

Risk assessment of emotional burnout development among paediatric ward nurses during the COVID-19 pandemic

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Abstract. The issue of burnout among healthcare personnel is highly pertinent, particularly during the COVID-19 pandemic, which underlines the importance of this study. The research aimed to analyse the results of an anonymous survey conducted among paediatric ward nurses regarding burnout in the context of the COVID-19 pandemic, to optimise their work. The assessment of burnout levels was performed by analysing the results of an anonymous questionnaire (V. Boiko's questionnaire) completed by 135 nurses working in paediatric wards of different specialisations in healthcare facilities in Chernivtsi. Respondents were divided into two observation groups. Group I consisted of 83 nurses working in non-infectious paediatric wards, while 52 nurses from infectious paediatric wards were included in Group II. The average age of the nurses in Group I was 38.02 ± 0.9 years, while for Group II it was 43.81 ± 1.6 years ($p > 0.05$), and the length of service was 18.01 ± 0.9 and 22.09 ± 1.4 years, respectively ($p > 0.05$). It was found that among the surveyed respondents in Groups I and II, the burnout scores were significantly higher for nurses in non-infectious wards, particularly in the phases of "tension" (42 and 28.2 points, respectively, ($p < 0.05$), "resistance" (54.9 and 37.8 points, respectively, ($p < 0.05$), and "exhaustion" (40.7 and 26.2 points, respectively, ($p < 0.05$). The risk scores for the development of burnout phases (≥ 37 points) among Group I nurses compared to Group II were as follows: "tension" phase: relative risk – 1.9, odds ratio – 4.2; "resistance" phase: relative risk – 1.9, odds ratio – 3.6; "exhaustion" phase: relative risk – 1.5, odds ratio – 2.7. It was established that during the COVID-19 pandemic, the chances of burnout registration among nurses in non-infectious wards increased by 2.7-4.2 times

Keywords: coronavirus infection; healthcare personnel; professional burnout; stress

✦ INTRODUCTION

The relevance of the issue of emotional burnout is widely recognised, as burnout syndrome significantly impacts both individuals and society as a whole, transforming from a simple phenomenon into a syndrome characteristic of the modern world. Emotional burnout is associated with professions that involve constant interaction with people. Unlike stress, burnout is characterised by difficulties in adaptation due to prolonged exposure to stressors, and it manifests in a variety of clinical signs and symptoms [1].

I.H. Jonsdottir & A. Sjörs Dahlman [2] define emotional burnout as a "multidimensional construct" or a "syndrome

consisting of an emotional component (depletion of emotional resources and decreased individual energy), depersonalisation (negative attitudes and feelings, lack of empathy), and reduced personal accomplishment (devaluation of personal achievements, negative self-evaluation of one's professional activities, and feelings of reduced competence)".

The World Health Organization (WHO) has recently included burnout syndrome in the 11th revision of the International Classification of Diseases as an occupational issue rather than a medical condition. Burnout is defined in the International Classification of Diseases (ICD-11) as

Suggested Citation:

Drutsul-Melnyk N, Ivanova L. Risk assessment of emotional burnout development among paediatric ward nurses during the COVID-19 pandemic. *Bull Med Biol Res.* 2024;6(3):17–24. DOI: 10.61751/bmbr/3.2024.17

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a phenomenon resulting from chronic workplace stress that has not been successfully managed. The WHO guidelines [3] identify three key dimensions of occupational burnout: a) feelings of energy depletion and exhaustion; b) increased mental distance from one's job, negative or cynical attitudes related to one's job; and c) reduced professional effectiveness.

Burnout can affect workers in many professional fields and is prevalent in 13-27% of the working population. P. Galanis *et al.* [4] note that emotional burnout syndrome has been extensively studied in various sectors, particularly among teachers and healthcare professionals who have been most frequently affected.

Its high prevalence is attributed to both the frequent and successive systemic changes in healthcare and the specific nature of the profession. Other factors contributing to professional burnout include long working hours (12-24-hour shifts), holding a second job, frequent and repetitive interactions with certain patient groups (e.g., non-compliance, aggressive behaviour due to severe illness), constant increased responsibility, unstable working conditions, and the absence of organisational systems to recognise and reward the demonstrated effectiveness of nurses in the workplace [5-7].

Despite numerous studies demonstrating the negative impact of emotional burnout on healthcare workers [8, 9], there is currently a lack of well-developed strategies for addressing burnout and for early intervention in cases of anxiety and depression among healthcare professionals. This issue has become particularly pressing during major pandemics, such as the COVID-19 pandemic. The COVID-19 pandemic, as a model for large-scale pandemics, provides an ideal context for studying emotional burnout among healthcare workers, especially nurses, as the immense psychological burden and stressful working conditions significantly increase the likelihood of developing burnout. This study aimed to assess the severity of emotional burnout among paediatric nurses working in different departments during the COVID-19 pandemic, based on the analysis of results from an anonymous survey.

✦ MATERIALS AND METHODS

A retrospective cohort study using simple random sampling was conducted between 2020 and 2021 to achieve the study's aim. An anonymous survey was administered to 135 paediatric nurses from various departments in healthcare facilities in Chernivtsi to diagnose the level of emotional burnout, utilising V. Boiko's questionnaire [10]. Respondents received the survey at their workplace, and the introductory section explained the purpose of the study, emphasised the anonymity of their participation, and assured them of data confidentiality. A note of gratitude for their participation was also included.

The questionnaire consisted of 84 questions and was divided into three sections. The first section focused on self-assessment of the "tension" phase, including levels of anxiety and depression, experiences of traumatic circumstances, and feelings of self-dissatisfaction. The second section evaluated "resistance", covering emotional-moral disorientation, inappropriate emotional responses, the expansion of emotional conservation, and the reduction of professional responsibilities. The third section assessed

the "exhaustion" phase in nurses, focusing on emotional detachment, personal depersonalisation, emotional depletion, and psychosomatic and psychological disturbances of the vegetative nervous system.

The assessment method involved considering each of the 12 symptoms and calculating the total score for the three main phases of emotional burnout development. A symptom was considered unformed if the total score was less than 9. If the total score ranged from 10 to 15, the symptom was regarded as being in the process of formation, while a score of ≥ 16 indicated that the symptom was fully developed. A total phase score of less than 36 was considered unformed, a score between 37 and 60 indicated the phase was in formation, and a total score above 60 suggested that the phase of emotional burnout was fully developed.

To assess the results of the anonymous survey on emotional burnout among paediatric ward nurses, two observation groups were formed. Group I consisted of 83 nurses working in non-infectious paediatric wards, while Group II included 52 nurses working in infectious paediatric wards. The average age of the nurses in Group I was 38.02 ± 0.9 years, with 98.8% being women. The average age of Group II was 43.81 ± 1.6 years ($p > 0.05$), with 92.2% women ($p > 0.05$), and their average length of service was 18.01 ± 0.9 years and 22.09 ± 1.4 years ($p > 0.05$), respectively. Thus, the groups were comparable based on the main characteristics.

The results of the study were analysed using biostatistical and clinical epidemiological methods with the software packages Statistica 10 by StatSoft and Excel XP for Windows, employing both parametric and non-parametric calculation methods. The Student's t-test was used to compare variables between groups for absolute values, while the Fisher criterion (p_ϕ) was applied for relative values. Predictive values for various threshold levels of the obtained results were also calculated. Statistical significance was determined at $p < 0.05$.

Additionally, from a clinical epidemiology perspective, relative risk (RR) and odds ratio (OR) were assessed for the development of specific events, along with their respective 95% confidence intervals (CI).

The study was conducted following the principles of biomedical ethics and the fundamental provisions of the "Ethical Principles for Medical Research Involving Human Subjects", as established by the Helsinki Declaration (1964-2013), ICH GCP (1997), the European Economic Community Directive No. 609 (24 November 1986), and the orders of the Ministry of Health of Ukraine No. 690 (23 September 2009), No. 944 (14 December 2009), and No. 616 (3 August 2012) [11-13].

✦ RESULTS

When assessing the three main phases of emotional burnout among paediatric ward nurses during the COVID-19 pandemic, it was found that nurses in non-infectious departments exhibited significantly higher scores across all phases of emotional burnout, specifically in the "tension", "resistance", and "exhaustion" phases (Fig. 1). Interestingly, the scores for Group I approached the threshold of final formation, being assessed within the range of 37-60 points. In contrast, the respondents in Group II showed that the phases of emotional burnout were virtually unformed.

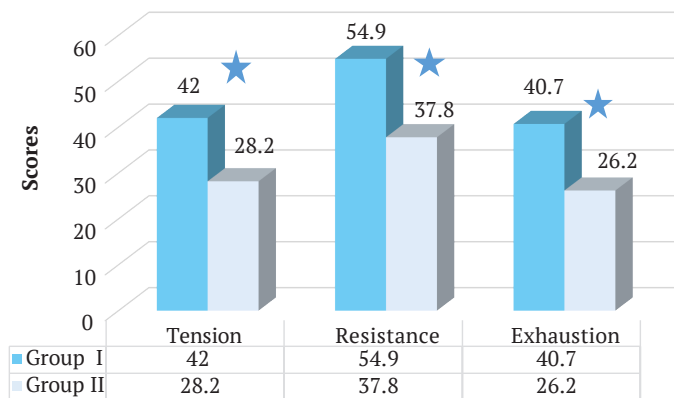


Figure 1. Comparative assessment of emotional burnout among paediatric ward nurses during the COVID-19 pandemic
Notes: ★ – significant difference ($p < 0.05$)
Source: compiled by the authors

The risk indicators for scoring ≥ 37 points in the “tension” phase among nurses in Group I compared to those in Group II were as follows: RR – 1.9 (95% CI: 1.3-2.9), OR – 4.2 (95% CI: 2.2-7.7); for ≥ 37 points in the “resistance” phase – RR – 1.9 (95% CI: 1.5-2.5), OR – 3.6 (95% CI: 1.9-6.4); for ≥ 37 points in the “exhaustion” phase – RR – 1.5 (95% CI: 1.0-2.4), OR – 2.7 (95% CI: 1.4-4.9). Thus, the data indicated that among nurses in non-infectious wards during the COVID-19 pandemic, the risk of developing emotional burnout was higher than that of nurses working in infectious wards. These findings were likely linked to the greater level of awareness

regarding coronavirus infection among healthcare workers in infectious departments and their training in responding to epidemiological threats. Further detailed assessment of the results from the anonymous survey regarding the “tension” phase revealed that the scores for three symptoms – levels of anxiety and depression, feelings of dissatisfaction with oneself, and the sensation of being “trapped” – in Group II nurses were recorded in the range of < 9 points, indicating that these symptoms were not yet formed. Meanwhile, the score for “experiencing traumatic circumstances” fell within the stage of symptom formation (Fig. 2).

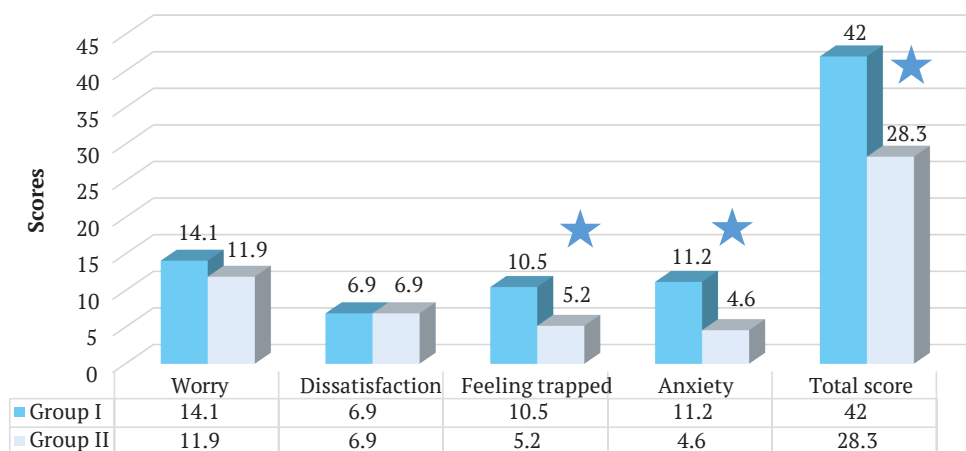


Figure 2. Score assessment of the “tension” phase of emotional burnout among paediatric ward nurses during the COVID-19 pandemic
Notes: ★ – significant difference ($p < 0.05$)
Source: compiled by the authors

At the same time, according to the results obtained, the overall score for the “tension” phase, as well as the individual symptom scores – such as the sensation of being “trapped”, and levels of anxiety and depression – were significantly higher among nurses in Group I. The proportion of nurses in Group I who exhibited the initial signs of exhaustion in the “tension” phase, indicated by a total score > 37 points, was 51.8%, while in Group II it was 25.0% ($p < 0.05$). Furthermore, the analysis revealed that a fully formed “tension” phase of emotional burnout (total score

> 60 points) was almost five times more frequently reported among respondents in Group I (28.9%) compared to 5.8% of respondents in Group II ($p < 0.05$).

A similar trend was observed in the assessment of symptoms in the “resistance” phase among the respondents (Fig. 3). Specifically, the scores for moral and emotional disorientation, the expansion of emotional conservation, and the reduction of professional responsibilities among nurses in infectious disease wards were significantly lower than those of the comparison group.

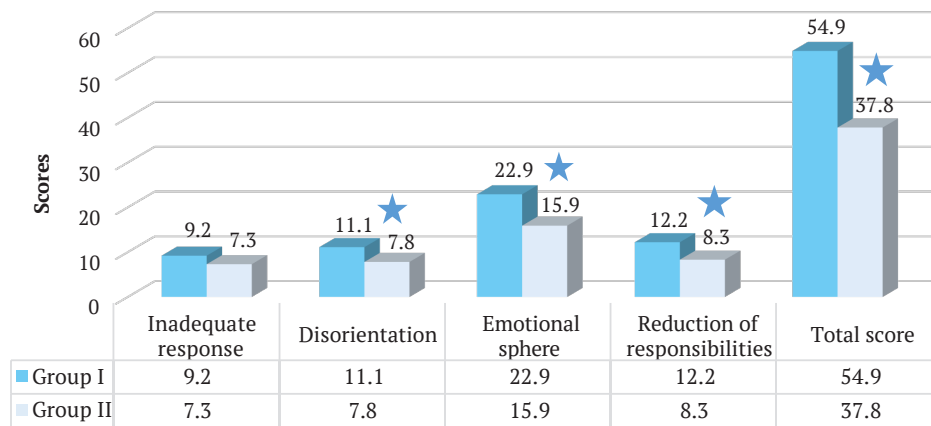


Figure 3. Score assessment of the “resistance” phase of emotional burnout among paediatric ward nurses during the COVID-19 pandemic

Notes: ★ – significant difference ($p < 0.05$)

Source: compiled by the authors

Symptoms of the “resistance” phase, such as inadequate emotional response, emotional and moral disorientation, and reduction of professional responsibilities among nurses in infectious disease wards, were not fully formed, being 1.4 to 1.46 times less pronounced than those in the comparison group. The proportion of nurses in Group I who exhibited initial signs of exhaustion in the “resistance” phase, indicated by a total score >37 points, was 71.1%, while in Group II it was 46.2% ($p < 0.05$). Further analysis revealed that a fully formed “resistance” phase of emotional burnout (total score >60 points) was nearly

twice as prevalent among respondents in Group I (38.6%) compared to 17.3% of respondents in Group II ($p < 0.05$).

This trend likely indicated a better theoretical and practical preparation of nurses for working in the conditions of the COVID-19 pandemic. The assessment of the “exhaustion” phase indicators among nurses in Group II – emotional detachment, personal depersonalisation, emotional deficit, and psychosomatic and psychological disturbances of the vegetative nervous system – did not reach 9 points, indicating that these symptoms were not expressed or fully formed (Fig. 4).

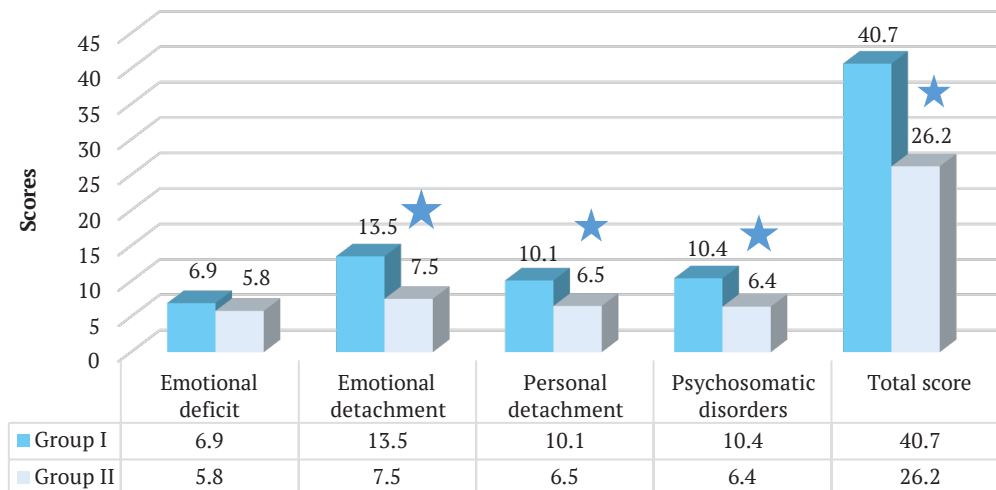


Figure 4. Score assessment of the “exhaustion” phase of emotional burnout among paediatric ward nurses during the COVID-19 pandemic

Notes: ★ – significant difference ($p < 0.05$)

Source: compiled by the authors

At the same time, among the nurses in Group I, emotional detachment, personal depersonalisation, psychosomatic disorders, and psychological disturbances of the vegetative nervous system were recorded significantly more frequently, by a factor of 1.5 to 1.8.

The proportion of nurses who exhibited initial signs of the “exhaustion” phase (total score >37 points) among

respondents in Group I was 42.2%, whereas in Group II it was 21.2% ($p < 0.05$). Further analysis revealed that a fully formed “exhaustion” phase of emotional burnout (total score >60 points) was almost twice as common among respondents in Group I (21.7%) compared to 11.6% of respondents in Group II ($p < 0.05$). Nurses in non-infectious paediatric wards during the COVID-19 pandemic exhibited

higher levels across all phases of emotional burnout compared to those in infectious wards, indicating greater resilience to stress among the latter.

DISCUSSION

Multicentre studies conducted before the COVID-19 pandemic have demonstrated that burnout is a global issue that significantly impacts the well-being of healthcare professionals. Specifically, based on 113 studies included in a systematic review and 61 studies examined in a meta-analysis, T. Woo *et al.* [14] showed that 11.23% of nurses worldwide experienced symptoms of burnout.

A systematic review conducted by U.O. Imo [15] revealed that the prevalence of burnout among nurses in the United Kingdom, particularly the phase of emotional exhaustion, ranged from 31% to 54.3% of respondents. The “resistance” phase, characterised by personal depersonalisation, was reported in 17.4-44.5% of cases, while feelings of self-dissatisfaction and emotional tension were found in 6-39.6% of nurses surveyed. These findings partially align with the results of the current study, especially those related to paediatric nurses in non-infectious wards. However, these symptoms were less pronounced among staff in infectious disease wards during the COVID-19 pandemic. The high prevalence of burnout among healthcare workers in normal times has become an even more significant challenge during epidemics, particularly in the context of the novel coronavirus infection caused by SARS-CoV-2.

At the same time, according to A. Aydin Sayilan *et al.* [16], more than half of the respondents exhibited signs of established emotional burnout syndrome. However, other researchers [14] reported that 78.5% of study participants exhibited only a mild level of emotional exhaustion. This partially aligns with the findings of this study, as nearly half of the patients in Group I displayed early signs of the onset of emotional burnout syndrome, in contrast to Group II, where such changes were noted in only one in four patients.

Findings regarding the characteristics of the “resistance” phase were further explored in studies by R. Chen *et al.* [17] and D. Hu *et al.* [18], who reported high levels of depersonalisation in 42% of respondents. Similar findings regarding the “resistance” phase were observed among the respondents in Group I of this study, where the figure was 38.6%. According to A. Bruyneel *et al.* [19], 38% of nurses had high levels of emotional exhaustion. The results obtained in this study showed that the fully developed “exhaustion” phase of emotional burnout was almost twice as prevalent among nurses in non-infectious wards.

The data regarding the impact of age and gender on the development of emotional burnout is quite contradictory. While A. Aydin Sayilan *et al.* [16] found that being under 30 years old and female were risk factors for emotional exhaustion, T. Sarbooji Hoseinabadi *et al.* [20] did not find a significant correlation between emotional burnout and age, sex, or education level. The authors of this study were unable to analyse this relationship due to the overwhelming majority of female respondents (over 90%).

Nurses undoubtedly faced challenges in maintaining emotional equilibrium as they were at a higher risk of contracting COVID-19 due to close patient contact during procedures and care. Consequently, they experienced sig-

nificant anxiety about the potential consequences of the disease. The negative emotions of patients, colleagues, and family members further exacerbated stress and feelings of depression, increasing the likelihood of emotional burnout.

Psychological factors also contribute to nurse burnout. According to S. Kisely *et al.* [21], during the COVID-19 pandemic, nurses reported feelings of anxiety and depression, along with various psychosomatic disorders, which aligned with the results of this study and were most prominently expressed among the members of Group I.

Given that paediatric nurses represent a relatively small subset of the nursing profession, there is a dearth of research specifically focused on burnout among this group, particularly during the COVID-19 pandemic. However, paediatric nurses are a vulnerable population who have faced significant challenges due to the pandemic, experiencing a range of emotions such as fear, stress, and anxiety. As a result, they are at risk of professional burnout and may require psychological support or intervention [22].

As highlighted by the research of M. Bakhsh *et al.* [23], approximately half of paediatric nurses experienced psychosocial difficulties during the COVID-19 pandemic. The authors also emphasise the need for mental health support measures for healthcare workers during pandemics and other medical crises. However, according to studies by F.G.B. Góes *et al.* [24], nurses working with children and adolescents had a lower risk of experiencing emotional burnout compared to those working with other age groups.

Paediatric nurses, including those working in infectious disease wards, who participated in the study demonstrated a high level of professional competence when caring for patients with COVID-19 [25]. However, it was found that nurses with less experience had a higher risk of making professional errors when working with sick children and their families, and were more likely to consider leaving their jobs. This indicates that younger nurses require additional training and support from more experienced colleagues during a pandemic. Thus, numerous studies have reached a consensus that nurses working during a pandemic experience elevated levels of stress, anxiety, depression, and burnout, which can have long-term consequences.

The study aimed to investigate the presence and severity of emotional burnout among nurses working in paediatric infectious and somatic departments during the COVID-19 pandemic, to develop specific strategies to address this issue in the future. The findings indicated that among nurses in paediatric infectious disease wards, the primary phases of emotional burnout were not fully developed, and the risk of emotional burnout was lower compared to nurses in non-infectious children’s wards. Conversely, nurses in non-infectious paediatric departments exhibited emotional detachment, depersonalisation, and psychosomatic and psychological disturbances of the vegetative nervous system with a likelihood 1.5 to 1.8 times greater. These results were likely associated with a higher level of awareness regarding the coronavirus among staff in infectious disease units and their experience in skills related to actions during epidemiological threats. Previous studies have shown that working in infectious paediatric wards increases the likelihood of learning aimed at improving or updating knowledge and skills related to infection control and COVID-19 (odds ratio – 3.8, relative risk – 2.0) [26].

Consequently, numerous COVID-19-related factors can contribute to the development of burnout among nurses. However, the pandemic's impact was less pronounced among nurses in infectious disease wards, where the risk of burnout was half that of nurses in non-infectious units. These nurses also demonstrated higher levels of personal achievement and knowledge of infection control and COVID-19. Higher levels of personal achievement are a powerful driver of professional growth, which may subsequently contribute to lower levels of burnout.

✦ CONCLUSIONS

The findings revealed that nurses in non-infectious departments exhibited higher levels of emotional burnout at all stages compared to those in infectious disease departments, with significant differences in the severity and manifestation of burnout symptoms. It was determined that the stages of emotional burnout were more likely to be fully developed in nurses from non-infectious departments during the COVID-19 pandemic. According to the V. Boiko questionnaire, the score range was 40.7-54.9.

The assessment of symptoms in the "tension phase", including levels of anxiety and depression, feelings of dissatisfaction, and a sense of being "trapped", among nurses in infectious paediatric wards recorded scores of less than 9, indicating that these symptoms were not yet fully developed. The fully established phase of emotional burnout, characterised by a total score exceeding 60, was noted almost five times more frequently among respondents in Group I. The results of the assessment of

the "resistance phase" of emotional burnout, particularly regarding moral-emotional disorientation, the expansion of emotional conservation, and the reduction of professional responsibilities among nurses in infectious wards, were significantly lower (by 1.4 to 1.46 times) compared to the respondents in the control group. At the same time, the fully developed phase of emotional burnout resistance (total score >60) was observed almost twice as frequently among respondents in Group I. The indicators of "exhaustion" related to emotional burnout, such as emotional detachment, personal depersonalisation, emotional deficiency, and psychosomatic and psychological disturbances of the vegetative nervous system, were 1.5 to 1.8 times higher in nurses from non-infectious departments.

The summary of the assessment of the formation of emotional burnout phases (≥ 37 points for a phase) among nurses in Group I compared to those in Group II indicated an increased risk of this occurrence, with the following results: for the "tension" phase: relative risk – 1.9, with odds ratio – 4.2; for the "resistance" phase: relative risk – 1.9, with odds ratio – 3.6; and for the "exhaustion" phase: relative risk – 1.5, with odds ratio – 2.7. The prospects for further research involve identifying effective strategies for the psychological relief of nurses to reduce emotional burnout.

✦ ACKNOWLEDGEMENTS

None.

✦ CONFLICT OF INTEREST

None.

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Оцінка ризиків розвитку емоційного вигорання в медичних сестер педіатричних відділень в період пандемії COVID-19

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Анотація. Проблема емоційного вигорання медичного персоналу є надзвичайно актуальною, особливо в період пандемії COVID-19, що визначило пріоритетність проведеного дослідження. Метою дослідження було проаналізувати результати анонімного анкетування медичних сестер педіатричних відділень щодо емоційного вигорання умовах пандемії COVID-19 з метою оптимізації їх роботи. Оцінка рівня емоційного вигорання проводилась шляхом аналізу результатів анонімного анкетування (анкета В. В. Бойко) 135 медичних сестер, які працюють в педіатричних відділеннях різного профілю лікувальних закладів м. Чернівці. Респонденти були розподілені на 2 групи спостереження. I групу сформували 83 медичні сестри, що працюють в дитячих відділеннях неінфекційного профілю, а 52 медичних сестри дитячих інфекційних відділень увійшли в II групу. Середній вік медичних сестер I групи склав $38,02 \pm 0,9$ роки, а представників II групи – $43,81 \pm 1,6$ роки ($p > 0,05$), а стаж роботи – $18,01 \pm 0,9$ років та $22,09 \pm 1,4$ ($p > 0,05$) років відповідно. Встановлено, що серед опитаних респондентів I та II груп показники оцінки всіх фаз емоційного вигорання були вірогідно вищими у медичних сестер неінфекційного профілю, зокрема фаз «напруження» (42 та 28,2 бали відповідно, ($p < 0,05$), «резистенції» (54,9 та 37,8 бали відповідно, ($p < 0,05$), та «виснаження» (40,7 та 26,2 бали відповідно, ($p < 0,05$)). Показники ризику формування фаз емоційного вигорання (≥ 37 балів) у медичних сестер I групи порівняно до представників II групи дорівнювали: фаза «напруження»: відносний ризик – 1,9, співвідношення шансів – 4,2; фаза «резистенції»: відносний ризик – 1,9, співвідношення шансів – 3,6; фаза «виснаження»: відносний ризик – 1,5, співвідношення шансів – 2,7. Встановлено, що у період пандемії COVID-19 серед медичних сестер неінфекційних відділень шанси рестрації емоційного вигорання зростали у 2,7-4,2 рази

Ключові слова: коронавірусна інфекція; медичний персонал; професійне вигорання; стрес