Peer-reviewed article

Authors

Fabio Ferraiuolo
PhD
Emergency Department, AST Ascoli Piceno

Corresponding author

Fabio Ferraiuolo
AST Ascoli Piceno
ferraiuolofabio@libero.it

Burnout and patient safety in operating room nurses during the COVID-19 pandemic: A cross-sectional study

Abstract

Introduction: The COVID-19 pandemic has profoundly impacted healthcare systems globally, placing operating room (OR) nurses under considerable strain and exposing them to elevated levels of psychological distress.

Aim: This study aimed to investigate the prevalence of burnout syndrome (BoS) among Italian OR nurses during the pandemic and examine its association with perceived job performance and patient safety.

Methods: A cross-sectional study was conducted between October and November 2020 involving members of the Italian Association of Nurses in Operating Teams (Associazione Italiana Coordinatori Infermieristici or AICO). Data were collected via an anonymous online questionnaire, which included the Maslach burnout inventory and items assessing clinical errors and self-perceived job performance.

Results: Of the 238 nurses invited, 233 completed the survey (97.9% response rate). High levels of emotional exhaustion were reported by 39.9 per cent of participants, moderate to high depersonalisation by 56.7 per cent and low personal accomplishment by 38.6 per cent. Additionally, 29.2 per cent reported having encountered risk and/or made a mistake in the past year, while 38.2 per cent reported a decline in their job performance. Both outcomes were significantly associated with higher levels of BoS ($p < 0.01$). Contributing factors included workplace disorganisation, negative team climate and workload intensity, particularly in general and neurosurgical settings.

Conclusion: These findings highlight the need for early identification of BoS and the implementation of targeted organisational strategies to support perioperative nurses. Addressing burnout is essential to safeguard staff wellbeing and maintain patient safety – both during public health crises and in everyday surgical care.

Keywords: burnout, operating room, perioperative nurses, patient safety, COVID-19

Introduction

The COVID-19 pandemic placed immense pressure on healthcare systems worldwide, triggering major disruptions in service organisation and delivery[1]. Healthcare facilities were rapidly re-organised to address the crisis, and nurses assumed a central, unprecedented role in managing patient care across all settings[2]. This frontline engagement came at a cost – many nurses were required to prioritise patient needs over their own, compromising their psychological wellbeing[3].

In Italy, as in other parts of Europe, the pandemic severely affected the healthcare system. As of mid-2020, infections in Europe had surpassed 4.3 million, with over 128 000 reported deaths[4]. The shortage of personnel and essential medical supplies – including personal protective equipment – exposed nurses to elevated occupational risks and increased workloads[5]. Additionally, the clinical severity of COVID-19 cases, often requiring repeated hospitalisations, placed significant physical and psychological strain on healthcare professionals[6].

DOI: 10.26550/2209-1092.1345

In this context, operating room (OR) nurses in Italy were frequently redeployed to emergency departments and intensive care units, further reducing the availability of perioperative personnel and compromising operating theatre function[7]. This redistribution of roles contributed to excessive workload, heightened stress and diminished patient safety. Many healthcare workers reported psychological symptoms ranging from fear and insecurity to anxiety and burnout[8].

Burnout syndrome (BoS) is characterised by emotional exhaustion, depersonalisation and a reduced sense of personal accomplishment in the workplace[9]. In 2019, the World Health Organization included BoS in the 11th Revision of the International Classification of Diseases (ICD-11), recognising it as an occupational phenomenon linked to unmanaged chronic workplace stress[10]. Nurses' performance can be significantly influenced by workload, job satisfaction and environmental conditions. BoS has been shown to undermine empathy, communication and professional-patient relationships, increasing the risk of clinical errors and negatively affecting quality of care[11,12].

In 2020, when data for this study was collected, little evidence was available of the prevalence and determinants of BoS among perioperative nurses, with most studies focusing on intensive care or emergency settings[3,8,13]. To our knowledge, this is the only Italian study specifically examining burnout in OR nurses during the COVID-19 pandemic. This study, using a validated instrument and a nationwide sample, addresses a gap in the literature by quantifying the association between BoS and self-reported patient safety outcomes in this professional group.

Although some years have passed since the onset of the pandemic, the findings remain highly relevant. Understanding how structural and organisational factors contributed to burnout during a period of extreme stress offers valuable lessons for strengthening perioperative workforce resilience, improving safety culture and preparing for future public health crises.

Aim

The primary aim of this study was to report the level of BoS among nurses working in operating theatres during the COVID-19 pandemic. The secondary aim was to explore the association between BoS and self-reported nursing performance, particularly in relation to patient safety and clinical errors.

Methods

Study design and setting

A cross-sectional exploratory study was conducted between 10 October and 30 November 2020, involving a sample of nurses affiliated with the Italian Association of Nurses in Operating Teams (Associazione Italiana Coordinatori Infermieristici or AICO). This national scientific association promotes the professional development of perioperative nurses within both national and international healthcare systems. AICO also supports the development of clinical guidelines concerning perioperative procedures, including intervention management, safety checks and, importantly, risk prevention and surgical risk management.

Participants

All nurses who were members of AICO at the time of the survey were considered eligible to participate. Those who provided informed consent were enrolled in the study. The sole exclusion criterion was not working in an operating theatre. Given the exploratory nature of the study, no formal sample size calculation was conducted.

Tools and operative procedures

The Italian validated version of the Maslach burnout inventory (MBI) was used to assess the level of BoS among nurses working in operating theatres[9]. The questionnaire comprises 22 items rated on a 7-point Likert scale ranging from 0 (never) to 6 (every day). The MBI evaluates three independent dimensions of BoS – emotional exhaustion (9 items), personal accomplishment (8 items) and depersonalisation (5 items). Score ranges are 0–54 for emotional exhaustion, 0–48 for personal accomplishment and 0–33 for depersonalisation. Higher scores in the emotional exhaustion and depersonalisation dimensions indicate higher levels of burnout, while lower scores in the personal accomplishment dimension are associated with greater burnout. The personal accomplishment dimension is independent of the emotional exhaustion and depersonalisation dimensions[9].

In addition, socio-demographic data were collected and six additional questions relating to professional experience were collected to explore the association between BoS levels and job performance.

Data collection methods

An electronic survey was administered using Google forms. The questionnaire was distributed to AICO members and was made accessible via the AICO website. To minimise the risk of bias, three specific questions were included concerning participant age and years of work experience, their role in the operating theatre and the surgical area in which they were employed.

Data analysis

Descriptive analyses were performed using frequencies (n), percentages (%), measures of central tendency (mean, M), measures of dispersion (standard deviation, ±SD) and Cronbach's alpha (α) for internal consistency. Bivariate analyses were conducted to assess the relationship between nurses' socio-demographic characteristics and work performance using the chi square test (χ^2). The level of statistical significance was set at $p \leq 0.05$. No formal sample size or power calculation was performed prior to data collection.

Multivariable logistic regression analyses were conducted to examine the association between the three burnout dimensions (continuous scores) and two binary outcomes: 'encountered risk and/or made a mistake' and 'decreased job performance'. Models were adjusted for gender, age group, years of operating room experience, primary role in the operating theatre and surgical specialty. Odds ratios with 95 per cent confidence intervals (CI) were reported. All analyses were performed using IBM SPSS Statistics version 25.

Ethics and data processing

This study was approved by the Ethics Committee of the AICO. The present survey complies with Italian data and privacy protection regulations (D.Lgs. 196/2003 and Art. 13 GDPR 679/16) and it adhered to ethical principles

Maslach burnout inventory

Emotional exhaustion	1.	I feel emotionally drained from my work.
	2.	I feel used up at the end of the workday.
	3.	I feel fatigued when I get up in the morning and have to face another day on the job.
	4.	Working with people all day is really a strain for me.
	5.	I feel burned out from my work.
	6.	I feel frustrated by my job.
	7.	I feel I'm working too hard on my job.
	8.	Working with people directly puts too much stress on me.
	9.	I feel like I'm at the end of my rope.
Personal accomplishment	10.	I can easily understand how my recipients feel about things.
	11.	I deal very effectively with the problems of my recipients.
	12.	I feel I'm positively influencing other people's lives through my work.
	13.	I feel very energetic.
	14.	I can easily create a relaxed atmosphere with my recipients.
	15.	I feel exhilarated after working closely with my recipients.
	16.	I have accomplished many worthwhile things in this job.
	17.	In my work, I deal with emotional problems very calmly.
Depersonalisation	18.	I feel I treat some recipients as if they were impersonal 'objects'.
	19.	I've become more callous toward people since I took this job.
	20.	I worry that this job is hardening me emotionally.
	21.	I don't really care what happens to some recipients.
	22.	I feel recipients blame me for some of their problems.

Additional professional experience questions

Question	Possible response
1. Have you ever encountered risk / made mistakes that could potentially harm the patient, in the last year of work?	yes/no
2. If 'yes', how much would you attribute this to your state of psychophysical suffering and/or to one of your burnout conditions?	Likert scale 0 = not at all, 10 = totally
3. Has a colleague told you that they had made a mistake that could cause damage to the patient, in the last year of work?	yes/no
4. Do you think that your job performance has decreased in the last year?	yes/no
5. If 'yes', how much would you attribute this to your state of psychophysical suffering and/or to one of your burnout conditions?	Likert scale 0 = not at all, 10 = totally
6. If you feel in burnout, what do you think is the cause that most brings you to this condition?	workplace disorganisation
	negative team culture
	lack of participation in decision-making processes
	lack of involvement in work dynamics
	tension with colleagues
	tension with superiors
	other

outlined in the Declaration of Helsinki. Participants contributed to the survey on a voluntary basis. Participation in the study was voluntary and informed consent was obtained electronically from all participants before they submitted the questionnaire. All completed questionnaires are securely stored by the principal investigator and are available upon request.

Results

Participants

A total of 233 nurses completed the questionnaire, out of 238 who were contacted by the researcher, resulting in a completion rate of 97.9 per cent. The majority of participants were female (n = 162, 69.5%), aged between 30 and 50 years (n = 143, 61.3%) and in a cohabiting relationship, either married or living with a partner (n = 150, 64.4%). Two-fifths of the sample was employed in Northern Italy (n = 98, 42.1%).

At the time of data collection, 148 participants (63.5%) held a diploma or bachelor's degree, 85 (36.5%) had completed postgraduate studies (e.g. a master's degree) and 97 (41.6%) had more than 15 years of professional experience. A total of 115 participants (49.4%) reported performing multiple roles in the operating theatre (e.g. circulating nurse, scrub nurse and/or nurse anaesthetist). In terms of surgical specialties, 137 (58.8%) participants worked in general surgery, 39 (16.7%) worked in orthopaedics and 29 (12.4%) worked in cardiac surgery.

Burnout syndrome of the involved population

The levels of burnout of participants in this study are shown in Table 2. There were 93 participants (39.9%) who reported high levels of emotional exhaustion and the mean score was 20.85 (range 0–54, α = 0.93). Low levels of personal accomplishment were reported by 90 participants (38.6%) and the mean score was 33.3 (range 0–48, α = 0.83). It should be noted that lower scores for the personal accomplishment dimension indicate greater levels of experienced burnout. More participants reported low levels (43.3%) of depersonalisation than high levels (32.2%), the mean score was 6.46 (range 0–33, α = 0.84).

Table 1: Participant characteristics (N = 233)

Characteristic		n (%)
Gender	female	162 (69.5)
	male	71 (30.5)
Age	< 30 years	33 (14.2)
	30–40 years	66 (28.3)
	41 – 50 years	77 (33.0)
	> 50	57 (24.5)
Home situation	single	83 (35.6)
	cohabiting	150 (64.4)
Work location	north	98 (42.1)
	centre	58 (24.9)
	south and islands	77 (33.0)
OR work experience	< 5 years	55 (23.6)
	5–15 years	81 (34.8)
	>15 years	97 (41.6)
Academic background	diploma or bachelor degree	148 (63.5)
	postgraduate qualification	85 (36.5)
Role/s performed	multiple roles	115 (49.4)
	instrument nurse	88 (37.8)
	nurse anaesthetist	26 (11.2)
	circulating nurse	4 (1.7)
Work surgical specialty	orthopaedics	39 (16.7)
	general surgery	137 (58.8)
	vascular	17 (7.3)
	cardiac surgery	29 (12.4)
	neurosurgery	11 (4.7)

Patient safety

The additional professional experience questions were about risks and/or mistakes and job performance. Taking risks, making mistakes and performing at a decreased level at work could all harm patients. When participants reported these phenomena, they were asked to indicate, using an 11-point Likert scale (0 = not at all, 10 = totally), how much burnout contributed to the phenomenon. Table 3 shows the distribution of responses to the additional professional experience questions.

Nearly one third of participants (n = 68, 29.2%) reported that, in the past year, they had taken risks or made errors that could potentially have harmed a patient. The sample mean score for how much these incidents were attributed to a state of psychophysical distress and/or burnout was 5.1 ± 3.0.

More than a third of participants (n = 85, 36.5%) stated that, over the same period, a colleague had confided in them about having made or nearly making a mistake with the potential to harm a patient.

Table 2: Distribution of participant scores in the three dimensions of the Maslach burnout inventory (N = 233)

Dimension	Level	n (%)	M	Score range	α
Emotional exhaustion	Low	89 (38.2)	20.85	0–54	0.93
	Moderate	51 (21.9)			
	High	93 (39.9)			
Personal accomplishment	Low	90 (38.6)	33.30	0–48	0.83
	Moderate	75 (32.2)			
	High	68 (29.2)			
Depersonalisation	Low	101 (43.3)	6.46	0–33	0.84
	Moderate	57 (24.5)			
	High	75 (32.2)			

M = sample mean score, α = Cronbach's α

Note: Higher scores on the emotional exhaustion and depersonalisation dimensions indicate higher levels of burnout, while lower scores on the personal accomplishment dimension are associated with greater burnout.

More than a third of participants (n = 89, 38.2%) reported a perceived decline in their own job performance over the past year, which they also attributed to psychophysical distress and/or burnout in the past year (Mean = 5.5 ± 3.0).

Participants were also asked to identify what contributed the most to their burnout. The most frequently reported contributing factors to burnout were workplace disorganisation (34.3%) and a negative team culture (25.3%).

Burnout distribution across nurse subgroups

Analysis of subgroup differences (Table 4) revealed that burnout was particularly prevalent among certain categories of OR nurses. Specifically, more participants aged 30–40 showed high levels of emotional exhaustion and depersonalisation (respectively 43.9% and 42.4%) than participants in the other age ranges. Similarly, 43.8 per cent of female participants and 45.3 per cent of participants working in general surgery reported high emotional exhaustion. Nurses performing multiple intra-operative roles also exhibited high burnout, with 42.6 per cent reporting emotional exhaustion.

For ease of interpretation, Table 4 summarises selected characteristics showing notable high/low burnout categories across at least two dimensions.

Results for all characteristics are shown in Supplement 1.

Clinical error and BoS level

Bivariate analysis of the three burnout dimensions and professional experience questions 1, 3 and 4 revealed a statistically significant association ($p \leq 0.05$) between emotional exhaustion and 'yes' responses to a colleague reporting risk or making a mistake (question 3) and self-reported decreased job performance (question 4). A statistically significant association was also found between depersonalisation and 'yes' responses to all three questions about experiencing risk or making a mistake, a colleague reporting risk or making a mistake, and self-reported decreased job performance. Table 5 shows the results of bivariate analysis of high emotional exhaustion, low personal accomplishment and high depersonalisation. Complete data are available in Supplement 2.

Of the 89 participants who reported a reduction in their job performance over the past year, most (86.5%) had moderate or high levels of emotional exhaustion ($p < 0.001$), about two thirds (69.7%) reported low or moderate levels of personal accomplishment ($p = 0.28$) and about two thirds (69.7%) had moderate or high levels of depersonalisation ($p < 0.001$).

Similarly, of the 68 nurses who reported having encountered risk and/or made a mistake, over two thirds (70.6%) had moderate or high emotional exhaustion ($p < 0.001$), under two thirds (64.6%) had low or moderate personal accomplishment ($p = 0.42$) and over two thirds (69.2%) had moderate or high depersonalisation ($p < 0.001$).

Independent predictors of experiencing risk and/or making a mistake and decreased job performance

The multivariable logistic regression model for experiencing risk and/or making a mistake revealed that higher depersonalisation scores were independently associated with increased odds of experiencing risk and/or making a mistake (odds ratio = 1.08, 95% CI 1.02–1.15, $p = 0.007$). Supplement 3 shows the full model.

For decreased job performance, higher emotional exhaustion scores were strongly associated with increased odds of performance decline (odds ratio = 1.10, 95% CI 1.06–1.14, $p < 0.001$). Female gender (OR = 0.39, 95% CI 0.18–0.82, $p = 0.013$) and performing the role of nurse anaesthetist rather than performing multiple roles (OR = 0.16, 95% CI 0.04–0.64, $p = 0.009$) were associated with reduced odds of performance decline. Supplement 4 shows the full model.

Table 3: Distribution of responses to the additional professional experience questions

Question		Response	n (%)
1	Have you ever encountered risk / made mistakes that could potentially harm the patient, in the last year of work?	no	165 (70.8)
		yes	68 (29.2)
2	If 'yes', how much would you attribute this to your state of psychophysical suffering and/or to one of your burnout conditions? (M ± SD)	0–10	5.1 ± 3.0
3	Has a colleague told you that they made a mistake that could cause damage to the patient, in the last year of work?	no	148 (63.5)
		yes	85 (36.5)
4	Do you think that your job performance has decreased in the last year?	no	144 (61.8)
		yes	89 (38.2)
5	If 'yes', how much would you attribute this to your state of psychophysical suffering and/or to one of your burnout conditions? (M ± SD)	0–10	5.5 ± 3.0
6	If you feel in burnout, what do you think is the cause that most brings you to this condition?	workplace disorganisation	80 (34.3)
		negative team culture	59 (25.3)
		lack of participation in decision-making processes	13 (5.6)
		lack of involvement in work dynamics	12 (5.2)
		tension with colleagues	18 (7.7)
		tension with superiors	17 (7.3)
		other	34 (14.6)

Discussion

This study confirms the high prevalence of BoS among Italian OR nurses during the COVID-19 pandemic, and the significant association of BoS with threat to patient safety, through risks taken and/or mistakes made and decreased job performance. While these outcomes are consistent with international findings on the psychological impact of the pandemic on frontline health professionals[13], this investigation is, to our knowledge, the first in Italy to specifically focus on OR nurses.

Analysis of subgroup differences revealed that burnout was more frequent among nurses aged between 30 and 40 and female nurses. Although not included in Table 4, nurses with 5 to 15 years of professional experience showed elevated emotional exhaustion, suggesting partial vulnerability to burnout in this subgroup. These findings align with existing literature indicating that mid-career nurses may experience higher levels of stress due to increasing responsibilities, evolving job demands and, at times, limited institutional support[14]. Additionally, nurses working in high-intensity specialties, such as general surgery and neurosurgery, reported higher levels of burnout likely reflecting the greater clinical pressure and procedural complexity in these settings.

A particularly relevant finding was the association between burnout and performing multiple intra-operative roles. While it is common and perioperative nurses are professionally capable of alternating between roles such as instrument nurse, circulating nurse and nurse anaesthetist, our results suggest that performing multiple functions within high-pressure environments may contribute to increased emotional exhaustion and depersonalisation. This highlights the need for organisational policies that optimise role allocation, ensure adequate staffing and allow for sufficient recovery between shifts, especially in high-acuity surgical environments. These outcomes likely reflect the cumulative physical and cognitive demands required in complex surgical settings, especially when combined with elevated workloads or limited recovery time.

Crucially, burnout was significantly associated with self-reported clinical errors and perceived decrease in job performance (as shown in Table 5). Notably, this association persisted even when errors were attributed to colleagues, suggesting the presence of shared stress or psychological contagion within surgical teams. This supports emerging evidence that burnout is not only an individual phenomenon, but can impact team dynamics and compromise overall patient safety[15].

In the adjusted models, higher depersonalisation was independently associated with an increased likelihood of reporting experience of risk and/or making a mistake, while higher emotional exhaustion emerged as the strongest predictor of decreased performance in patient care. These findings suggest that distinct burnout dimensions may differentially impact patient safety outcomes. Depersonalisation, reflecting a detached or cynical attitude toward patients, may directly compromise attention to detail and increase the risk of adverse events[16,17]. This result aligns with previous studies linking depersonalisation to higher self-reported error rates among

Table 4: Levels of burnout by demographic and professional characteristics

Characteristic		EE level (low/moderate/high)	PA level* (low/moderate/high)	DP level (low/moderate/high)
Gender	female	high	low	low
	male	low	low	high
Age	30–40 years	high	high	high
	40–50 years	high	low	low
	> 50 years	high	low	low
Home situation	cohabiting	high	low	low
Work location	south and islands	high	low	low
Academic background	diploma or bachelor degree	high	low	low
Role/s performed	multiple role	high	low	high
	nurse anaesthetist	high	low	low
Work surgical specialty	general surgery	high	low	low
	neurosurgery	high	high	high

EE = emotional exhaustion, PA = personal accomplishment, DP = depersonalisation

* Lower levels of personal accomplishment are associated with greater burnout.

Note: Only characteristics with significant results in two dimensions are shown. Results for all characteristics are shown in Supplement 1.

perioperative nurses and other acute care professionals[12,13]. In contrast, emotional exhaustion appears to be more closely related to perceived declines in work performance, possibly due to its pervasive effect on cognitive resources and motivation[13,18].

The protective associations between being female and performing only the role of nurse anaesthetist and a reduced likelihood of decreased job performance may reflect contextual or role-related factors, such as stronger team integration or differences in workload distribution. However, these findings should be interpreted with caution, as they may be influenced by unmeasured organisational variables[19]. The absence of a significant independent effect for personal accomplishment suggests that its role in predicting patient safety outcomes may be more indirect, potentially mediated by other burnout dimensions or job satisfaction[11].

These results reinforce the need for targeted interventions addressing specific components of burnout. Strategies aimed at reducing depersonalisation – such as fostering team cohesion and enhancing patient engagement – may help lower error risk, while interventions focused on mitigating emotional exhaustion – including workload management and psychosocial support – could sustain performance levels[15,20].

The organisational factors most frequently reported by participants – workplace disorganisation and negative team culture – underscore the central role of workplace

Table 5: Bivariate analysis of burnout dimensions and professional experience questions

Professional experience question	Response	EE level	χ2	PA level*	χ2	DP level	χ2
Question 1	yes	high	0.06	low, high	0.42	high	0.01
Question 3	yes	high	0.01	low	0.40	high	0.02
Question 4	yes	high	< 0.001	low	0.28	high	0.00

EE = emotional exhaustion, PA = personal accomplishment, DP = depersonalisation, χ2 = chi square

* Lower levels of personal accomplishment are associated with greater burnout.

Question 1: Have you ever encountered risk / made mistakes that could potentially harm the patient, in the last year of work?

Question 3: Has a colleague told you that they made a mistake that could cause damage to the patient, in the last year of work?

Question 4: Do you think that your job performance has decreased in the last year?

Note: Selected bivariate associations (including markedly high or low burnout levels), are shown. Complete data are available in Supplement 2.

culture in shaping nurse wellbeing and patient safety. Rather than focusing solely on individual resilience, interventions should target structural determinants, including team cohesion, communication practices and workflow management. These priorities remain relevant beyond the pandemic context, as high workloads, role overlap and strained interpersonal dynamics are not unique to COVID-19 but are embedded in perioperative practice.

Limitations

Although multivariable logistic regression was performed to adjust for key demographic and professional confounders, residual confounding from unmeasured variables cannot be excluded. The sample size limited the ability to conduct subgroup analyses and to include additional organisational factors. The open survey link, disseminated via the AICO website, prevented estimation of a true response rate, which may affect the generalisability of the findings.

Practical implications for perioperative practice

The findings of this study highlight several practical implications for improving perioperative care and staff wellbeing. Firstly, structured workload management strategies are crucial to mitigate burnout, especially among operating room nurses performing multiple roles. Surgical units should adopt balanced shift rotations, limit excessive task overlaps and ensure adequate staffing levels to prevent overload and task fatigue[21].

Secondly, fostering a positive team culture through interdisciplinary communication and mutual support may reduce depersonalisation and emotional exhaustion. Promoting team-building activities, regular debriefings and shared decision-making processes can strengthen professional cohesion and safety culture within the operating theatre[19].

Thirdly, the implementation of burnout surveillance systems should become routine practice. Periodic assessments using validated tools such as the MBI can assist in identifying early signs of distress and prompt targeted interventions, reducing long-term risks to both staff and patient safety[22].

Finally, healthcare organisations should provide structured psychological support programs, such as counselling services, stress management training or resilience workshops tailored to perioperative staff. These interventions have been shown to reduce emotional exhaustion and enhance job satisfaction among nurses in high-stress environments[22].

By integrating these strategies into perioperative practice, healthcare systems can not only reduce the prevalence of burnout but also enhance the overall quality and safety of surgical care delivery.

Conclusion

In the context examined, burnout levels among operating room nurses were notably high. The COVID-19 pandemic had a profound impact on the national healthcare system, significantly altering work dynamics. Although nursing staff demonstrated professionalism and adaptability throughout the crisis, the psychological toll was substantial. Healthcare administrators and policy makers should prioritise the implementation of strategies aimed at reducing emotional strain, promoting staff wellbeing and ensuring the delivery of high-quality perioperative care.

Conflict of interest and funding statement

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

This research did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

References

1. Alderwick H, Dunn P, Dixon J. England's health policy response to COVID-19 [Internet]. BMJ. 2020[cited 2025 Jul 12];369:m1937. DOI: 10.1136/bmj.m1937
2. Fernandez R, Lord H, Halcomb E, Moxham L, Middleton R, Alananzeh I et al. Implications for COVID-19: A systematic review of nurses' experiences of working in acute care hospital settings during a respiratory pandemic [Internet]. Int J Nurs Stud. 2020[cited 2025 Jul 12];111:103637. DOI: 10.1016/j.ijnurstu.2020.103637
3. Hu D, Kong Y, Li W, Han Q, Zhang X, Zhu LX, et al. Frontline nurses' burnout, anxiety, depression, and fear statuses and their associated factors during the COVID-19 outbreak in Wuhan, China: A large-scale cross-sectional study [Internet]. EClinicalMedicine. 2020[cited 2025 Jul 12];24:100424. DOI: 10.1016/j.eclinm.2020.100424
4. European Centre for Disease Prevention and Control (ecdc). COVID-19 situation update worldwide [Internet]. Solna: ecdc; 2020[cited 2025 Jul 12]. Formerly available from: www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases
5. Galanis P, Vraka I, Fragkou D, Bilali A, Kaitelidou D. Nurses' burnout and associated risk factors during the COVID-19 pandemic: A systematic review and meta-analysis [Internet]. J Adv Nurs. 2021[cited 2025 Jul 12];77(8):3286–302. DOI: 10.1111/jan.14839
6. Pappa S, Ntella V, Giannakas T, Giannakoulis VG, Papoutsi E, Katsaounou P. Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis [Internet]. Brain Behav Immun. 2020[cited 2025 Jul 12];88:901–7. DOI: 10.1016/j.bbi.2020.05.026
7. Lucchini A, Iozzo P, Bambi S. Nursing workload in the COVID-19 era: A case report from an intensive care unit [Internet]. Intensive Crit Care Nurs. 2020[cited 2025 Jul 12];61:102929. DOI: 10.1016/j.iccn.2020.102929
8. De Kock JH, Latham HA, Leslie SJ, Grindle M, Munoz SA, Ellis L et al. A rapid review of the impact of COVID-19 on the mental health of healthcare workers: Implications for supporting psychological wellbeing [Internet]. BMC Public Health. 2021[cited 2025 Jul 12];21(1):104. DOI: 10.1186/s12889-020-10070-3
9. Maslach C, Jackson SE. The measurement of experienced burnout [Internet]. J Occup Behav. 1981[cited 2025 Jul 12];2(2):99–113. DOI: 10.1002/job.4030020205
10. World Health Organization (WHO). Burn-out an 'occupational phenomenon': International classification of diseases [Internet]. Geneva: WHO; 2019[cited 2025 Jul 12]. Available from: www.who.int/news/item/28-05-2019-burn-out-an-occupational-phenomenon-international-classification-of-diseases
11. Dall'Ora C, Ball J, Recio-Saucedo A, Griffiths P. Burnout in nursing: A theoretical review [Internet]. Hum Resour Health. 2020[cited 2025 Jul 12];18(1):41. DOI: 10.1186/s12960-020-00469-9

12. García CL, Abreu LC, Ramos JLS, Castro CFD, Smiderle FRN, Santos JAD et al. Influence of burnout on patient safety: Systematic review and meta-analysis [Internet]. Medicina (Kaunas). 2019[cited 2025 Jul 12];55(9):553. DOI: 10.3390/medicina55090553
13. García GM, Calvo JCA. The threat of COVID-19 and its influence on nursing staff burnout [Internet]. J Adv Nurs. 2021[cited 2025 Jul 12];77(2):832–44. DOI: 10.1111/jan.14642
14. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: A systematic review [Internet]. PLoS One. 2016[cited 2025 Jul 12];11(7):e0159015. DOI: 10.1371/journal.pone.0159015
15. Panagioti M, Geraghty K, Johnson J, Zhou A, Panagopoulou E, Chew-Graham C et al. Association between physician burnout and patient safety, professionalism, and patient satisfaction: A systematic review and meta-analysis [Internet]. JAMA Intern Med. 2018[cited 2025 Jul 12];178(10):1317–31. DOI: 10.1001/jamainternmed.2018.3713
16. Tawfik DS, Profit J, Morgenthaler TI, Satele DV, Sinsky CA, Dyrbye LN et al. Physician burnout, well-being, and work unit safety grades in relationship to reported medical errors [Internet]. Mayo Clin Proc. 2018[cited 2025 Jul 12];93(11):1571–80. DOI: 10.1016/j.mayocp.2018.05.014
17. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry [Internet]. World Psychiatry. 2016[cited 2025 Jul 12];15(2):103–11. DOI: 10.1002/wps.20311
18. Poghosyan L, Clarke SP, Finlayson M, Aiken LH. Nurse burnout and quality of care: Cross-national investigation in six countries [Internet]. Res Nurs Health. 2010[cited 2025 Jul 12];33(4):288–98. DOI: 10.1002/nur.20383
19. Shanafelt TD, Ripp J, Trockel M. Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic [Internet]. JAMA. 2020[cited 2025 Jul 12];323(21):2133–34. DOI: 10.1001/jama.2020.5893
20. Ruotsalainen JH, Verbeek JH, Mariné A, Serra C. Preventing occupational stress in healthcare workers [Internet]. Cochrane Database Syst Rev. 2015[cited 2025 Dec 21];(4). DOI: 10.1002/14651858.CD002892.pub5
21. West CP, Dyrbye LN, Satele DV, Sloan JA, Shanafelt TD. Concurrent validity of single-item measures of emotional exhaustion and depersonalization in burnout assessment [Internet]. J Gen Intern Med. 2012[cited 2025 Jul 12];27(11):1445–52. DOI: 10.1007/s11606-012-2012-7
22. Cohen C, Pignata S, Bezazc E, Tie M, Childs J. Workplace interventions to improve well-being and reduce burnout for nurses, physicians and allied healthcare professionals: a systematic review [Internet]. BMJ Open. 2023[cited 2025 Jul 12];13(6):e071203. DOI: 10.1136/bmjopen-2022-071203