Explaining The Impact of Surgical Team Communication Skills On Patient Safety In The Operating Room: A Qualitative Study

Behzad Imani

Hamadan University of Medical Sciences

Shima Bahrami Jalal (✉ bahramijalalshima@gmail.com)

Hamadan University of Medical Sciences <https://orcid.org/0000-0002-9363-7443>

Research Article

Keywords: Communication Skills, Patient Safety, Operating Room, Qualitative Research

Posted Date: November 17th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-1082850/v1>

License: This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Aim: The aim of this study was to explain the causes and attributes of communication skill of the surgical team and patient safety in the operating room.

Background: Communication skills and how to work in a team is one of the effective factors on the incidence of error and patient safety in the operating room. However, the quality of this communication and how communication skills increase the patient's safety in the operating room is not entirely clear. The aim of this study was to find out the relationship between communication skills and patient safety in the operating room.

Methods: This qualitative study was performed based on grounded theory approach. In this study, data collection was performed by conducting semi-structured interviews. Eight interviews were conducted with members of the surgical team including surgeons, operating room and anesthesia experts, and the samples were selected purposefully. The obtained data were analyzed by Strauss and Corbin's approach.

Results: In data analysis, two main categories were extracted: Factors affecting patient safety before surgery and Factors affecting patient safety during surgery. Consequently, eight sub-themes were classified.

Conclusion: The results of the present study show that working in the operating room is a teamwork that requires cooperation and communication. In addition, the formation of proper communication between members of the surgical team has a significant impact on patient safety in the operating room.

Relevance to clinical practice: Since the formation of proper communication between members of the surgical team can affect patient safety in the operating room, improving the communication skills of surgical team members can improve patient safety in the operating room.

Introduction

Patient safety is one of the most important issues in health centers. However, despite extensive advances in healthcare, the incidence of medical errors in various parts of medical centers, especially in operating rooms, is still high. Medical errors in the operating room increase complications and mortality from surgery. Unfortunately, every year a large number of deaths in the operating room are reported by the surgical team due to errors. Among the factors affecting the incidence of errors in the operating room are communication skills and the quality of the personnel teamwork of the department. It seems that by increasing the communication skills of employees and improving teamwork, it is possible to reduce the incidence of medical errors in the operating room and, consequently, improve the patient's safety status. Nevertheless, the quality of this communication and how communication skills increase the patient's safety in the operating room are not entirely clear. Therefore, considering the importance of patient safety in the operating room and the fact that no study has been conducted in this field in Hamadan province,

the purpose of this study is to determine the attributes of the relationship between communication skills and patient safety in the operating room.

Aim

The aim of this study was to clarify how the surgical team's communication skills affect patient safety in the operating room.

Background

Patient safety means the prevention and reduction of errors or injuries resulting from the processes of providing patient care (1). Patient safety and quality of services provided to patients are important health issues in health care systems. Although many advances have been made in recent decades, the rate of patient injuries due to errors is still high (2). For this reason, the issue of patient safety in the medical system has recently been approved worldwide (3). On average, in developed countries, one in 10 people is injured in a health center. This figure seems to be higher in developing countries due to limitations in technology, human resources and infrastructure (4). In Iran, there are no accurate statistics on the incidence of medical errors in medical centers, but some studies in the country have reported the incidence of medical errors on warning level (1). Additionally, the study of Sheikh Taheri (2013) shows that 24,500 people die annually due to medical errors in Iran (5).

Among the various departments of medical centers, the operating room is a high-risk environment that needs a lot of attention in order to prevent medical errors (6). Issues related to the patient, treatment protocol, high level technology, and technical complexities in the operating room have made the patient's safety in the operating room of particular importance and a major concern for the personnel of this department (7).

It is estimated that 234 million surgeries are performed annually, of which 3 to 16% cause complications and 0.4 to 0.8 cause the death of patients (8). Although surgery depends on the surgeon's skill and ability, surgery itself is like a social situation in which many tasks require a proper relationship between members of the surgical team (9). Macari's study (2006) considers the three main causes of errors are human factors, leadership and communication (10). Joint Commission in 2006, reported that 70% of medical errors that resulted in death or physical or psychological injury were due to communication errors (11). Therefore, inter-professional communication has a significant role in the transmission of information during surgery and consequently patient safety. Moreover, studies in this field indicate that patient safety in the operating room is to a great degree conditioned by communication (12).

Communication skills are defined as behaviors that help a person to express emotions and needs correctly and achieve interpersonal goals (13). The ability to communicate therapeutically is a prerequisite for providing appropriate services in the field of treatment. The effects of proper communication include job and organizational success, increasing the sense of participation and cooperation, reducing medical errors, reducing depression and job stress, and increasing job satisfaction

and productivity (14). As a result, efficient and appropriate communication between members of the treatment team can increase patient safety and reduce mortality and complications (15). Unfortunately, many studies have reported inadequate communication between medical personnel (16). For example, Pak Gohar's study (2015) considers communication skills of more than 50% of health care providers undesirable (17). On the other hand, proper inter-professional communication is one of the requirements of teamwork, and since providing the required security in the operating room is a teamwork and everyone has a common responsibility, surgery will face many problems without an effective communication to create an inclusive environment and make various coordination during surgery (18). In Lingard's (2004) study, 48 surgical cases were observed, during which 421 communications were formed between the surgical team, one third of which were identified as communication errors (19). However, the problem is that it is not clear how communication and communication skills of operating room personnel increase and improve patient safety in the operating room. Given the above and the importance of patient safety in medical centers, especially in the operating room, as well as the limited number of studies in this field, we decided to conduct a qualitative study to clarify how communication affects patient safety in the operating room; since qualitative research is a means of discovering the meaning, depth, inherent complexity, and revealing the various aspects of a subject.

Methods

Study setting

In this study, 12 members of the surgical team in Besat Hospital in Hamadan were used to review the data using a qualitative content analysis method.

Participants

The study population in this study was the surgical team including surgeons, anesthesiologists, operating room experts and anesthesiologists. The sampling method in this study was first purposive and then theoretical. First, the primary sample is selected and based on the analysis of data related to this sample and the formation of theory, the next samples are selected. In order to determine the sample size, theoretical saturation was used. Theoretical saturation occurs when the new sample does not add information to the previous information and nothing new is obtained. Therefore, sampling continued until no new data were available. Inclusion criteria were having more than 5 years of work experience in the operating room and consent to participate in the study (table 1).

Data Collection

In this study, the researcher used a semi-structured interview to collect and produce data. The interviews were conducted individually for a period of about 45 to 90 minutes and at a time and place accepted by the participants. The interview was recorded with the permission of the participants. Some of the interview questions, including "how to ensure patient safety in the operating room?", "do the surgical team communication skills affect the patient's safety in the operating room?" and "how is this done" were

designed as a pre-interview primary guide. During the interview, exploratory questions such as "please explain more" or "can you give an example in this regard" were gradually asked in order to clarify the concept and deepen the interview process. The interviews were transcribed verbatim at the first opportunity using Microsoft Word and then they were prepared for analysis. During the study, numbers (P1, P2, P3, etc.) were used instead of the names of the participants. Interviews were conducted with 8 participants until data saturation.

Data Analysis

In this study, the data obtained from the interviews were analyzed based on the conventional content analysis method. In order to analyze the data using the conventional content analysis method, the 5-step Lundman-Graneheim method was used, the steps of which are: 1. Implementing the interviews and reviewing it several times in order to find a correct understanding of the whole Implemented items 2. Extracting semantic units and classifying them 3. Summarizing and categorizing the units and choosing the appropriate label for them 4. Sorting the subcategories based on comparing similarities and differences 5. Selecting the appropriate title that can cover the resulting categories To have.

Rigor

In order to ensure the acceptability of the data, the Lincoln and Goba technique were used. Based on this method, the four principles of Credibility, Dependability, Transferability and Confirmability were examined. For this purpose, a survey of participants was used. The handwritten text of the interviews was provided to them and they were asked to check its accuracy and consistency with their statements and experiences. In order to ensure consistency and reliability, two other expert observers with quality work experience were asked to review the interviews, coding, and classes. Additionally, in order to investigate the transferability of information, an attempt was made to interview different samples in terms of field and level of education, and the results were provided to some members of the surgical team who did not participate in the study and they were asked to match the results with their own experiences.

Results

In the present study, the researcher obtained information saturation level after conducting interviews with 8 participants (1 surgeons, 2 anesthesiologists and 5 operating room experts). This study provided 8 sub-themes and 2 main themes (Table 2).

1- Factors affecting the patient's safety before surgery:

Based on the information obtained from the interviews, a set of measures and examinations that should be performed for the patient before the start of surgery are among the important factors affecting the patient's safety. These measures require effective and appropriate communication with the patient and members of the surgical team. In other words, it is not possible to perform these actions and achieve these goals without communication. According to the participants, getting the correct history from the

patient, verifying the patient's identity, reducing the patient's stress, proper planning for the surgery and providing the equipment and tools needed for the surgery are the sub-themes of the factors affecting the patient's safety before surgery.

1-1. Getting the correct history from the patient:

Getting a proper history from the patient is one of the most important and influential factors on the patient's safety before starting surgery. In fact, obtaining accurate information and history from the patient is the first step to a safe surgery. In other words, by communicating with the patient, their underlying problems can be understood, and if this communication is formed correctly, a correct history of the patient can be obtained because this information influences surgical decisions and planning.

Participant No. 1:

"...When a patient refers to the hospital and is hospitalized, they may have a series of problems. To understand these problems, we need to establish a proper communication with the patient..."

1-2. Patient Identification:

Lack of proper identification of the patient is one of the cases that cause irreparable mistakes in the health care system. Misidentifying a patient sometimes causes the wrong surgery to be performed on a patient or the surgeon performs the surgery on the wrong side of the body. For this reason, patient identification is an important factor in patient safety in the operating room. At the beginning of the patient's entry into the operating room, by establishing a proper communication with the patient, their identity can be ensured. Participant No. 2:

"...Well, first of all, when the patient comes into the room, you introduce yourself and ask the patient to introduce themselves. Then you ask about their surgery and calm them down..."

1-3. Proper planning for surgery:

Planning for a safe surgery requires proper communication between the members of the surgical team. With the right communication, the right workforce for a surgery is provided in the best way. In addition, estimating the duration of the surgery and arranging the surgeries that should be performed in the operating room during the day is achieved with a proper planning. Participant No. 3:

"...In cases like personnel changes, for example, the operation may take up to two hours and the team needs to be changed, while in the morning an old skilled force is on the operation and in the evening an inexperienced young girl comes to the operation room. If the surgical team has already estimated the need to a skilled force, they must inform the operating room manager in advance. They must communicate so that there will be no problems..."

1-4. Patient stress reduction:

Patient stress is one of the factors influencing the surgical procedure. A patient with stress has an increased heart rate and their cardiovascular condition will not be stable and they will experience high-risk anesthesia. It will be difficult for these patients to undergo anesthesia as well as to regain consciousness. The operating room environment is a stressful environment for patients. The patient who enters the operating room naturally experiences high stress. The patient is afraid of the surgery and its outcome. At this time, operating room personnel can significantly reduce the patient's stress by establishing a friendly and intimate relationship with the patient before anesthesia. Participant No. 4:

"...Now with what I have seen, when a patient is stressed, because the operating room is an unfamiliar environment for the patient or the patient enters the operating room and sees the surgeon and the nurse for the first time, all new faces, well, for this patient it's natural to be stressed..."

1-5. Supplying required equipment and tools:

Providing the necessary equipment and tools before the start of surgery is one of the factors that can ensure the safety of the patient during surgery. Some medical devices, such as catheters, are in direct contact with the patient's body, and failures and problems in their operation can harm the patient. Moreover, in some surgeries, a special set of tools and equipment are needed to perform the surgery with high quality. In order to supply some equipment as well as to equip and repair some equipment, it is necessary to communicate with different units such as medical equipment unit. By establishing this communication, all tools and equipment can be provided and their correct operation can be ensured. Participant No. 5:

"...The other part about safety is about the devices that are used in the room, as the surgical instruments. In the case of cutters, there is the possibility of unwanted burns on the plate of the cutter, or the metal objects in contact with the body, because there will be the possibility of burns..."

2- Factors affecting the patient's safety during surgery:

During surgery, the surgical team needs to communicate in order to ensure the patient's safety. In fact, surgery is a team effort. Teamwork also requires collaboration and communication. During surgery, safely positioning the patient as well as securing the physical structure requires proper communication between members of the surgical team. With the formation of a proper communication, the speed of surgery increases. The following items are considered as factors that affect the patient's safety during surgery.

2-1. Safe Positioning:

Positioning the patient is an important requirement for surgery. Wrong positioning of the patient and injuries to the patient during positioning are common medical errors. Positioning is a team effort between surgery and anesthesia teams. During the positioning, with the right communication formed between the team and even the patients, they can be placed in the proper surgical position. Participant No. 6:

"...The next part about effective communication between personnel is to change the types of positions while the surgeon is in the room, especially in patients who are traumatized and there is a possibility of damage to sensitive areas such as the spine. By communicating effectively during positioning, the patient's injury is minimized..."

2-2. Speeding the Operation:

Proper communication during surgery increases the speed of surgery and ultimately reduces the duration of surgery. With the formation of a proper communication between the members of the team, task division is performed in the best way, and if all the tasks are predetermined, nothing is done again and things are done as soon as possible. Participant No. 8:

"...When the personnel do not talk to each other in a room, you do not know what they want to do at all. Well, shall we do or shall we not do this now. You have to wait and see what they do. They do not talk to you at all. This is annoying. You do something and then see that they do the same thing. You go and bring a peg, then you see that they bring it too ... this is how things are done again in the operating room..."

2-3. Securing the Physical Structure of the Operating Room:

The physical structure of the operating room has a significant impact on patient safety in the operating room as well as the safety of the intended surgery. In fact, it can be said that the structure of the operating room indirectly affects the patient's safety. For example, operating room ventilation can increase the incidence of infection in patients if there is a problem. Providing structural and physical security of the operating room requires communication with external teams and various units of the hospital, including services, facilities and equipment. For example, operating room ventilation problem can increase the incidence of infection in patients. Participant No. 7:

"...In terms of structure, safety must be observed in such a way that the patient who undergoes surgery does not become infected later. For example, to give a very minor example I can mention the sewage system channel which are passageway for insects to enter the operating room, and in turn increase the infection. Therefore, they are forbidden in the operating rooms or sterile areas. These things must be checked frequently by the facility unit..."

Discussion

The results of this study determined the effect of surgical team communication on patient safety. Based on the analysis of interviews conducted with members of the surgical team, it is possible to arrive at the conclusion that communication between the surgical team is one of the important and influential factors on patient safety. Because operating room work is a team effort which requires collaboration and communication between people (Lindberg 1998), a qualitative study in the emergency department showed that communication is the primary tool of most care and treatment activities (19). Teamwork is

also one of the important factors in professional errors and patient safety. Nobahar (2013) also shows that good cooperation, proper communication and being experienced are effective factors in providing teamwork and one of the sub-themes of teamwork is communication (20). All members of the treatment team always need to communicate appropriately with patients, patients' families and other members of the treatment team (21). Working in the operating room is also very sensitive, and performing a safe surgery requires extensive cooperation and coordination. It is clear that the formation of these collaborations requires a lot of communication. Therefore, with the formation of proper communication in the operating room, the safety of patients in the operating room can be greatly increased. On the other hand, establishing effective communication strengthens solidarity, enhances the level of knowledge and skills and creates mutual trust between members of the treatment team (22).

The findings of this study, which was conducted to explain the causes and characteristics of communication skills impact on patient safety in the operating room, showed that communication with various factors affecting patient safety before and during surgery, can have a role in patient safety in the operating room.

Factors affecting patient safety before surgery is one of the main themes extracted in this study. Among the sub-themes of this main theme is getting the correct history from the patient, patient identification, proper planning for surgery, reducing patient stress and providing the equipment and tools needed for surgery. In the first stage and at the beginning of the patient's entry into the operating room, by establishing a proper relationship with the patient, the patient's identity can be verified and accurate information about the patient's history can be received. Properly performing these procedures can prevent many problems that may occur to the patient during surgery. According to the study of Safazadeh (2012), 15% of hospital errors are due to incorrect identification of patients (23). Similarly, the study of Profit(2012) shows that the correct identification of patients and receiving the correct history from them and considering this issue in all stages of treatment is an important and influential factor effecting patient safety (24).

All patients in the operating room suffer from high levels of stress due to inherent stressors and advanced technology. Uncontrolled stress in patients can endanger their safety. These patients need to communicate with caregivers (25). In fact, by communicating properly with these patients, their stress can be significantly reduced, which can increase the safety of patients during surgery. Gilmartin (2008) in his study shows that most patients in the preoperative stage feel abandoned because nurses do not care to communicate with them (26).

In order to provide safe nursing care, it is important to provide facilities, equipment and supplies needed by nurses and this is one of the important tasks of management. In fact, managers can reduce the incidence of professional errors by providing appropriate facilities (20). Mohabbati (2010) also showed in their study that the lack of facilities and equipment in medical centers is one of the main factors reducing the level of safety of patients in the operating room (27). Providing the equipment needed for surgery as

well as resolving problems in some equipment in the operating room requires communication with various units, including hospital facilities.

Factors affecting patient safety during surgery is another major theme extracted from the interview text. Safe positioning, increasing the speed of operation and ensuring the security of the physical structure of the operating room are the sub-themes of this main theme. In order to start a safe operation, first the patient must be placed in the correct position. This requires good cooperation between different groups, including surgery and anesthesia teams. In other words, by forming a proper relationship between the members of the team, the patient is correctly prepared for a safe surgery. This cooperation and coordination between the team members increases the speed of their operation and the surgery is performed in a short time, which reduces post-surgical complications by reducing anesthesia time.

During surgery, the physical structure of the operating room can play a role in patient safety. Factors such as sound, light, ambient temperature and infection-related factors, each affect the safety of patients. Ajali (2016) in a qualitative study on the safety of patients in psychiatric wards, found that the unsafe atmosphere of the ward and making noise is one of the factors affecting the safety of patients because this noise disturbs the peace of patients (28). Golmohammadi (2014) after reviewing and comparing the lighting level of public hospitals in Hamadan with the announced standards report that the average intensity of local and area artificial lighting in Hamadan hospitals is less than recommended and states that the problem can lead to mental and physical health problems and increased treatment errors (29).

Implications

Finding how the surgical team communications affect patient safety in the operating room was the most important goal of this study. Based on the results of this study, it can be seen that communication between the members of the surgical team, for example, communication between the surgical team and anesthesia team or the communication between the surgeon and their assistant reduces the incidence of error and thus increases patient safety in the operating room. Therefore, health system officials and planners are recommended to include communication skills for on-the-job training programs.

Conclusion

The findings of the present qualitative study led to the clarification of the role of communication between members of the surgical team and patient safety in the operating room. Since several specialized groups are providing services in the operating room, when a better coordination and communication is formed between them, better and more perfect services are provided, which increase the safety of patients in the operating room.

Declarations

Conflict of interest

The authors declare no conflicts of interest.

Funding

This study was financially supported by the Hamadan University of Medical Sciences of Iran.

Ethical approval

This study is the result of a student thesis that has been registered in Hamadan University of Medical Sciences of Iran with the ethical code IR.UMSHA.REC.1398.403.

Consent for publication

Not applicable

Acknowledgements

We wish to thank the individuals who took the time to participate in this study.

Author contributors

SHB designed the study, collected the data, and provide the first draft of manuscript. BI designed the study and revised the manuscript. All authors read and approved the final manuscript.

Availability of data and materials

Please contact author for data requests

Acknowledgements

Researchers express their gratitude to the Vice Chancellor and Research Department of Hamadan University of Medical Sciences and the operating room group in this study.

Ethical considerations

Informed consent to participate in this study was obtained from the participants. The authors ensured that the confidentiality of their information and identity. This study was approved by the Ethics Committee of Hamedan University of Medical Sciences (IR.UMSHA.REC.1398.403). The time and place of interviews were also determined due to the participants' convenience.

Funding

The study was funded by Vice-chancellor for Research and Technology, Hamadan University of Medical Sciences (No. 9810177845).

References

1. Nabilou B, Rasouli J, Khalilzadeh H. Patient Safety Status in Medical Education: Students Perception, Knowledge and Attitude. Research in Medical Education. 2013; 5 (2): 23-31.

2. Memarbashi E, Zadi O, Imani F, Nasiri E. Evaluation of the Patient Safety Culture Status and its related Factors from the Perspective of Operating Room Personnel. *Journal of Client-Centered Nursing Care*. 2020; 6 (1): 23-30.
3. Kwon E, Kim YW, Kim SW, Jeon S, Lee E, Kang H-Y, et al. A comparative study on patient safety attitude between nurses and doctors in operating rooms. *Journal of International Medical Research*. 2019: 0300060519884501.
4. Haugen AS, Sevdalis N, Sjøfteland E. Impact of the world health organization surgical safety checklist on patient safety. *Anesthesiology: The Journal of the American Society of Anesthesiologists*. 2019; 131 (2): 420-5.
5. Sheikhtaheri A, Sadoughi F, Ahmadi M, Moghaddasi H. Developing Iranian patient safety indicators: an essential approach for improving healthcare health safety. *Asian Biomedicine*. 2013; 7 (3): 365-73.
6. Gutierrez LdS, Santos JLdG, Peiter CC, Menegon FHA, Sebold LF, Erdmann AL. Good practices for patient safety in the operating room: nurses' recommendations. *Brazilian magazine of nurses*. 2018; 71: 2775-82.-7.
7. Lee DJ, Ding J, Guzzo TJ. Improving operating room efficiency. *Current urology reports*. 2019; 20 (6): 28.
8. Cha JS, Monfared S, Stefanidis D, and Nussbaum MA, Yu D. Supporting surgical teams: Identifying needs and barriers for exoskeleton implementation in the operating room. *Human Factors*. 2020; 62 (3): 377-90.
9. Zhu S, Fan W, Yang S, Pei J, Pardalos PM. Operating room planning and surgical case scheduling: a review of literature. *Journal of Combinatorial Optimization*. 2019; 37 (3): 757-805.
10. Makary MA, Sexton JB, Freischlag JA, Holzmüller CG, Millman EA, Rowen L, et al. Operating room teamwork among physicians and nurses: teamwork in the eye of the beholder. *Journal of the American College of Surgeons*. 2006; 202 (5): 746-52.
11. Poore SO, Sillah NM, Mahajan AY, Gutowski KA. Patient safety in the operating room: I. Preoperative. *Plastic and reconstructive surgery*. 2012; 130 (5): 1038-47.
12. Lingard L, Espin S, Whyte S, Regehr G, Baker G, Reznick R, et al. Communication failures in the operating room: an observational classification of recurrent types and effects. *BMJ Quality & Safety*. 2004; 13 (5): 330-4.
13. Etherington N, Wu M, Cheng-Boivin O, Larrigan S, Boet S. Interprofessional communication in the operating room: a narrative review to advance research and practice. *Canadian Journal of Anesthesia / Canadian Journal of Anesthesia*. 2019; 66 (10): 1251-60.-9.

14. Frasier LL, Quamme SRP, Ma Y, Wiegmann D, Levenson G, DuGoff EH, et al. Familiarity and communication in the operating room. *Journal of Surgical Research*. 2019; 235: 395-403.
15. Kane P, Marley R, Daney B, Gabra JN, Thompson TR. Safety and Communication in the Operating Room: A Safety Questionnaire after the Implementation of a Blood-Borne Pathogen Exposure Checkpoint in the Surgical Safety Checklist Preprocedure Time-Out. *The Joint Commission Journal on Quality and Patient Safety*. 2019; 45 (10): 662-8.
16. Iernler E, Yildiz T, Bahar S. Evaluation of the communication skills of operating room personnel . *Journal of Interprofessional Education & Practice*. 2018; 10: 44-6.
17. Pakgohar M, Rahimikian F, Mehran A, Mohammadi T. Quality assessment of family planning counseling in health and treatment centers, affiliated to Tehran University of Medical Sciences. *Journal of life*. 2015; 8 (2): 62-71.
18. Mousavi E, Kavi E, Larti N, Dorcheh SJ, Gharahzadeh A. The relationship between attitude towards the effectiveness of teamwork and observing safety standards in Isfahan educational hospitals. *Latin American Journal of Hypertension*. 2018; 13 (3): 271.
19. Lindberg JB, Hunter ML, Kruszewski AZ. *Introduction to nursing: concepts, issues, and opportunities*. 3rd ed. Philadelphia, PA: Lippincott; 1998.
20. Nobahar M. Professional errors and patient safety in intensive cardiac care unit. *Journal of Holistic Nursing and Midwifery*. 2015; 25 (3): 63-73.
21. Burgener AM. Enhancing communication to improve patient safety and to increase patient satisfaction. *The health care manager*. 2020; 39 (3): 128-32.
22. Garosi E, Kalantari R, Zanjirani Farahani A, Zuaktafi M, Hosseinzadeh Roknabadi E, Bakhshi E. Concerns about verbal communication in the operating room: a field study. *Human factors*. 2020; 62 (6): 940-53.
23. Safazadeh SH, Zarei A, Frequency of hospital errors identify the cause and severity of their damage caused by in teaching hospital Al-Zahra Isfahan, First National Congress of Clinical Governance and Improve the Quality of Student Tabriz university of medical sciences 2012; 3074 [Persian].
24. Profit J, Etchegaray J, Petersen LA, et al. The safety attitudes questionnaire as a tool for benchmarking safety culture in the NICU. *Arch Dis Child Fetal Neonatal Ed*. 2012; 97 (2): F127 – F32. doi: 10.1136 / archdischild-2011-300612
25. Hanssen I, Smith Jacobsen IL, Skråmm SH. Non-technical skills in operating room nursing: Ethical aspects. *Nursing Ethics*. 2020: 0969733020914376.

26. Gilmartin J, Wright K. Day surgery: patients' felt abandoned during the preoperative wait. *J ClinNurs* 2008; 17 (18): 2418-25.
27. Mohebati F, Keshtkaran V, Hedayati SP, Hatam N, Shahmoradi M, Respecting the Safety standards of operating rooms in Shiraz University of Medical Sciences Hospitals in 2008, *NezameSalamat* 2010; 1 (1): 11 [Persian].
28. Gillespie BM, Chaboyer W, Longbottom P, Wallis M. The impact of organizational and individual factors on team communication in surgery: a qualitative study. *International journal of nursing studies*. 2010; 47 (6): 732-41.
29. Golmohamadi R, ShafieeMotlagh M, Jamshidi Rastani M, Salimi N, Valizadeh Z. Assessment of Interior and Area Artificial Lighting in Hospitals of Hamadan City. *Journal of Occupational Hygiene Engineering*. 2014; 1 (1): 47-56.

Tables

Table (1) Participant information

number	sex	age	job	work experience
1	male	42	ST	20
2	female	36	ST	13
3	male	45	ST	18
4	male	39	ST	18
5	female	38	ST	12
6	male	51	ST	29
7	male	50	surgeon	20
8	male	48	anesthesiologist	17

Surgical Technologist (ST)

Table (2) Sub-themes and main themes of the effects of communication skills on patient safety

Main themes	Sub-themes
<ul style="list-style-type: none"> · Factors effecting the safety of the patient before the surgery 	<ul style="list-style-type: none"> · Getting the correct history from the patient · Confirming the identity of the patient · Proper Program planning for surgery · Reducing patient stress · Supplying the needed equipment
<ul style="list-style-type: none"> · Factors effecting the safety of the patient during surgery 	<ul style="list-style-type: none"> · Safe position · Increasing the operation speed · Providing the safety of the physical structure of the operating room