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Stress in the operating room: Prevalence, sources, and mitigation strategies among surgeons

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Abstract
Introduction: Moderate to high levels of stress are prevalent among operating room staff, particularly affecting surgical trainees. This stress can lead to burnout, decreased motivation, and impaired well-being. This study aimed to assess the prevalence, sources, effects, and coping mechanisms of stress among surgeons.
Methods: A cross-sectional, anonymous survey was conducted among 71 surgeons across all specialties and career levels. The survey assessed stress levels on a 10-point scale, identified sources and effects of stress, and documented personal coping strategies and desired institutional resources.
Results: The majority of respondents (63.3%) were trainees or junior surgeons. Most surgeons (61.3%) reported a moderate stress level (3-6/10). The primary sources of stress were technical or equipment problems (76.1%), procedural complexity (47.9%), and team behavior or lack of coordination (42.3% and 31.0%, respectively). Reported effects included intense fatigue (41.4%), feelings of burnout (35.7%), and irritability with the team (15.7%). Common personal coping strategies were relaxing activities like sports (59.2%), proactive communication (43.7%), and mental or technical preparation (42.3%). Surgeons requested reliable equipment (81.7%), improved communication/coordination (66.2%), stress management training (54.9%), and psychological support (42.3%).
Conclusion: Stress is a significant issue in the surgical profession, driven by technical, relational, and emotional factors. Current formal training in stress management is inadequate. There is a strong demand for institutional support, including reliable equipment, enhanced teamwork, and structured wellness programs.

Keywords: Stress; operating room; surgeons; burnout; surgical education

Introduction
The operating room (OR) is a high-stakes environment characterized by time pressure, complex decision-making, and intense responsibility for patient outcomes. Consequently, surgeons are frequently exposed to significant psychological stress [1]. While a certain level of stress can enhance performance, chronic or excessive stress is detrimental, leading to surgeon burnout, diminished job satisfaction, medical errors, and negative impacts on patient care [2, 3].
This issue is particularly acute among surgical trainees and junior surgeons, who are simultaneously mastering advanced technical skills and navigating hierarchical structures [4]. Despite its recognized impact, stress and its management are rarely formally addressed in surgical curricula [5]. Most surgeons develop personal, often suboptimal, coping mechanisms without structured guidance.
The primary objective of this study was to quantify the perceived level of stress among a diverse group of surgeons. Secondary objectives were to identify the main sources and effects of this stress, document existing personal coping strategies, and elucidate the resources surgeons believe would be most effective for mitigation.

Materials and Methods
Study design and population
A cross-sectional, anonymous survey was conducted among surgeons at a tertiary care hospital. The study included 71 surgeons, encompassing all surgical specialties (General Surgery, Gynecology-Obstetrics, Orthopedics) and all professional levels (from residents to senior consultants). Participation was voluntary.

Data collection

A self-administered questionnaire was distributed electronically and in print. The questionnaire collected data on:

- **Demographics:** Specialty and professional level.
- **Stress Level:** Self-assessed on a numerical scale from 1 (minimal) to 10 (extreme).
- **Sources of Stress:** A multiple-choice list including technical issues, case complexity, team behavior, and coordination problems.
- **Effects of Stress:** Including fatigue, burnout, and irritability.
- **Personal Coping Strategies:** Such as sports, communication, and preparation.
- **Desired Institutional Resources:** Including equipment, training, and psychological support.

Data analysis

Data were analyzed using descriptive statistics. Results for categorical variables are presented as frequencies and percentages. Continuous variables (e.g., stress scores) are summarized descriptively.

Results

Demographic characteristics

Of the 71 respondents, General Surgery was the most represented specialty (43.3%), followed by Gynecology-Obstetrics (18.3%). The majority of participants (63.3%) were surgical trainees or junior surgeons.

Prevalence and sources of stress

The majority of surgeons (61.3%) reported a moderate stress level, with self-rated scores between 3 and 6 out of 10. The primary sources of stress identified were:

- **Technical or equipment problems:** 76.1%
- **Complexity of the surgical procedure:** 47.9%
- **Behavior or attitude of team members:** 42.3%
- **Lack of team coordination:** 31.0%

Reported effects of stress

The most commonly reported negative effects of OR stress were:

- **Intense fatigue:** 41.4%
- **Feeling of moral or professional exhaustion (burnout):** 35.7%
- **Irritability or tension with the OR team:** 15.7%

Personal coping strategies

Surgeons reported employing various personal strategies to manage stress:

- **Relaxing activities (e.g., sports):** 59.2%
- **Proactive communication with the team:** 43.7%
- **Mental or technical preparation before surgery:** 42.3%

Desired institutional resources

There was a strong consensus on the need for institutional support. The most requested resources were:

- **Access to reliable and well-maintained equipment:** 81.7%
- **Improvement of communication and coordination within teams:** 66.2%
- **Formal training in stress management:** 54.9%
- **Access to psychological support or coaching:** 42.3%

Discussion

This study confirms that stress is a pervasive reality in the surgical workplace, particularly for those in training. The moderate stress levels reported by over 60% of respondents align with findings in the broader literature on surgical culture [6, 7].

The identified sources of stress highlight a multifactorial origin. The predominant cause technical and equipment failures underscores the critical link between system-level resources and surgeon well-being. Inadequate tools not only increase cognitive load but also directly threaten patient safety, thereby amplifying stress [8]. The complexity of procedures and interpersonal team dynamics were also major contributors, consistent with studies identifying non-technical skills as key determinants of both performance and stress [9, 10].

The consequences of this unmanaged stress, notably high rates of intense fatigue and burnout, are alarming. Surgeon burnout is a well-documented crisis associated with depression, substance abuse, and attrition from the profession [11, 12]. The reported irritability further suggests that stress can create a negative feedback loop, impairing team cohesion and communication, which are vital for a safe OR environment [13].

While surgeons primarily rely on individualistic strategies like sports and proactive communication, these may be insufficient against systemic issues. The high demand for reliable equipment, improved teamwork, and formal training indicates a clear gap between individual coping and necessary organizational support. The call for psychological support and coaching (42.3%) reflects a growing recognition within the field of the need to address mental health proactively [14, 15].

The main limitation of this study is its single-center design and modest sample size, which may limit the generalizability of the findings. Future multi-institutional studies are warranted.

Conclusion

Stress among surgeons, particularly juniors, is a significant problem fueled by technical, relational, and systemic factors. The current reliance on personal coping strategies is inadequate to address the root causes. Our findings reveal a strong and clear demand from surgeons for systemic interventions. We recommend that hospital administrations and surgical training programs prioritize investments in reliable equipment, formal training in non-technical skills and stress management, and the establishment of accessible, destigmatized psychological support systems. Fostering a culture of "humanity" and open dialogue is essential for safeguarding both surgeon well-being and the quality of patient care.

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