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Developing an interprofessional conflict management framework for surgical residents: a qualitative study

Sohrab Nosrati[1], Shoaleh Bigdeli[1] and Zohreh Sohrabi[1*]

Abstract

Introduction Interprofessional conflict is the actual or perceived contradiction of needs, values, or interests between two or more individuals, often arising from individual or organizational factors. This type of conflict can lead to stress, tension, and negative emotions between the parties involved. Given the importance of teamwork in clinical settings, this study aims to develop a framework for interprofessional conflict management tailored for surgical residents in clinical environments.

Methods This qualitative study employed a conventional content analysis approach. Participants included surgical specialists from Iran University of Medical Sciences, selected through purposive sampling. Data were collected through semi-structured interviews and analyzed using the inductive content analysis method described by Graneheim and Lundman.

Results A total of 21 participants (15 men and six women) were included in the study. The codes were derived from meaning units, categorized into subcategories based on shared themes or concepts. The analysis of the interview led to the identification of 845 initial codes, 15 Sub-categories, and five main categories. Among these, "Conflict Management Competencies" emerged as the primary category due to its high frequency and central relevance to the research objectives. Based on the five main categories identified in this study, we developed an Interprofessional Conflict Management Framework for surgical residents.

Conclusion The findings indicate that surgical specialists regularly experience interprofessional conflicts in clinical settings, with conflict management competencies emerging as the most frequently identified code. Therefore, it is essential to incorporate Conflict management into Surgery formal and hidden curriculums to enhance teamwork and achieve optimal patient outcomes.

Keywords Conflict Management, Clinical competence, Surgery, Surgeons, Surgical residents

Introduction

Conflicts among healthcare professionals in hospitals are prevalent and crucial to address, as they can compromise patient care, foster a negative work atmosphere, and diminish trust between patients and the health care team [1]. Unresolved conflicts can lead to medical errors, burnout, or legal issues, and can undermine teamwork and communication [2]. Managing these conflicts with open dialogue, mutual respect, rapport, and collaboration is crucial for ensuring the optimal outcomes for both

*Correspondence:
Zohreh Sohrabi
zo_sohrabi@yahoo.com
[1] Department of Medical Education, Center for Educational Research in Medical Sciences (CERMS), School of Medicine, Iran University of Medical Sciences, Tehran, Iran

patients and healthcare providers [3]. These conflicts manifest both within professional groups (intra-professionally) and between different healthcare disciplines (inter-professionally) [4]. If these conflicts are deep and serious, they can impact patient recovery and treatment, as well as the well-being of the healthcare team members [5]. Research demonstrates that healthcare professionals regularly encounter conflicts in their workplace environments. Nikitara et al. stated in their study that in the United States, conflicts are reported on a weekly basis. Approximately 20% of resident doctors face serious conflicts with other staff members, while nearly half of surgeons report disagreements regarding postoperative care objectives [6]. Patient care is an interprofessional process in which specialists work together as a team, and studies show that interprofessional conflict in clinical settings is linked to medical errors, reduced team performance, decreased patient satisfaction, compromised patient safety, adverse treatment outcomes, and increased healthcare costs. In a survey of physicians from 24 countries, 71% of respondents reported that conflict is very common in clinical environments, with over 80% describing these conflicts as "harmful" [7]. Conflicts may arise in various clinical situations, such as managing a complex patient, decision-making among specialists regarding a patient, learning in newly established interdisciplinary teams, and implementing evidence-based guidelines [8]. Conflict refers to a situation in which there is a disagreement between the beliefs or behaviors of one or more team members [9]. The term interprofessional conflict in clinical settings has a broader perspective and includes differences in viewpoints regarding patient management among all professionals in various health sectors, such as physicians, surgeons, residents, nurses, occupational therapists, physiotherapists, pathologists, and other health specialists [10]. Conflict management is the process of limiting the negative aspects of conflict and enhancing the positive aspects of conflict management [11]. Inappropriate conflict management is a major contributor to suboptimal collaboration within medical teams, potentially leading to serious consequences such as prolonged hospital stays and increased patient mortality [12].

In clinical settings, the Operation rooms have a unique and complex dynamic of teams with professionals working in various disciplines. This environment is highly prone to conflicts causing hindrance to inpatient treatment and healthcare [13]. Operating room teams consist of professionals, including surgeons, surgical residents, anaesthesiologists, anesthesia technologists, surgical technologists and nurses. Since multiple teams are working in the operation room to perform the desired surgery and offer adequate health care to the patient being treated [14]. Surgical residents in the operating room must collaborate with various specialists, including surgery professors, anesthesiologists, internists and cardiologists, to ensure successful surgeries. Literature review indicates that conflict management competencies can be taught but, there is limited consensus in the literature regarding the essential conflict management competencies for surgical residents [15–17]. By identifying the essential competencies for interprofessional conflict management and integrating them into both formal and hidden curricula, curriculum designers, as well as surgical residents in healthcare can derive substantial benefits (e.g. curriculum review and learning conflict management competencies) [18]. In Iran, most studies focus on the intensity of conflict occurrence, sources of conflict, and conflict management styles in clinical setting, and no comprehensive studies have surveyed conflict management competencies in clinical settings [19–21]. By reviewing the surgical resident curricula in Iran, a significant gap in conflict management training was identified, which is particularly challenging for surgical residents working in high-stress environments. Given this gap in the formal residency curriculum, developing a structured framework for conflict management competencies is essential. Therefore, this study aims to develop an interprofessional conflict management framework for surgical residents at Iran University of Medical Sciences, addressing both educational and practical needs in surgical settings, and filling this critical gap in medical education.

Materials and Method

This qualitative research was conventional content analysis study conducted from June 22, 2023 to October 10, 2024 at Iran University of Medical Sciences. The study participants, included surgeons, surgical residents, and operating room and anesthesia staff, were selected through purposeful sampling. Qualitative research methods provide valuable approaches for designing research frameworks by offering deeper insights into phenomena and uncovering hidden concepts. These methods are recommended for their ability to enhance understanding, identify hidden patterns, and interpret meanings related to the research topic. Consequently, this study employed a qualitative approach to design the framework [22].

Therefore, this explanatory study aimed to design a framework of conflict management competencies for surgical residents. Graneheim and Lundman's Six-steps approach was used for content analysis [23], which consists of the following steps: 1) transcribing each interview immediately after completion, 2) reading the whole text to reach a general understanding of the content, 3) Paragraphs, sentences, or words were regarded as meaning units, 4) The meaning units were abstracted and

conceptualized according to their implicit meaning and were labeled with primary codes, 5) categorizing the similar primary codes into more comprehensive categories, and 6) determining the main theme of the categories. Moreover, four criteria of Guba and Lincoln [24], were used to improve the credibility and accuracy of data, which include: Credibility, Consistency, Confirmability, and Transferability. To enhance the accuracy of the study, the researchers engaged in the interview process for a long time and fully engaged with the participants, collecting credible information and confirming the data with them.

To enhance credibility of the data, researchers immersed themselves in the data by repeatedly reviewing the interviews and maintaining prolonged engagement with the study participants. To increase the validity of the findings, the researchers employed member checking that confirmed the validity of the data. Additionally, to ensure the rigor of the study during data analysis phase, a peer review was conducted, incorporating feedback from experts. Finally, to ensure credibility, the interview texts and findings were shared with two qualitative research specialists, who reviewed the analysis process and validated the findings. To enhance confirmability, the opinions of faculty members and their complementary comments were secured. To improve transferability, a thick description of the research report was provided to facilitate the evaluation and applicability of the research findings in other contexts. Furthermore, quotations from participants during the interviews were included for each of the codes.

Before the interviews began, participants were provided with a research information sheet. This sheet included a summary of research information such as the topic and objectives of the study. The interview guide for this study was designed by the researchers. First, five pilot interviews were conducted, and then the researchers reviewed the interview questions pertaining to its language, wording and relevance. At this point in the process, two questions were modified accordingly due to the leading question. The interview questions were open-ended and crafted in alignment with the study objectives and review of the literature. Data were collected through semi-structured interviews, each lasting approximately 30 to 40 min. The interviews were conducted and recorded individually with participants' consent. In cases that the participants declined audio recording, their responses were noted. Participation in the research was voluntary, and all participants were free to withdraw from the study at any point during the research process. The interviews with surgical specialists were conducted at their workplace in the hospital and in the rest room, in a calm and suitable environment to minimize interference with patient care and the data collection process.

Data saturation typically serves as a guideline for determining the sufficient number of interviews. When no new information emerges during data collection, and the researchers encounter only cases that confirm and validate previous findings while collecting and updating the extracted data, sampling was terminated. Based on this principle, the researchers achieved data saturation after interviewing 18 participants but continued the interviews with an additional three participants to ensure confidence in the findings.

The interview process began with guided questions such as, "Can you share your experience of conflicts during a workday?" "In what situations do interprofessional conflicts arise?" and "In your opinion, what are the key competencies for conflict management in a clinical environment?" Throughout the interviews, probing questions such as " Could you please discuss that further?" and "Can you provide an example?" were used to clarify concepts and enrich the discussion. After data collection, the responses were recorded, coded, and categorized into major concepts. One researcher (SN) carried out the one-on-one interviews. Three researchers (SN, ShB and ZS) transcribed, read, coded and analyzed the interviews, our research team had healthcare, nursing and medical education background, experienced in qualitative research, and we had no potential biases related to the research topic. The interviews were conducted privately to ensure confidentiality and minimize any external influence.

The researchers employed purposive sampling with maximum variation to capture a wide range of experiences from the participants. The main target group was surgical residents, but due to achieve a more comprehensive understanding of conflict management in surgical environments the opinions of experienced surgeons and operating room staff were also reviewed. This approach ensured diversity in the sample regarding surgical specialties and various positions held within the hospital. For follow-ups, participants were asked to review and confirm the accuracy of the interview findings, codes, and themes. They provided feedback on the developed conflict management framework to ensure it reflected their experiences. This process helped validate the data and enhance credibility of the study. The research participants included surgical specialists who met the study's inclusion criteria, which were as follows:

1. Surgeons or residents in one of the surgical fields, including General Surgery, Neurosurgery, Otolaryngology, Urology, Gynecology, Orthopedics, Pediatrics, Plastic Surgery, Oral and Maxillofacial Surgery, and Ophthalmology.

Table 1 Demographic Characteristics of Participants

Participant ID	Sex	Academic Rank	Specialty	Position	Clinical Experience
P1	Female	Resident	Obstetrics and Gynecology	Student	4 years
P2	Male	Resident	Orthopedics	Student	5 years
P3	Male	Professor	Orthopedics	The head of the hospital	12 years
P4	Male	Associate Professor	Orthopedics	Faculty	7 years
P5	Male	Professor	Neurosurgery	Technical Director	15 years
P6	Male	Associate Professor	Pediatrics	Hospital Management	8 years
P7	Male	Resident	General Surgery	Student	9 years
P8	Male	Resident	General Surgery	Student	11 years
P9	Female	Resident	Otolaryngology	Student	8 years
P10	Male	Professor	General Surgery	Full-Time Professor	12 years
P11	Male	Associate Professor	Neurosurgery	Faculty / Department Chair	12 years
P12	Male	Resident	Urology	Student	5 years
P13	Female	Professor	Plastic Surgery	Full-Time Professor	10 years
P14	Male	Resident	Urology	Student	8 years
P15	Female	Professor	Pediatrics	Research Vice Dean	9 years
P16	Female	Resident	General Surgery	Student	8 years
P17	Male	Resident	Plastic Surgery	Student / Research Committee Chair	7 years
P18	Female	Associate Professor	Obstetrics and Gynecology	Quality Improvement Manager	9 years
P19	Male	Resident	Maxillofacial Surgery	Student	8 years
P20	Female	Nurse	Operating Room	Operating Room Supervisor	10 years
P21	Male	Nurse	Anesthesia	Accreditation Committee Chair	9 years

2. Had participation in conflict resolution meetings in the clinical environment (such as operating room and anesthesia staff nurses).

3. Had Work experience in surgical clinical settings.

Those with less than one year of experience in clinical environments were excluded from the study.

Results

A total of 21 individuals participated in this study, including 15 males (66.5%) and six females (33.5%). The demographic characteristics of the participants are presented in Table 1.

The content analysis of the interviews resulted in the identification of 845 initial codes, 15 subcategories, and five main categories. Codes were grouped into themes using constant comparison, with an iterative process to refine categories and identify relationships between them (Similar codes were merged, reducing the total to 61 codes). Table 2` presents the extracted codes, and their frequencies based on the inductive content analysis following the Graneheim and Lundman method. The codes related to competencies in conflict management in the clinical environment exhibited the highest frequency.

After extracting the codes, the researchers categorized those that were related or overlapping into subcategories. This process resulted in a total of 15 subcategories. The subcategories were then examined and compared, leading to the identification of five main categories. Tables 3 and 4 present the Sub-categories, and categories with their corresponding codes. Also, Fig. 1 shows a Framework of conflict management in clinical environments. As illustrated, the competencies for conflict management carry the highest weight, accounting for %29.

Data Description

Based on the analysis of interview data, five main categories were extracted as follows:

1. Conflict experience in clinical Settings
2. Conflict formation sources
3. Conflict management Competencies
4. Conflict resolution Approaches
5. Conflict outcomes

Conflict experience in clinical Settings

The first key theme identified in this study was the experience of conflict within clinical environments. This theme encompassed three subcategories, each providing deeper insights into the nature and dynamics of conflict in these settings.

Severity of Conflict

Table 2 Extracted Codes and Their Frequencies Based on Inductive Content Analysis

N	Code (Frequency)	N	Code (Frequency)	N	Code (Frequency)	N	Code (Frequency)
1	Incompatibility between motivation and desire [8]	25	Workload [11]	49	Determining duties [1]	73	Stress management [1]
2	Disagreement with others [8]	26	The variety of moral and philosophical views about the patient [32]	50	Improving community health [5]	74	Self-improvement [8]
3	Different opinions on how to solve the patient's problem [8]	27	Different scientific and experimental levels [16]	51	Exchange reflection and criticizing new ideas [11]	75	Self-awareness [4]
4	The constant presence of conflict in the clinical environment [11]	28	Failure to comply with professional duties [4]	52	Impact on organizational culture and vitality [22]	76	Flexibility [10]
5	The normality of conflict in the clinical environment [8]	29	Avoid autocratic decision making [13]	53	Creating an educational environment for learners [1]	77	Thinking positive [3]
6	Intrapersonal conflict [9]	30	Conflict of interest among surgeons [13]	54	Impact on organizational relationships [2]	78	Creativity [1]
7	Intraprofessional conflict [17]	31	Uncertainty about treatment method [6]	55	Impact on the dynamics of the therapeutic team [9]	79	Work commitment [1]
8	Interprofessional conflict [46]	32	Unscientific decision making [7]	56	Changing the treatment and management methods of the patient [33]	80	being reliable [2]
9	Organizational conflict [3]	33	Stress [4]	57	Impact of conflict on treatment costs [10]	81	Analysis and criticism skills [6]
10	Economic and cultural conditions of society [3]	34	Learning conflict management skills [4]	58	Impact of conflict on patient satisfaction [3]	82	Planning [2]
11	Variety of surgical procedures [16]	35	Efforts to reduce the negative effects of conflict [2]	59	Impact on the quality of decisions [15]	83	Being a role model for learners [12]
12	Complexity of the clinical environment [7]	36	Improving the scientific level [3]	60	Learning and strengthening conflict management skills [2]	84	Understanding and analyzing the conflict situation [9]
13	Organizational hierarchy [15]	37	Institutionalization of a conflict management committee [17]	61	Individual growth [4]	85	Mediation [5]
14	Lack of medical personnel [7]	38	Instruction of conflict management skills [17]	62	Performance quality [4]	86	Counseling [8]
15	The educational nature of the clinical center [6]	39	Assessment of conflict management skills [2]	63	Reflection [8]	87	Ability to reasoning and problem solving [8]
16	Diversity of roles and specialties [32]	40	Cultivation of Conflict management [5]	64	Feedback [1]	88	Negotiation and consultation [14]
17	Insufficient patient information [12]	41	Motivation of the Surgical team [1]	65	Impact on the mental health of the therapeutic team [37]	89	Check out other views [5]
18	Patients with multi-morbid conditions [3]	42	Workload reduction [1]	66	Influence of conflict on creative thinking [3]	90	Active listening of views [10]
19	Ambiguity in the description of people's duties [17]	43	Adaptation of personnel [2]	67	Impact of conflict on personnel motivation [2]	91	Communication skills [7]
20	Lack of proper planning [8]	44	Planning [1]	68	Use of scientific evidence [21]	92	Cross-functional teamwork [13]
21	Inappropriate valuation system on services [5]	45	Strengthen teamwork [2]	69	Clinical experience [22]	93	Objectivity and non-prejudice [3]
22	Lack of proper culture [1]	46	Development of treatment protocols [11]	70	Professionalism [31]	94	Judgment and decision-making skills [6]
23	Failure to train the necessary skills to manage conflicts [1]	47	Timely and fair resolution of conflicts [4]	71	Emotional Intelligence [7]	95	Mutual understanding [6]
24	Stressful environment [5]	48	Professional ethics training [6]	72	Patience [4]	**Total**	845

Participants noted that interprofessional conflicts are common and often occur on a daily basis in the high-pressure environment of surgical departments. One participant's experience was expressed as follows:

"Interprofessional conflict is quite normal. When conflict doesn't occur, it means that colleagues aren't thinking thoroughly about the patient, and one person is making all the decisions." (P19)

Table 3 Codes, Sub-categories and Categories extracted from Data Analysis

Code (Frequency)	Sub-category (N. of Codes)	Category (N. of Codes)
Incompatibility between motivation and desire [8]	Definition of Conflict [24]	Experience of conflict [118]
Disagreement with others [8]		
Different opinions on how to solve the patient's problem [8]		
The constant presence of conflict in the clinical environment [11]	Intensity of Conflict [19]	
The normality of conflict in the clinical environment [8]		
Intrapersonal conflict [9]	Types of Conflict [75]	
Intraprofessional conflict [17]		
Interprofessional conflict [46]		
Organizational conflict [3]		
Variety of surgical procedures [16]	Organizational source [149]	Sources of Conflict Formation [247]
Complexity of the clinical environment [7]		
Organizational hierarchy [15]		
Lack of medical personnel [7]		
The educational nature of the clinical center [6]		
Diversity of roles and specialties [32]		
Insufficient patient information [12]		
Patients with multi-morbid conditions [3]		
Ambiguity in the description of people's duties [17]		
Lack of proper planning [8]		
Inappropriate valuation system on services [5]		
Lack of proper culture [1]		
Failure to train the necessary skills to manage conflicts [1]		
Stressful environment [5]		
Workload [11]		
The variety of moral, philosophical views about the patient [32]	Individual source [95]	
Different scientific and experimental levels [16]		
Failure to comply with professional duties [4]		
Avoid autocratic decision making [13]		
Conflict of interest among surgeons [13]		
Uncertainty about treatment method [6]		
Unscientific decision making [7]		
Stress [4]		
Economic and cultural conditions of society [3]	Trans organizational source [3]	
Learning conflict management skills [4]	Micro level [9]	Conflict resolution approaches [79]
Efforts to reduce the negative effects of conflict [2]		
Improving the scientific level [3]		
Institutionalization of a conflict management committee [17]	Macro level [70]	
Instruction conflict management skills [17]		
Assessment of conflict management skills [2]		
Cultivation of Conflict management [5]		
Motivation of the Surgical team [1]		
Workload reduction [1]		
Adaptation of personnel [2]		
Organizational planning for proper management of conflict situations [1]		
Strengthen teamwork [2]		
Development of treatment protocols [11]		
Timely and fair resolution of conflicts [4]		
Professional ethics training [6]		
Determining duties [1]		

Table 4 Codes, Sub-categories and Categories extracted from Data Analysis

Code (Frequency)	Sub-category (N. of Codes)	Category (N. of Codes)
Improving community health [5]	Impact of conflict on community health [5]	Consequences of Conflict [172]
Exchange reflection and criticizing new ideas [11]	Impact of conflict on hospital rules, policies and climate [45]	
Impact on organizational culture and vitality [22]		
Creation of an appropriate educational environment for learners [1]		
Impact on organizational relationships [2]		
Impact on the dynamics of the therapeutic team [9]		
Changing the treatment and management methods of the patient [33]	Impact of conflict on patient care [61]	
Impact of conflict on treatment costs [10]		
Impact of conflict on patient satisfaction [3]		
Impact of conflict on the quality of decisions [15]		
Learning and strengthening conflict management skills [2]	Impact of conflict on personal and professional behavior [61]	
Enhancing personal growth [4]		
Performance quality [4]		
Strengthening reflective skills [8]		
Getting feedback [1]		
Impact of conflict on the mental health of the therapeutic team [37]		
Influence of conflict on creative thinking [3]		
Affecting on individuals' motivation [2]		
Use of scientific evidence [21]	Individual competencies [121]	Competencies of conflict management [229]
Clinical experience [22]		
Professionalism [31]		
Emotional Intelligence [7]		
Patience [4]		
Stress management [1]		
Self-improvement [8]		
Self-awareness [4]		
Flexibility [10]		
Thinking positive [3]		
Creativity [1]		
Work commitment [1]		
Flexibility [10]		
being reliable [2]		
Analysis and criticism skills [6]		
Planning skills for proper management of conflict situations [2]	Managerial and leadership competencies [63]	
Being a role model for learners [12]		
Understanding and analyzing the conflict situation [9]		
Mediation in conflict parties [5]		
Check out other views [5]		
Counseling [8]		
Ability to reasoning and problem solving [8]		
Negotiation and consultation [14]		
Active listening of views [10]	Interpersonal competencies [45]	
Communication skills [7]		
Cross-functional teamwork [13]		
Objectivity and non-prejudice [3]		
Judgment and decision-making skills [6]		
Mutual understanding [6]		

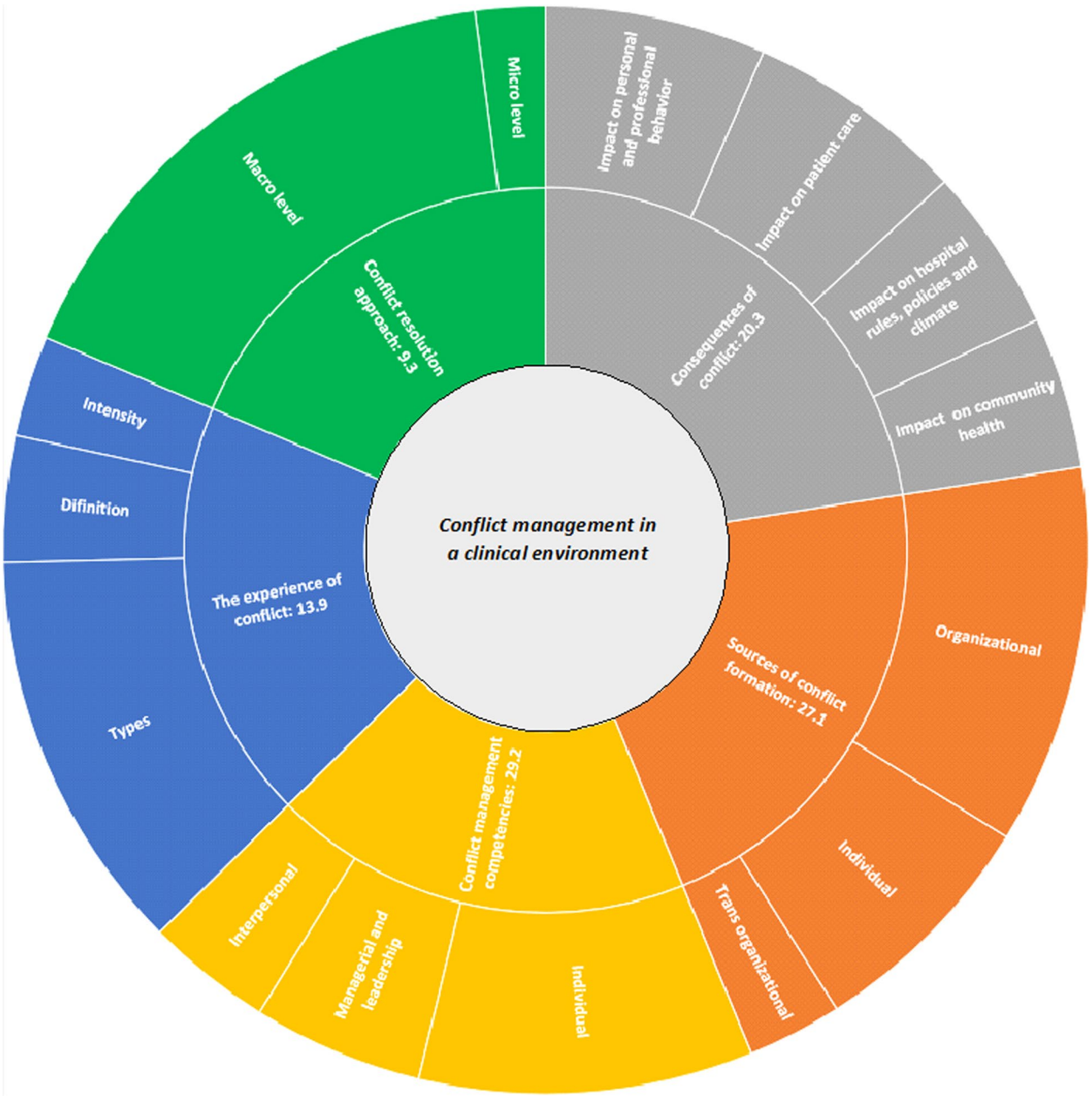

Fig. 1 Conflict Management Framework in a Clinical Environment

Definition of Conflict

Participants had a shared perception of interprofessional conflict, mostly describing it as differing opinions and viewpoints among healthcare professionals when it comes to patient care and decision-making. One participant stated:

"In my opinion, interprofessional conflict can be defined as a difference in opinion and perspective among two or more healthcare staff regarding a patient and decision-making for that patient." (P1).

Types of Conflict

Based on the interview results, the subcategory of types of conflict in the clinical environment can be divided into three categories including Intrapersonal, Interprofessional and Organizational Conflicts. Intrapersonal conflict arises from the belief that an individual's perception of a patient is unique. In this situation, inconsistency in motivations and viewpoints regarding the patient leads to conflict.

The lack of timely and effective communication and the inability to establish mutual understanding are primary sources of interpersonal conflict. This type of conflict typically occurs due to varying levels of power, expertise, and diverse roles, coupled with inadequate communication skills. In this regard, some participants stated:

The source of organizational conflicts lies in the complexity of workflows, including tasks, procedures, and resources. Organizational conflicts are generated by forces external to the individuals involved in the conflict.

Conflict formation sources

Multiple factors lead to conflict in clinical environments. These factors can generally be categorized into two groups:

Individual Characteristics

Participants identified several factors related to individual characteristics that contribute to conflicts, including:

- Lack of training in essential skills for managing conflicts in the clinical environment.
- Diverse ethical, philosophical, and scientific perspectives regarding patient care.
- Failure to adhere to professional responsibilities.
- Conflicts of interest and uncertainty.

Organizational Characteristics

Participants identified several organizational factors contributing to conflict, including inadequacy of healthcare personnel, the educational nature of the clinical centers, the diversity of roles and specialties, insufficient patient information, and patients with multi-morbid conditions. Additionally, issues such as ambiguity in job descriptions, an inappropriate valuation system for services, and a lack of proper planning were identified.

Conflict Management Competencies

The third main category is related to essential skills required for effective conflict management in clinical settings. These skills can be categorized into three major competency domains:

Individual Competencies

Several participants emphasized the importance of individual and psychological competencies in conflict management, highlighting the significance of self-awareness. This subcategory includes the following skill:

Psychological Skills

Emotional Intelligence and Self-Management Skills:

- Self-awareness of emotional reactions during conflicts.
- Ability to regulate emotional responses in challenging situations.
- Stress management techniques for high-pressure situations.

Cognitive and Professional Skills:

- Critical thinking abilities for analyzing conflict situations.
- Creative problem-solving approaches.
- Clinical reasoning skills.
- Evidence-based decision-making capabilities.
- Professional ethics application.
- Reflective practice skills.

Adaptability Skills:

- Flexibility in approaching different conflict situations.
- Patience in dealing with complex interprofessional dynamics.
- Openness to alternative perspectives.
- Ability to adjust approaches based on situation specifics.

Management and Leadership Skills

Strategic Planning Skills:

- Situation analysis and assessment capabilities
- Conflict prevention planning
- Resource allocation management
- Priority setting in conflict situations

Mediation and Resolution Skills:

- Problem identification and analysis
- Solution development and implementation
- Consensus-building abilities
- Decision-making in complex situations

Leadership Skills:

- Role modeling appropriate conflict management behaviors
- Mentoring and guiding others through conflicts
- Creating supportive environment for open discussion
- Facilitating constructive dialogue among team members

Interpersonal and Communication Skills

Active Communication Skills:

- Active listening techniques.
- Clear and effective verbal communication
- Non-verbal communication awareness
- Feedback provision and reception.

Team Collaboration Skills:

- Building and maintaining professional relationships.
- Cross-functional team coordination.
- Collaborative decision-making.
- Respect for diverse professional perspectives.

Negotiation Skills:

- Interest-based negotiation techniques.
- Compromise and consensus building.

Conflict Resolution Approaches

The fourth main category focuses on conflict resolution approaches in the clinical environment. Based on the analysis of interview data, two general approaches for reducing conflicts in hospitals were identified, encompassing actions at both micro and macro levels.

Micro Level

Some surgical team members believed that conflicts could be resolved at the micro level through the following actions:

- Learning conflict management skills.
- Making efforts to mitigate the negative effects of conflict.
- Improving the scientific level.

Macro Level

At the macro level, several actions can be implemented within hospitals to minimize conflicts. Clinical care professionals believe that establishing a conflict management unit, comprising representatives from all professional groups and recognizing working groups within the hospital, is an effective measure for managing conflicts. Participants also noted the following organizational actions:

- Instruction of conflict management skills.
- Assessment of conflict management skills.
- Cultivation of conflict management practices.
- Motivating the surgical team to effectively manage conflict situations.
- Workload reduction.
- Adaptation of personnel roles.
- Organizational planning for proper management of conflict situations.
- Strengthening teamwork.
- Development of treatment protocols.
- Timely and fair resolution of conflicts.
- Professional ethics training.
- Clarification of duties.

Conflict outcomes

This is the final main category derived from the data analysis, that addresses the consequences of conflict in clinical environments, which can be further divided into four subcategories as follows:

Impacts of Conflicts on Personal and Professional Behavior

Conflict situations not only affect patient management and clinical impacting but also influence the personal and professional behavior of clinical team members. This subcategory can be further divided into:

- Learning and strengthening conflict management skills.
- Impact on mental health and creative thinking of the treatment team.
- Affecting individuals' motivation.
- Strengthening reflective skills.
- Enhancing personal growth.

Regarding the strengthening of reflective skills, one participant remarked:

"If a professor comments on my patient, I think about their opinion and weigh it against my own experience to see which action would be best. Sometimes these disagreements are beneficial; they make me think and help me make better decisions." (P2).

Table 5 Positive and negative consequences of conflict

Consequences of constructive conflict management	Consequences of not managing conflict
It leads to the emergence of new ideas or approaches and the selection of the best one for patient management. (P2,5,16,18)	Poses a threat to patient health. (P1,2,4,5,6,8,10,11,16)
It creates learning opportunities for learners. (P7,8,12,17,20)	Leads to dissatisfaction, loss of patient trust, and waste of resources. (P1,4,6,17,21)
It improves communication. (P2,3,4,5,6,16,20)	Creates tension. (P3,5,6,13)
It enhances the quality of decisions. (P1,6,9,12,16,18)	Creates a negative atmosphere. (P5,9,12,17,19)
It promotes organizational vitality. (P2,3,4,5,6,7,11,16)	Reduces group coherence. (P3,4,18,19,21)

Impact of Conflicts on Patient Care

Most interprofessional conflicts in the clinical environment have consequences for patients. When conflict situations are constructively managed, they can lead to the introduction of new ideas and selection of optimal treatment options. Based on participants' insights, the impacts of conflicts on patient care can be divided into five categories:

- Changes in patient treatment and management approaches.
- Impacts on treatment costs, patient satisfaction and team dynamics.
- Impacts on the quality of decision-making.

Impact of conflict on hospital rules, policies, and climate

Conflicts in clinical environments creates opportunities for change in patient treatment and management approaches. One advantage of conflict in this setting is its potential to motivate individuals to think creatively and critically evaluate new ideas. According to participants, when managed effectively, conflict can yield positive outcomes, benefiting all members of the healthcare team. The positive outcomes of effective conflict management in the clinical environment include:

- Examination and critique of new ideas.
- Positive impact on organizational vitality.
- Creation of an appropriate educational environment for learners.

Regarding the examination and critique of new ideas, one participant commented:

"As long as team members do not examine and critique different opinions and challenge the status quo, outdated or ineffective treatment methods may continue to be applied. When people question a specific method, new ideas can always emerge. Sometimes conflicts need to occur among surgical specialists, so that the best decision can be made based on the patient's condition." (P14).

Impact of Conflicts on Community Health

In this regard, one of the participants stated:

"In my opinion, conflicts are beneficial; they help break the monotony of our environment. When I am asked for my opinion during meetings and clinical rounds, and I can freely critique and discuss my colleagues' views, I feel like we are a family within the organization, collectively responsible for providing the best care and services for patients. Ultimately, we need to be able to review and critique each other's opinions to achieve positive health outcomes for the community." (P16).

Overall, the consequences of conflict management in the clinical environment are summarized in the Table 5.

Discussion

This study developed a interprofessional conflict management framework for surgical residents in surgical clinical settings, identifying five main categories. Regarding experience of conflict in clinical Settings, our findings align with previous studies showing the widespread occurrence of interprofessional conflicts in healthcare settings [6, 25, 26]. Research indicates that most of healthcare staff experience conflict at least weekly, highlighting the importance of conflict management [27]. On conflict sources, our findings identified both individual and organizational levels. At the individual level, poor communication skills were identified as the primary factor, aligning with Katarzyna et al. findings that most conflicts stem from communication issues [28]. At the organizational level, the diversity of roles and specialties within surgical departments emerged as a key source of conflict. This finding is particularly relevant in modern healthcare settings where multiple specialists must coordinate care for more complex cases, which is consistent with recent research [29, 30]. The shortage of healthcare personnel was another source of conflict, and when combined with the educational nature of teaching hospitals, it creates a complex environment susceptible to interprofessional conflict. Chinguwo et al. also mentioned in their research that one of the important factors in the emergence of interprofessional conflicts is the shortage

of medical personnel [31]. Organizational structural issues, including ambiguous job descriptions, hierarchical structures, the educational nature of hospitals, and inappropriate service valuation systems, were identified as significant triggers of conflict. Lack of proper planning and unclear delineation of responsibilities often lead to role confusion and professional territory disputes. These findings are consistent with the study by Tosanloo et al. [32].

The identification of conflict management competencies across three domains: individual, managerial-leadership, and interpersonal provides a comprehensive framework for surgical residency curriculum. Recent research highlights the importance of developing comprehensive conflict management and leadership skills in surgical residency curricula. Studies have shown that structured programs focusing on communication, emotional intelligence, and conflict management can significantly improve residents' abilities in these areas [17, 33].

Our findings on conflict resolution approaches suggest interventions must occur at both Micro and Macro levels. At the micro level, training in interprofessional conflict management competencies and improving the scientific level of surgical residents can be effective. This finding was also highlighted in the study by O'Keeffe et al., which emphasized the effectiveness of training in interprofessional conflict management and the improvement of scientific skills for surgical residents [34].

In the Macro-Level Approaches, a key recommendation is establishing conflict management units within hospitals, involving diverse professional groups to implement and monitor strategies. The study emphasizes addressing workload management, role adaptation, and organizational culture while fostering a culture that encourages surgical teams to engage in conflict resolution through training, clear protocols, teamwork, and fair resolution mechanisms. This aligns with Catapano et al. study, which states that effective conflict resolution in organizations requires a multilevel approach addressing both individual and organizational factors [35].

Conflict outcomes in our study revealed a spectrum of positive and negative effects. A notable finding was that constructive conflict can enhance clinical decision-making, which is supported by Alexander et al. study on constructive conflict [36]. One positive outcome is the opportunity for reflection and learning from conflicts. First introduced by John Dewey as active, continuous consideration of knowledge [37], reflection was later expanded by Donald Schön, who defined a reflective practitioner as one who learns from experiences to address complex professional challenges [38].

Based on five main categories—conflict experience, sources, resolution approaches, outcomes, and required competencies—we developed a comprehensive Interprofessional Conflict Management Framework for surgical residents. This framework contributes to understanding interprofessional conflict management in surgical settings, where hierarchical structures, time pressure, and high-stakes decision-making create distinct conflict patterns. It highlights the high frequency of conflicts in surgical care, shaped by micro (individual) and macro (organizational) factors, and emphasizes the need for organizational interventions. Leadership and communication competencies emerged as critical for surgical residents, reflecting the importance of broader institutional policies and structural solutions in conflict management.

Implementing conflict management frameworks in surgical settings faces challenges such as hierarchical resistance, resource constraints (time, staffing), and interference between educational and patient care objectives. Additionally, measuring the effectiveness of interventions is difficult in complex clinical environments. Successful implementation requires strong leadership, allocated resources for training, clear evaluation metrics, adaptable strategies for various subspecialties, and integration with quality improvement initiatives.

This study has key implications:

Educational: Integrating conflict management competencies into surgical curricula, developing assessment tools, and using clinical scenarios for practice.
Organizational: Establishing formal conflict management structures, supportive policies, and mentorship programs for communication.
Clinical Practice: Enhancing patient safety, improving team dynamics, and enabling more effective decision-making.

Limitations of the study

- Research method: Qualitative nature of the study affects generalizability of the findings to be applicable in other surgical specialties.
- Methodological Limitations: While content analysis may not traditionally be associated with framework development, it was instrumental in identifying the foundational skills and competencies for conflict management in Iranian context. Future studies, such as Delphi methods or participatory workshops, may help validate and refine the proposed framework.
- Focus on a Specific Context: The study specifically focused on surgeons and surgical residents, which

means the findings may not be fully applicable to other health care professionals.

- Insufficient Cooperation from Hospitals and Administrative Departments: Despite extensive efforts to establish rapport and cooperation with hospitals and administrative departments, some medical centers did not provide the necessary support for the researchers to conduct the study.
- Access to the study participants: Difficulty in accessing participants due to their hectic schedules in the operating rooms.
- Sampling Limitations: Given the wide range of surgical fields and specialties, it was not feasible to sample all surgical disciplines.
- Generalizability of the findings: This study was conducted at a specific medical university in Iran, which may limit the generalizability of the findings to other healthcare settings or countries. Cultural, organizational, and structural differences could influence the outcomes.

These limitations highlight the need for further research (qualitative, quantitative and mixed methodologies) to explore the topic of conflict management in clinical settings more deeply and broadly. Future studies should address the above- mentioned limitations to provide a more comprehensive understanding of interprofessional conflict management in healthcare environments.

Conclusion

This study identified five key categories that form a comprehensive framework for interprofessional conflict management in surgical settings: experience of conflict, conflict formation sources, resolution approaches, outcomes, and required competencies. Our findings demonstrate that interprofessional conflicts in surgical environments are daily occurrences that emerge from both individual and organizational factors. The study reveals specific competencies required for effective conflict management, categorized into individual-psychological, managerial-leadership, and interpersonal domains. Given the occurrence of conflict in clinical environments, integrating essential competencies for interprofessional conflict management into both formal and hidden curriculums for surgical residents may contribute to improved teamwork and potentially enhance patient outcomes. Based on our research, successful conflict management in surgical settings requires a dual approach: developing individual competencies among surgical residents and establishing supportive organizational structures. The framework developed in this study offers a structured approach for integrating conflict management training into surgical residency curriculums, aiming to address the complex dynamics of surgical environments in teaching hospitals where multiple stakeholders interact under high-pressure situations. Furthermore, our findings support the establishment of dedicated conflict management units within hospitals, comprising representatives from various professional groups, to facilitate timely and constructive conflict resolution. This structured approach to conflict management has the potential to enhance team dynamics, improve patient care outcomes, and create more effective learning environments in surgical settings. Implementation of this framework could serve as a model for developing similar conflict management structures in other clinical environments, though further research is needed to validate its effectiveness across different surgical contexts.

Clinical trial number

Not applicable.

Supplementary Information

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Supplementary Material 1.

Supplementary Material 2.

Supplementary Material 3.

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Authors' contributions

S.N. and Z.S Conceptualization, Sh. B. and S. N. Writing Original draft, All authors reviewed the manuscript.

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Data availability

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

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Declarations

Ethics approval and consent to participate

This study received approval from the ethics committee of the School of Medicine at Iran University of Medical Sciences (Code: IR.IUMS.FMD.REC.1401.390). During the research process, the ethical policies of the university were followed in accordance with the principles of the Declaration of Helsinki, including obtaining informed consent to participate in the research and assuring them of the confidentiality of their information. Participants were free to withdraw from the study at any time.

Competing interests
The authors declare no competing interests.

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