

# Stress of the Polish medical staff of the hospital emergency department in the time of the COVID-19 pandemic

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## ABSTRACT

Infectious disease pandemics pose a psychological challenge to the general population, particularly to healthcare professionals. This study aimed to evaluate the level of work stress and coping strategies used by healthcare professionals during the COVID-19 pandemic, considering sociodemographic and work-related variables. A cross-sectional study included 141 Polish healthcare professionals working with COVID-19 patients. The research was conducted using a diagnostic survey method, employing the Coping Inventory for Stressful Situations (CISS), the Perceived Stress Scale (PSS-10), and a self-written questionnaire. Among the respondents, 46.8% reported severe stress. The study found that older age was associated with less frequent use of avoidance-oriented coping styles, such as engaging in alternative activities ( $p = 0.031$ ) and seeking

social contacts ( $p = 0.005$ ). Additionally, avoidance-oriented coping was more commonly used by individuals from large cities compared to those from villages, and more frequently by those from small cities than by those from villages and medium-sized cities ( $p = 0.004$ ). Engaging in alternative activities was significantly more common among individuals from medium-sized cities ( $p = 0.01$ ), while seeking social contacts was more frequent among those from large cities compared to villagers ( $p = 0.03$ ). The study revealed that the majority of Polish medical staff working in hospital emergency departments experienced high levels of stress. Education, age, place of residence, and work experience significantly influenced the choice of coping styles among medical staff. **Keywords:** COVID-19 pandemic; medical staff; stress; mental health; healthcare professionals.

## INTRODUCTION

In modern society, workplace stress is a significant concern in the healthcare sector. Work-related stress is defined as a pattern of emotional, perceptual, behavioral, and physiological reactions that unfavorably affect various aspects, organization, and environment of work. High levels of stress can negatively impact mental health and impair employee performance [1].

Medical staff are particularly exposed to workplace stress. This group engages in the social, psychological, and physical problems of their patients, working under arduous conditions and strong emotional strain. When performing a profession directly related to saving lives, the ability to control one's emotions is crucial as patient outcomes and the safety of others depend on effective stress coping. The multitasking nature of the work, time pressure, sudden unforeseen situations, and shift work system all significantly affect the well-being and health of healthcare professionals. Fatigue and frustration can impact relationships with colleagues and patients [2, 3].

The COVID-19 pandemic has been a traumatic event significantly affecting the mental health of medical staff, leading to increased anxiety, depression, and stress. Medical staff responsible for admitting and caring for COVID-19 patients were exposed to various individual and organizational stressors that negatively impacted their health and work satisfaction. During the pandemic, healthcare professionals risked their lives due to higher exposure to the

virus, high work demands, irregular and long work hours, and increased mental stress, resulting in depression, anxiety, professional burnout, low immunity, and fatigue [3, 4].

Literature indicates that factors related to professional and personal burnout among healthcare professionals included direct involvement in COVID-19 treatment, coexisting diseases, and insufficient psychological support in the workplace [5]. Significant factors related to mental distress included thoughts of quitting one's job, unwillingness to work, fear of infecting family members, frequent protocol changes, and infection prevention and control guidelines. Prolonged exposure to stress increases the risk of psychosomatic disorders [6, 7]. Therefore, recognizing stressors and providing stress-reducing training or psychological support is vital. Long-term psychological difficulties can decrease immunity, exposing healthcare professionals to a higher risk of infection [8].

The literature review indicates many basic causes of stress among healthcare professionals. These include psychological or physical abuse, confrontation with death, lack of staff, high patient frequency, and exposure to infection as highly stressful factors in the workplace [8]. Additionally, age, marital status, workload, and educational background are significant predictors of higher stress [9].

Assessing the impact of stress on the work and health of nurses is crucial for preventing threats like burnout. Work-related stress is one of the most serious health and safety challenges. It can decrease nurses' energy and work efficiency, leading to inadequate nursing care, negatively impacting patient outcomes, care quality, increased

practice errors, and loss of compassion for patients. Job-related stress affects caring behavior due to excessive activity or workload [3].

Due to the negative influence of the COVID-19 pandemic on the mental health of healthcare professionals, identifying the causes and prevalence of stress in the workplace among those caring for COVID-19 patients is necessary. The period between 2020–2022 in Poland was challenging due to the SARS-CoV-2 pandemic. More than half of the beds designated for COVID-19 patients were occupied, with new cases reported daily. During this time, many healthcare professionals struggled with symptoms of restlessness, depression, or higher stress levels. Therefore, this study aimed to appraise the level of work stress and coping strategies used by healthcare professionals during the COVID-19 pandemic, considering sociodemographic and work-related variables.

## MATERIALS AND METHODS

### Organization and course of study

Respondents were recruited from August to October 2021 among healthcare professionals (nurses, physicians, paramedics) working in the hospital emergency departments of the Independent Public Regional Hospital in Szczecin and the Independent Public Health Care Center in Kościan. The study included 180 healthcare professionals working in the hospital emergency department (Fig. 1). The sample size was determined based on statistical data regarding healthcare professionals working in hospital emergency departments in the West Pomeranian Voivodeship and Greater Poland in 2022. The confidence level was set at 95%, the maximum error at 7%, and the estimated fraction size at 0.5.

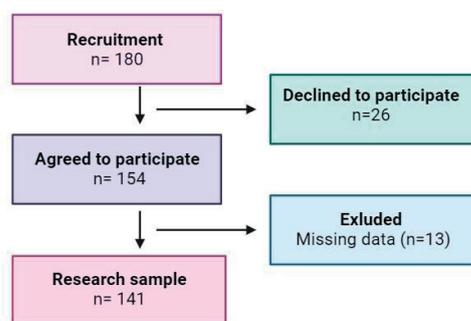


FIGURE 1. Study flow chart

The subjects who met the following inclusion criteria were included in the study: age over 18 years, working in a hospital emergency department, and providing informed consent to participate. The exclusion criteria were lack of consent to participate and working in hospital wards other than the emergency department.

Ultimately, 141 respondents who met all the inclusion criteria were involved in the study (completion rate: 78%). The survey included questions about sociodemographic data and work-oriented variables such as work experience (in years) and average monthly hours. These variables were selected based on a literature review [1, 2].

The respondents were informed about the aim of the research and the possibility of withdrawing from the study

at any stage. This study is part of a larger project concerning the incidence of behavioral addictions among women.

The research was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Ethics Committee of the Pomeranian Medical University in Szczecin (KB-0012/25/04/2020/Z). Participants were guaranteed anonymity, confidentiality, and the opportunity to withdraw from the study at any stage. Participation was voluntary. The research was carried out using the traditional method by distributing paper versions of questionnaires among healthcare professionals working in the West Pomeranian Voivodeship.

### Research instruments

The following standardized survey instruments were used:

- the Coping Inventory for Stressful Situations (CISS) – it is a self-report measure that focuses on 3 dimensions: task-oriented, emotion-oriented, and avoidance-oriented coping, consisting of 48 statements about different behaviors people undertake in stressful situations. The avoidance dimension takes 2 forms – engaging in alternative activities and seeking social contacts. The range of scores is 16–80 points for task-oriented, emotion-oriented, and avoidance-oriented coping; 8–40 points for engaging in alternative activities; and 5–25 points for seeking social contacts. The psychometric properties of the Polish version of the CISS questionnaire, measured with the Cronbach's alpha coefficient, range 0.72–0.92 [10];
- the Perceived Stress Scale (PSS-10) – it is a 10-item questionnaire used to assess the severity of stress related to how individuals have perceived their lives as unpredictable, uncontrollable, and overloading over the previous month. Interpretation is carried out by analyzing norms indicating the severity of stress: low score (1–4 points), average score (5–6 points), and high score (7–10 points). In the Polish adaptation by Juczyński and Ogińska-Bulik, the PSS-10 has a reliability index with Cronbach's alpha ranging 0.72–0.90 and a high test-retest reliability ( $r = 0.90$ ) [11];
- a self-written survey form which included questions about sociodemographic data (age, sex, place of residence) and work-oriented variables for medical staff (work experience in years, average monthly hours). These sociodemographic and work-oriented variables were selected based on a literature review [1, 2].

### Ethical considerations

The Bioethics Committee of the Pomeranian Medical University in Szczecin approved this study (KB-0012/46/01/2013). The study was conducted in accordance with the Declaration of Helsinki. All participants were verbally informed about the study, and their consent was obtained.

### Statistical analysis

To calculate and interpret data, relationships, and correlations between variables, descriptive statistics were used, including:

count, mean, median, mode, fashion count, maximum, minimum, lower and upper quartile, range, quartile range, standard deviation (SD), and proportions.

Quantitative variables were compared using the Mann–Whitney U-test (for 2 groups) and the Kruskal–Wallis test (for 3 groups). Post-hoc analysis was performed using Dunn's test to identify statistically significant differences between groups. Furthermore, the Spearman correlation coefficient was used to analyze correlations between quantitative variables.

The statistical analysis was performed using the R software (version 4). The level of statistical significance was set at  $p < 0.05$  [12]. Additionally, the Bonferroni correction was applied for multiple testing, setting the level of statistical significance at 0.008 ( $p = 0.008$ ).

## RESULTS

### Brief characteristics of the healthcare professionals

The research was conducted among 141 healthcare professionals working in a hospital emergency department, with a mean age of 36.61 years ( $SD = 9.94$ ). The surveyed respondents comprised nurses (40.42%), paramedics (39.72%), and doctors (19.86%). The vast majority of participants were female (59.57%), in a formal relationship (50.35%), had a university education (71.63%), lived in a city with over 250,000 residents (41.13%), and had 0–10 years of work experience (60.28%) – Table 1.

TABLE 1. Characteristics of the respondents

	Variables	n	%
Sex	female	84	59.70
	male	57	40.43
Marital status	formal relationship	71	50.35
	informal relationship	30	21.28
	single	40	28.37
Education	secondary/post-secondary education	40	28.37
	university	101	71.63
	village	36	25.53
Place of residence	city with up to 10,000 residents	18	12.77
	city with 10,000–250,000 residents	29	20.57
	city 100–250,000 population	7	4.96
	city more than 250,000 population	58	41.13
Profession	nurse	57	40.42
	paramedic	56	39.72
	doctor	28	19.86
Seniority (years)	0–10	85	60.30
	11–20	32	22.70
	21–30	13	9.20
	>30	11	7.80

n – number; % – frequency

### Stress level assessment

Table 2 presents the ways of coping with stress as measured by the CISS questionnaire and the stress severity according to PSS-10. The data analysis showed that the majority of healthcare professionals used low levels of emotion-oriented coping (50.25%), coping related to seeking social contacts (48.23%), and avoidance-oriented coping (45.39%). Conversely, 43.97% of respondents used a medium level of task-oriented coping, and 36.88% presented a medium level of coping related to engaging in alternative activities. Nearly half of the respondents (46.8%) reported severe stress, while 37.59% perceived moderate stress and 15.6% observed low stress.

TABLE 2. Analysis of stress-coping styles according to CISS and the stress severity according to PSS-10

Questionnaires	Variables	Stress severity category (points)	n	%
CISS	emotion-oriented coping	low (1–4 sten)	71	50.25
		medium (5–6 sten)	42	29.79
		high (7–10 sten)	28	19.86
	avoidance-oriented coping	low (1–4 sten)	64	45.39
		medium (5–6 sten)	56	39.72
		high (7–10 sten)	21	14.89
	engaging in alternative activities	low (1–4 sten)	49	34.75
		medium (5–6 sten)	52	36.88
		high (7–10 sten)	40	28.37
	task-oriented coping	low (1–4 sten)	34	24.11
		medium (5–6 sten)	62	43.97
		high (7–10 sten)	45	31.91
seeking social contacts	low (1–4 sten)	68	48.23	
	medium (5–6 sten)	41	29.08	
	high (7–10 sten)	32	22.70	
PSS-10	low (1–4 sten)	22	15.60	
	medium (5–6 sten)	53	37.50	
	high (7–10 sten)	66	46.80	

n – sample size; % – sample percentage; CISS – Coping Inventory for Stressful Situations questionnaire; PSS-10 – Perceived Stress Scale

### The association of sociodemographic variables with the styles of coping with stress according to CISS and the stress level according to PSS-10

The research analyzed the influence of sociodemographic variables on the choice of coping styles according to the CISS. The collected data demonstrated a statistically significant negative correlation between age and the use of avoidance-oriented coping ( $r = -0.256$ ;  $p = 0.002$ ), as well as the styles of engaging in alternative activities ( $r = -0.182$ ;  $p = 0.031$ ) and seeking social contacts ( $r = -0.237$ ;  $p = 0.005$ ). No correlations were found between age and the remaining coping styles according to CISS (Tab. 3).

**TABLE 3. The association of age with the styles of coping with stress according to CISS and the stress level according to PSS-10**

Questionnaires	Variables	Age	
		r	p
CISS	emotion-oriented coping	0.009	0.911
	avoidance-oriented coping	-0.256	0.002
	engaging in alternative activities	-0.182	0.031
	task-oriented coping	0.085	0.315
	seeking social contacts	-0.237	0.005
PSS-10		-0.099	>0.05

r – correlation coefficient; p – statistical significance; CISS – Coping Inventory for Stressful Situations questionnaire; PSS-10 – Perceived Stress Scale

The results of the study demonstrated statistically significant differences in the choice of coping styles depending on the respondents' place of residence. Avoidance-oriented coping was significantly more frequently used by people from large cities compared to those from villages. Additionally, it was more often used by people from small cities than by those from villages and medium-sized cities ( $p = 0.004$ ). The style of engaging in alternative activities was most frequently chosen by people from medium-sized cities compared to other respondents ( $p = 0.01$ ). The style of seeking social contacts was significantly more often used by people from large cities than by those from villages ( $p = 0.03$ ). No correlations were found between the place of residence and the remaining coping styles according to CISS (Tab. 4).

**TABLE 4. The influence of sociodemographic variables such as sex, marital status, place of residence, education and other variables, such as profession and the type of hospital emergency department on the styles of coping with stress according to CISS and the stress level according to PSS-10**

Variables		CISS					PSS-10	
		emotion-oriented coping	avoidance-oriented coping	engaging in alternative activities	task-oriented coping	seeking social contacts		
Sex	women (n = 84)	M	40.36	42.87	18.99	53.51	15.51	18.71
		SD	10.99	9.76	5.01	9.57	4.50	5.97
		Me	41.00	44.00	19.50	52.50	15.00	19.00
		IQR	14.50	12.25	7.00	13.25	7.00	9.00
	men (n = 57)	M	39.56	41.28	19.12	51.84	14.26	19.80
		SD	10.27	8.96	5.53	8.68	3.93	4.98
		Me	41.00	43.00	19.00	52.00	15.00	20.00
		IQR	15.00	13.00	8.00	12.00	5.00	7.00
	p		0.809	0.252	0.931	0.291	0.174	0.297
	Marital status	formal relationship (n = 71)	M	40.13	40.84	18.28	53.56	14.71
SD			11.03	8.66	5.15	9.51	4.19	5.55
Me			41.50	43.50	20.00	51.00	15.50	19.00
IQR			13.25	9.75	7.25	11.75	6.00	7.25
informal relationship (n = 30)		M	39.27	43.63	19.97	54.90	15.37	20.63
		SD	10.65	10.78	4.82	8.25	4.74	5.73
		Me	42.00	42.00	19.00	52.00	14.00	18.00
		IQR	16.00	12.50	7.00	14.00	6.00	7.50
single (n = 40)		M	40.45	43.62	19.70	50.00	15.25	19.62
		SD	10.29	9.61	5.52	8.98	4.24	5.43
	Me	40.00	46.50	21.00	54.50	15.00	20.50	
	IQR	16.50	14.50	7.50	13.50	7.75	7.75	
p		0.913	0.11	0.18	0.066	0.52	0.109	

**TABLE 4.** The influence of sociodemographic variables such as sex, marital status, place of residence, education and other variables, such as profession and the type of hospital emergency department on the styles of coping with stress according to CISS and the stress level according to PSS-10

Variables	CISS					PSS-10		
	emotion-oriented coping	avoidance-oriented coping	engaging in alternative activities	task-oriented coping	seeking social contacts			
Place of residence	village (n = 36) – A	M	37.97	38.31	17.25	52.08	13.81	17.83
		SD	10.80	8.80	5.51	10.80	3.98	5.63
		Me	36.00	38.50	18.00	13.00	52.50	19.00
		IQR	10.25	11.00	8.00	3.25	14.50	6.25
	city with up to 10,000 residents (n = 18) – B	M	43.00	47.61	22.06	50.89	15.78	20.17
		SD	10.56	9.11	4.62	9.13	3.93	5.19
		Me	44.50	48.00	23.00	15.00	52.50	19.50
		IQR	9.00	7.75	4.50	3.50	10.25	6.50
	city with 10,000–250,000 residents (n = 29) – C	M	42.34	41.58	19.55	52.28	13.89	20.41
		SD	11.15	9.44	4.47	9.79	4.74	5.05
		Me	42.00	42.00	19.00	14.00	51.00	20.00
		IQR	15.00	9.00	3.00	6.00	13.00	8.00
	city with over 250,000 residents (n = 58) – D	M	39.24	43.31	18.97	54.19	16.07	19.03
		SD	10.26	9.11	5.18	7.88	4.15	5.90
		Me	42.00	44.90	20.50	16.00	52.50	19.00
		IQR	16.75	125.00	7.75	6.00	12.00	8.75
p		0.219	<b>0.004</b> D > A; B > C, A	<b>0.01</b> B > D, C, A	0.56	<b>0.03</b> D > A	0.395	
Education	secondary vocational (n = 40)	M	42.12	41.84	19.77	50.90	13.80	19.23
		SD	10.58	7.50	4.49	7.84	3.41	6.06
		Me	43.50	43.00	20.00	50.00	13.00	20.00
		IQR	11.75	8.25	4.25	9.25	4.00	7.75
	university (n = 101)	M	39.21	42.38	18.75	53.60	15.48	19.13
		SD	10.65	10.14	5.46	9.66	4.54	5.44
		Me	39.00	44.00	19.00	54.00	15.00	19.00
		IQR	17.00	15.00	8.00	4.00	6.00	7.00
	p		0.126	0.563	0.346	0.08	0.018	0.835
	Profession	nurse (n = 57)	M	41.39	44.30	19.97	53.37	15.67
SD			9.61	8.73	4.42	9.25	4.41	19.75
Me			42.50	44.75	20.50	52.50	15.50	19.75
IQR			9.60	9.40	4.90	9.40	8.20	6.62
paramedic (n = 56)		M	39.32	41.12	18.50	52.61	14.58	19.73
		SD	11.28	10.01	5.44	8.81	4.19	6.09
		Me	39.50	43.50	19.00	52.50	15.00	20.00
		IQR	15.50	17.25	11.75	13.50	6.00	5.50
doctor (n = 28)		M	39.46	41.54	18.96	54.96	14.79	19.54
		SD	10.46	10.64	5.87	10.47	4.89	5.87
		Me	39.00	42.00	19.00	55.50	15.00	19.50
		IQR	18.50	6.00	7.50	13.50	5.25	7.75
p		0.838	0.542			0.529	0.43	

**TABLE 4.** The influence of sociodemographic variables such as sex, marital status, place of residence, education and other variables, such as profession and the type of hospital emergency department on the styles of coping with stress according to CISS and the stress level according to PSS-10

Variables		CISS					PSS-10	
		emotion-oriented coping	avoidance-oriented coping	engaging in alternative activities	task-oriented coping	seeking social contacts		
Type of ED	decontamination area of ED (n = 35)	M	39.29	40.86	18.51	54.91	14.54	19.80
		SD	9.35	9.31	4.41	7.72	4.52	6.21
		Me	36.00	42.00	19.00	55.00	15.00	19.00
		IQR	15.00	12.50	6.50	12.00	7.00	9.50
	clean zone of ED (n = 15)	M	41.27	42.25	19.00	52.47	14.93	18.80
		SD	11.22	7.59	6.62	9.07	3.35	5.44
		Me	44.00	44.00	19.00	48.00	14.00	19.00
		IQR	10.00	8.00	10.50	9.00	3.50	7.50
	ward with patients of undetermined status (n = 91)	M	40.12	42.75	19.25	52.10	15.20	18.97
		SD	11.15	9.80	5.28	9.75	4.39	5.43
		Me	41.00	44.00	20.00	52.00	15.00	19.00
		IQR	16.50	13.00	7.00	0.239	7.00	7.00
	p	0.786	0.688	0.74	0.898	0.898	0.733	

M – mean; SD – standard deviation; Me – median; IQR – interquartile range; CISS – Coping Inventory for Stressful Situations questionnaire; PSS-10 – The Perceived Stress Scale; ED – emergency department; p – the Mann-Whitney U-test, the Kruskal-Wallis test, post-hoc analysis (Dunn's test); n – sample size

In addition, statistically significant differences were found between education and the choice of the stress coping style of seeking social contacts. This coping style was more frequently used by individuals with university education. The study did not reveal correlations between education and the remaining styles of coping with stress according to CISS.

No statistically significant differences were observed between the remaining sociodemographic variables (sex, marital status), other variables (profession, types of emergency departments), and the styles of coping with stress as measured by CISS.

The research analyzed the association of sociodemographic data with stress levels according to PSS-10. No statistically significant correlations were found between sex, age, marital status, place of residence, and stress levels according to PSS-10.

### The association of work-oriented variables with the styles of coping with stress according to CISS and the stress level according to PSS-10

The study analyzed the influence of work-oriented variables (work experience in years, average monthly hours) on the choice of coping styles as measured by CISS and stress levels according to PSS-10.

A statistically significant negative correlation was found between work experience (years) and the use of avoidance-oriented coping ( $r = -0.22$ ;  $p = 0.009$ ), as well as the style of seeking social contacts ( $r = -0.298$ ;  $p < 0.001$ ). The analysis did not reveal any statistically significant correlations between work experience and the remaining stress coping strategies. Additionally, no statistically significant correlations were observed between average monthly hours and the use of coping styles as measured by CISS (Tab. 5).

**TABLE 5.** The impact of work experience and average monthly hours on the styles of coping with stress according to CISS and the stress level according to PSS-10

Variables	Work experience (years)		Average monthly hours	
	r	p	r	p
emotion-oriented coping	0.074	0.385	-0.028	0.745
avoidance-oriented coping	-0.22	<b>0.009</b>	-0.011	0.895
CISS				
engaging in alternative activities	-0.077	0.366	0.053	0.532
task-oriented coping	0.005	0.949	0.035	0.679
seeking social contacts	-0.298	<b>&lt;0.001</b>	-0.019	0.821
PSS-10	-0.032	>0.05	-0.178	<0.05

r – correlation coefficient; p – statistical significance; CISS – Coping Inventory for Stressful Situations questionnaire; PSS-10 – The Perceived Stress Scale

The data analysis showed a statistically significant positive correlation ( $r = 0.178$ ;  $p < 0.05$ ) between average monthly hours and the stress level according to PSS-10. The research did not find any statistically significant influence of work experience on the respondents' level of perceived stress according to PSS-10 ( $p > 0.05$ ).

### The relationship between stress severity according to PSS-10 and coping with stress according to CISS

The study analyzed the relationship between stress severity according to PSS-10 and coping with stress as measured by CISS. Based on the collected data, stress level showed a statistically significant positive correlation with emotion-oriented

coping ( $r = 0.536$ ;  $p < 0.001$ ), avoidance-oriented coping ( $r = 0.167$ ;  $p = 0.048$ ), and the style of engaging in alternative activities ( $r = 0.246$ ;  $p = 0.003$ ). The study did not reveal a relationship between stress levels as per PSS-10 and the remaining styles of coping with stress according to CISS (Tab. 6).

**TABLE 6.** The correlation of stress according to PSS-10 and the styles of coping with stress according to CISS

CISS	PSS-10	
	r	p
Emotion-oriented coping	0.536	<0.001
Avoidance-oriented coping	0.167	0.048
Engaging in alternative activities	0.246	0.003
Task-oriented coping	-0.083	0.329
Seeking social contacts	0.038	0.652

r – correlation coefficient; p – statistical significance; CISS – Coping Inventory for Stressful Situations questionnaire; PSS-10 – The Perceived Stress Scale

## DISCUSSION

Stress is an integral part of human life and one of the most frequent problems in modern society. The literature review indicates that medical staff are particularly vulnerable to various stressors in the workplace due to the responsibility for their patients' health and lives [13, 14]. The COVID-19 pandemic has proven to be a traumatic event with a significant impact on the mental health of medical staff. Estimating the impact of stress on medical staff's work and health is crucial for preventing threats such as professional burnout.

A review of the literature indicates that despite vaccinations against COVID-19 carried out since 2020, no reduction in the level of stress related to the care of patients diagnosed with COVID-19 has been observed among healthcare workers [15].

### Stress level assessment

This study showed that almost half of the respondents reported experiencing severe stress. This is consistent with the research by Rachubińska et al. [14]. Many scientists emphasize that frontline healthcare professionals are particularly vulnerable to stress, exhibiting higher stress levels compared to other medical staff [16]. Salari et al. found that the general prevalence of stress was 45%, with doctors being particularly vulnerable to higher stress levels [17]. Similarly, Abdulah and Musa reported the highest frequency of stress occurrence among medical staff at 93.7% [18]. Al Maqbali et al. indicated that the total stress prevalence varies across research studies, ranging 8–91% [19].

Many studies highlight that medical staff exposed to COVID-19 face a variety of specific stress factors, such as the nature of the disease, social and organizational demands [20, 21]. Additionally, fear of contracting COVID-19, shortages of personal protective equipment, and the risk of infecting family members contribute to increased stress levels among medical staff [22, 23].

The analysis of our results showed that the vast majority of respondents exhibited low levels of emotion-oriented coping.

In contrast, Cybulska et al. and Dolić et al. revealed that among nurses, the dominant style of coping with stress is emotion-focused [24, 25]. The literature indicates that the use of emotion-oriented coping is associated with experiencing stronger pressure [26, 27] and higher levels of occupational stress [28]. This problem is particularly evident in intensive care units, palliative care, and among emergency nurses. Therefore, the importance of social support is emphasized, as it helps cope with circumstantial emotional demands and problem-solving [29, 30].

According to Portero de la Cruz et al., the most frequently used coping strategy among healthcare professionals was problem-focused coping, while the least frequently used was the avoidance-oriented style [31]. Similar results were obtained by Lim et al., confirming that nurses more often chose problem-focused strategies rather than emotion-focused ones [32]. Kowalczyk et al. found that nurses most often used active strategies for coping with stress, with avoidance strategies being used the least often [33].

Additionally, Babore et al. reported that a positive attitude was the strongest protective factor against stress [34]. This finding aligns with previous research indicating that a positive attitude in the workplace significantly impacts stress reduction [35]. According to Dharra and Kumar, hospital administrations should invest substantially more resources and programs in training nursing staff to improve their levels of self-efficacy and reduce anxiety [36].

### The association of sociodemographic variables with the styles of coping with stress according to CISS and the stress level according to PSS-10

The analysis of our results showed statistically significant correlations between: age, place of residence, education, and the choice of coping styles. The collected data revealed a statistically significant negative correlation between age and the styles focused on avoidance, engaging in alternative activities, and seeking social contacts. This indicates that as age increases, the frequency of using these coping styles decreases. Additionally, people with a university education were found to use the style focused on seeking social contacts more frequently. After applying the Bonferroni correction and setting a statistical significance level of  $p = 0.008$ , only the negative correlations between age and the styles focused on avoidance and seeking social contacts remained significant. No statistically significant correlations were found between education and other stress coping styles.

The study also revealed that avoidance-oriented coping was more frequently used by people from large cities than those from villages and was more often used by people from small cities than by those from villages and medium-sized cities. The coping style focused on engaging in alternative activities was significantly more frequently used by people from medium-sized cities compared to other respondents. The style of seeking social contacts was much more often chosen by people from large cities than by those from villages.

Posavec reported that a higher level of education was correlated with a greater need to find one's purpose and more frequent use of active coping, planning, and emotional support as coping strategies [32, 35]. Different results were obtained

by Iwanowicz-Palus et al. and Kotarba and Borowiak, who found that a higher level of education was associated with more frequent use of task-oriented coping styles [37, 38]. Research by Żuralska et al. indicated that unmarried nurses more often chose stress-coping strategies focused on confrontation rather than avoidance [39], consistent with the findings of Dolić et al. [25]. Luo et al. revealed that women and nurses experienced higher stress levels compared to men and doctors [40], aligning with previous reports [34, 41].

Kowalczuk et al. found no statistically significant correlations between demographic characteristics and stress behavior, except for respondents in quarantine or home isolation. These respondents were more likely to use active coping, planning, and emotional support strategies than others [33].

Sharma and Kumar reported that stress levels were significantly associated with age, academic session, travel history, laboratory-confirmed COVID-19 status, and the presence of parents and siblings in the medical profession. Their data analysis showed correlations between psychological distress and preferred coping styles among nursing students, with a significant positive relationship between adaptive and maladaptive coping styles and psychological distress [42].

### **The influence of work-oriented variables on the styles of coping with stress according to CISS and the stress level according to PSS-10**

The analysis of our results did not reveal statistically significant correlations between work experience (years) and stress coping strategies. Conversely, a study by Iwanowicz-Palus et al. showed that shorter work experience in one's chosen profession was associated with more frequent use of emotion-focused and avoidance coping styles [37]. Emotion-oriented coping likely occurs due to a lack of experience, resources, or supervision [35]. Different results were obtained by Basińska and Dziewiątkowska-Kozłowska, who reported that people with longer work experience more frequently used strategies focused on avoidance and resignation in stressful workplace situations [43].

Based on the collected data, a statistically significant positive correlation was found between average monthly hours and stress levels. The more hours worked, the higher the level of stress. Working overtime has significant negative effects on mental health. Healthcare professionals who work long hours experience constant anxiety and pressure. They rest and relax less, leading to poor sleep quality, fatigue, and a negative impact on mental and physical health [44, 45]. The researchers' study results are consistent with reports by Rasmus et al., who observed a significant influence of hours worked on increased depersonalization [46].

### **Limitations**

The study had some limitations, such as the use of a self-report questionnaire, which may lead healthcare professionals to answer in a socially desirable way. Furthermore, the study recruited a relatively small group of medical staff, as it focused only on those from a hospital emergency department.

Future research should re-examine a larger group and assess the potential impact of uncontrolled confounding variables on stress levels among healthcare professionals.

## **CONCLUSIONS**

This study showed that the vast majority of medical staff working in a hospital emergency department experienced high levels of stress. Education, age, place of residence, and work experience were the variables that significantly influenced the choice of coping styles among the surveyed healthcare professionals.

## **PRACTICAL RECOMMENDATIONS**

Healthcare professionals, due to their specific working conditions, struggle with many physical and mental problems. The difficulties related to their work expose them to various health hazards and numerous risk factors for occupational stress [47]. Prolonged and continuous stress is detrimental to health, making it crucial to introduce intervention measures that help cope with stress. These measures can include relaxation and stress reduction techniques such as reading, writing, listening to music, meditation, autogenic training, and mindfulness exercises. Since the mental health of healthcare professionals directly impacts the quality of care and health outcomes for patients, every hospital manager should develop a program for reporting signs of stress or mental health challenges that require intervention and build a strategy for mental health protection.

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