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Professional work not only meets existential needs but also fosters personal development and fulfillment. The nursing profession, rooted in the desire to help others, holds a unique place in this context (1). However, the number of people pursuing nursing education and entering the profession declines each year. Young people are discouraged by low prestige, high physical and mental demands, and inadequate compensation. Additionally, the aging nursing workforce further complicates recruitment and retention efforts (2). Given the vital role of nurses in therapeutic teams and their proportion in the healthcare workforce, it is essential to understand the factors contributing to professional burnout (3). Burnout leads to various individual and societal issues, including sleep disorders, behavioral problems, and disturbances in immune, digestive, and circulatory systems. It affects personal life, reduces work quality, increases medical errors and sick leave, and contributes to staffing shortages as many nurses leave the profession. In severe cases, burnout can result in addiction, depression, or suicide (4). ICU nurses are particularly vulnerable due to the high emotional demands of their work, including constant vigilance, time-pressured decisions, and frequent exposure to critical patient conditions. Prolonged stress and insufficient coping mechanisms increase the risk of burnout. Economic pressures, staffing shortages, shift work, and sleep deprivation further exacerbate the problem, contributing to higher rates of psychosomatic illnesses such as cancer and mental health disorders. Exploring the link between burnout and psychosomatic diseases is crucial, given the premature mortality in this profession (5). The concept of professional burnout was first introduced in 1974 by American psychiatrist Freudenberger (6), who defined it as a decrease in an individual's energy level, resulting from the overload of dealing with other people's problems and the excessive demands placed by the work environment. Burnout is a state of fatigue or frustration arising from devoting oneself to a cause, lifestyle, or relationship that does not yield the expected rewards. In essence, failure to achieve a goal leads to discouragement and apathy (7). Burnout is a psychosocial phenomenon that arises as a response to chronic interpersonal stressors observed in the workplace. This syndrome reflects an ongoing process. According to Maslach, burnout involves three key elements: loss of energy, where the individual feels overwhelmed, stressed, and exhausted; loss of enthusiasm, where cynicism replaces passion, patients are perceived as burdens, there is a sense of threat from superiors, and colleagues are seen as obstacles; and loss of confidence, as the lack of engagement and motivation makes it difficult to see the positive aspects of professional activity. Skills such as expertise, creativity, and empathy diminish, and the individual enters an energy-saving mode (8, 9). Pines and Aronson define burnout as a state of physical, emotional, and mental exhaustion caused by prolonged involvement in emotionally demanding situations (10). What distinguishes burnout from other concepts, such as job-related stress, fatigue, alienation, depression, and existential crisis, is that burnout is always the final result of a gradual disillusionment with the idea of finding meaning in professional life. According to Pines, engagement in one's work is understood as a factor contributing to fulfillment in the profession, mental wellbeing, and possessing the necessary competencies to perform duties in the workplace (11). From another perspective, Cherniss linked burnout with changes in motivation, describing it as withdrawal from professional activity due to excessive stress or dissatisfaction with one's job (12). According to him, burnout is caused by prolonged stress, leading to fatigue, impulsivity, and a feeling of tension. With burnout comes a loss of enthusiasm, commitment, and a sense of purpose, eventually resulting in isolation, emotional distancing from patients, and cynical or even abrasive behavior. Burnout is the body's response to stress caused by the work environment, particularly when the job fails to provide satisfaction, when the employee is overloaded with responsibilities, faces excessive demands, or when the work becomes monotonous and boring. Stress from overwork leads to the burnout effect. A characteristic feature of those affected by burnout is the discrepancy between feeling competent and completely ineffective. These individuals lose engagement and see no value in their actions (13). Schaufeli and Enzmann compared burnout syndrome to a battery that gradually discharges despite being supplied with energy, as more is drawn from it than it receives (4). Engagement in work is not commensurate with what the employee receives in return. According to the researchers, burnout is "a persistent, negative state related to work that occurs in generally healthy individuals. It is primarily characterized by exhaustion, accompanied by psychological and physical discomfort, a sense of decreased efficacy, reduced motivation, and dysfunctional attitudes and behaviors at work. This state develops gradually and stems from a mismatch between professional intentions and realities. Burnout is often a self-perpetuating process due to inadequate coping strategies" (14). Stress arises from various factors, typically categorized into three main stressors: physical, social, and psychological. Physical stressors disrupt the body's equilibrium and include changes in temperature, pressure, humidity, noise, strong light, radiation, and vibrations. Social stressors are related to group life, especially in the workplace. Sources of stress in this context may include poor communication, lack of acceptance or understanding of norms, and flawed group structures. Stress can result from the communication style and a lack of proper interaction between employees and supervisors or among co-workers (15). Psychological sources of stress are divided into four categories: disturbances, threats, overload, and deprivation. Disturbance occurs when specific circumstances force an individual to exert more effort. A threat is a situation where there is a likelihood of an accident, bodily harm, material, or moral loss. Threat-related stress can stem from a real situation or anticipated danger. Threats may be physical or social, linked to fulfilling multiple social roles, continuous competition, or being subjected to constant evaluation by others. Overload occurs when an individual performs tasks at the limit of their physical and mental capabilities. A form of overload is discomfort, such as working in unpleasant conditions. Deprivation is a state of chronic unfulfilled needs, which can occur in situations like being in shelters, psychiatric hospitals, submarines, or polar expeditions (16). 1.1 Aim The aim of this study was to assess factors influencing professional burnout among nursing staff in intensive care units (ICUs). 2 Methods 2.1 Research design The study was conducted among a group of nurses participating in qualification and specialization training courses at the European Centre for Postgraduate Education in Wrocław. The study was anonymous and voluntary, and it took place between March and November 2019. The project was approved by the Bioethics Committee at the Wrocław Medical University (Approval No. KB-12/2019) and the Directorate of the European Centre for Postgraduate Education in Wrocław. Incomplete responses to the questionnaire or failure to meet any of the inclusion criteria resulted in the exclusion of the questionnaire from further analysis. 2.2 Sample size A total of 286 questionnaires were collected, but 4 (1.4%) were excluded due to incomplete responses or failure to meet the inclusion criteria. Eleven individuals did not consent to participate in the study. The participants were informed about the purpose, assumptions, and course of the study. All respondents provided informed consent to participate. 2.3 Recruitment The following inclusion criteria were established for recruitment to the study: possessing a valid nursing license; current employment in an intensive care unit (ICU); at least 2 years of work experience; and consent to participate in the study. 2.4 Outcome measures 2.4.1 Demographic and work-related data questionnaire The demographic section consisted of 9 questions and allowed for the collection of variables related to sociodemographic characteristics such as sex, age, education (including postgraduate), marital status, and place of residence. In terms of work-related characteristics, the questionnaire gathered information on years of experience in the profession, years of experience in an intensive care unit (ICU), and work system. 2.4.2 Maslach burnout inventory (MBI) The Maslach Burnout Inventory (MBI), developed by Christina Maslach (17), in its Polish adaptation (18), allows for the assessment of three dimensions of professional burnout: emotional exhaustion, depersonalization, and personal achievement. The questionnaire consists of 22 statements across three subscales: 9 statements on emotional exhaustion, 5 on depersonalization, and 8 on reduced personal achievement. Respondents rated each statement on a four-point scale assessing the frequency of their feelings: 1 – very often, 2 – sometimes, 3 – rarely, 4 – never. Results for each subscale are expressed on a scale from 0 to 100, where higher scores indicate higher levels of burnout. Additionally, a general burnout index is calculated as the average score from the three subscales. This questionnaire is the most commonly used tool for assessing professional burnout (19). 2.4.3 Mini-COPE inventory for coping with stress The Mini-COPE Inventory is used to assess typical ways of reacting and coping in situations of severe stress. The inventory consists of 28 statements divided into 14 stress-coping strategies (with two statements per strategy). The Polish version was developed by Juczyński and Ogińska-Bulik (20). The coping strategies include Active Coping, Planning, Positive Reappraisal, Acceptance, Sense of Humor, Turning to Religion, Seeking Emotional Support, Seeking Instrumental Support, Engagement in Distraction Activities, Denial, Venting, Substance Use, Behavioral Disengagement, and Self-Blame. Responses are rated on a scale from 0 to 3 points: 0 – I almost never act this way, 1 – I rarely act this way, 2 – I often act this way, 3 – I almost always act this way. 2.4.4 Perceived stress scale (PSS-10) The Perceived Stress Scale (PSS-10) was originally developed by Cohen, Kamarck, and Mermelstein (21), and the Polish adaptation was created by Juczyński and Ogińska-Bulik (20). The scale consists of 10 questions related to subjective feelings about personal problems, behaviors, and ways of coping with stress. Respondents answered each question using a five-point scale assessing thoughts and feelings experienced in the last month: 0 – never, 1 – almost never, 2 – sometimes, 3 – fairly often, 4 – very often. 2.5 Statistical analysis Quantitative variables (i.e., those expressed numerically) were analyzed by calculating the mean, standard deviation, median, quartiles, minimum, and maximum values. Qualitative variables (i.e., those not expressed numerically) were analyzed by calculating the number and percentage of occurrences of each value. The Mann–Whitney test was used to compare the values of quantitative variables between two groups. The Kruskal-Wallis test was applied for comparisons across three or more groups. Post-hoc analysis was performed using Dunn's test to identify statistically significant differences between groups when statistically significant differences were detected. Correlations between quantitative variables were analyzed using Spearman's correlation coefficient. Multivariate analysis of the independent influence of multiple variables on a quantitative variable was performed using linear regression. The results were presented as regression model parameter values with a 95% confidence interval. A significance level of 0.05 was assumed for the analysis, meaning that all p-values below 0.05 were interpreted as indicating statistically significant relationships. The analysis was conducted using R software, version 3.6.2. 2.6 Ethics statement The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of Wrocław Medical University no. KB-12/2019. 3 Results 3.1 Participants The study group consisted of 282 individuals. The average age was 42.24 years (SD = 9.62), ranging from 24 to 60 years. The largest group was in the 41–50 age range (42.91%). Women dominated the group, representing 93.62% of respondents. The distribution of educational levels (secondary, bachelor's, and master's) was comparable. A slightly larger group had a master's degree (35.82%). The most common form of postgraduate education was qualification courses, held by 70.57% of respondents. Slightly fewer (63.12%) had completed specialist courses, and more than half had completed a specialization. Nearly one in 10 respondents (9.57%) had completed other forms of postgraduate education. The average length of professional experience was 19.97 years (SD = 10.45), ranging from 2 to 40 years. The largest group, over one-third of the respondents, had 21–30 years of work experience. The average length of experience in an ICU was 14.26 years (SD = 9.24), ranging from 2 to 40 years, with most nurses (40.43%) having up to 10 years of ICU experience. The majority of respondents (83.69%) reported working in a shift system. Marital status included both partnered and single individuals, with nearly three-quarters of respondents being in a relationship. Over three-quarters of the respondents lived in a city. Detailed results are presented in Supplementary Table S1. 3.2 Results of the MBI questionnaire The MBI assesses the level of professional burnout in three dimensions (subscales): emotional exhaustion, depersonalization, and lack of personal achievement. Scores for each subscale are expressed on a scale of 0–100, where higher scores indicate a higher level of burnout. Additionally, a general burnout index is calculated as the average of the three subscales. There are no standardized norms to determine whether burnout is severe among respondents. The overall burnout index averaged 39.78 points out of a possible 100 (SD = 20.7), with a range from 0 to 93.33 points (detailed results are presented in Supplementary Table S1). Burnout among respondents was most strongly associated with emotional exhaustion (mean score of 53.03 points), followed by depersonalization (mean score of 39.79 points), and to a lesser extent, a lack of personal achievement (mean score of 26.51 points). Correlations between years of professional experience and work in the ICU with the level of burnout are presented in Table 1, and the analysis of sex and education in relation to the level of professional burnout is presented in Table 2 (detailed subscale results are available in Supplementary Table S2). Table 1. Correlations between job tenure in the profession and work in the ICU with the level of burnout. Table 2. Analysis of sex and education in relation to the level of occupational burnout. 3.3 Results of the PSS-10 questionnaire The PSS-10 questionnaire allows for the assessment of the severity of perceived stress. For the PSS-10, sten norms are available, enabling the interpretation of raw scores. Typically, sten scores of 5 and 6 indicate average stress levels, sten scores from 7 to 10 represent high stress levels, and sten scores from 1 to 4 reflect low stress levels. Out of 282 participants, 122 (43.26%) reported high stress levels, 104 (36.88%) had moderate stress levels, and 56 (19.86%) reported low stress levels. The data are presented in the Supplementary Table S3. 3.4 Results of the mini-COPE questionnaire The Mini-COPE questionnaire assesses the frequency of using 14 stress-coping strategies. Each strategy is represented by two questions in the questionnaire, for which an average score is calculated. The frequency of each strategy is expressed on a scale from 0 to 3. The strategies Active Coping and Planning were used between "often" and "almost always" (average between 2 and 3). The strategies Positive Reappraisal, Acceptance, Turning to Religion, Seeking Emotional Support, Seeking Instrumental Support, Engagement in Distraction Activities, Venting, and Self-Blame were used between "rarely" and "often" (average between 1 and 2). The strategies Sense of Humor, Denial, Substance Use, and Behavioral Disengagement were used between "almost never" and "rarely" (average between 0 and 1). The data are presented in Table 3. Table 3. Results of the mini-COPE questionnaire analysis. 3.5 Correlations between PSS-10 and MBI questionnaire result The PSS-10 shows a statistically significant ($p < 0$) correlation with the overall MBI score, emotional exhaustion, depersonalization, and lack of personal achievement. This indicates that the higher the level of perceived stress, the greater the degree of professional burnout in these areas. The relationship between PSS-10 and the level of professional burnout is presented in Table 4. Table 4. The relationship between PSS-10 and the level of professional burnout. 3.6 Correlations between mini-COPE and MBI questionnaire result Active Coping showed a statistically significant (p