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Level of stress and strategies used to cope with stress by physicians working in intensive care units

Katarzyna Białek, Marcin Sadowski

Institute of Medical Sciences, Faculty of Medicine and Health Sciences, Jan Kochanowski University, Kielce, Poland

Abstract

Background: The physicians of intensive care units (ICUs) encounter patients who are critically ill and have severe injuries and require life-saving interventions. Working in such a stressful environment may be highly stressful. A high level of stress among intensive care units' staff is commonly reported. The aim of this study was to explore doctors' perceptions of their stress and identify the coping processes associated with this task.

Methods: A total of 89 physicians of various specialties working in ICUs were included. For evaluation of coping with stress the Inventory to Measure Coping Strategies with Stress (Mini-COPE) was used together with the Perceived Stress Scale (PSS-10) to assess the stress level.

Results: In 46 respondents (51.7%) a high level of stress was identified. Women were under a higher level of stress than men ($P = 0.011$). Adaptive stress-coping strategies were more frequently used than maladaptive stress-coping strategies. Planning, active coping and seeking support were the most frequently reported stress-coping strategies while denial, turning to religion, suppression of activities and psychoactive substance use were the least frequently reported stress-coping strategies. Females used both adaptive and maladaptive stress-coping strategies more frequently than males ($P > 0.05$).

Conclusions: Approximately a half of surveyed physicians presented symptoms of a high level of stress, which indicates that it is a very important problem. Further investigations of stress and coping strategies among ICU physicians are necessary.

Key words: stress, intensive care unit, stress coping, anesthesiology.

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CORRESPONDING AUTHOR:

Katarzyna Białek, Institute of Medical Sciences, Faculty of Medicine and Health Sciences, Jan Kochanowski University, IX Wieków Kielc 19, 25-317, Kielce, Poland, e-mail: katarzynabialek@vp.pl

In recent decades, particular attention has been paid to the importance of research into psychosocial risks and work-related stress in professional work, which are considered one of the greatest contemporary challenges for occupational safety. According to data from the World Health Organization (WHO), almost half of working people feel discomfort in their work, which is associated with a negative perception of it as a place that is a source of many aggravating and stressful situations [1].

Stress can be a set of mobilizing and activating factors (eustress), but it can also be a collection of undesirable effects, disturbing the correct cycle of performed or planned activities (distress) [2]. Positive stress is desirable in the context of professional work. However, whether stress will gain a positive or negative dimension depends not only on the employee's requirements, but also on their physical, emotional and intellectual abilities and coping skills [3]. Modern psychology perceives stress as an imbalance between the resources and abilities of an individual and the requirements set by the environment. It can be said that stress in this approach is defined as a definite relationship between a person and the environment, which is assessed by the individual as aggravating or exceeding one's resources and threatening one's well-being [2]. In the face of stress, a person takes on a specific form of activity referred to as coping ability, which can be grouped into adaptation strategies, for example active coping, planning, positive re-evaluation of a difficult situation, and maladaptive activity, such as substance abuse, denial, withdrawal and/or blaming. These strategies depend on the context and strength of the stressor [4]. However, not everyone has the resources to fight in a difficult situation. If stress exceeds human strength and coping abilities are exhausted, pathological reactions, e.g. depression, may occur. Stress is responsible, among other things, for a decrease in the professional satisfaction and well-being of the individual, as well as stagnation of personal development, absence from work, reduced quality of services or more mistakes [5]. Stress and stress situations are particularly present

in the emergency and intensive care units (ICU), where key decisions are made regarding patients in a state of immediate threat to health and life. The situation at the ICU is often very dynamic and requires medical personnel to respond quickly, effectively and skillfully, as every second is important in rescuing emergency tasks, and even small mistakes can have fatal consequences, including death of the patient. Employees of intensive care units are therefore exposed to two types of stressors: traumatic, which include situations related to the rescue of a direct threat to life and health; and chronic, constantly affecting the well-being of the individual, i.e. responsibility for another person, unpredictability of events in the workplace, overloading with bureaucracy, shift work or night shifts [4]. According to the literature, even contact with traumatic events of low intensity is a source of severe stress in this occupational group and may lead to cumulative traumatization [6].

All this can far outweigh the subjective possibilities of proper functioning in such a demanding environment. The assessment of stress risk factors and ways of dealing with it is therefore a key point in the work of ICU medical personnel. This will make it easier to take remedial measures to increase the comfort of physicians' work as well as the motivation and quality of services provided, which will also improve patient and family care. However, the issue of coping styles among ICU physicians is rarely discussed in the literature. Although in recent years the number of such analyses in the world literature has increased, in the Polish literature data on this subject are fragmentary and very few, and studies describing styles of coping of anesthesiologists and medical personnel at ICUs, started by Kwiatosz-Muc *et al*. [7], did not find empirical continuation in other centers of the country. This work will be the first to develop it.

The aim of the study was to determine the level of stress as well as different strategies used to cope with stress by physicians working in intensive care units, where first of all patients in immediate threat to life and health are rescued and treated.

METHODS

The Ethics Committee of the Jan Kochanowski University of Kielce approved the study (4/2019) and all participants gave their written consent.

The study was conducted among 89 physicians of various specialties working in the departments of anesthesiology and intensive therapy, cardiovascular intensive care, cardiology and cardiac surgery as well as surgery, oncology, orthopedics and traumatology in two hospitals in a voivodship city in Poland in the period from January to February 2019. Medical staff of all of these wards treat patients in life-threatening conditions requiring special care and supervision. The study was approved by the Bioethics Committee and authors obtained permission from the hospitals' directors' and from the physicians who agreed to take part in the survey. The research was carried out with particular emphasis on ethical principles. In addition, the study was voluntary and the respondents were informed that they would remain anonymous, and the obtained data would be generalized and would be used only for scientific work. All participants completed the surveys through personal contact and face-to-face conversation with the researcher. In effect all the questionnaires that were distributed have been returned to the authors.

The conducted study used standardized measurement tools and its own questionnaire to collect sociometric data, which included single-choice questions about sex, age, marital status, specialization, internship and main workplace in the ward.

To assess the level of perceived stress, the Perceived Stress Scale (PSS-10) by S. Cohen, T. Kamarck, R. Mermelstein was used in the Polish adaptation [8]. The PSS-10 scale is used to assess the intensity of stress associated with the responder's own life situation over the past month. It contains 10 questions, of which six questions are constructed negatively (1, 2, 3, 6, 9 and 10), and four questions are structured positively (4, 5, 7 and 8). Each question begins with the phrase "How often in the last month...", where 0 means never, 1 – almost never, 2 – sometimes, 3 – quite often, 4 – very often. The result for each question ranges from 0 to 4 points, and the overall score is from 0 to 40 points. The higher the score, the higher the level of stress in the responder. In the assessment of coping strategies in stress situations, the Mini-COPE questionnaire – Inventory for Measuring Cope with Stress authored by Ch.S. Carver in the Polish adaptation was used [8]. The structure of the questionnaire is based on an interactive theoretical model according to which the remedial actions taken by a person in stressful situations are the effect of interaction between the style of coping characteristic of a given person and the characteristics of the situation. Mini-COPE contains 28 sentences characteristic for a given method of coping with stress. The strategies have been divided into four categories: I. Active coping (including: Active Coping; Planning; Positive reappraisal), II. Helplessness (Use of psychoactive substances; Suppression of activities; Self-blame), III. Seeking support (Seeking emotional support; Seeking instrumental support), IV. Avoidant behaviors (Dealing with something else; Denial; Venting of emotions). Three strategies create independent factors: Turning to religion,

Acceptance, Sense of humor. The responses assessed claims about behavior in a stress situation on a scale from 0 to 3, where 0 meant I almost never do this, 1 – I rarely do this, 2 – I often do this, 3 – I almost always do this. The scale reliability is 0.86.

Statistical analysis

The analysis was carried out in the R program, version 3.5.2 [9].

The analysis of quantitative variables was carried out by calculating the mean, standard deviation, median, quartiles, minimum and maximum, while the analysis of qualitative variables was carried out by calculating the number and percentage of occurrences of each value. The comparison of values of qualitative variables in groups was made using the χ^2 test (with Yates correction for 2×2 tables) or the exact Fisher test where low expected frequencies appeared in the tables.

The comparison of the values of quantitative variables in two groups was performed using Student's *t* test or the Mann-Whitney test, and the comparison of the values of the quantitative variables in three or more groups was performed by means of the ANOVA or Kruskal-Wallis test. After detection of statistically significant differences, post-hoc analysis was performed using Fisher's LSD test or Dunn's test. Correlations between quantitative variables were analyzed using the Pearson or Spearman correlation coefficient. The normality of the variable distribution was examined using the Shapiro-Wilk test. The significance level of 0.05 was assumed in the analysis. $P < 0.05$ was adopted as significant.

RESULTS

Completed questionnaires were obtained from 89 physicians, including 52 men (58.4%) and 37 women (41.6%). The mean age of the respondents was 40.33 years (SD = 10.29) and ranged from 25 to 64 years. Seventy-one out of 89 participants of the survey (79.8%) were in a relationship, 15 respondents (16.9%) were not in a relationship, and 3 respondents (3.4%) did not answer this question. Taking into account the ward in which the respondents work, 26 of them (29.2%) indicated the department of Surgical Care Unit, 24 (27%) Intensive Care Unit, 16 (18%) worked in the clinic of cardiology and cardiac surgery (Cardiac Care Unit), 14 (15.7%) in the Orthopedic and Trauma Care Unit and 9 (10.1%) in the Cardiovascular Surgery Intensive Care Unit. Fifty-one respondents (57.3%) had worked in the ward for up to 10 years, 23 (25.8%) from 11 to 19 years, and 15 (16.9%) for 20 years or more. Concerning the work schedule, 59.6% worked in the 8-hour system, 15.7% in the 12 and 24-hour system, 13.5% in the 24-hour system, 5 respondents (5.6%) had 12-hour shifts, 4 (4.5%) had 8-, 12- and 24-hour shifts and 1 respondent (1.1%) did not answer this question. Out of 89 participants, as many as 75 (84.3%) answered that they take additional working hours. In turn, taking into account the type of the center, 53 respondents (59.6%) indicated a voivodship center, 20 (22.5%) poviat, 12 (13.5%) academic and 3 respondents (3.4%) both academic and voivodship hospitals. One respondent (1.1%) did not answer this question.

It was found that 46 out of 89 participants (51.7%) had high stress levels, 23 (25.8%) average stress levels, and 20 (22.5%) low levels of stress (Table 1). The relationship between the level of perceived stress among groups in reference to age, sex, marital status, ward and work experience in the ward, specialization, working system and overtime work were also examined. It was found that in women, the level of stress was significantly higher than in men ($P < 0.05$). The above values are presented in Table 2. According to the professional experience, responders were divided into three groups: working up to 10 years, between 11 and 19 and 20 those working for years or more. In order to answer the question about the relation between stress level and work experience, a post-hoc analysis was made. It showed that in the group of physicians working for 11-19 years, the level of stress is significantly higher than in those working less than 10 years or for 20 years or more (Table 3). After taking into consideration the work system, it was noted that almost 60% of respondents had been working in the 8-hour

TABLE 1. Level of stress in the examined group of doctors obtained from the Perceived Stress Scale (PSS-10)

PSS-10 – points	Interpretation	*n*	%
0–13	Low stress level	20	22.47
14–19	Medium stress level	23	25.84
19 and more	High stress level	46	51.69

TABLE 2. Stress level in the examined group in relation to sex

PSS-10 – points	Female ($n = 37$)	Male ($n = 52$)	*P**
Mean ± SD	20.84 ± 6.83	17.56 ± 6.35	0.011
Median	22	17.5	
Quartiles	17–25	13–22	

TABLE 3. Stress level in the examined group in relation to work experience

PSS-10 – points	Up to 10 years ($n = 51$) – A	11–19 years ($n = 23$) – B	20 years and more ($n = 15$) – C	*P**
Mean ± SD	18.57 ± 5.55	21.96 ± 6.95	15.47 ± 8.29	0.015
Median	19	23	15	
Quartiles	13.5–22	19.5–26	12.5–23	B > A, C

*No normality of distribution in groups, Kruskal-Wallis test + post-hoc analysis results (Dunn's test).

TABLE 4. Stress level in the examined group in relation to work system

PSS-10 – points	8-h ($n = 53$)	Other ($n = 35$)	P*
Mean ± SD	17.98 ± 6.59	20.49 ± 6.76	0.048
Median	17	22	
Quartiles	13–22	18–24	

*No normality of distribution in groups, Mann-Whitney test.

system. The remaining respondents had been working in another system, i.e. 12-hour and 24-hour. To facilitate the statistical analysis those who had not been working in 8-hour shifts were combined into one group, named "Other". There was a significant relationship ($P < 0.05$) between stress level and type of working shift. Physicians working in a system other than the 8-hour shift had significantly higher stress level compared to responders working in the 8-hour shift system (Table 4). The analysis of the potential influence of overtime work on the level of stress revealed a significantly higher level of stress is in physicians who work overtime ($P = 0.034$).

Post-hoc analysis of the relationship between the stress level and the type of hospital showed that working in a voivodship or poviat center results in significantly higher stress level compared to working in an academic center ($P = 0.006$). There were no significant relationships with respect to the age of the respondents, marital status, work ward and specialization ($P > 0.05$). Concerning the applied coping strategies in difficult situations, it was found that the respondents most often used planning strategies, active coping and seeking emotional support (average between 2 and 3, so these strategies were used between "often" and "always"). The detailed results are presented in Table 5.

It was found out that the age of the surveyed physicians correlates significantly and negatively with the use of a strategy of sense of humor, so the older the doctor is, this less frequently the strategy is used ($P = 0.03$). There was also a significant difference between sexes in the use of the strategies of active coping, seeking emotional and instrumental support, dealing with something else, venting and blaming themselves – they were more often used by women. The data are presented in Table 6.

It was found out that the strategy of sense of humor was used significantly more often by people who had been in a relationship and the strategies of seeking instrumental support and blaming themselves were used by lonely people ($P < 0.05$). The self-blame strategy was significantly more often used by people working in the Anesthesiology and Intensive Therapy Unit and in the Department of Intensive Cardiac Surveillance than by those working in the Department of Cardiology and Cardiac Surgery and the Orthopedics and Traumatology Department, and was more often used by physicians working in the Department of Surgery than by those working in the Orthopedic Department and Traumatology. The results are presented in Table 7.

Different ways of dealing with stress in relation to the working experience, type of work shift and type of hospital were analyzed. It was found that the planning strategy was used significantly more often by people with working experience between 11-19 years than by those working less than 10 or for those working for 20 years and more. The opposite situation was found with the strategy of religion related approach, which was more often used by the less and the most experienced respondents

TABLE 5. Strategies of coping with stress in the examined group obtained from the MINI-COPE questionnaire

Strategies	n	Mean	SD	Median	Min	Max	Q1	Q3
1: Active coping	89	2.36	0.64	2.5	0	3	2	3
2: Planning	89	2.36	0.61	2.5	0.5	3	2	3
3: Positive reappraisal	89	1.69	0.65	2	0	3	1.5	2
4: Acceptance	89	1.86	0.65	2	0	3	1.5	2
5: Sense of humor	89	0.96	0.8	0.5	0	3	0.5	1.5
6: Turning to religion	89	0.65	0.83	0	0	3	0	1
7: Seeking emotional support	89	2.01	0.91	2	0	3	1.5	3
8: Seeking instrumental support	89	1.9	0.92	2	0	3	1	2.5
9: Dealing with something else	89	1.76	0.79	2	0	3	1.5	2.5
10: Denial	89	0.67	0.74	0.5	0	3	0	1
11: Venting of emotions	89	1.66	0.72	1.5	0	3	1.5	2
12: Use of psychoactive substances	89	0.5	0.76	0	0	3	0	1
13: Suppression of activities	89	0.61	0.57	0.5	0	2	0	1
14: Self-blame	89	1.48	0.92	1.5	0	3	1	2

TABLE 6. Strategies of coping with stress in the examined group obtained from the MINI-COPE questionnaire in relation to sex

Strategies		Female ($n = 37$)	Male ($n = 52$)	P*
1: Active coping	Mean ± SD	2.57 ± 0.54	2.21 ± 0.67	0.007
	Median	3	2.5	NP
	Quartiles	2–3	2–2.5	
2: Planning	Mean ± SD	2.47 ± 0.62	2.28 ± 0.6	0.101
	Median	2.5	2	NP
	Quartiles	2–3	2–3	
3: Positive reappraisal	Mean ± SD	1.65 ± 0.68	1.72 ± 0.63	0.823
	Median	2	2	NP
	Quartiles	1–2	1.5–2	
4: Acceptance	Mean ± SD	1.84 ± 0.66	1.88 ± 0.66	0.829
	Median	2	2	NP
	Quartiles	1.5–2.5	1.5–2	
5: Sense of humour	Mean ± SD	0.8 ± 0.69	1.08 ± 0.85	0.149
	Median	0.5	1	NP
	Quartiles	0.5–1.5	0.5–1.5	
6: Turning to religion	Mean ± SD	0.69 ± 0.86	0.62 ± 0.82	0.772
	Median	0	0	NP
	Quartiles	0–1	0–1	
7: Seeking emotional support	Mean ± SD	2.46 ± 0.7	1.68 ± 0.9	< 0.001
	Median	3	2	NP
	Quartiles	2–3	1–2.5	
8: Seeking Instrumental Support	Mean ± SD	2.31 ± 0.85	1.62 ± 0.86	< 0.001
	Median	2.5	2	NP
	Quartiles	2–3	1–2	
9: Dealing with something else	Mean ± SD	2.04 ± 0.82	1.57 ± 0.72	0.006
	Median	2	1.5	NP
	Quartiles	1.5–2.5	1.5–2	
10: Denial	Mean ± SD	0.76 ± 0.8	0.62 ± 0.68	0.478
	Median	1	0.5	NP
	Quartiles	0–1	0–1	
11: Venting of emotions	Mean ± SD	1.85 ± 0.78	1.53 ± 0.65	0.036
	Median	2	1.5	NP
	Quartiles	1.5–2.5	1.38–2	
12: Use of psychoactive substances	Mean ± SD	0.45 ± 0.78	0.54 ± 0.75	0.363
	Median	0	0	NP
	Quartiles	0–1	0–1	
13: Suppression of activities	Mean ± SD	0.54 ± 0.57	0.65 ± 0.56	0.328
	Median	0.5	0.5	NP
	Quartiles	0–1	0–1	
14: Self-blame	Mean ± SD	2 ± 0.71	1.11 ± 0.88	< 0.001
	Median	2	1	NP
	Quartiles	1.5–2.5	0.5–2	

*P – normal distribution in groups, Student's *t* test; NP – no normality of distribution in groups, Mann-Whitney test

TABLE 7. Strategies of coping with stress in the examined group obtained from the MINI-COPE questionnaire in relation to ward

Strategies		ICU ($n = 24$) – A	Cardiovascular Unit ($n = 9$) – B	Surgery ($n = 26$) – C	Cardiac Care Unit ($n = 16$) – D	Orthopedic and Trauma ($n = 14$) – E	*P**
1: Active coping	± SD	2.44 ± 0.76	2.56 ± 0.58	2.29 ± 0.57	2.28 ± 0.77	2.32 ± 0.46	0.495
	Median	2.75	3	2	2.5	2.5	NP
	Quartiles	2–3	2–3	2–3	2–2.62	2–2.5	
2: Planning	± SD	2.6 ± 0.57	2.44 ± 0.68	2.13 ± 0.71	2.44 ± 0.51	2.21 ± 0.38	0.064
	Median	–	2.5	2	2.5	2	NP
	Quartiles	2–3	2–3	2–3	2–3	2–2.5	
3: Positive reappraisal	± SD	1.65 ± 0.62	1.72 ± 0.87	1.58 ± 0.59	1.62 ± 0.67	2.04 ± 0.57	0.177
	Median	1.5	2	1.75	1.75	2.25	NP
	Quartiles	1.5–2	1.5–2	1–2	1.5–2	1.62–2.5	
4: Acceptance	± SD	2 ± 0.55	1.67 ± 0.87	1.77 ± 0.59	1.88 ± 0.89	1.89 ± 0.49	0.543
	Median	2	1.5	2	2	2	NP
	Quartiles	1.5–2.5	1.5–2	15–2	1.38–2.5	1.62–2	
5: Sense of humor	± SD	0.9 ± 0.96	0.89 ± 0.6	0.85 ± 0.77	1.22 ± 0.77	1.04 ± 0.72	0.481
	Median	0.5	0.5	0.5	1.25	1	NP
	Quartiles	0–1.5	0.5–1.5	0.5–1	0.5–1.62	0.5–1.5	
6: Turning to religion	± SD	0.46 ± 0.62	1.06 ± 1.1	0.65 ± 0.81	0.81 ± 1.06	0.54 ± 0.66	0.65
	Median	0	1	0.5	0	0.25	NP
	Quartiles	0–1	0–2	0–1	0–1.62	0–1	
7: Seeking emotional support	± SD	2.1 ± 0.85	2.11 ± 0.96	2 ± 0.95	1.94 ± 1.03	1.86 ± 0.84	0.914
	Median	2	2	2	2	2	NP
	Quartiles	1.88–3	2–3	1.5–3	1–3	1.12–2.5	
8: Seeking instrumental support	± SD	2.02 ± 1.01	2.06 ± 1.01	1.87 ± 0.92	1.75 ± 0.93	1.86 ± 0.74	0.776
	Median	2	2	2	2	2	NP
	Quartiles	1.5–3	2–3	1.12–2.5	1–2.5	1.62–2.38	
9: Dealing with something else	± SD	2.06 ± 0.89	2 ± 0.83	1.63 ± 0.59	1.5 ± 0.89	1.64 ± 0.72	0.099
	Median	2	2	1.5	1.5	1.5	NP
	Quartiles	1.5–3	1.5–2.5	1.5–2	0.88–2	1.5–2	
10: Denial	± SD	0.75 ± 0.66	0.44 ± 0.46	0.58 ± 0.8	0.66 ± 0.77	0.89 ± 0.86	0.536
	Median	1	0.5	0.25	0.5	1	NP
	Quartiles	0–1	0–1	0–1	0–1	0–1.5	
11: Venting of emotions	± SD	1.88 ± 0.85	1.5 ± 0.79	1.54 ± 0.6	1.75 ± 0.71	1.54 ± 0.66	0.24
	Median	2	1.5	1.5	2	1.5	NP
	Quartiles	1.5–2.5	1.5–2	1.5–2	1.5–2	1–1.88	
12: Use of psychoactive substances	± SD	0.44 ± 0.83	0.56 ± 0.85	0.4 ± 0.57	0.5 ± 0.91	0.75 ± 0.78	0.526
	Median	0	0	0	0	1	NP
	Quartiles	0–0.62	0–1	0–0.88	0–0.62	0–1	
13: Suppression of activities	± SD	0.54 ± 0.59	0.61 ± 0.6	0.63 ± 0.52	0.47 ± 0.56	0.82 ± 0.61	0.489
	Median	0.5	0.5	0.5	0.25	1	NP
	Quartiles	0–1	0–1	0.12–1	0–1	0.5–1	
14: Self-blame	± SD	1.92 ± 0.76	2 ± 0.79	1.58 ± 0.88	1.06 ± 0.87	0.68 ± 0.72	< 0.001
	Median	2	2	1.5	1	0.75	NP
	Quartiles	1.5–2.5	1.5–2.5	1–2	0.5–1.62	0–1	B, A > D, E C > E

*P – normal distribution in groups, ANOVA + post-hoc results (Fisher's LSD test), NP – lack of normality of distribution in groups, Kruskal-Wallis test + post-hoc results (Dunn test).
ICU – Intensive Care Units, Cardiovascular Unit – Cardiovascular Surgery Intensive Care, Surgery – Surgical Care Unit, Cardiac Care Unit, Orthopedic and Trauma – Orthopedic and Trauma Care Unit

($P < 0.05$). The strategies of sense of humor and religion were significantly more often used by people working in the 8-hour system, and the planning strategy by people working in other systems ($P < 0.05$). The strategy of sense of humor was also significantly more often used by physicians working in academic centers than by those working in poviat centers ($P < 0.05$). Interestingly, no significant difference were found when analyzing the relation between abovementioned strategies and the physicians' specialization and the fact of working overtime ($P > 0.05$).

DISCUSSION

Treating a seriously ill patient is a particularly difficult experience and requires large amounts of physical and mental strength. Considering that many stressors encountered by ICU physicians are almost continuously present and will remain unchanged, such as dealing with suffering or death of patients, it is important to lower their levels. As shown in this study, the vast majority of responders declared that stress is an integral part of their professional work and more than 50% of physicians surveyed reported stress level as high. In Poland, Kwiatosz-Muc *et al*. [7] carried out a study of the level of stress among anesthesiologists in the intensive care unit. In that study, however, a moderate level of experienced stress was noted by ICU medical personnel. Similar results were also obtained in studies conducted in international centers [10, 11]. Interestingly, a greater level of perceived stress was declared by women. It can be assumed that this is related to the greater emotionality of women and their adoption of an overly empathic attitude towards the patient and their family, which consequently leads to being too self-responsible for the life and health of the treated patients.

Some studies confirm that more experienced anesthesiologists have better ability to deal with potentially stressful situations and work overload. This ability is less frequently observed in young physicians working in the ICU [12]. This is partly confirmed by the presented study, which showed that the level of stress in the group of physicians with working experience between 11 and 19 years is significantly higher than in those working for 20 years or more. It can be assumed that in the case of people who have worked for the longest time, contact with death and a seriously ill persons has become a kind of everyday life, and therefore they are able to keep these situations in perspective and have better coping abilities. It was also observed that anesthesiologists in the age group between 31 and 40 years are more prone to the development of burnout syndrome and show greater dissatisfaction with their work [12].

The results obtained in this study show how physicians manage to deal with a difficult and complex ICU environment and what strategies they undertake. Their attitude includes using more than one stress diminishing strategy and the approach used most often consists of planning, active coping and seeking emotional support. From the psychological point of view, these are adaptation strategies. The problem-solving strategy aims to change the situation through a critical and insightful assessment of the problem, while planning gives a sense of control over the situation. Instead of canceling or removing a stressor from everyday life, a person who undertakes such coping decides to solve their problems by being able to cope with the pressure, reducing or eliminating the stressful situation [5].

Applying these strategies can strengthen the individual and increase their motivation as well as job satisfaction. Moreover, studies have shown that people who were trained to develop proactive strategies such as direct problem solving were more effective in coping with stress, had a stronger sense of personal achievement, were less emotionally deprived and had higher mental resilience, which means less exposure at the risk of psychological complications [13]. The strategies of denying, cessation of activities and the use of psychoactive substances have been least frequently used. It is a positive finding as these are non-adaptive strategies and usually do not lead to desired results. A person undertaking such actions tries to escape from difficult circumstances, falsifying their real image and not taking into account real facts, pushing away negative thoughts and feelings without changing the situation and further increasing stress, hindering interpersonal relations and professional dissatisfaction [5].

The strategies of coping with stress in work at the ICU described in this study are consistent with similar results that can be found in international literature. Active coping methods by focusing on the problem or planning are also the preferred methods of physicians in a study conducted among orthopedist physicians and traumatologists at a university hospital in the USA [14], among Emergency Unit staff members in France [15], anesthesiologists in Saudi Arabia [16], oncologists in Oncology Hospitals in Turkey [17], and even nurses working in emergency departments [18]. The search for emotional support and conversations with family and friends was a frequently used strategy [19]. This is important because isolation from loved ones may be associated with higher rates of psychological problems and burnout syndrome (BS) [13]. Analyzing the sex of the surveyed physicians, it was found that the strategies of active coping, seeking emotional and instrumental support, dealing with something else,

venting and blaming themselves were significantly more often used by women than by men. These results are consistent with international studies [16]. Moreover, it was found that women, unlike men, more often used maladaptive coping strategies, which can also explain the significantly higher level of perceived stress obtained in this study. Interestingly, the blame strategy was also more often used by people working in the ICU, Cardiovascular Surgery Intensive Care unit and surgery departments than by those working in the Department of Cardiology and Cardiac Surgery or Orthopedics and Traumatology. This is probably due to the fact that anesthesiologists and medical staff of intensive care units and cardiological supervision often face critical situations. Usually, these are emergencies, and their consequences can be serious, such as deterioration of organ functions and subsequent chronic organ dysfunction, and quite often human death. They therefore require immediate rescue interventions. It happens, however, that despite the efforts of medical personnel and the application of all available therapeutic measures, patient death is inevitable. In social culture, however, there is a widespread belief that the doctor is the protector of life, which further intensifies the perception of the death of the patient as a failure of treatment, thereby increasing the guilty conscience and guilt of the physicians.

In order to be able to cope with the specific nature of ICUs, medical staff also develops specific types of attitudes and behavior, ranging from excessive empathy to cold distancing or closing problems in a hospital environment. These approaches, however, seem inappropriate and will not solve the problem in the long run. Finally, it can affect the quality of relationships with dying patients and their families or result in rapid emotional exhaustion of the medical team [20]. Nowadays, the health service puts a great emphasis on creation of the greatest possible comfort for patients and their relatives, with the needs of employees often being marginalized. And yet, developing close relationships with patients, medical staff also suffers from their loss, and the results clearly show that physicians are experiencing the sadness associated with the patient's death from the moment of death as a prognosis [21]. What's more, Artiss and Levine [22] have shown that physicians have great difficulty in maintaining their balance when their patient passes away, and the most common defensive reactions are aggression, denial, isolation or excessive distance. Yet another way to deal with these difficulties is the language. The role it plays is probably the most evident in the conversations about death and dying patients through the use of euphemisms and exaggerated sense of humor [19]. Although in the medical context they can alleviate the reality of severe clinical practices and reduce the feeling of helplessness, on the other hand abnormalities in the communication with the patient may result in greater pain sensation and heighten difficulties in adapting to the disease [20]. In this study, however, it was noted that with increasing age of physicians, the strategy of humor was used less frequently.

The attitudes mentioned above can certainly help to protect oneself in the confrontation with the difficult environment of the ICU and dying patient. The tension associated with strongly experienced emotions in the face of death, suffering and the overwhelming environment of ICUs is also effectively relieved by conversations and sharing of this topic with colleagues from individual departments. Such practices in the field of conducting clinical supervision were described by Nyklewicz and Krajewska-Kułak [23]. It seems also legitimate to include a psychologist in the work of the ward. There is no doubt that bad professional functioning affects not only one's own self-esteem but also other aspects of life, e.g. family relationships or social relations. As seen from the above considerations, the importance of the problem is significant and requires prophylactic measures to ensure mental comfort both for medical staff and indirectly for patients and their families. It is also worth mentioning that a significant proportion of hospitals cope well with these requirements. However, further verification of stress factors in the work of ICU physicians seems to be crucial in order to learn how to effectively deal with them in difficult situations.

LIMITATIONS

This study has several limitations. First of all, a relatively small sample of 89 physicians limits the representativeness of the results and the statistical power of the analyses. The main limitation of the presented study is also related to the fact that the data verification was carried out in a relatively short time. Secondly, due to the organizational tasks and the specific nature of the operation of the hospital, it was not possible to precisely distinguish between anesthesiologists working in the intensive care unit and those who work mainly in the operating theater. Many physicians worked in several wards at the same time, for example, surgery and ICU and/or cardiology and ICU.

It is also worth asking whether the stress related to the ICU environment is such an objective experience that it can be included in the context of normative analysis to look for its common properties and reduce it to one, all-embracing pattern, explaining it even with the heterogeneity of the studied population.

Likewise, data collection was also a challenge, as ICU physicians were working on various shifts, usually continuously fulfilling their work duties, so that the time for collection of data and time spent on the ward were very limited.

CONCLUSIONS

Over half of the surveyed ICU physicians reported a high level of stress. In women, the level of stress is significantly higher than in men. The strongest stress was reported by physicians with work experience between 11 and 19 years. In people working in the 12-hour and 24-hour system and taking overtime hours, the stress level was the highest. Most physicians have used constructive coping strategies in difficult situations, i.e. planning, active coping and seeking support.

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