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Working Relationships in the Operating Room: Stress, Interpersonal Conflicts, and Impact on Healthcare Quality and Staff Well-Being

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Abstract **Original Research Article**

Background: The operating room (OR) represents a high-pressure environment where effective interprofessional communication is crucial for patient safety and staff well-being. However, conflicts and stress among OR personnel remain poorly documented in many healthcare settings. ***Objective:*** This study aimed to evaluate stress levels and their indicators among OR practitioners, explore the mechanisms and origins of interpersonal conflicts, and demonstrate the impact of working relationships on care quality and staff well-being. ***Methods:*** A prospective descriptive study was conducted at Mohammed Boudiaf Public Hospital in Ouargla, Algeria, over 15 days. OR personnel, including surgeons, anesthesiologists, nurse anesthetists, and OR nurses, completed a self-administered questionnaire addressing demographics, satisfaction levels, stress indicators, conflict frequency and nature, and perceived impact on care quality. ***Results:*** Forty-eight healthcare professionals participated (21 surgeons, 4 anesthesiologists, 12 nurses anesthetists, 11 OR nurses). The overall stress level was high (5.9/10), marked by physical and emotional suffering symptoms. Task-related conflicts were reported by 81% of personnel, with staff shortage (70.83%) and equipment deficiency (47.9%) as primary factors. Relational conflicts affected 50% of participants, mainly due to communication deficits (27.08%). These conflicts negatively impacted care quality and staff well-being, contributing to professional burnout (47.9%), stress (66.66%), and job dissatisfaction (35.41%). ***Conclusion:*** Stress management and interpersonal conflict prevention are priorities for optimal OR functioning. Further research at the national level is needed to elucidate the complexity of OR working relationships and develop appropriate interventions.

Keywords: Operating room, stress, interpersonal conflicts, quality of care, staff well-being, healthcare communication, surgical team dynamics.

INTRODUCTION

In the medical field, where the primary concern is delivering high-quality patient care, the healthcare team constitutes the core foundation [1]. Effective teamwork is essential for achieving this primary objective, and such collaboration is built upon professional relationships among different personnel who share responsibility for adequate patient care. These working relationships themselves rely on effective interprofessional communication [2].

Among all hospital departments, the operating room represents a high-risk environment [3], the most complex and volatile workplace [2], heavily charged with emotion and requiring excellent communication among multidisciplinary medical team members [4]. The goal is always appropriate patient care. However, these different members do not necessarily share the same perspectives, values, priorities, beliefs, or work organizations. Consequently, the occurrence of interpersonal conflicts in this complex societal microcosm becomes inevitable [5].

In high-pressure environments such as the operating room, interprofessional communication plays a crucial role in transmitting information during surgical interventions and ensuring patient safety. It is estimated that among the 243 million surgical operations performed annually worldwide, 3-16% result in complications and 0.4-0.8% in patient death. Although surgery depends on the surgeon's competence and skill,

surgery itself resembles a social situation in which numerous tasks require appropriate relationships among surgical team members [3]. The study by Macari et al. (2006) identified human factors, leadership, and communication as the main causes of medical errors [3]. In 2006, the Joint Commission indicated that 70% of medical errors resulting in death or physical or psychological injury were due to communication defects [6].

Unresolved conflicts, hierarchical culture, leaders' inability to meet team expectations through effective and timely communication, and issues related to patients, treatment protocols, high-level technology, and the technical complexity of the operating room can be sources of frustration and stress for OR personnel [3,4]. A survey conducted by the American College of Surgeons among more than 7,900 surgeons revealed a 40% burnout rate and 30% presenting depression symptoms; additionally, the average suicide rate among surgeons (13.3%) was double that of the general population [7]. In this regard, a French survey on burnout syndrome among public hospital practitioners revealed that burnout doubles following tense relationships among members and poor teamwork quality [8].

To support the fact that working relationships in the operating room are particularly disturbed by frequent conflicts that harm, at least partially, the well-being of OR personnel and consequently the services provided to patients, our study has as its main objective the evaluation of stress levels and their main indicators among OR practitioners. Two secondary objectives include: (1) detailing and exploring the multiple mechanisms, origins, nature of conflicts, and prevention and resolution of interpersonal conflicts involving OR personnel; and (2) demonstrating the impact of working relationships on care safety and professionals' well-being in the operating room.

Materials and Methods

Study Design and Setting

This was a prospective, descriptive, single-center study conducted at the Operating Room of Mohammed Boudiaf Public Hospital in Ouargla, Algeria. The OR is located on the first floor adjacent to the men's surgery department and consists of seven operating rooms (two for emergency interventions, one for oncological procedures, and four for scheduled interventions), covering various surgical specialties including general surgery, orthopedic-traumatology, urology, pediatric surgery, thoracic surgery, plastic surgery, vascular surgery, otolaryngology, and maxillofacial surgery.

Study Population

Inclusion criteria:

Surgical residents, specialist physicians in surgery and anesthesiology-resuscitation, certified nurse anesthetists, and certified OR nurses working within the OR of Mohammed Boudiaf Public Hospital who completed the distributed questionnaire.

Exclusion criteria: Interns, medical students, and nursing assistants.

Data Collection

Data collection was performed from March 1 to March 14, 2024, using an anonymous self-administered questionnaire. The survey instrument was developed from the literature, pre-tested, and modified accordingly. The questionnaire comprised seven distinct parts:

1. Demographic characteristics of respondents
2. Overall satisfaction level of personnel regarding their OR practice
3. Behavior and state of mind after a workday in the OR
4. Overall feelings and levels of different stress aspects during OR practice
5. Frequency of interpersonal conflicts in the OR, their nature, contributing factors, and personnel responses
6. Frequency of negative impact of communication defects on quality of patient care
7. Consequences of OR conflicts on personnel well-being and satisfaction

Statistical Analysis

Data were analyzed using SPSS software (Statistical Package for the Social Sciences). Descriptive statistics included means ± standard deviations, frequency distributions, and percentages. Comparisons between specialties were performed using appropriate statistical tests.

Ethical Considerations

The study was conducted in accordance with ethical principles. Participation was voluntary, and anonymity was guaranteed. Informed consent was obtained from all participants through questionnaire completion.

Results

Sample Characteristics

We collected 48 exploitable questionnaires from an estimated OR personnel population of approximately 100 individuals. The sample comprised 29 women (60.4%) and 19 men (39.6%), with a sex ratio of 1.52. The mean age was 34.2 years, with 91.7% between 20-40 years old. The majority were married (56.3%) with an average of two children, while 41.7% were single.

Regarding professional distribution: 21 surgical medical personnel (43.1%), 4 anesthesiology-resuscitation medical personnel (8.3%), 12 certified nurse anesthetists (25%), and 11 certified OR nurses (22.9%). Among the 25 physicians, 15 were assistants (60%), 6 were senior assistants (24%), and 4 were

surgical residents (16%). Most participants (54.2%) had 0-5 years of experience, and 72.9% worked both day and night shifts, participating in both emergency and scheduled operations.

The majority (85.4%) had no toxic habits, though 12.5% reported tobacco use. Nearly all (95.8%) estimated their socioeconomic level as average, and 93.7% reported no chronic illnesses.

Overall Satisfaction Levels

The main sources of dissatisfaction during OR activity were the pace between two patients (31.57% dissatisfaction), the number of interventions per program (23.68%), and relationships with administrative teams (21.05% contribution to dissatisfaction).

Conversely, the main satisfaction elements were the atmosphere among practitioners (19.71%), between medical and paramedical teams (20.19%), and the ability to consult a colleague when needed (19.71%).

Post-Workday Behavior and Mental State

Nearly half of the personnel felt exhausted after an OR workday, with poor sleep (45.8%), headaches (43.8%), or back pain (43.8%) significant elements of persistent fatigue and stress. Furthermore, 79.2% reported continuing to relive difficult moments from their workday, with 18.8% declaring they could never disconnect.

However, more than half developed their professional knowledge after work, practiced sports, and shared moments with loved ones. Approximately 10% smoked tobacco or consumed tranquilizers, but none consumed alcohol.

Overall Stress Feelings and Levels

Personnel ratings on a 0-10 scale revealed:

- **Pleasure level:** Mean of 6.65, considered stimulating by 85.4%
- **Stress level:** Mean of 5.9, judged acceptable by only 68.7% (31.3% found it unacceptable)
- **Mental fatigue:** Mean of 7.4 (28 respondents rated ≥8)
- **Physical fatigue:** Mean of 7.79 (28 respondents rated ≥8)
- **Task complexity:** Mean of 6.94 (23 personnel rated ≥8)
- **Distraction level:** Mean of 5.44 (only 9 individuals rated ≥8)

Frequency and Nature of Interpersonal Conflicts

Six respondents (12.5%) reported habitually encountering interpersonal conflicts in the OR, while 29 (60.4%) encountered them occasionally, and 13 (27.1%) rarely or never experienced them.

Task-related conflicts: Reported by 81.3% of personnel, with particularly high rates among surgeons (90.47%), anesthesiologists (75%), and OR nurses (81.81%), though somewhat lower among nurse anesthetists (58.33%).

The main contributing factors to task-related conflicts were:

- Staff shortage or insufficient personnel (70.83%)
- Lack of materials/inadequate materials (47.9%)
- Personnel not adequately performing their role (41.66%)
- Non-respect of the posted program (41.66%)
- Excessively long patient turnover time (37.5%)

Relational conflicts: Reported by 50% of participants, with the highest rate among OR nurses (81.81%), followed by nurse anesthetists (58.33%), surgeons (33.33%), and anesthesiologists (25%).

The main contributing factors to relational conflicts were:

- Lack of adequate communication among members (27.08%)
- Lack of appreciation for other team members' roles (20.83%)
- Individualistic attitude, authoritarianism (20.83%)
- Lack of tolerance toward others' work (18.75%)

Responses to Conflicts

When facing conflicts, OR personnel primarily responded by:

- Preserving both parties' interests by finding solutions/compromises (47.91%)
- Completely avoiding conflict existence (43.75%)
- Adapting to others' decisions (14.58%)
- Aiming to win and be right (6.25%)

Impact on Care Quality

Based on OR practitioners' experience, 69% believed that communication defects frequently harmed the quality of services provided to patients, particularly noted by surgeons (76.19%), anesthesiologists (75%), nurse anesthetists (58.33%), and OR nurses (63.63%).

Impact on Personnel Well-being

Communication defects and unhealthy professional relationships in the OR had negative repercussions on personnel well-being:

- **Stress contribution:** 66.66% (42.85% of surgeons, 100% of anesthesiologists, 91.8% of nurse anesthetists, 72.72% of OR nurses)
- **Professional burnout:** 47.9%
- **Discomfort and dissatisfaction:** 35.41%
- **Poor performance:** 25% (including 12.5% of surgeons and 50% of anesthesiologists)
- **Team change:** 22.9% (particularly 72.72% of OR nurses)

- **Thoughts of resigning:** 22.9% (28.57% of surgeons, 25% of anesthesiologists, 25% of nurse anesthetists, 18.18% of OR nurses)
- **Family conflicts:** 14.58%

DISCUSSION

Population Characteristics

Our sample predominantly consisted of young women (mean age 34.2 years, 60.4% female) with average socioeconomic status and relatively limited professional experience (54.2% with <5 years). This demographic profile differs from some international studies. For instance, a French survey evaluating stress among OR practitioners included 1,204 physicians who were predominantly male (85.5%) with a mean age of 50.4 years [21]. However, our sample's characteristics align more closely with a Moroccan study on OR conflicts, which also found younger personnel (56% aged 20-30 years) with shorter tenure (54% with <5 years experience) [52].

The predominance of surgical personnel in our sample (43.75%) reflects the typical OR staffing structure, though the lower participation of anesthesiologists (8.3%) may have introduced some selection bias in specialty-specific analyses.

Satisfaction and Dissatisfaction Elements

Our findings revealed that the main sources of dissatisfaction were related to time management issues specifically, the pace between patients (31.57%) and the number of interventions per program (23.68%) along with administrative relationships (21.05%). These results align with Herzberg's two-factor theory (1959), which distinguished between motivating factors and hygiene factors [53]. The dissatisfaction elements we identified primarily relate to working conditions rather than the work itself.

Conversely, satisfaction stemmed mainly from interpersonal relationships among practitioners (19.71%), between medical and paramedical teams (20.19%), and the ability to consult colleagues (19.71%). These findings are consistent with the French study by Vincent *et al.,* [21], which identified similar satisfaction factors among surgeons and anesthesiologists. This underscores the importance of collective involvement, promoted through team spirit, shared values and common goals, and effective communication all contributing to professional fulfillment and sustained motivation [53].

Post-Workday Stress Indicators

Our study revealed concerning post-workday stress indicators: over half of personnel reported feeling exhausted, with poor sleep (45.8%), headaches (43.8%), or back pain (43.8%). Furthermore, 79.2% continued to relive difficult moments from their workday, with 18.8% unable to disconnect. These physical and emotional suffering symptoms indicate persistent stress that extends beyond working hours.

While Vincent et al.'s French study [21] reported similar but less pronounced findings (27.2% insomnia, 11.3% migraines, 29.3% back pain), the higher percentages in our study may reflect greater work pressure, fewer resources, or less developed coping mechanisms. A qualitative study of 10 OR nurses similarly revealed stress indicators including headaches, muscle tension, insomnia, palpitations, irritability, and nervousness [54].

Notably, despite high stress levels, most personnel engaged in positive coping strategies: over half practiced sports, developed professional knowledge, and spent time with loved ones. Only a small minority (6.3%) regularly consumed tobacco or tranquilizers, and none reported alcohol consumption suggesting relatively healthy stress management approaches compared to some international cohorts [21].

Stress Levels and Aspects

Our study revealed a paradoxical situation: a high pleasure level (6.65/10, judged stimulating by 85.4%) coexisting with a high stress level (5.9/10, considered unacceptable by 31.3%). This imbalance, also noted in the French study [21] with similar values (pleasure 6.7/10, stress 5.9/10), suggests vulnerability to burnout syndrome if not addressed.

Confucius's wisdom "Choose a job you love and you will never have to work a day in your life" may partly explain the pleasure felt despite high stress. The sense of competence and mission fulfillment may sustain motivation even in challenging conditions. However, the persistently high stress levels across multiple dimensions raise concerns:

- Mental fatigue: 7.4/10 (58.3% rated ≥8)
- Physical fatigue: 7.79/10 (58.3% rated ≥8)
- Task complexity: 6.94/10 (47.9% rated ≥8)
- Environmental distraction: 5.44/10 (18.8% rated ≥8)

These findings align with Rigot *et al.*'s study [55] of 633 OR nurses, which found globally elevated stress levels that tended to increase particularly intraoperatively, varying according to parameters such as intervention duration and program density.

Frequency and Nature of Conflicts

Task-Related Conflicts

Task-related conflicts were reported by 81.3% of our sample, consistent with the Moroccan study (78.9%) [52] and a Canadian observational study showing conflicts occurring 1-4 times per surgical procedure [1]. A Spanish survey similarly found that two-thirds of anesthesiologists regularly entered into conflict with surgeons, with frequencies between once

and four times per month for most, and several times per week for a minority [56].

This high frequency is understandable given the nature of OR work: multiple specialists with different training backgrounds, values, and priorities must coordinate complex patient care under time pressure. Divergent views on appropriate management whether regarding antibiotic prophylaxis protocols, timing decisions, or resource allocation naturally generate tensions.

The main contributing factors we identified were:

1. **Staff shortage (70.83%):** Particularly noted by surgeons (85.7%), this aligns with the SMART survey finding staff shortages as conflict generators in 56% of cases [58]. Our OR's workload handling multiple specialties with both emergency and scheduled procedures exacerbates this issue.
2. **Equipment deficiency (47.9%):** Material inadequacy or unavailability creates operational difficulties and frustrations, particularly for surgeons (57%).
3. **Inadequate role performance (41.66%):** When personnel don't fulfill their responsibilities adequately, it disrupts the coordinated workflow essential to OR functioning.
4. **Program non-respect (41.66%):** Schedule disruptions and cancellations generate frustration and conflicts, especially when stakeholders have different priorities regarding urgency and timing.
5. **Long patient turnover time (37.5%):** Delays between patients particularly frustrate surgeons (57.4% in our study), who may perceive slow turnover as inefficiency.

Comparative analysis with international studies reveals interesting variations:

- **Operation cancellations:** Reported by 42.8% of our surgeons versus 91.1% in the Egyptian study [59] but only 25% of our anesthesiologists versus 15.6% Egyptian anesthesiologists. These differences may reflect different cancellation policies, preoperative assessment processes, or communication patterns between specialties.
- **Disagreement on urgency:** Marked by 50% of our anesthesiologists and 33.3% of surgeons, this factor highlights the complex decision-making hierarchy in the OR. While treating physicians typically lead decision-making, OR authority structures are more ambiguous, with each specialty potentially acting as the final authority in specific situations. Studies report anesthesia-related cancellation rates of 2-14% (up to 21.8% in tertiary centers) [2], often creating friction when anesthesiologists postpone surgery for medical optimization while surgeons prioritize immediate intervention.
- **Incomplete patient information:** This factor showed dramatic variations across studies 50% of our anesthesiologists but only 4.16% of our surgeons cited it, while the Egyptian study found it problematic for 100% of surgeons and 93.8% of anesthesiologists [59]. These differences likely reflect variations in medical record systems, consultation processes, and communication protocols.
- **Non-cooperative attitude:** Relatively low in our study (14.28% of surgeons, 0% of anesthesiologists) compared to the Egyptian study (26.7% surgeons, 96.9% anesthesiologists) [59], suggesting potential cultural differences in teamwork expectations and interpersonal dynamics.

For nursing staff, program non-respect was particularly problematic (63.6% of OR nurses, 50% of nurse anesthetists), aligning with Obgimi's findings (65.5%) [60] but exceeding the Moroccan study rates (15% OR nurses, 28.57% nurse anesthetists) [52]. This may reflect nurses' position at the interface of multiple professional demands, making them particularly vulnerable to schedule disruptions.

Relational Conflicts

Relational conflicts were reported by 50% of our participants, notably higher than most literature reports. The Moroccan study found only 25% [52], while a Taiwanese hospital study reported that among 147 conflict incidents, only 41 (27.9%) involved relational components alongside task conflicts [57]. The higher rate in our study may indicate either more honest reporting, greater interpersonal tensions, or different interpretations of "relational conflict."

Distribution by specialty was revealing:

- OR nurses: 81.81% (highest)
- Nurse anesthetists: 58.33%
- Surgeons: 33.33%
- Anesthesiologists: 25%

This gradient suggests that nursing staff, who often occupy less powerful positions in OR hierarchies, may be more vulnerable to relational conflicts or more aware of their interpersonal dimensions.

The main contributing factors were:

1. Lack of adequate communication (27.08%):

Particularly noted by OR nurses (45.45%) and surgeons (19.04%), this exceeded rates in other North African studies but fell below some international reports. For example, the Moroccan study found 70% of surgeons and 50% of anesthesiologists citing communication deficits [52], while the Egyptian study reported 55% and 62% respectively [59]. A Nigerian study found 50.7% of nurses mentioning communication defects as causing frequent conflicts with physicians [62].

These variations may reflect differences in team structures, training in communication skills, or cultural norms around interpersonal communication. The gap between physicians and nurses in our study (nurses reporting higher rates) suggests asymmetric communication patterns, possibly reflecting hierarchical structures where nurse concerns are less heard.

2.Lack of role appreciation (20.83%):

Less prominent in our study than in some international comparisons (e.g., 100% in the Egyptian study [59]), but still significant, particularly for OR nurses (45.45%). This reflects the importance of mutual respect and recognition in maintaining healthy team dynamics.

3.Individualistic attitudes and authoritarianism (20.83%):

These personality-related factors create particular challenges when expressed by those in authority positions. The hierarchical medical culture, with surgeons often at the apex, can amplify the negative impact of such traits.

4.Lack of tolerance for others' work (18.75%) and **personality traits such as perfectionism, compulsivity, and aggression (approximately 25% across specialties):**

These factors highlight how individual characteristics interact with the high-pressure OR environment. Perfectionism and compulsivity often adaptive traits in surgical training can become maladaptive in team settings, making it difficult to recognize others' expertise and compromising team cohesion [2].

5.Differences in values, beliefs, and cultures:

Relatively less reported in our study and most North African studies (9.5-25%) compared to the Egyptian study (approximately 50%) [59], suggesting either lower cultural diversity in our OR or less perception of culture as a conflict source.

Conflict Response Patterns

Our participants' conflict response patterns showed relatively mature approaches:

- **Collaborative (47.91%):** Seeking to preserve both parties' interests through compromise
- **Avoidance (43.75%):** Denying or sidestepping conflict existence
- **Accommodating (14.58%):** Adapting to others' decisions
- **Competitive (6.25%):** Aiming to win and be right

The predominance of collaborative and avoidance strategies aligns with literature suggesting that healthcare professionals tend to respond to conflicts first through avoidance, then with more aggressive approaches, and finally, if conflicts persist, with collaborative strategies [5]. While collaboration seems ideal for task-related conflicts, research suggests relational conflicts may be better managed through avoidance strategies [5].

The relatively low rate of competitive responses (6.25%) suggests either genuine collaborative culture or possible social desirability bias in self-reporting. The high avoidance rate (43.75%) is concerning, as unaddressed conflicts tend to fester and potentially escalate, though avoidance can be useful in early stages when tensions are very high.

Impact on Care Quality

A striking 69% of our participants believed communication defects frequently harmed patient care quality, with particularly high agreement among surgeons (76.19%) and anesthesiologists (75%). This subjective assessment aligns with substantial objective evidence from the literature.

The 2006 Joint Commission finding that 70% of medical errors resulting in death or injury stemmed from communication failures [6] provides crucial context. Douglas et al.'s analysis of 910 malpractice claims related to anesthesia found that communication failures contributed to patient harm in 43% (389 cases) [51].

These were not minors incidents:

- 36% resulted in patient death
- 20% caused permanent, disabling injury
- Payment ranges ($63,765-$596,094) confirmed injury severity

The financial costs pale beside human suffering, but they objectively demonstrate the serious consequences of communication breakdowns. Multiple communication failures occurred in 13% of cases, and claims involving communication failures were more likely judged as having received substandard anesthesia care (68% vs. 31%) and more likely to result in payment (62% vs. 43%) [51].

These findings validate our participants' perceptions and underscore the critical importance of addressing communication deficits. The surgical team's perception that their communication problems frequently harm patients should serve as an urgent call to action.

Impact on Staff Well-being

The negative impact of unhealthy working relationships and communication defects on personnel well-being was substantial:

Stress (66.66%):

Remarkably, 100% of anesthesiologists, 91.8% of nurse anesthetists, 72.72% of OR nurses, and 42.85% of surgeons reported that communication problems contributed to their stress. This near-universal recognition among anesthesiologists is striking and may

reflect their particular position coordinating between surgical, nursing, and patient-care imperatives.

Professional burnout (47.9%):

Nearly half reported communication defects contributing to burnout a concerning finding given burnout's well-documented consequences. The French survey on public hospital practitioner burnout found that it doubled following tense relationships and poor teamwork quality [8]. Xue *et al.,* noted that nurses' psychological and physiological states influence work capacity; when well-being diminishes, service quality declines substantially, increasing error susceptibility [54].

Discomfort and dissatisfaction (35.41%):

More than one-third experienced job dissatisfaction linked to communication problems, likely contributing to the concerning finding that 22.9% had considered resignation.

Poor performance (25%):

A quarter reported that unhealthy relationships affected their OR performance, including 50% of anesthesiologists and 12.5% of surgeons. Wetzel et al.'s study of 16 surgeons using semi-structured interviews identified that stress regardless of origin influenced cognitive performance including judgment and decision-making [63]. Surgeons described situations where they couldn't think clearly, found logical analysis difficult, and struggled with simple decisions. One surgeon noted: "When it obscures your judgment... you feel you can't do what you want...you can't make decisions about simple, simple things" [63]. Periprocedural stress particularly affected non-technical performance: judgment, decision-making, and communication all linked to errors and poor surgical outcomes.

Team changes and resignation thoughts:

- 22.9% had changed teams (particularly 72.72% of OR nurses)
- 22.9% had considered hospital resignation (28.57% of surgeons, 25% of anesthesiologists, 25% of nurse anesthetists, 18.18% of OR nurses)

Rogers *et al.,* (2012) found that relational history with surgeons could deteriorate to the point where nurses wanted to resign or take measures to avoid working with particular physicians [55]. The high rate among nurses in our study (nearly three-quarters had changed teams) suggests this is not merely theoretical but represents significant workforce disruption and potential loss of experienced personnel.

Family conflicts (14.58%):

The work stress spilled over into personal life, creating a vicious cycle. As one OR nurse in Jorion Joyce et al.'s qualitative study explained: "I was exhausted...because in addition, in the morning I got up at 7 for my kids, to take care of my children, take them to school... I tried to pick them up at noon since they didn't see me in the evening, have lunch with them at noon, take them back to school, then go to work. So I never recovered what I had lost from my nights since you try to manage your family life too and I was divorced so..." [54].

This quote poignantly illustrates how OR stress compounds personal challenges, particularly for single parents or those with significant family responsibilities demographics represented substantially in our sample.

Study Limitations

Our study has several important limitations:

1. **Small sample size (n=48):** While representing approximately half of our OR's personnel, this limits statistical power and generalizability.
2. **Restricted participation of certain professional categories:** Notably, only 4 anesthesiologists participated compared to 21 surgeons, limiting specialty-specific analyses and potential comparisons.
3. **Timing coinciding with vacation periods:** This may have introduced selection bias, as available participants during this period might differ systematically from those on leave.
4. **Voluntary response bias:** Those particularly interested (or particularly aggrieved) about workplace relationships may have been more likely to respond.
5. **Self-report methodology:** Subject to recall bias, social desirability bias, and subjective interpretation. While validated questionnaires were used, objective stress measures (heart rate variability, cortisol levels) would complement subjective reports.
6. **Limited analytical literature including paramedical staff:** Most studies focus exclusively on physicians, limiting our ability to contextualize nursing staff experiences.
7. **Subjective care quality assessment:** While participant perceptions are valuable, objective quality metrics (complication rates, near-miss events, surgical outcomes) would strengthen conclusions about care impact.
8. **Cross-sectional design:** Cannot establish causality or temporal relationships between variables. Longitudinal studies would better elucidate how conflicts evolve and impact outcomes over time.
9. **Single-center study:** Findings may not generalize to other Algerian hospitals or healthcare systems with different resources, cultures, or organizational structures.
10. **Multiple objectives with limited time:** Attempting to address stress assessment, conflict analysis, and impact evaluation in one study may have limited the depth of analysis for each component.

11. **Cultural and linguistic factors:** The questionnaire, though pre-tested, may not have captured all culturally specific aspects of interpersonal dynamics in our setting.

Despite these limitations, our study provides valuable preliminary data on an understudied topic in our context and highlights areas requiring urgent attention and further research.

Recommendations

Based on our findings and the broader literature, we propose the following multilevel recommendations:

Immediate Actions

1. **Stress awareness and management training:** Implement mandatory training programs for all OR personnel on stress recognition, healthy coping mechanisms, and burnout prevention. This should begin in professional schools (medical and nursing education) and continue through ongoing professional development.
2. **Communication skills training:** Develop and deliver structured programs in:
    - Effective verbal and non-verbal communication technique
    - Active listening skills
    - Assertive (not aggressive) communication
    - Conflict de-escalation strategies
    - Debriefing and team briefing protocols
3. **Conflict management education:** Sensitize healthcare professionals to conflict causes, consequences, and resolution strategies. This neglected topic must be openly discussed and analyzed rather than ignored or avoided.
4. **Regular team meetings and debriefings:** Institute structured opportunities for team members to voice concerns, share experiences, and problem-solve collectively. Psychological safety is essential team members must feel able to speak without fear of retribution.
5. **Workplace improvements:**
    - Address identified dissatisfaction sources: pace between patients, program density, administrative communication
    - Create comfortable break spaces where personnel can decompress
    - Ensure adequate staffing levels and equipment availability
    - Implement realistic scheduling that accounts for true procedural duration

Organizational Interventions

1. **Multidisciplinary representation in decision-making:** Develop teams representing different professional groups in organizational decisions, particularly those directly affecting them. Systematic team reflection on "objectives, strategies, goals, processes, and results" could improve coordination.
2. **Clear institutional policies:** Establish explicit policies for:
    - Managing interdepartmental and interprofessional relationships
    - Reporting conflicts and unethical professional conduct
    - Addressing disruptive behavior by any team member
    - Protecting whistleblowers who report problematic practices
3. **Well-defined roles and responsibilities:** Create job descriptions and role definitions based on mutual respect and each specialty's relevant competencies, clarifying decision-making authority in different clinical scenarios.
4. **Recognition systems:** Implement formal recognition programs acknowledging contributions by peers and institutions. Recognition at work creates a quality environment, increasing personnel motivation, engagement, and productivity.
5. **Stable team structures:** Where possible, promote team stability to maintain established collaboration and communication lines. Familiarity among members facilitates coordination.
6. **Human resource strengthening:** Develop strategies to:
    - Improve recruitment and retention
    - Provide
    - Continuer

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adequate staffing for workload - Offer competitive compensation and benefits - Create career development pathways

Monitoring and Research

1. **Establish wellness monitoring:** Implement regular surveys or check-ins to assess personnel stress, satisfaction, and burnout, allowing early intervention.
2. **Incident reporting and analysis:** Develop systems to document and analyze communication-related adverse events, near misses, and safety concerns not for punishment but for learning and improvement.
3. **Expand research scope:**
    - Conduct similar studies with larger samples across multiple Algerian hospitals
    - Implement objective stress measurement (physiological markers)
    - Longitudinal studies tracking relationships between conflicts and patient outcomes
    - Qualitative research exploring lived experiences of OR personnel
    - Intervention studies testing specific improvement strategies

4. **National-level initiatives:**
   This issue transcends individual hospitals. National societies, health ministries, and professional organizations should prioritize OR team functioning, developing evidence-based guidelines and supporting implementation.

Cultural Change

1. **Challenge hierarchical culture:** Promote "flattened" hierarchies where all team members feel empowered to speak up about safety concerns or interpersonal issues, regardless of professional status.
2. **Foster psychological safety:** Create environments where personnel can express concerns, admit mistakes, or ask for help without fear of humiliation or punishment.
3. **Emphasize shared goals:** Continually reinforce that despite different roles, all team members share the ultimate goal: optimal patient care and safety. This shared purpose should transcend interprofessional boundaries and conflicts.
4. **Model desired behaviors:** Senior personnel and leaders must exemplify respectful communication, collaborative problem-solving, and healthy stress management. Culture change begins at the top.
5. **Celebrate successes:** Acknowledge when teams work well together, when conflicts are successfully resolved, and when communication prevents problems. Positive reinforcement strengthens desired behaviors.

CONCLUSION

This study provides important insights into the complex working relationships within our operating room environment. The high stress levels (5.9/10), marked by physical and emotional suffering symptoms extending beyond work hours, signal a concerning situation requiring urgent attention. While personnel find pleasure in their work (6.65/10), the imbalance between enjoyment and stress creates vulnerability to burnout syndrome.

Interpersonal conflicts are frequent, primarily task-related (81.3%) but with substantial relational components (50%). The main contributing factors staff shortages (70.83%), equipment deficiencies (47.9%), and communication deficits (27.08%) are modifiable through organizational interventions. These conflicts have tangible negative consequences: 69% of personnel believe communication defects frequently harm patient care quality, while 66.66% report these issues contribute to their stress, 47.9% to burnout, and 22.9% have considered resignation.

The path forward requires multilevel interventions addressing individual (stress management skills), team (communication training, stable team structures), organizational (adequate resources, clear policies, recognition systems), and cultural (challenging hierarchy, fostering psychological safety) factors. Neither stress management nor conflict prevention can be viewed as optional or peripheral they are fundamental to ensuring high-quality, safe patient care and sustainable healthcare workforce.

Our study has limitations, including small sample size, single-center design, and reliance on subjective reports. However, it provides crucial preliminary data for an understudied issue in our context. More comprehensive research at the national level is urgently needed to elucidate the complexity of OR working relationships and develop evidence-based interventions. Such research should employ both quantitative and qualitative methods, include objective outcome measures, and test specific interventions.

Perhaps most importantly, the conversation about OR relationships, stress, and conflicts must move from whispered complaints in break rooms to open professional discourse. The data are clear: unhealthy working relationships harm both personnel and patients. Addressing this issue is not merely about making work more pleasant (though that matters) it is fundamentally about patient safety, care quality, and the sustainability of our healthcare workforce.

As Balch and Shanafelt noted, talking with peers about common problems is particularly beneficial, eliminating the sense of isolation facing difficult issues [64]. Creating formal and informal opportunities for such peer support, combined with systemic changes to address root causes, offers the most promising path forward.

Every surgical procedure should be a cooperative endeavor benefiting both team and patient. Achieving this vision requires sustained commitment to managing stress, preventing and resolving conflicts, and cultivating healthy working relationships. The stakes measured in healthcare worker well-being and patient lives could not be higher.

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Ethical Approval

This study was conducted in accordance with ethical principles for medical research. All participants provided informed consent through voluntary questionnaire completion. Participant anonymity was maintained throughout data collection and analysis.

Data Availability Statement

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request, subject to appropriate ethical and privacy considerations.

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