



Work-Related Burnout Dominates Among Anesthesia Personnel: A Comparative Analysis of Burnout Dimensions in Iraqi Hospitals

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ARTICLE INFO	ABSTRACT
Article Type:	Occupational burnout is a significant concern among anesthesia personnel; however, the relative prominence of its dimensions, personal, work-related, and client-related, remains underexplored in resource-constrained settings. This study aimed to compare these dimensions among anesthesia staff in Iraqi hospitals and determine which was the most prevalent. A cross-sectional study was conducted among 150 anesthesia staff recruited from five public and teaching hospitals in Karbala, Iraq. Burnout was assessed using the Copenhagen Burnout Inventory. Paired-samples t-tests with Bonferroni correction ($\alpha = 0.0167$) were used to compare dimensions, and effect sizes were calculated using Cohen's d. Work-related burnout demonstrated the highest mean score (M = 42.76, SD = 18.37), followed by personal (M = 36.47, SD = 17.04) and client-related (M = 33.40, SD = 16.72). Work-related burnout was significantly higher than personal (mean difference = 6.30, $p = 0.001$, $d = 0.277$) and client-related burnout (mean difference = 9.37, $p < 0.001$, $d = 0.412$). No significant difference was observed between personal and client-related burnout ($p = 0.064$). The sample was predominantly young (62.7% aged 20–29 years) and early-career (54.0% with 1–5 years of experience). In conclusion, work-related burnout is the dominant dimension among anesthesia staff in Iraqi hospitals. Organizational interventions targeting workload, shift scheduling, and supervisory support may be more effective than individual-focused strategies in addressing burnout in this population.
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Introduction

Occupational burnout has emerged as a major threat to healthcare workforce sustainability, patient safety and organizational performance. Burnout is characterized by persistent emotional and physical

exhaustion, reduced engagement, and impaired professional functioning, and arises from prolonged exposure to inadequately managed occupational stress [1, 2]. Among healthcare professionals, its consequences extend beyond individual well-being to include decreased job satisfaction, increased turnover,

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and compromised quality of care [3]. These effects are particularly concerning for health systems already burdened by workforce shortages and resource constraints.

Anesthesia personnel may be especially vulnerable to burnout due to the sustained vigilance, high cognitive demands, time-critical decision-making, and medico-legal responsibility inherent to their work [4, 5]. These demands are often compounded by long or irregular shifts, high caseloads, and limited recovery time, contributing to persistent exhaustion and impaired well-being [6]. Recent evidence continues to identify burnout as a substantial concern among anesthesia professionals, although prevalence varies considerably across settings [7, 8].

The implications of burnout in anesthesia are particularly significant because clinical performance depends on continuous attention, effective communication, and rapid decision-making. Burnout may adversely affect concentration, situational awareness, empathy, and teamwork, potentially increasing the risk of medical errors and threatening patient safety [9]. Therefore, addressing burnout among anesthesia staff should be viewed not only as a well-being initiative but also as an integral component of healthcare quality and patient safety policy [10].

Burnout, however, is not a unitary phenomenon. The Copenhagen Burnout Inventory (CBI) conceptualizes exhaustion across three related but distinct domains: personal burnout (general fatigue irrespective of source), work-related burnout (exhaustion attributed to occupational demands), and client-related burnout (exhaustion arising from patient interactions) [11]. This multidimensional framework is particularly relevant to anesthesia practice, where the burden of exhaustion may arise from interacting sources, including organizational pressures, workload, and emotional demands of patient care.

Identifying the predominant burnout dimension has important practical implications for organizations. A predominance of work-related burnout suggests prioritizing organizational interventions, such as workload distribution, shift scheduling, and supervisory support [12]. In contrast, higher personal burnout may indicate a need for broader well-being and mental health support, whereas elevated client-related burnout may indicate challenges in patient communication and emotional demands [13, 14]. Thus, examining the relative prominence of burnout dimensions may provide more actionable information than reporting an overall burnout score.

Although burnout among anesthesia professionals has received increasing international attention, the available evidence remains inconsistent. Differences in

healthcare infrastructure, staffing, workload, and measurement methods limit direct comparisons between settings [15]. Recent studies have demonstrated substantial international variations in burnout dimensions among anesthesia personnel, suggesting that findings from high-income countries may not be transferable to other contexts [5]. This highlights the need for context-specific evidence, particularly in countries where healthcare professionals face workforce limitations, resource constraints, and increasing clinical demands.

In Iraq, the healthcare system has experienced prolonged structural challenges that may intensify occupational pressure on anesthesia staff, who are essential to surgical, obstetric, emergency, and critical care services [16]. However, evidence regarding the relative distribution of burnout dimensions among anesthesia personnel in Iraqi hospitals is scarce. Without a clear understanding of which dimension is most prominent, developing targeted and contextually appropriate interventions is difficult.

Therefore, this study aimed to compare personal, work-related, and client-related burnout among anesthesia staff in Iraqi hospitals and determine which dimension was most prevalent. By identifying the dominant pattern of occupational exhaustion, the study seeks to provide evidence that may inform targeted workforce-support strategies and organizational interventions within anesthesia services.

Materials and Methods

Study Design and Data Source

This cross-sectional study was conducted among anesthesia personnel employed in five public and teaching hospitals located in the Karbala Governorate, Iraq in 2025. The participating hospitals were Karbala Children's Teaching Hospital, Al-Safir Imam Al-Hussein Surgical Hospital, Imam Al-Hassan Al-Mujtaba Teaching Hospital, Women's and Gynecology Teaching Hospital, and Imam Hussein City Teaching Hospital. These facilities were selected as they represent major referral and teaching centers providing a wide range of surgical, obstetric, and intensive care services requiring substantial anesthesia coverage.

Participants and Sampling

A convenience sample of 150 anesthesia staff members was recruited from the anesthesia departments of the participating hospitals. A sample size of 150 was determined a priori using G*Power software ($\alpha = 0.05$, power = 0.80, medium effect size

$f^2 = 0.15$), which exceeded the minimum required sample size of 85 for multiple regression analyses in the parent study and was considered adequate for the paired comparisons in the present analysis. Eligible participants met the following criteria: (a) current employment in a public or teaching hospital in Iraq, (b) active service in an anesthesia department, (c) possession of a diploma, bachelor's, master's, or board certification in anesthesia, and (d) a minimum of six months of work experience in their current role. Individuals were excluded if they submitted incomplete questionnaires or formally withdrew from the study.

Data Collection

Data were collected using a paper-based, self-administered questionnaire distributed during non-emergency shifts and departmental meetings to minimize disruption to clinical services. Eligible staff were approached, provided with an information sheet explaining the study objectives and confidentiality procedures, and invited to participate voluntarily. Written informed consent was obtained from all participants prior to questionnaire completion. Each questionnaire required approximately 10 minutes to complete and was returned immediately in a sealed, unmarked envelope to ensure anonymity. For staff unavailable during the initial visit, a second visit was scheduled within the same week to maximize the response rate.

Data Collection Instruments

Copenhagen Burnout Inventory (CBI): Burnout was assessed using the Copenhagen Burnout Inventory (CBI), a widely validated instrument originally developed by Kristensen et al. [11]. The CBI comprises three distinct subscales: personal burnout (six items), work-related burnout (seven items), and client-related burnout (six items). Each item is rated on a 5-point Likert scale ranging from 0 (never/almost never) to 100 (always), with higher scores indicating greater levels of exhaustion. In the current study, the Arabic version of the CBI, previously translated and validated by Youssef et al. [17] among Lebanese community pharmacists, was used. The validation study reported satisfactory internal consistency (Cronbach's α ranging from .77 to .90) and good construct validity (three-factor structure explaining 72.17% of the variance). In our sample, Cronbach's alpha coefficients were 0.84 for personal burnout, 0.88 for work-related burnout, and 0.81 for client-related burnout, indicating good-to-excellent reliability.

Demographic and Occupational Form: A researcher-developed section collected background information, including age, sex, marital status, educational level, and years of work experience.

Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows version 27. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were computed to summarize the participants' characteristics and burnout dimension scores. Prior to conducting the primary analyses, the distribution of the data was assessed using the Kolmogorov-Smirnov test with Lilliefors significance correction, supplemented by Monte Carlo simulation with 10,000 resamples. This was performed to evaluate the normality of the difference scores between burnout dimensions, as required for paired-samples t-tests. To compare the three burnout dimensions (personal, work-related, and client-related), a series of paired-samples t-tests were conducted. Given that three pairwise comparisons were performed, a Bonferroni correction was applied to control for Type I error, setting the statistical significance threshold at $\alpha = 0.0167$ ($0.05 \div 3$). Paired-samples t-tests were selected over repeated-measures ANOVA because the three burnout dimensions were measured as distinct dependent variables, and this approach provided more direct and interpretable pairwise comparisons between dimensions. For each significant comparison, effect sizes were calculated using Cohen's d , interpreted as small (0.20–0.49), medium (0.50–0.79), or large (≥ 0.80).

All statistical tests were two-tailed, and statistical significance was set at $p < 0.05$ prior to adjustment. The results are presented as means with standard deviations, mean differences with 95% confidence intervals, t-values, degrees of freedom, and p-values. The reporting of this study follows the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for cross-sectional studies.

Results

Demographic Characteristics of Participants

A total of 150 anesthesia staff members participated in the study, yielding a response rate of 94%. The sample was predominantly young and early career, with the majority of participants aged 20–29 years and having one to five years of experience. Females constituted slightly more than half of the sample, and most of the participants held a bachelor's degree (Table 1).

Descriptive Statistics of Burnout Dimensions

The mean scores for the three burnout dimensions indicated that work-related burnout ($M = 42.76$, $SD = 18.37$) was the highest, followed by personal burnout

($M = 36.47$, $SD = 17.04$), and client-related burnout ($M = 33.40$, $SD = 16.72$) (Table 2).

Comparison of Burnout Dimensions

Prior to conducting the paired-samples t -tests, the normality of the difference scores was confirmed using the Kolmogorov–Smirnov test with Lilliefors correction ($p > 0.05$ for all comparisons).

Paired-samples t -tests were performed to compare the three burnout dimensions. A Bonferroni

correction was applied to control for Type I error, setting the significance level at $\alpha = 0.0167$.

Work-related burnout was found to be significantly higher than both personal and client-related burnout. However, the difference between personal burnout and client-related burnout did not reach statistical significance. The effect sizes (Cohen's d) for the significant comparisons ranged from 0.277 to 0.412, indicating small to small-to-medium effects (Table 3, Figure 1).

Table 1. Demographic Characteristics of Participants ($N = 150$)

Characteristic	Category	n (%)
Gender	Male	70 (46.7)
	Female	80 (53.3)
	Single	75 (50.0)
Marital status	Married	73 (48.7)
	Divorced/Widowed	2 (1.4)
Educational level	Diploma	47 (31.3)
	Bachelor's degree	90 (60.0)
	Master's/Board	13 (8.7)
Age group (years)	20–29	94 (62.7)
	30–39	37 (24.7)
	≥ 40	19 (12.7)
Years of experience	1–5	81 (54.0)
	5–10	43 (28.7)
	> 10	26 (17.3)

Table 2. Descriptive Statistics of Burnout Dimensions ($N = 150$)

Dimension	Mean	SD	CI 95%	Minimum	Maximum
Personal Burnout	36.47	17.04	[33.72, 39.22]	0.81	81.09
Work-Related Burnout	42.76	18.37	[39.79, 45.73]	11.43	97.50
Client-Related Burnout	33.40	16.72	[30.70, 36.10]	8.33	75.49

Table 3. Pairwise Comparisons of Burnout Dimensions Among Anesthesia Staff ($N = 150$)

Comparison	Mean Difference	t	df	p-value*	Cohen's d
Work-Related vs. Personal Burnout	6.30	3.398	149	0.001	0.277
Work-Related vs. Client-Related Burnout	9.37	5.046	149	< 0.001	0.412
Personal vs. Client-Related Burnout	3.07	1.867	149	0.064	0.152

*Bonferroni-corrected significance level: $p < 0.0167$

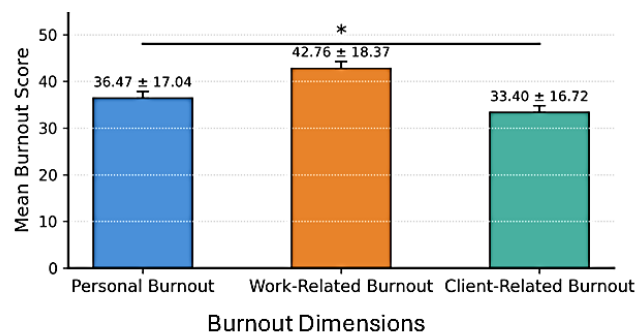


Figure 1. Comparison of mean scores of burnout dimensions among anesthesia staff in Iraqi hospitals ($N = 150$). Error bars represent standard error of the mean (SEM). Work-related burnout was significantly higher than personal burnout and client-related burnout. * $p < 0.001$ (Bonferroni-corrected for three comparisons).

Discussion

This study compared the three dimensions of occupational burnout among anesthesia staff working in Iraqi hospitals using the Copenhagen Burnout Inventory. The principal finding was that work-related burnout demonstrated significantly higher mean scores than both personal and client-related burnout, whereas no statistically significant difference was observed between personal and client-related burnout. These findings suggest that occupational exhaustion among Iraqi anesthesia personnel is driven predominantly by factors inherent to the work environment rather than by generalized personal exhaustion or fatigue arising from patient interactions.

The predominance of work-related burnout is consistent with the nature of anesthesia practice. Anesthesia personnel routinely work in environments characterized by sustained vigilance, continuous monitoring of physiologically unstable patients, rapid decision-making [18], unpredictable emergencies, prolonged procedures, shift work, and substantial medico-legal responsibility [4, 6]. These occupational demands require prolonged cognitive and emotional engagement, making work-related exhaustion a plausible consequence even when interpersonal interactions with patients are relatively limited compared with many other healthcare professions [5]. Recent evidence continues to identify anesthesia as one of the clinical specialties at substantial risk of burnout, with workload, organizational demands, staffing shortages, and work intensity consistently emerging as major contributing factors [7, 19].

Our findings also align with the conceptual framework of the Copenhagen Burnout Inventory, which distinguishes exhaustion according to its source, rather than treating burnout as a single construct [11]. This multidimensional approach provides greater insight into the direction of interventions. The observation that work-related burnout exceeded client-related burnout suggests that the principal drivers of exhaustion may lie within organizational and occupational conditions rather than patient care itself. Similar observations have been reported in studies using the CBI in other healthcare settings, where work-related and personal burnout often cluster together, while client-related burnout represents a distinct dimension influenced by different workplace experiences [8, 17].

Several contextual factors may help explain the predominance of work-related burnout in this study. Iraqi anesthesia staff frequently work in public teaching hospitals that provide high volumes of surgical, obstetric, emergency, and critical care. Such

settings commonly involve demanding workloads, irregular working hours, limited recovery time between shifts and finite organizational resources [15, 16]. Although the present study did not directly evaluate these workplace characteristics, they represent plausible organizational contributors to work-related exhaustion and should be examined in future studies. Because this study employed a cross-sectional design, these explanations should be interpreted as hypotheses rather than causal inferences.

Although the effect sizes (Cohen's *d*) for the significant comparisons ranged from 0.277 to 0.412, indicating small-to-small-to-medium effects, these findings retain practical importance in the field. In resource-constrained healthcare settings, even modest differences in burnout dimensions may have meaningful implications for workforce well-being and patient safety at the population level. Identifying work-related burnout as the dominant dimension, regardless of effect size magnitude, provides actionable directions for organizational interventions.

Interestingly, personal burnout did not differ significantly from client-related burnout scores. This finding may indicate that, despite experiencing considerable occupational demands, anesthesia personnel do not perceive patient interaction as a disproportionately important source of exhaustion. Unlike healthcare professionals whose practice involves prolonged therapeutic relationships, anesthesia providers generally interact with patients for relatively brief but highly intensive periods [20]. Consequently, the emotional burden associated with direct patient contact may be outweighed by the cognitive, organizational, and operational demands of anesthesia.

This study has several limitations. First, the use of a convenience sample from hospitals in a single governorate (Karbala) limits the generalizability of the findings to other regions, hospital types (e.g., private or rural facilities), and healthcare settings in Iraq. Second, the cross-sectional design precludes any causal inferences. Third, although we observed statistically significant differences between burnout dimensions, we did not directly measure organizational factors such as workload, shift patterns, or supervisory support, which may underlie the predominance of work-related burnout in our sample. Future studies should employ longitudinal designs and include objective measures of organizational factors to establish causality and evaluate the effectiveness of targeted interventions in this context.

The findings have important implications for healthcare management. Because work-related burnout appears to be the dominant dimension, interventions focusing solely on individual resilience or stress management are unlikely to adequately address the underlying problem. Greater attention should instead be directed toward organizational strategies, including optimizing staffing levels, improving workload distribution, minimizing excessive working hours [3], ensuring adequate recovery between shifts, strengthening supervisory and peer support, and promoting healthy work environments [12]. Evidence increasingly suggests that organizational interventions are more likely than individual-focused approaches to achieve sustainable reductions in occupational burnout among healthcare professionals [21].

Overall, the present study provides one of the first multidimensional assessments of burnout among anesthesia staff in Iraqi hospitals using the Copenhagen Burnout Inventory. By demonstrating that work-related burnout constitutes the most prominent dimension, the findings provide context-specific evidence that may assist healthcare leaders and policymakers in prioritizing organizational strategies to improve workforce well-being and support the long-term sustainability of anesthesia services [22].

Conclusion

This study demonstrated that work-related burnout was the most prevalent dimension among anesthesia staff in Iraqi hospitals. The findings suggest that organizational and occupational factors may be primary drivers of burnout in this population. Given the demanding nature of anesthesia practice in resource-constrained settings, healthcare administrators should prioritize structural interventions, including workload optimization, improved shift scheduling, enhanced supervisory support, and adequate recovery time. However, future research is needed to directly evaluate the effectiveness of such interventions and to examine the specific organizational determinants underlying work-related burnout in this context.

Authorship contribution statement

All authors have taken ownership of the entire content of this manuscript and have given their approval for its submission.

A.SH.: Conceptualization, Methodology, Writing - Review& Editing; H. D.: Conceptualization, Methodology, Writing - Original Draft, Review&

Editing; E.Sh: Supervision, Conceptualization, Methodology, Writing -Writing - Review& Editing; M.M: Writing -Writing - Review& Editing; F.A: Writing -Writing - Review& Editing

Ethical Considerations

The study protocol was approved by the Ethics Committee of the Tehran University of Medical Sciences, School of Public Health (IR.TUMS.SPH.REC.1404.143). All procedures were conducted in accordance with the ethical standards of the institutional research committee and the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all participants before data collection. Participation was entirely voluntary, and the participants were assured of their right to withdraw at any time without any negative consequences. Anonymity and confidentiality were maintained throughout the study by using unique identification codes and storing the data in password-protected files accessible only to the research team.

Conflict of interest statement

No conflict of interest has been declared

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Data Availability

This study did not generate any new datasets. However, more information may be obtained from the corresponding author upon reasonable request.

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Declaration of Generative AI

The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of tables, or their corresponding captions.

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