



Research article

The impact of the COVID-19 pandemic on burnout levels among healthcare workers: A comparative analysis of the pandemic period and post-pandemic period

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ABSTRACT

Emotional burnout among physicians is a serious problem that can affect their health and the quality of medical care. This condition occurs when physicians experience excessive stress and pressure at work, often due to high demands and expectations imposed on them by patients. This study aims to assess the experience and factors associated with emotional burnout among health workers who deal with COVID-19-positive patients. The study population includes employees at the infectious diseases hospital and the inpatient clinical hospital examined using the Maslach Burnout Inventory. The prevalence of high emotional exhaustion among infectious diseases specialists and inpatient physicians was $51.2 \pm 3.4\%$ and $43.3 \pm 8.1\%$, respectively. The prevalence of high depersonalization was $39.4 \pm 7.9\%$ and $40.5 \pm 8.1\%$, respectively. Finally, the prevalence of reduced professional efficacy was $26.3 \pm 7.1\%$ and $41.3 \pm 8.3\%$, respectively. The main burnout contributors were a heavy workload, a high risk of infection, the lack of protective equipment, insufficient social support, constant interaction with suffering patients, and work-life imbalance. To prevent burnout among health workers who deal with COVID-19-positive patients, it is best to create a working environment that is conducive to good physical and mental health, implement stress management courses, and provide employees with enough time for rest and recovery. These preventive measures will help to improve the quality of health care. The findings of the study can be utilized for the development of support programs for healthcare professionals, improvement of working conditions, and reduction of the risk of emotional burnout.

1. Introduction

One of the biggest issues facing healthcare today is the shortage of workforce. This problem owes much to burnout. The risk groups

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include physicians who work in intensive care, cancer care, palliative care, and some other units where they witness suffering patients [1,2]. Burnout is a state of mental and emotional exhaustion caused by prolonged stress, excessive work hours, and a lack of support in the workplace. Burnout among physicians can lead to physical fatigue, reduced enthusiasm for work, low productivity, and diminished service quality. One way to prevent this from happening is to ensure that all medical staff members receive psychological assistance and to create a working environment that is conducive to good mental and emotional health [3,4].

The COVID-19 pandemic had a dramatic effect on people's lifestyles [5,6] and working conditions, especially in the healthcare industry. It was also responsible for the global surge in burnout among medical workers [7–9].

When discussing the differences between burnout caused by the COVID-19 pandemic and other common causes in medical institutions, it should be noted that, first and foremost, the COVID-19 pandemic brought an unprecedented increase in workload for healthcare staff, as the number of patients significantly exceeded the capacities of healthcare facilities. This led to excessive working hours, insufficient rest, and difficulties in organizing patient care. As a result, healthcare professionals face a high level of emotional burnout, which differs in intensity and rate of development from other causes of burnout [10].

Secondly, the COVID-19 pandemic has significantly reduced opportunities for social support and collegial communication among healthcare workers. Restrictions on hospital visits, quarantine measures, and reduced staffing levels have led to isolation and feelings of loneliness among healthcare professionals. This contrasts with the usual causes of burnout, where social support and collegial communication are more accessible [11].

Thirdly, the COVID-19 pandemic has led to a significant increase in stress related to uncertainty, fear of infection, and the need to make quick and high-risk decisions. This has resulted in elevated levels of anxiety and depression among healthcare workers, differing from other causes of burnout, where stress is typically associated with factors such as high workload or decision-making difficulties [12].

Overall, COVID-19-induced burnout among physicians and first-line health workers is a serious issue that requires urgent action. Otherwise, it may reduce their well-being and diminish the quality of health care. One also has to understand how serious this problem is and how it can be addressed. This study seeks to answer these questions.

The main symptoms of emotional burnout among medical workers include cognitive impairment, feelings of energy depletion or exhaustion, lack of effort at work, longer recovery time, excessive stress, and feelings of cynicism [13–15]. Burnout among doctors working with COVID-19 patients was reported to be associated with occupational stress [16,17]. In healthcare, the most dangerous consequence of burnout is maltreatment, sometimes lethal [18,19].

The current research on COVID-19 highlights the following factors that impact burnout [20–22]: (1) excessive stress and uncertainty, which cause deterioration of mental health; (2) lack of control, which results in the feeling of frustration; (3) heavy workload leading to fatigue; (4) perceived risk of infection, which causes anxiety; (5) and the lack of social support. Some researchers argue that the prolonged stress induced by COVID-19 may have severe and far-reaching consequences, thus necessitating the implementation of effective prevention strategies [23]. In this context, identifying and assessing burnout among healthcare professionals working with COVID-19 patients remains a challenging task [24–26]. Burnout is a condition that impedes individuals' active engagement in research activities. Future research may encompass additional factors related to burnout and the development of a comprehensive prevention and treatment program for healthcare professionals. There are also other issues associated with data collection and with the need to control other factors, such as personality traits, social support, stress exposure, and more. Such research would take a long time to complete.

The problem of pandemic-related emotional burnout in the field of healthcare is attracting increasing attention from both academicians and the public. Front-line health workers are at high risk of developing burnout due to heavy workloads, extreme stress, social isolation, and insufficient protection from infection. An effective strategy to prevent and overcome burnout among physicians involves improving the working environment, emotionally supporting the personnel, raising awareness, teaching stress tolerance and coping techniques, and adopting self-care and healthcare practices within the team.

This study aims to evaluate the experience and factors associated with burnout among healthcare professionals who work with COVID-19-positive patients, specifically those employed in the infectious diseases hospital and the patient holding facility. The objectives of the study thus are (1) to compare the levels of burnout between medical workers employed in different institutions and (2) to determine what caused emotional exhaustion and how it can be reduced, specifically, to examine the impact of workload on levels of burnout among healthcare workers and investigate the role of psychosocial factors such as peer support, organizational support, and opportunities for recovery in reducing emotional exhaustion.

1.1. Hypotheses

1. There exist statistically significant differences in burnout levels between infectious disease specialists and hospital physicians, which may be associated with the specifics of their work and exposure to COVID-19 patients.
2. Younger age and female gender may be associated with higher levels of emotional exhaustion.
3. Elevated levels of burnout among healthcare workers in the post-pandemic period may be linked to the duration of stress and unrecognized fatigue that may arise from a prolonged period of dealing with the consequences of the pandemic.

The novelty of this study lies in its focus on the unique challenges and impact of burnout syndrome caused by the COVID-19 pandemic. By highlighting the exhaustion induced by COVID-19, this research provides valuable insights into the specific issues faced by healthcare workers during the pandemic.

The value of the study is in its contribution to identifying the risk factors for emotional burnout among healthcare workers caring

for COVID-19 patients. It informs the development of mental health support strategies, enhances patient care, and guides policy and practice in healthcare organizations.

2. Materials and methods

2.1. Study design and participants

The research took place in two clinical hospitals: (1) the City Clinical Hospital No. 5 in Nizhny Novgorod, where patients had been receiving infectious diseases care for more than a year; and (2) the Clinical Hospital No. 3 affiliated with the Privolzhsky District Medical Center. The study enrolled 75 medical specialists (38 were employed in the infectious diseases hospital and 37 were employed in the hospital providing planned care throughout the pandemic). The conducted study was cross-sectional.

A preliminary power analysis was conducted to determine the required sample size to ensure the statistical reliability of the conclusions. This approach allowed for the effective use of resources and ensured the scientific validity of the results.

Based on the power analysis, it was determined that to achieve the target power level of 0.80 at a significance level of 0.05, a minimum sample size of 70 participants is necessary.

Experts were selected based on their work experience and specialized qualifications in the field of infectious diseases and planned medical interventions, ensuring the representativeness of the chosen group.

Regarding the power analysis conducted before the study, we performed an a priori power analysis to determine the necessary sample size, ensuring the statistical reliability of our conclusions. This approach allowed us to efficiently utilize resources and ensure the scientific validity of our results.

The detailed data collection period was determined taking into account various factors such as the dynamics of the pandemic, hospital schedules, and participant availability. Our team is grateful to all study participants for their active participation and valuable contribution to our research.

2.2. Data collection and analysis

All participants were surveyed in May 2021 using the standard tool for assessing burnout, the Maslach Burnout Inventory (MBI) [27]. The MBI encompasses three aspects of burnout: emotional exhaustion (EE), depersonalization (D), and reduced professional efficacy (PE), each with a frequency response scale (0 = never to 6 = every day). This instrument helps to measure occupational exhaustion and identify potential directions for treatment.

During the study, the following data were collected: response rates (the percentage of participants who answered the question), the experience of burnout (the number of medical workers with burnout symptoms), MBI scores, and factors associated with burnout (i.e., being male or female, age, and workload). The single-factor and multivariate analyses were performed. Data reliability was evaluated in Microsoft Excel and Statistica 10 using the multivariate analysis of variance (MANOVA) procedure. Differences between patient groups were considered significant at $P \leq 0.05$ (according to Student's t-test).

Before applying MANOVA, the normality of the distribution of each dependent variable (emotional exhaustion, depersonalization, reduced personal accomplishment) was assessed in both groups of healthcare workers using the Shapiro-Wilk test. All variables showed acceptable levels of normality ($p > 0.05$), confirming the validity of this assumption.

The validity of the MBI was confirmed through several steps.

- **Construct Validity:** The study established that the MBI appropriately reflects three primary dimensions of burnout that are relevant to healthcare workers during the pandemic. This was validated through factor analysis and its relationship with other dimensions of psychological state.
- **Criterion Validity:** The MBI was compared with other measures of burnout and indicators of psychological state, affirming its ability to accurately assess levels of burnout among healthcare professionals.

Table 1
Demographic characteristics of participants.

Characteristics	Number of Participants
Age Distribution	
25–29 years	15
30–34 years	30
35 years or older	30
Gender Ratio	
Female	52
Male	23
Experience	
1–5 years	18
6–10 years	28
11–20 years	22
More than 20 years	7

Ethical statement

All participants included in the study signed an informed consent form before enrollment. To mitigate the risk of self-report bias, participants were ensured confidentiality and anonymity throughout the entire study.

3. Results

The study involved a group of 75 participants, whose demographic characteristics are summarized in Table 1, including distributions by age, gender, and level of experience.

It was established that infectious disease specialists and inpatient physicians had different burnout levels according to the Maslach Burnout Inventory (Fig. 1). Around half of all medical workers in the infectious diseases hospital were categorized as having a high level of EE (51.2 ± 3.4 %) and a moderate level of PE (50.6 ± 7.3 %). The prevalence of moderate emotional exhaustion was also relatively high (34.2 ± 7.7 %). Some infectious disease specialists reported moderate to high depersonalization (31.6 ± 7.5 % and 39.4 ± 0.9 %, respectively). Around a quarter of medical workers in this category (26.3 ± 7.1 %) showed reduced efficacy (Fig. 2). Similarly, the proportions of inpatient physicians with different burnout levels were as follows (Fig. 3): 43.3 ± 8.1 %, high EE; 31.6 ± 7.1 %, moderate EE; 40.5 ± 8.1 %, high D; 27.1 ± 7.3 %, moderate D; 41.3 ± 8.3 %, moderate and low PE levels.

No statistically significant differences were found between medical institutions. This is true for emotional exhaustion ($\chi^2 = 0.40$, with a critical value of 5.99, p-value = 0.82), depersonalization ($\chi^2 = 0.21$, with a critical value of 5.99, p-value = 0.90) and even reduced efficacy ($\chi^2 = 1.59$, with a critical value of 5.99, p-value = 0.45). Therefore, the next step of comparative analysis was to consider demographic and work-related contributors to burnout.

The results of a study involving 115 physicians conducted on the same research database in 2024 revealed similar findings to those obtained during the pandemic period in aspects of emotional exhaustion (the proportion of physicians with low levels was 11.30 %, moderate – 33.4 %, high – 55.65 %) and depersonalization (the proportion of physicians with low levels was 24.34 %, moderate – 37.39 %, high – 38.26 %). However, the results were slightly worse in terms of reduction in professionalism: the proportion of physicians with low levels increased to 34.78 %, decreased to 28.70 % with moderate levels, and increased to 36.50 % with high levels

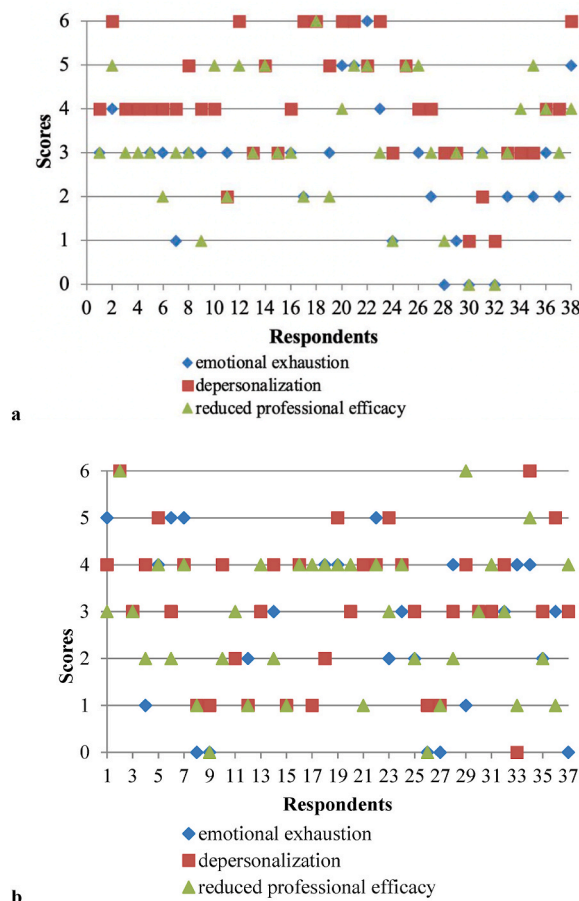


Fig. 1. MBI subscale scores for healthcare professionals in (a) the infectious diseases hospital and (b) the inpatient clinical hospital.

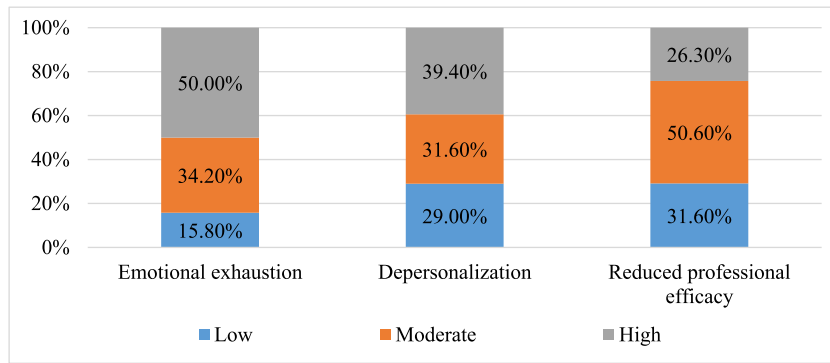


Fig. 2. The percentage of infectious disease specialists with different burnout levels.

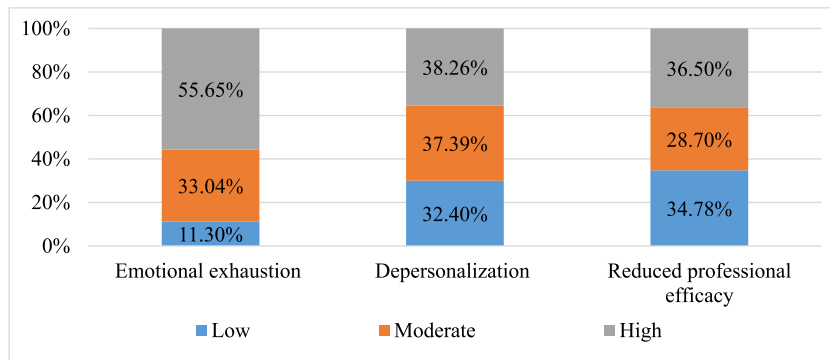


Fig. 3. The percentage of inpatient physicians with different burnout levels.

(Figs. 4 and 5) [9].

This can be explained by the prolonged processes of combating COVID-19 and its consequences at present, the lingering echo of burnout, and the preservation of emotional strain among physicians associated with addressing the consequences of COVID-19 in patients. Additionally, the sense of involvement in the collective effort among physicians working in high-risk areas, coupled with the increased societal attention and social value attributed to physicians as agents of change and "saviors" within the healthcare system in the eyes of patients during the acute phase of the pandemic, and substantial material incentives contributed to the concentration of efforts and resources during the period of struggle (leaving little room for burnout). Consequently, burnout is currently catching up with this professional group.

Medical workers with less than 30 years of working experience reported higher levels of burnout than more experienced colleagues (Table 2). Female specialists scored higher on emotional exhaustion than male specialists. The higher number of patients per day corresponded to higher MBI scores. Here, the highest scores on EE and reduced PE were observed in medical workers who saw more than 30 patients per day. Note that specialists working less than 8 h per day had lower scores on all MBI subscales.

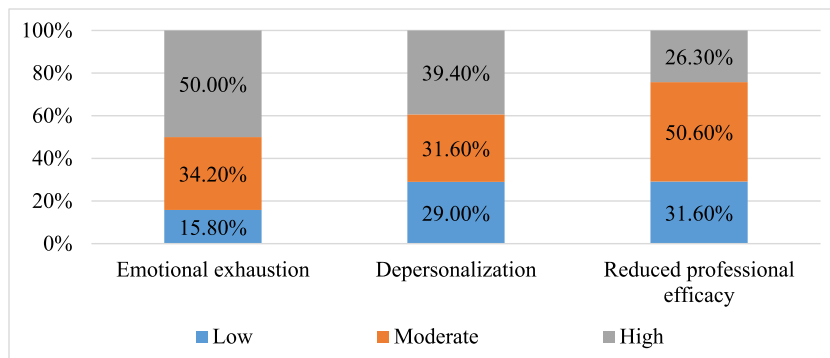


Fig. 4. The percentage of infectious disease specialists with different burnout levels, 2024.

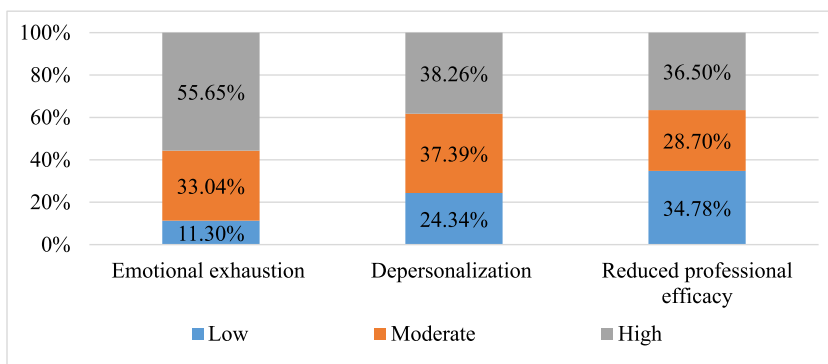


Fig. 5. The percentage of infectious disease specialists with different burnout levels, 2024.

Measures for burnout prevention require medical workers to be proactive and mentally invested in their health. Here are some examples of preventive actions to take.

- (1) *Adoption of healthy habits.* Healthcare professionals who work with COVID-19-positive patients should practice healthy lifestyle habits. These include regular physical activity, proper nutrition, adequate sleep, etc.
- (2) *Maintenance of work-life balance.* Medical workers should optimize their schedules in a way that leaves enough time for their needs and interests outside of work to avoid overload and emotional exhaustion.
- (3) *Communication.* Healthcare specialists should engage in work-related conversations with their colleagues more often to gain motivation at work and grow professionally.
- (4) *Psychological consultation.* Medical workers should have access to psychological services to be able to cope with stress. Even though this practice is not common in Russia, it is necessary to inform medical staff members about the effectiveness of psychological assistance.
- (5) *Stress management.* It is important to teach physicians about the different ways in which they can handle stress, such as through meditation, listening to music, or practicing yoga. Another possible option is to participate in various educational programs for managing stress and improving communication skills.

The reliability report on implemented measures has demonstrated that strategies aimed at reducing workload, and stress, and providing support can effectively mitigate the risk of emotional burnout among healthcare workers. The analysis confirms that these measures significantly impact the improvement of employees’ psychological well-being and ensure their professional satisfaction.

Recommendations stemming from the results include the implementation of strategies to optimize working conditions, establish effective support systems, and provide specialized training for staff in stress management. These measures will help enhance the resilience of healthcare workers and promote their psychological comfort in the workplace.

It is recommended to establish systematic monitoring of levels of emotional burnout and the effectiveness of measures to ensure continuous improvement of support strategies for medical personnel. This will facilitate the identification of risk factors and prompt adjustment of measures for maximum effectiveness in managing emotional burnout.

Understanding the challenges faced by healthcare professionals amid the COVID-19 pandemic, the country’s officials implemented a range of financial and social support measures for employees in infectious diseases hospitals. Yet, given the duration of the pandemic and the level of stress endured by the healthcare industry, the working conditions remained conducive to burnout development.

Table 2
 MBI subscale scores in patients with different demographic and work-related characteristics.

Variables	Emotional exhaustion	Depersonalization	Reduced professional efficacy
Age, years			
25–29	26.89 ± 3.45	19.21 ± 2.19	24.87 ± 3.51
30–34	22.14 ± 4.15	17.15 ± 3.36	20.28 ± 2.64
>35	24.91 ± 5.35	18.33 ± 2.73	22.11 ± 4.30
Sex			
Male	27.05 ± 3.26	17.25 ± 2.19	22.26 ± 4.61
Female	28.91 ± 4.18	17.93 ± 4.36	21.43 ± 3.32
Number of patients per day			
<30	26.83 ± 4.21	18.09 ± 2.76	22.98 ± 3.42
>30	27.21 ± 3.28	17.21 ± 2.61	29.62 ± 4.63
Hours per shift			
<8	27.21 ± 4.41	16.36 ± 2.36	21.34 ± 3.47
8–12	28.09 ± 2.48	18.24 ± 3.27	22.15 ± 4.56

4. Discussion

Comparing the burnout indicators of healthcare workers during the pandemic period and in 2024 provides valuable insights into the situation's development.

1. Persistence of elevated levels of burnout. The study revealed that despite the end of the pandemic, burnout levels remained elevated in 2024. This may indicate the long-term consequences of stressful situations associated with combating the pandemic.
2. Increase in burnout levels in various aspects. The rise in levels of emotional exhaustion, depersonalization, and reduced professional efficacy suggests that the challenges affecting medical personnel are complex and may deepen over time.
3. Role of stress factors. Elevated levels of burnout among younger workers and women may indicate the need for specialized support strategies for these categories of personnel.
4. Impact of patient load. The number of patients remains a relevant factor in determining the level of burnout, especially for healthcare workers who have a high number of patient contacts.
5. Influence factors such as workload, stressful situations, and lack of effective support measures are statistically significantly associated with elevated levels of emotional burnout among medical personnel.

The demographic aspects of the study indicate that younger age and female gender may serve as conditions that increase susceptibility to emotional burnout in this group of professionals. These findings underscore the importance of considering not only work conditions but also personal factors when developing support strategies for medical personnel.

This study shows that there are high rates of burnout in the medical institutions under consideration. This finding is consistent with the results obtained by other Russian researchers who reported high levels of emotional exhaustion and depersonalization [20]. The said researchers also detected the low prevalence of reduced professional efficacy, which they associated with the high awareness of medical care during the pandemic. A similar study conducted with young doctors (residents) indicates serious burnout according to all three components of MBI [11]. This is not the only research indicating a higher susceptibility to burnout among young doctors [19].

In Russia, comparative research on burnout among healthcare professionals who work with COVID-2019-positive patients is scarce; at the same time, foreign studies seem to be rather contradictory. Some scientists in America [19] and Japan [28] reported a higher experience of emotional burnout among infectious disease specialists. In Canada, on the other hand, the highest burnout levels were detected among first-line workers [25]. According to some studies conducted in China, the frequency of burnout within ordinary wards is higher than when dealing with COVID-19 [16,29].

A study among healthcare workers in Italy during the COVID-19 pandemic demonstrated a high prevalence of burnout: 61.9 % for emotional exhaustion, 47.6 % for depersonalization, and 34.3 % for reduced personal accomplishment. Nurses were 4.5 times more likely to experience burnout compared to assistants, and depersonalization was significantly more common among younger nurses [30].

Research in Spain, involving a sample of 355 nurses, showed mean scores of 27.44 for emotional exhaustion, 7.26 for depersonalization, and 38.27 for personal accomplishment. The "Personal Accomplishment" subscale was higher in the age group of 51–65 years. Significant statistical differences were found in the "Depersonalization" subscale concerning current years of work experience, which were higher in the group aged 39 years and older. Therefore, the authors concluded that intervention programs are necessary within healthcare systems to improve the emotional well-being of nurses [31].

In this study, there were no significant differences between infectious disease specialists and inpatient physicians. The likely reason for this must be the high workload during the pandemic period; there were no grounds for reducing access to other medical services at the time, and all resources were allocated to infectious diseases hospitals.

The prolonged burnout can cause mental and physical problems, such as depression, anxiety, chronic fatigue, back and neck pain, and an increased risk of cardiovascular disease [32]. Emotionally exhausted healthcare providers can fail to provide high-quality care and are more likely to make mistakes. This could have serious health implications [33–35]. Therefore, it is crucial for healthcare professionals who deal with COVID-19 to receive support at work [36]. Medical workers with lower emotional burnout are healthier and work better [37]. Overall, the COVID-19 pandemic has exacerbated the already high levels of stress among healthcare practitioners in different countries [15,28].

According to research data, the experience of emotional exhaustion and overall professional burnout was significantly higher among physicians, nurses, mid-level medical, and administrative staff who worked in direct contact with COVID-19 patients compared to healthcare workers who worked without direct contact with COVID-19 patients [38,39].

Quantitative studies confirm the prevalence of the association between physicians' uncertainty in medical decision-making and symptoms of poor mental health. However, inconsistencies in the results have been identified, which may indicate the complexity of the impact of this factor. Qualitative studies emphasize that uncertainty in decision-making by physicians is considered a stressor that can affect their emotional state. These studies support the notion that uncertainty in the context of medical decision-making may be a contributing factor to stress [20,40,41].

Research has revealed that general practitioners also face high levels of burnout; however, their challenges often differ from those experienced by infectious disease specialists and frontline workers. General practitioners are more likely to experience emotional exhaustion due to constant contact with patients presenting a wide range of conditions and the need to make rapid and complex decisions. Studies have shown that general practitioners, particularly those working in rural areas, are at increased risk of emotional burnout due to isolation and limited resources [42].

Psychiatrists also face a significant risk of burnout, particularly due to the intense emotional interaction with patients. Research

indicates that psychiatrists may experience high levels of depersonalization, which is associated with constant contact with patients suffering from severe mental disorders. It is also known that psychiatrists often work under conditions of insufficient funding and support, which increases the risk of professional burnout [43].

In contrast to frontline doctors and infectious disease specialists, medical laboratory technicians have less direct contact with patients. However, they encounter other forms of stress, such as working with precision equipment and the necessity to ensure the accuracy of diagnostic results. Studies show that these professionals may experience high levels of stress due to the constant need to avoid errors and work under conditions of high responsibility, which can lead to emotional burnout [44].

These comparisons underscore that burnout among healthcare professionals is a multifaceted issue that can affect different professions in varying ways. It is crucial to develop specialized support strategies for each medical specialty, taking into account the unique challenges and stressors they face.

Overall, the results indicate that the impact of the pandemic remains relevant even after its conclusion, necessitating further efforts in the development and implementation of strategies to ensure the physical and emotional well-being of healthcare workers.

The universality of the findings in the study lies in their applicability to various healthcare workers dealing with infectious diseases, regardless of their professional category or level of experience. Recognizing burnout and emotional exhaustion issues can serve as a basis for developing universal support and prevention strategies among medical personnel.

Taking into account factors such as workload, lack of protection, risk of infection, and work-life imbalance can be applicable in various clinical settings and work environments. Further research can help establish the extent to which the proposed strategies are universal and whether they require adaptation for different groups of healthcare workers.

A comprehensive approach to preventing and treating emotional burnout, such as creating favorable working conditions and implementing psychological support programs, may have a universal nature in ensuring the well-being and effectiveness of medical personnel across different medical fields.

The obtained results carry important theoretical implications for understanding burnout dynamics under conditions of stress and resource constraints. They validate Maslach's theory of burnout and support the idea that burnout is a dynamic process that can change over time depending on changes in stress factors and resources.

Furthermore, the findings underscore the significance of social support and resources in preventing burnout. They can be valuable for developing burnout prevention and support programs for employees working under high-stress conditions.

This study is limited by its data collection methods and study design. The results primarily reflect conditions in two specific hospitals in Nizhny Novgorod (Russia) and may not be broadly generalizable to all healthcare facilities or regions. Additionally, the sample size of 75 participants, although sufficient for initial understanding, may limit the statistical power needed to detect smaller differences or nuances in burnout levels among different groups within hospitals.

Future research should focus on monitoring the evolution of burnout over time or implementing experimental interventions to mitigate its effects. It could also be beneficial to study the reasons and factors influencing the differences in burnout levels among different medical institutions. This would help develop more targeted burnout management strategies and improve the quality of life and work for healthcare professionals.

5. Conclusion

In conclusion, burnout among healthcare workers can lead to impairments in concentration, memory, and decision-making, which may affect the quality of medical care delivery. Burnout among healthcare professionals may lead to decreased empathy and detachment, negatively impacting their interactions with patients. The study results indicate that a significant portion of infectious disease specialists and hospital physicians exhibited high levels of emotional exhaustion and depersonalization, as well as reduced professional effectiveness.

The analysis revealed that the level of emotional burnout was higher among medical workers with less than 30 years of experience and among female specialists. High levels of emotional exhaustion and reduced professional effectiveness were associated with seeing more than 30 patients per day and working more than 8 h per day. The main factors contributing to emotional burnout were heavy workload, lack of protective measures, high risk of infection and fear, work-life imbalance, inadequate support, and constant patient interaction.

Factors such as heavy workload, lack of protective measures, high risk of infection, and work-life imbalance can aid in the implementation of practical solutions. Specifically, building a balanced work schedule and creating a supportive environment for healthcare workers may be key steps in reducing burnout and ensuring the quality of medical care during pandemics.

This study may contribute to society at large and existing research domains by aiding in the improvement of mental health among healthcare professionals and the quality of medical care provided to patients.

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Data availability

Data will be available on request.

Ethics approval

The research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. The research was approved by the local ethics committees of I.M. Sechenov First Moscow State Medical University (Protocol no. 4993 dated from February 02, 2021).

Informed consent

Informed consent was signed by participants.

CRedit authorship contribution statement

Andrey Reshetnikov: Writing – original draft, Investigation, Funding acquisition, Conceptualization. **Olga Abaeva:** Writing – original draft, Validation, Methodology, Data curation. **Nadezhda Prisyazhnaya:** Writing – original draft, Supervision, Project administration. **Tatyana Romanova:** Writing – review & editing, Methodology, Formal analysis, Conceptualization. **Sergey Romanov:** Supervision, Software, Resources, Investigation. **Konstantin Sobolev:** Software, Resources, Methodology, Investigation. **Anahit Manukyan:** Writing – review & editing, Validation, Methodology, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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