **(11) ED** | **1.97** | **0.66** | **2.0** | **1.56** | **0.56** | **1.50** | **1.40** | **0.65** | **1.50** | **22.533** | **0.001** |
| (12) TR | 1.31 | 1.04 | 1.50 | 1.07 | 0.90 | 1.0 | 1.12 | 0.94 | 1.0 | 1.303 | 0.521 |
| (13) A | 1.99 | 0.70 | 2.0 | 1.84 | 0.61 | 2.0 | 1.94 | 0.68 | 2.0 | 1.444 | 0.486 |
| **(14) SH** | **1.43** | **0.86** | **1.50** | **1.07** | **0.74** | **1.0** | **0.92** | **0.71** | **1.0** | **11.278** | **0.004** |

Legend: (1) Active Coping (AC), (2) Planning (P), (3) Positive Revaluation (PR), (4) Use of Psychoactive Substances (PS), (5) Cessation of action (CA), (6) Self-Blame (SB), (7) Seeking Instrumental Support (SIS), (8) Seeking Emotional Support (SES), (9) Preoccupation With Other Activities (PwOA), (10) Denial (D), (11) Emotional Discharge (ED), (12) Turning to Religion (TR), (13) Acceptance (A), (14) Sense of Humor (SH)

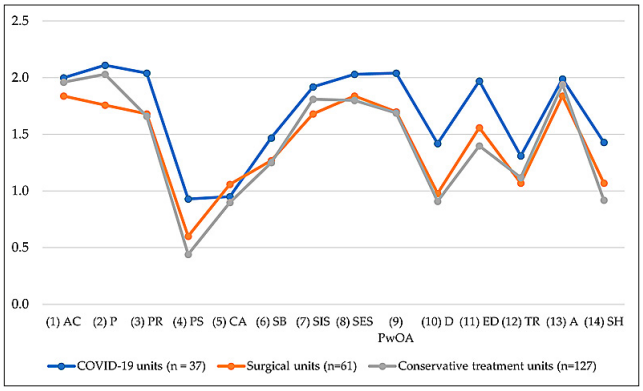


**Figure 2.** Stress coping strategies practiced by nurses according to their place of work – measured using the Mini-COPE questionnaire and illustrating the results of Table 3

The analysis showed that nurses working in COVID units, compared to surgical and conservative treatment units, were significantly more likely to use mood-regulating strategies, namely: Discharging Accumulated Emotions (Emotional Discharge), using a Sense of Humor (p = 0.001, p = 0.004), and Denial (p = 0.009). The second most popular were strategies of Positive Revaluation (p = 0.019) and Preoccupation with Other Activities (p = 0.030). They also had a stronger tendency to cope by means of Psychoactive Substance Use (p = 0.030), compared to nurses from other units. The strategy of Planning was the most frequently practiced strategy out of all of the units, but especially in the COVID units. This strategy reached the limit of statistical significance (p = 0.051) in COVID units. This could suggest that these units had the highest level of staff concentration on the performance, or introduction, of medical/legal procedures.

The survey also included questions about how the behavior of the nursing staff changed in response to the stress of working in COVID units, compared to nurses working in surgical and conservative treatment units (Table 4, Figure 3).

Nurses working in COVID units most often thought seriously about what measures to take to reduce stress levels (25; M = 2.24), preoccupying themselves with other activities in order to avoid thinking about it (19; M = 2.19), by trying to reconcile and accept what has already happened (20; M = 2.11), but at the same time trying to see the difficult experiences in a more positive light (12; M = 2.05), or letting go of things over which they had no control (17; M = 2.03). The second most popular answers were seeking help from others, to receive encouragement and understanding (15; M = 2.03), emotional support (5; M = 2.03), or help or advice from other people (23; M = 2.0) while at the same time taking steps to improve the situation (7; M = 2.03). In both the surgical and conservative treatment units there were equally frequent attempts to improve the situation (7; M = 1.9; M = 2.02) and to accept the situation (20; M = 1.9; M = 1.91). The surgical treatment unit was characterized more by seeking emotional support from others (5; M = 1.84) and seeking encouragement and understanding from them (15; M = 1.84). However, it was common for a nurse to seriously consider what steps to take to try to limit the stressfulness of the situation (25; M = 1.8) or to learn to live with it (24; M = 1.79). Slightly less common were avoidance-type behaviours, such as watching TV, reading, and shopping (19; M = 1.75). The behaviours aimed at coping with stress were characterized by taking action to improve the situation (7; M = 2.02), and attempting to put in place a strategy or plan to deal with the stressful situation (14; M = 2.00). Failure was often followed by serious consideration of more radical solutions (25; M = 2.06), or trying to learn to live with the burden (24; M = 1.98).

Behaviours aimed at giving up the struggle to achieve certain goals (6; M = 0.92) and drinking alcohol or taking drugs to get through it (28; M = 0.92) and to feel better (4; M = 0.95) were used least often in COVID units, and thus less than in surgical (M = 0.61) and conservative treatment (M = 0.44) units. It was also very rare to try to reduce tension by treating a stressful situation as a game (28; M = 0.92), which was even more rarely applied in conservative treatment (M = 0.62) and surgical units (M = 0.75). Not dealing with the problem was also rarely applied in conservative treatment units (16; M = 0.80).

**Table 4.** Nurses' behaviors aimed at coping with stress in different hospital units

| Behaviors | Place of work | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | COVID unit (n=37) | | | Surgical unit (n=61) | | | Conservative treatment unit (n=127) | | | Kruskal-Wallis test | |
| | M | SD | Me | M | SD | Me | M | SD | Me | H | p |
| (1) BwW | 1.89 | 0.99 | 2.0 | 1.66 | 0.87 | 2.0 | 1.78 | 0.88 | 2.0 | 2.083 | 0.353 |
| (2) IME | 1.97 | 0.90 | 2.0 | 1.79 | 0.88 | 2.0 | 1.91 | 0.75 | 2.0 | 1.314 | 0.518 |
| **(3) L** | **1.46** | **1.10** | **1.0** | **0.98** | **0.83** | **1.0** | **0.80** | **0.85** | **1.0** | **11.871** | **0.003** |
| **(4) DAF** | **0.95** | **1.10** | **1.0** | **0.61** | **0.86** | **0.0** | **0.44** | **0.80** | **0.0** | **8.672** | **0.013** |
| (5) ES | 2.03 | 0.87 | 2.0 | 1.84 | 0.92 | 2.0 | 1.78 | 0.88 | 2.0 | 2.108 | 0.349 |
| (6) F | 0.92 | 0.89 | 1.0 | 1.07 | 0.73 | 1.0 | 1.00 | 0.83 | 1.0 | 1.665 | 0.435 |
| (7) AS | 2.03 | 0.87 | 2.0 | 1.90 | 0.87 | 2.0 | 2.02 | 0.77 | 2.0 | 0.756 | 0.685 |
| (8) Lm | 1.38 | 1.01 | 1.0 | 0.97 | 0.82 | 1.0 | 1.01 | 0.86 | 1.0 | 4.976 | 0.083 |
| **(9) Ds** | **1.97** | **0.93** | **2.0** | **1.64** | **0.86** | **2.0** | **1.45** | **0.83** | **2.0** | **12.079** | **0.002** |
| (10) AO | 1.84 | 1.04 | 2.0 | 1.67 | 0.72 | 2.0 | 1.83 | 0.86 | 2.0 | 1.776 | 0.412 |
| **(11) DAT** | **0.92** | **1.19** | **0.0** | **0.59** | **0.86** | **0.0** | **0.45** | **0.86** | **0.0** | **6.633** | **0.036** |
| **(12) PL** | **2.05** | **0.81** | **2.0** | **1.66** | **0.85** | **2.0** | **1.68** | **0.89** | **2.0** | **6.400** | **0.041** |
| (13) SC | 1.68 | 1.06 | 2.0 | 1.30 | 0.82 | 1.0 | 1.32 | 0.88 | 1.0 | 4.215 | 0.122 |
| (14) P | 1.97 | 0.83 | 2.0 | 1.72 | 0.82 | 2.0 | 2.00 | 0.77 | 2.0 | 4.629 | 0.099 |
| (15) SO | 2.03 | 0.87 | 2.0 | 1.84 | 0.80 | 2.0 | 1.83 | 0.90 | 2.0 | 1.382 | 0.501 |
| (16) AD | 0.97 | 1.01 | 1.0 | 1.05 | 0.74 | 1.0 | 0.80 | 0.81 | 1.0 | 5.179 | 0.075 |
| **(17) WW** | **2.03** | **1.01** | **2.0** | **1.70** | **0.92** | **2.0** | **1.64** | **0.91** | **2.0** | **5.929** | **0.052** |
| **(18) SH** | **1.95** | **1.03** | **2.0** | **1.38** | **0.86** | **1.0** | **1.21** | **0.91** | **1.0** | **15.672** | **0.001** |
| **(19) POA** | **2.19** | **0.88** | **2.0** | **1.75** | **0.85** | **2.0** | **1.60** | **0.99** | **2.0** | **12.451** | **0.002** |
| (20) A | 2.11 | 0.84 | 2.0 | 1.90 | 0.70 | 2.0 | 1.91 | 0.80 | 2.0 | 2.145 | 0.342 |
| **(21) D** | **1.97** | **0.80** | **2.0** | **1.48** | **0.77** | **2.0** | **1.35** | **0.87** | **1.0** | **14.563** | **0.001** |
| (22) TR | 1.24 | 1.09 | 1.0 | 1.07 | 0.96 | 1.0 | 1.10 | 1.05 | 1.0 | 0.614 | 0.736 |
| (23) AoP | 2.00 | 0.78 | 2.0 | 1.69 | 0.79 | 2.0 | 1.79 | 0.86 | 2.0 | 2.923 | 0.232 |
| (24) A | 1.86 | 0.75 | 2.0 | 1.79 | 0.71 | 2.0 | 1.98 | 0.79 | 2.0 | 3.294 | 0.193 |
| **(25) P** | **2.24** | **0.76** | **2.0** | **1.80** | **0.73** | **2.0** | **2.06** | **0.75** | **2.0** | **8.838** | **0.012** |
| (26) SB | 1.27 | 0.90 | 1.0 | 1.25 | 0.81 | 1.0 | 1.18 | 0.89 | 1.0 | 0.671 | 0.715 |
| (27) PM | 1.38 | 1.19 | 2.0 | 1.08 | 0.97 | 1.0 | 1.14 | 1.03 | 1.0 | 1.565 | 0.457 |
| (28) SH | 0.92 | 1.06 | 0.0 | 0.75 | 0.81 | 1.0 | 0.62 | 0.80 | 0.0 | 2.450 | 0.294 |

Legend: (1) I get busy with work or other activities (BwW), (2) I invest my effort into solving the problem in front of me (IME), (3) I say to myself "that's not true" (L), (4) I drink alcohol or take drugs to feel better (DAF), (5) I get emotional support from others (ES), (6) I give up trying to achieve a goal (F), (7) I take action to improve the situation (AS), (8) I don't want to believe it really happened (Lm), (9) I talk about things to distract me from unpleasant feelings (Ds), (10) I seek advice from others (AO), (11) I drink alcohol or take drugs, which help me get through it (DAT), (12) I try to see the situation in a more positive light (PL), (13) I criticize myself (SC), (14) I try to develop a strategy on what I should do (P), (15) I get encouragement and support from others (SO), (16) I avoid dealing with it (AD), (17) I look for what went well (WW), (18) I joke about it (SH), (19) I do certain things to think less about it, e.g. I watch TV, read, shop (POA), (20) I accept that it happened (A), (21) I make my negative emotions known (D), (22) I try to seek comfort in religion or faith (TR), (23) I get help or advice from other people (AoP), (24) I learn to live with it (A), (25) I seriously consider what steps to take (P), (26) I blame myself for what happened (SB), (27) I pray or meditate (PM), (28) I treat the situation like a game (SH)

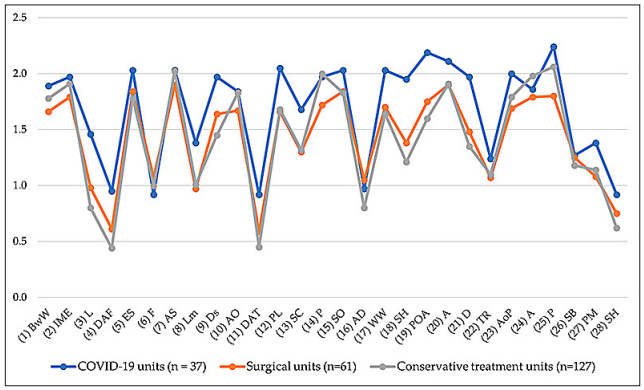


**Figure 3.** Nurses' behaviors aimed at coping with stress in different hospital units - illustrating the results displayed in Table 4

The statistical significance analysis described above showed some regularities and reveals the specificity of the ways of coping with stress and types of behaviours of nurses working in COVID units. The most significant were disclosing one's negative emotions (21; p = 0.001), joking about the situation (18; p = 0.001), talking about other things as a distraction from unpleasant feelings (9; p = 0.002), or convincing oneself that 'it's not true' (3; p = 0.003), and thinking seriously about what steps to take to cope with occupational stress; for example, by changing one's job (25; p = 0.012). Other coping mechanisms that occurred more often in COVID units included reaching for alcohol or psychoactive substances to feel better (4; p = 0.013), and to help oneself get through it (11; p = 0.036). There were also attempts to deal with stress on a cognitive level: trying to see the situation from a different perspective, in a more positive light (12; p = 0.041), or looking for the good in what happened (17; p = 0.052). The statistically significant socio-demographic factors that influenced the nurses' coping styles are presented in Table 5. Two were determined to be statistically insignificant: Focusing on the Problem and Acceptance.

**Table 5.** Independent variables that explain the "Styles of Coping with Stress" of nurses working in COVID, surgical and conservative treatment units during the pandemic

| STYLE Mini-COPE | INDEPENDENT VARIABLES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Age | | Gender | | Education | | Marital status | | Place of residence | |
| | H | p | Z | p | H | p | H | p | Z | p |
| Helplessness | *6.679* | *0.083* | 2.882 | 0.004 | - | - | *7.264* | *0.064* | - | - |
| Seeking support | - | - | - | - | 14.620 | 0.001 | - | - | - | - |
| Avoidance behavior | *6.291* | *0.098* | *1.909* | *0.056* | - | - | *7.243* | *0.065* | - | - |
| Turning to Religion | - | - | - | - | - | - | - | - | 3.348 | 0.001 |
| Sense of Humor | 11.903 | 0.008 | 3.701 | 0.001 | - | - | 13.919 | 0.003 | 6.433 | 0.040 |

Male nurses fell into Helplessness significantly more often (p = 0.004) than female nurses. One can observe that the frequency of utilizing this style decreased with age and 'marital seniority'. Additional observations are that place of residence were not very important determinants in coping styles, and that male and female nurses with at least a Bachelor's degree were more likely to seek support from others (p = 0.001). Turning to Religion was most popular among nurses living in rural areas (p = 0.001), while a Sense of Humour, on the other hand, was significantly more common among the younger nurses (p = 0.008), especially men (p = 0.001), who are married (p = 0.003) and who live in rural areas (p = 0.40). It is worthwhile noting that education did not influence the frequency of using Sense of Humour as a coping style. This was true for both male and female nurses. Avoidance as a style of behaviour did not reach the required level of significance, but there was a slight tendency for it being more popular in the group of younger (p = 0.098), unmarried (p = 0.065) men (p = 0.056).

According to the data, variables such as age, gender, marital status, education, or place of residence were not relevant factors when determining what behavioural style a person would follow. Neither the style of Planning, Active Coping, Positive Revaluation, Acceptance and Being Preoccupied with Other Activities were included in Table 6, because they did not reach the required level of statistical significance.

In terms of stress-reducing strategies, sense of humor was used mainly by male nurses (p = 0.001) with a Master's degree (p = 0.040), who were younger (p = 0.008) and unmarried (p = 0.003). Nurses from rural backgrounds were significantly more likely to use the strategy of cessation of action (p = 0.028) and turning to religion (p = 0.001). Male and female nurses with higher education were more likely to seek emotional support (p = 0.001) and instrumental support (p = 0.001). Passive strategies, such as denial (p = 0.004) and cessation of action (p = 0.022), were more frequently used by nurses living in urban areas (p = 0.028), with older nurses having the strongest tendency toward cessation of action (p = 0.076). Those who were unmarried or divorced were significantly more likely to blame themselves (p = 0.019).

Regarding behavioural patterns applied by nurses in COVID, surgical and conservative treatment units, the most popular behaviours among the nurses were to say that 'this situation is not true' (p = 0.001) and to criticize themselves (p = 0.006). These individuals also tended to blame themselves for what had happened (p = 0.062), or to refuse to believe that the situation really took place (p = 0.061). Giving up on reaching their goal was practiced significantly more often by nurses living in cities (p = 0.006). Coping with it was most popular among older (p = 0.015) men (p = 0.035). The use of alcohol and other psychoactive substances took place most often among men (p = 0.035), especially with the motivation of feeling better (p = 0.002) (Tab. 7).

Another form of evasive behaviour, practiced more often by female nurses (p = 0.032), was talking about other topics in order to escape unpleasant feelings. Seeking advice and help from others (p = 0.001) and receiving encouragement and support (p = 0.008) were behaviours more frequently practiced by nurses with a Master's degree. Behaviours aimed at reducing stress through seeking comfort in religion or faith were most popular among women (p = 0.041) living in rural areas (p = 0.004), They were also significantly more

**Table 6.** Independent variables that explain the "Stress Coping Strategies" of nurses working in COVID, surgical and conservative treatment units during the pandemic

| STRATEGIES Mini-COPE | INDEPENDENT VARIABLES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Age | | Gender | | Education | | Marital status | | Place of residence | |
| | H | p | Z | p | H | p | H | p | Z | p |
| SH | 11.9 | 0.008 | -3.7 | 0.001 | 6.4 | 0.040 | 13.9 | 0.003 | - | - |
| TR | - | - | - | - | - | - | - | - | -3.4 | 0.001 |
| SES | *6.9* | *0.076* | - | - | 13.3 | 0.001 | - | - | - | - |
| SIS | - | - | - | - | 13.9 | 0.001 | - | - | - | - |
| D | - | - | -2.9 | 0.004 | - | - | - | - | - | - |
| ED | - | - | - | - | - | - | 13.9 | 0.003 | - | - |
| PS | - | - | -3.3 | 0.001 | - | - | 8.6 | 0.036 | - | - |
| CA | 6.9 | 0.076 | -2.3 | 0.022 | - | - | - | - | -2.2 | 0.028 |
| SB | - | - | - | - | - | - | 9.9 | 0.019 | - | - |

Legend: SH - Sense of Humor, TR - Turning to Religion, SES - Seeking Emotional Support, SIS - Seeking Instrumental Support, D - Denial, ED - Emotional Discharge, PS - Psychoactive Substance Use, CA - Cessation of Activities, SB - Self-Blame

**Table 7.** Independent variables that had a significant influence on stress coping behaviors of nurses working in COVID, surgical and conservative treatment units during the pandemic

| BEHAVIORS Mini-COPE | INDEPENDENT VARIABLES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Age | | Gender | | Education | | Marital status | | Place of residence | |
| | H | p | Z | p | H | p | H | p | Z | p |
| (3) L | - | - | - | - | 6.5 | 0.040 | - | - | - | - |
| (4) DAF | - | - | -3.2 | 0.002 | - | - | - | - | - | - |
| (6) F | - | - | - | - | - | - | - | - | -2.8 | 0.006 |
| (8) Lm | - | - | *-1.9* | *0.061* | - | - | - | - | - | - |
| (9) Ds | - | - | - | - | - | - | 8.8 | 0.032 | - | - |
| (10) AO | - | - | - | - | 16.0 | 0.001 | - | - | - | - |
| (11) DAT | - | - | -2.1 | 0.035 | - | - | 11.0 | 0.007 | - | - |
| (13) SC | - | - | - | - | - | - | 12.4 | 0.006 | - | - |
| (15) SO | - | | - | - | 9.7 | 0.008 | - | - | - | - |
| (16) AD | 10.5 | 0.015 | -2.1 | 0.035 | - | - - | - | - | - | - |
| (18) SH | 8.9 | 0.030 | -2.5 | 0.013 | - | - | 9.5 | 0.024 | - | - |
| (22) TR | - | | 2.0 | 0.041 | - | - | - | - | -2.9 | 0.004 |
| (23) AoP | *6.5* | *0.089* | - | - | 8.8 | 0.012 | - | - | - | - |
| (25) P | - | | *1.8* | *0.073* | - | - | - | - | - | - |
| (26) SB | - | | - | - | - | - | *7.4* | *0.062* | - | - |
| (27) PM | *6.3* | *0.099* | - | - | - | - | - | - | -2.9 | 0.004 |
| (28) SH | 9.0 | 0.029 | -3.5 | 0.000 | *5.9* | *0.053* | 9.1 | 0.029 | - | - |

Legend: (3) L - I say to myself "that's not true", (4) DAF - I drink alcohol or take drugs to feel better, (6) F - I give up trying to achieve my goal, (8) Lm - I don't want to believe it really happened, (9) Ds - I talk about things that allow me to escape unpleasant feelings, (10) AO - I seek advice from others, (11) DAT - I drink alcohol or take drugs to help me get through it, (13) SC - I criticize myself, (15) SO - I get encouragement and support from others, (16) AD - I avoid dealing with it, (18) SH - I joke about it, (22) TR - I try to seek comfort in religion or faith, (23) AoP - I get help or advice from other people, (25) P - I seriously consider what steps to take, (26) SB - I blame myself for what happened (OS), (27) PM - I pray or meditate, (28) SH - I treat the situation like a game

likely to use prayer or meditation (p = 0.004) to cope with stress in their work. This tendency was more often true for older, rather than younger people (p = 0.099). Behaviours that aimed to change the perception of a stressful situation – for example, joking about it or treating the situation as fun – were most often used by older nurses (p = 0.030) in civil partnerships (p = 0.024). These were often men (p = 0.013) who also tended to treat difficult situations as fun (p = 0.000). As already mentioned, frequently they were older (p = 0.029) and in civil partnerships (p = 0.029). Education was a variable on the borderline of statistical significance (p = 0.053), but it showed that nurses with higher education were more likely to treat a difficult situation as fun when coping with stress. Women, on the other hand, tended to think about what steps to take to properly deal with a situation (p = 0.073).

Behaviours such as – 'I get busy with work or other activities so as not to think about it'; 'I invest my effort into solving the problem in front of me'; 'I get emotional support from others'; 'I take action to improve the situation'; 'I try to see the situation in a more positive light'; 'I try to develop a strategy on what I should do'; 'I look for what went well'; 'I do certain things to think less about it', e.g. 'I watch TV, read, or shop'; 'I accept the fact that it has already happened'; 'I make my negative emotions known'; 'I learn to live with it' – turned out not to determine the ways of coping with stress of those working in COVID units, compared to surgical and conservative treatment units.

## DISCUSSION

Coping with stress is defined as a specific activity of an individual aimed at neutralizing the impact of the source of stress by regaining a state of homeostasis between the demands of the external environment and the individual's internal resources, and by regulating the emotional state of the individual. This can be analyzed as a process, strategy or style [2]. The purpose of this study was to analyze the ways nurses working in COVID units coped with stress as compared to nurses working in surgical and conservative treatment units.

The nurses in COVID units had a clearly distinct set of practices for coping with stress, compared to nurses from non-COVID units – conservative treatment and surgical. They often took various forms of evasive behavior: the denial of facts, preoccupying themselves with different activities, downplaying the seriousness of a problem by making jokes, and treating the situation like a game. These mechanisms characterize hard to control and unavoidable difficult situations, like disasters, earthquakes, fires, floods, or the death of a loved one. These 'evasive' mechanisms for coping with stress also constitute defensive mechanisms that people use when experiencing mental overload and trauma. Avoidance, unfortunately, does not solve the difficulties encountered, but rather help in us coping with the stress they cause. In the case of COVID, such behaviours aim to downplay the severity of qa situation. The nursing staffs of COVID units often used avoidance to cope with stress. An earlier study conducted in the USA by Ali et al. [33] obtained similar results; according to the authors, the nurses in COVID units tried to avoid learning new information about the epidemiological situation and exhibited anxiety and fear (this was also observed in a study by Sheroun et al. [34]). Furthermore, a study conducted in the UK by McFadden et al. [35] showed that nurses in stressful situations preferred to preoccupy themselves with different activities.

Bartzik et al. proposed an interesting approach to understanding the use of a sense of humour as a coping strategy to reduce the stress caused by the pandemic [36]. According to the study, having a sense of humour can serve as a buffer between a person and a difficult situation. The negative effects of stress can be significantly reduced if a sense of humor is applied (as previously discussed by Lazarus and Folkman [8]). Having a sense of humour improves well-being, increases the satisfaction felt with life, enhances professional performance, and strengthens feelings of self-satisfaction [36]. Polish nurses, however, as can be seen in the results of the current study, although they are more educated and have obtained more academic distinctions, are using this very effective form of coping (humor), less and less. A significant factor in this is gender, with male nurses being significantly more likely to use the strategy of humour to cope with stress. Unfortunately, they were also significantly more likely to turn to psychoactive drugs in response to stress experienced at work.

Nurses working both in COVID and non-COVID units most often coped with stress by using adaptive acceptance (facilitated by seeking help and support) and avoidance strategies, which did not solve the problem that was the source of the stress (i.e. denial, blame, substance abuse and cessation of action). Nurses from COVID units tended to plan at the stage of diagnosing the patient. When working directly with the patients, however, they resorted to self-destructive and distancing behaviours, like cessation of action.

The study also showed that both male and female nurses felt a lack of control, and even the ability to influence the approach towards patients, thus leading them to break imposed rules and procedures. They most often felt helpless. This state of affairs seems to derive from the dehumanization of the healthcare system. In the past there was more emphasis on 'Service' and 'Care, while today it is becoming more of a 'System' in which the main job of medical personnel is to supervise the meticulous observance of dealing with the procedures foreseen for all patients. These procedures, however, do not take into account individual cases, and nurses have barely any tools left to alleviate the suffering of the patients entrusted to their care, as if this were not the main purpose of nursing the sick.

Although substance use was not frequently mentioned by the respondents, nurses working in COVID units compared to non-COVID units were significantly more likely to use drugs and alcohol as a coping strategy. Similar conclusions were reached by P. Ybonpunt et al. in Thailand [37] and H. Ali et al. [33] in the USA. The use of psychoactive substances, including alcohol, as a way of coping with stress, stems from a person's feeling of helplessness in the face of difficulties. Substance use as a coping strategy is destructive and is often referred to as anti-health behaviour [38]. This way of coping with stress, experienced as a result of specific factors in a person's professional environment, is not constructive, especially in the medical environment, which is highly predisposed to permanent exposure to stress [27, 28]. A study by McFadden et al. [35] confirmed that the substance use strategy practiced by nurses in COVID units had a negative impact on their well-being.

The current study showed no significant difference between the frequency of practicing strategies, such as active coping, cessation of action, self-blame, seeking instrumental support, seeking emotional support, turning to religion, and acceptance. A similar lack of significant differences in the anxiety and fear levels between nurses working in COVID and non-COVID hospital units, was demonstrated by studies conducted by A. Kandeğer et al. [39] in Turkey and Y. Liang et al. [40] in China.

A study conducted in the UK showed that nurses most often used the acceptance strategy. Accepting the new professional situation and the family and personal situations was the optimal solution in coming to terms with the challenge posed by COVID and 'living with it'. Making the best of a situation that is unavoidable and beyond one's individual ability to influence it is necessary; we have to be able to continue 'living in spite of it' [35].

A positive attitude toward patients proved to be the most effective way of coping with stress when working in COVID units. The value of the positive revaluation strategy was confirmed in studies conducted in Italy in which it was understood as a kind of style that generates an approach to patients [41, 42]. A very large study [35] that surveyed 2,166 people from 32 countries in Europe, Asia, Africa and South America, found that one of the most common ways of coping with stress among healthcare professionals was to seek social support. This action helped them manage their emotions and was the main method of stress reduction. In the time of COVID-19, this support was often looked for through the Internet or through remote communication. Secondly, the study recognized the appeal to religion and spirituality as a significant coping strategy, regardless of how religious a particular society was. Such an approach promotes positive thinking and gives people hope. Prayer and meditation reduce anxiety and stress in situations of danger or misfortune. Turning to religion as a way of coping with stress was also recognized in a study conducted by Munawar and Choudhry [7] in Pakistan. Pakistani nurses believed that the virus was sent by God and nothing could hurt them without His will – 'COVID-19 not being an exception'. This attitude was a great help to nurses in Pakistan to cope with the stress of working in COVID units.

The availability of psychological support in COVID units was another form of helping medical personnel manage their stress [7]. Psychologists, for example, were available to nurses in COVID units in Anhui Province in China, to help them deal with stress [43]. The results of studies showed that in hospitals that did provide psychological support, such support became a very important form of coping with stress for nurses in COVID units. In a study by S. Rose et al. [44] conducted in the USA, nurses complained about the lack of psychological support in their hospitals as a method of dealing with stress. Similar results were obtained by A. S. Hammami et al. [45] in a study conducted in Tunisia. In the context of the current study, however, Polish nurses did not mention the need for such assistance from psychologists as a means of coping with stress.

The nature of the source of stress determines the best way of dealing with it. The results of thisr study showed that male nurses working in COVID units were more likely to use a sense of humour and psychoactive substances as forms of coping. Similar results were obtained by C. L. Park et al. [46] in a study conducted in the USA. The results confirmed even earlier findings by E. Yoshida et al. [47]. The current study showed that when coping with stress, female nurses were more likely than men to use avoidant styles of behaviour and to fall into helplessness, which confirms the results of

a study conducted in Jordan by Alnazly and Hjazeen [14]. These authors found that male nurses coped with stress better, using more healthy methods, than did female nurses working in COVID units.

**Practical application of research.** The results of this study confirm the need for therapy for nurses working in COVID-19 units, and have difficulty coping with the difficult work with SARS-CoV-2 infected patients who have contracted COVID-19, as also indicated by other authors [29].

There is a need for special training for nurses which will raise their level of empathy and resilience, and which will raise the quality of care for the patients, as well as prevent professional burnout more effectively. This is indicated by Wilczek-Rużyczka [48], who showed that empathy and resilience have an indirect effect on raising the level of quality of care, as empathy is the basis for good interactions between medical professionals and patients, and resilience, as a dynamic process, helps caregivers adapt well to difficult working conditions, risks, or traumas experienced. Indeed, it is necessary for nurses to know more fully that infection with SARS-CoV-2 and contracted COVID-19 can lead not only to short-term but also long-term sequelae, as indicated by a group of experts from the Lancet Commission which represents 15 Universities in the USA and Canada [49]. The authors pointed out that since first detected, research has indicated that people contracting the virus may suffer neurological and mental disorders and deficits, in addition to the respiratory and other organ challenges caused by COVID-19. In particular, research suggests that contracting COVID-19 may have both mild effects (e.g. loss of taste (ageusia), loss of smell (anosmia), latent blinks (heterophila), disorientation, headaches and dizziness), as well as more serious complications (e.g. strokes, seizures, cognitive impairment, psychosis, delirium). Long-term effects may also include neurological challenges and damage. Patients can also develop neuroCOVID and a variety of related disorders, including PTSD [50].

This knowledge should provide clinical guidelines, assessment, and public health planning, while more systematic research using biological, clinical, and longitudinal methods would provide further insights. Training nurses and gaining relevant knowledge in this area would undoubtedly help change the attitudes of nurses working on COVID-19 wards, and changing their strategies of denying the facts, getting distracted by various activities and/or downplaying the seriousness of the situation, and result in better planning of the treatment of patients.

## CONCLUSIONS

There is a clear distinction between the strategies, styles and behaviours observed among nurses working in COVID units, and the ways of coping practiced by nurses working in non-COVID units – conservative treatment and surgical units. The nursing staff of COVID units were significantly more likely to behave evasively by denying facts, distracting themselves with different activities, or downplaying the seriousness of situations by joking and treating the situation with fun and humor. 'Psychoactive Substance Use' was also more popular among COVID nurses. On the other hand, however, they were the most likely to use planning and positive re-evaluation to cope with stress.

Socio-demographic factors, including gender, age, and living in rural or urban areas, proved significant in determining the ways of coping with stress. Male nurses were significantly more likely to fall into a style of helplessness, a tendency that often decreased with age and marital seniority. Younger male nurses and those living in rural areas used humour as a strategy, and were significantly more likely to use psychoactive drugs. Female nurses were more likely to use acceptance, as well as forms of avoidance, such as denial, self-blame, psychoactive substance use, and cessation of action. In terms of turning to religion, this form was most popular among nurses living in rural areas.

## REFERENCES

1. Biegańska-Banaś JM, Makara-Studzińska M. Coping strategies among nurses during the COVID-19 outbreak. Nursing Problems. 2020;28(1):1–11. https://doi.org/10.5114/ppiel.2020.96088
2. Backer JH, Bakas T, Bennett SJ, et al. Coping with stress: Programs of nursing research. In: Rice VH, editor. Handbook of stress, coping, and health: Implication for nursing research, theory, and practice. Thousand Oaks, CA, USA: Sage Publications; 2000. p. 223–263.
3. Demerouti E, Bakker AB, Nachreiner F, et al. The job demands-resources model of burnout. J Appl Psychol. 2001;86:499–512.
4. Lazarus RS. Stress and Emotion: A New Synthesis. New York, NY, USA: Springer; 1999.
5. Folkman S, Lazarus RS, Pimley S, et al. Age differences in stress and coping processes. Psychol Aging. 1987;2(2):171–184. http://dx.doi.org/10.1037/0882-7974.2.2.171
6. Martínez JP, Méndez I, Ruiz-Esteban C, et al. Profiles of Burnout, Coping Strategies and Depressive Symptomatology. Front Psychol. 2020;11:591. https://doi.org/10.3389/fpsyg.2020.00591
7. Munawar K, Choudhry FR. Exploring stress coping strategies of frontline emergency health workers dealing with Covid-19 in Pakistan: A qualitative inquiry. Am J Infect Control. 2020;49(3):286–292. https://doi.org/10.1016/j.ajic.2020.06.214
8. Lazarus RS, Folkman S. Stress, appraisal, and coping. New York, NY, USA: Springer; 1984. (Available from: https://books.google.com/books?hl=en&lr=&id=iySQQuUpr8C&oi=fnd&pg=PR5&dq)
9. Endler NS, Parker JDA. Coping Inventory for Stressful Situations (CISS): Manual. Toronto, Canada: Multi-Health Systems; 1990.
10. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. J Pers Soc Psychol. 1989;56(2):267–83. https://doi.org/10.1037/0022-3514.56.2.267
11. Juczyński Z, Ogińska-Bulik N. Tools for Measuring Stress and Coping with Stress. Handbook. Warsaw, Poland: Psychological Testing Laboratory of the Polish Psychological Association; 2012.
12. Gonzalez A, Cervoni C, Lochner M, et al. Supporting health care workers during the COVID-19 pandemic: Mental health support initiatives and lessons learned from an academic medical center. Psychol Trauma. 2020;12(1):168–170. https://doi.org/10.1037/tra0000893
13. McFadden P, Ross J, Moriarty J, et al. The Role of Coping in the Wellbeing and Work-Related Quality of Life of UK Health and Social Care Workers during COVID-19. Int J Environ Res Public Health. 2021;18(2):815. https://doi.org/10.3390/ijerph18020815
14. Alnazly EK, Hjazeen AA. Psychological Distress and Coping Strategies among Nurses during the COVID-19 Pandemic: A Cross-Sectional Online Survey. Open Nurs J. 2021;1:262–272. https://doi.org/10.2174/1874434602115010262
15. Ing EB, Xu QA, Salimi A, et al. Physician deaths from corona virus (COVID-19) disease. Occup Med (Lond). 2020;70(5):370–374. https://doi.org/10.1093/occmed/kqaa088
16. Chirico F, Nucera G, Magnavita N. Protecting the mental health of healthcare workers during the COVID-19 emergency. BJPsych International. 2020;18(1):1–2. https://doi.org/10.1192/bji.2020.39
17. Htay MNN, Marzo RR, Bahari R, et al. How are healthcare workers coping with mental health challenges during COVID-19 pandemic? – A cross-sectional multi-countries study. Clin Epidemiol Glob Health. 2021;11:100759. https://doi.org/10.1016/j.cegh.2021.100759
18. Farquharson B, Bell C, Johnston D, et al. Nursing stress and patient care: real-time investigation of the effect of nursing tasks and demands on psychological stress, physiological stress, and job performance: study

protocol. J Adv Nurs. 2013;69(10):2327–2335. https://doi.org/10.1111/jan.12090
19. Mark G, Smith AP. Occupational stress, job characteristics, coping, and the mental health of nurses. Br J Health Psychol. 2012;17(3):505–521. https://doi.org/10.1111/j.2044-8287.2011.02051.x
20. Keykaleh MS, Safarpour H, Yousefian S, et al. The Relationship between Nurse's Job Stress and Patient Safety. Open Access Maced J Med Sci. 2018;6(11):2228–2232. https://doi.org/10.3889/oamjms.2018.351
21. Lai J, Ma S, Wang Y, et al. Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. JAMA Netw Open. 2020;3(3):e203976. https://doi.org/10.1001/jamanetworkopen.2020.3976
22. Rowe J. The Suffering of the Healer. Nurs Forum. 2003;38:16–20. https://doi.org/10.1111/j.0029-6473.2003.00016.x
23. Park YM, Kim SY. Impacts of Job Stress and Cognitive Failure on Patient Safety Incidents among Hospital Nurses. Saf Health Work. 2013;4(4):210–215. https://doi.org/10.1016/j.shaw.2013.10.003
24. Rosenbaum L. Facing COVID-19 in Italy – ethics, logistics, and therapeutics on the epidemic's front line. N Engl J Med. 2020;382:1873–1875. https://doi.org/10.1056/NEJMp2005492
25. Karimi Z, Fereidouni Z, Behnammoghadam M, et al. The lived experience of nurses caring for patients with COVID-19 in Iran: a phenomenological study. Risk Manag Healthc Policy. 2020;13:1271–1278. https://doi.org/10.2147/RMHP.S258785
26. Beh LS, Loo LH. Job Stress and Coping Mechanisms among Nursing Staff in Public Health Services. Int J Acad Res Business Soc Sci. 2012;2:131–176.
27. Holmes EA, O'Connor RC, Perry VH, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry. 2020;7(6):547–560. https://doi.org/10.1016/S2215-0366(20)30168-1
28. Chatzigianni D, Tsounis A, Markopoulos N, et al. Occupational Stress Experienced by Nurses Working in a Greek Regional Hospital: A Cross sectional Study. Iran J Nurs Midwifery Res. 2018;23(6):450–457. https://doi.org/10.4103/ijnmr.IJNMR_120_17
29. Góral-Pólrola J, Kochańska E, Cielebąk K, et al. A new, neuromarker-based, form of combined neurofeedback EEG/tDCS training in the reduction of occupational burnout syndrome in an anaesthetic nurse working with COVID-19 patients. Acta Neuropsychol. 2024;22(3):301–330. https://doi.org/10.5604/01.3001.0054.6376
30. Xu J, He Y. Psychological health and coping strategy among survivors in the year following the 2008 Wenchuan earthquake. Psychiatry Clin Neurosci. 2012;66(3):210–9. https://doi.org/10.1111/j.1440-1819.2012.02331.x
31. Ursin H, Eriksen HR. The Cognitive Activation Theory of Stress. Psychoneuroendocrinol. 2004;29:567–592. https://doi.org/10.1016/S0306-4530(03)00091-X
32. Carver CS. You want to measure coping but your protocol's too long: consider the brief COPE. Int J Behav Med. 1997;4:92–100. https://doi.org/10.1207/s15327558ijbm0401_6
33. Ali H, Cole A, Ahmed A, et al. Major stressors and coping strategies of frontline nursing staff during the outbreak of coronavirus disease 2020 (COVID-19) in Alabama. J Multidiscip Healthc. 2020;13:2057. https://doi.org/10.2147/JMDH.S285933
34. Sheroun D, Wankhar D, Devrani A, et al. A study to assess the perceived stress and coping strategies among BSc nursing students of selected colleges in Pune during COVID-19 pandemic lockdown. Int J Sci Healthcare Res. 2020;5(2):280–288.
35. McFadden P, Ross J, Moriarty J, et al. The Role of Coping in the Wellbeing and Work-Related Quality of Life of UK Health and Social Care Workers during COVID-19. Int J Environ Res Public Health. 2021;18(2):815. https://doi.org/10.3390/ijerph18020815
36. Bartzik M, Aust F, Peifer C. Negative effects of the COVID-19 pandemic on nurses can be buffered by a sense of humor and appreciation. BMC Nurs. 2021;20:1–12. https://doi.org/10.1186/s12912-021-00770-5
37. Yubonpunt P, Kunno J, Supawattanabodee B, et al. Prevalence of perceived stress and coping strategies among healthcare workers during the COVID-19 outbreak at Bangkok metropolitan, Thailand. PLoS One. 2022;17(7):e0270924. https://doi.org/10.1371/journal.pone.0270924
38. Hobfoll SE. Stress, culture, and community: the psychology and philosophy of stress. New York, NY, USA: Springer Science & Business Media; 2004.
39. Kandeğer A, Aydın M, Altınbaş K, et al. Evaluation of the relationship between perceived social support, coping strategies, anxiety, and depression symptoms among hospitalized COVID-19 patients. Int J Psychiatry Med. 2021;56(4):240–254. https://doi.org/10.1177/0091217420982085
40. Liang Y, Chen M, Zheng X, et al. Screening for Chinese medical staff mental health by SDS and SAS during the outbreak of COVID-19. J Psychosom Res. 2020;133:110102. https://doi.org/10.1016/j.jpsychores.2020.110102
41. Flesia L, Monaro M, Mazza C, et al. Predicting Perceived Stress Related to the Covid-19 Outbreak through Stable Psychological Traits and Machine Learning Models. J Clin Med. 2020;9(10):3350. https://doi.org/10.3390/jcm9103350
42. Babore A, Lombardi L, Viceconti ML, et al. Psychological effects of the COVID-2019 pandemic: Perceived stress and coping strategies among healthcare professionals. Psychiatry Res. 2020;293:113366. https://doi.org/10.1016/j.psychres.2020.113366
43. Huang L, Lei W, Xu F, et al. Emotional responses and coping strategies in nurses and nursing students during Covid-19 outbreak: A comparative study. PLoS One. 2020;15(8):e0237303. https://doi.org/10.1371/journal.pone.0237303
44. Rose S, Hartnett J, Pillai S. Healthcare worker's emotions, perceived stressors and coping mechanisms during the COVID-19 pandemic. PLoS One. 2021;16(7):e0254252. https://doi.org/10.1371/journal.pone.0254252
45. Hammami AS, Jellazi M, Mahjoub L, et al. Psychological Impact of the COVID-19 Pandemic on Healthcare Professionals in Tunisia: Risk and Protective Factors. Front Psychol. 2021;12:754047. https://doi.org/10.3389/fpsyg.2021.754047
46. Park CL, Russell BS, Fendrich M, et al. Americans' COVID-19 stress, coping, and adherence to CDC guidelines. J Gen Intern Med. 2020;35(8):2296–2303. https://doi.org/10.1007/s11606-020-05898-9
47. Yoshida E, Yamada K, Morioka I. Sense of coherence (SOC), occupational stress reactions, and the relationship of SOC with occupational stress reactions among male nurses working in a hospital. Sangyo Eiseigaku Zasshi. 2014;56(5):152–61. https://doi.org/10.1539/sangyoeisei.b14002
48. Wilczek-Rużyczka E. Empathy and resilience in health care professionals. Acta Neuropsychol. 2023;21(4):395–410. https://doi.org/10.5604/01.3001.0053.9172
49. Aknin L, De Neve J, Dunn E, et al. The neurological consequences of contracting COVID-19. Acta Neuropsychol. 2021;19(3):301–305. https://doi.org/10.5604/01.3001.0014.9953
50. Pąchalska M. Goal-oriented neuropsychological rehabilitation with EEG-neurofeedback for a visual artist with PTSD resulting from SARS-CoV-2 infection, followed by a severe course of neuroCOVID and the sequelae of long term pharmacologically-induced coma. Acta Neuropsychol. 2022;20(4):485–514. https://doi.org/10.5604/01.3001.0016.2024