

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_348_19

Educational concern of surgical technology students in the operating room: A grounded theory study

Roghayeh Zardosht, Hossein Karimi Moonaghi¹, Mohammad Etezzad Razavi², Soleiman Ahmady³

Department of Operative Room and Anesthetics, Iranian Research Center on Healthy Aging, School of Paramedical, Sabzevar University of Medical Sciences, Sabzevar, Iran,
¹Nursing and Midwifery Care Research Center, Department of Medical Surgical Nursing, School of Nursing and Midwifery, and Department of Medical Education, School of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran,
²Eye Research Center, Faculty of Medicine, Khatam-al-Anbia Hospital, Mashhad University of Medical Sciences, Mashhad, Iran,
³Department of Medical Education, Faculty of Medical Sciences Education, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Address for correspondence:

Dr. Hossein Karimi Moonaghi, School of Nursing and Midwifery, Mashhad University of Medical Sciences, Ebne-Sina Street, Mashhad, PO: 9137913199, Iran.
E-mail: karimih@mums.ac.ir

Received: 18-06-2019
Accepted: 05-11-2019

Abstract

INTRODUCTION: Bachelor's program in surgical technology is a major of medical science, in Iran. Learning and adapting to different skills and roles in the operation room environment is a daunting work. The complexity of this environment needs to bring together researchers in this field to work on different aspects. The aim of this qualitative study was comprehensively understanding of clinical teaching process in surgical technology.

MATERIALS AND METHODS: The present study was conducted based on the qualitative research design of the grounded theory approach (Corbin and Strauss, 2008). This study was conducted at schools of nursing and paramedical in five academic settings. Study participants in the present study include 14 students, seven educational instructors, six staff of operation room, one dean of faculty, three surgeon assistants, one instructor, and four head nurses of operation room. A semi-structured interview method and a memo were conducted using theoretical and purposive sampling. Constant comparative analysis was used for data analysis.

RESULTS: Findings showed that the nonacceptance of student by surgical team was identified as the main concern of the students. The "gaining clinical competence and approval" was found the central process (strategy) in response to main concern of clinical education, and the "interactive and dynamic nature of the operation room environment" was defined as the context for this major concern. Strategies that students used to address this concern included individual efforts to overcome distrust, learning in the shadow of surgical team members, and seeking help and support of the instructor.

CONCLUSION: Accepting the students of surgical technology as a member of surgical team creates opportunities for students to learn, gain experience, and enhance their professional qualifications and abilities.

Keywords:

Clinical education process, grounded theory, operation room, operative room technology

Introduction

The operation room staff are important members of the healthcare team who work closely with surgeons, anesthesiologists, and nurses to provide optimal care for patients.^[1] The operation room, as one of the complicated educational environments, provides a context for learning and at the same time acts as a factor that impacts learning and teaching

and also could play a role in supporting or prevention and restricting students' learning opportunities.^[2,3]

The clinical environment consists of all the impressive situations and potential triggers of learning. This environment is composed of cognitive, social, cultural, emotional, motivational, and learning components. Learning and adapting to different skills and roles in clinical environments such as operation room is a tough work because

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Zardosht R, Karimi Moonaghi H, Etezzad Razavi M, Ahmady S. Educational concern of surgical technology students in the operating room: A grounded theory study. *J Edu Health Promot* 2020;9:58.

students should be trained for many skills in the surgical process before, during, and after the surgery.^[4,5] The teaching and learning process in the operation room environment is different and more complex than other clinical environments. In addition the three elements of the patient, the instructor, and the student, other factors including surgeon, anesthesiologist, surgical team and operation room staff affect the education in operative room.^[6,7] OR environment can be influenced by teamwork and interdisciplinary collaboration. The variety of procedures in the operation room, workload, heavy responsibilities, speed and precision of action, and rapid turn out of patients need to be managed. Unpredictability of work in many cases, rapid occurrences of high-risk incidents in the operation room, acute and severe emergency situations,^[8,9] simultaneous management of multiple tasks and duties, and close interactions between surgical team members and multicultural environment, which could all impact the educational process.^[3,10] The results of many researches in this field indicate the different environments of the operation room from other clinical sections, which influence corresponding education methods. These researches have mainly been conducted on surgical team interactions,^[6] tensions, communication failures,^[11] the effects of tensions on other members of the surgical team and students, and the development a checklist for the promotion of team communication.^[7] Unfortunately, there are no effective studies in Iran on the process of clinical education of the surgical technology program. Most of the researches have been carried out quantitatively and focus only on some aspects of training in the surgical technology and have not been able to cover all corresponding aspects.^[12-17]

Clinical education of students of surgical technology is a multifactorial process with unknown aspects and components. To understand this conceptual framework and to assess all aspects of education in this environment, in addition to quantity approaches, it is necessary to use some quality approaches with a holistic viewpoint on this issue, which merely cover a specific aspect in detail.^[18,19] This qualitative study based on grounded theory method aimed to find out the social process of the interaction between learners and educational stakeholders, influential factors, potential challenges associated with educational issues, as well as a complete theoretical description of the clinical education of major based on the experiences of the participants in operations room.

Materials and Methods

This qualitative study was carried out in four stages, based on the grounded theory approach of Corbin and Strauss. This study was conducted at schools of nursing and paramedical in five academic settings. At the beginning, the study samples were selected

through target-based sampling, with a shift to theoretical sampling with the progression of the study. Based on the entry criteria of the study, the participants (clinical educational stakeholders) were as follows: instructors of surgical technology with at least 1 year teaching experience, surgical technology students of different semesters who completed at least one internship course in operation room, surgeons, head nurses, and personnel of operation room with minimum 1 year working experience in the operation room, who were rich in information and willing to report on their experience.

Semi-structured interviews, observations, field notes, and memo were used to fully understand the clinical education process. After the participant's conviction about the objectives of the plan and obtaining informed consent, the data collection begun through semi-structured individual-based interviews with a number of open-ended questions according to the interviewer guide, and additional exploratory questions were used to gather further insights. Each interview lasted between 20 and 65 min, depending on the situation, participants' cooperation, and environmental conditions. The location of the interviews was determined by the participants. The entire interview was recorded by a digital voice recorder and converted into portable audio files. The researcher simultaneously collected the data and analyzed it using MAXQD software, immediately after each interview. Sampling continued to reach a theoretical saturation. Writing memo and attempts to fill the gaps, along with emerging codes, classes, and theories, was the main guide for the researcher in the process of data collection to reach theoretical saturation.

Saturation in grounded theory is the completion of all levels and codes until there are no new conceptual data in need of emerging new category or code or even expansion of the existing codes.^[20-22] At the end of the data analysis for concept, main issues would arise. What did the students of the surgical technology experience relate to their field of study during their clinical education? The researcher focused on personal, environmental, organizational, familial, social, political, economic, cultural, and historical factors that influenced directly or indirectly the concept of clinical education of surgical technology students. The next step thus to identify the concepts of the field and examine the quality of clinical education of the students was data analysis for context. The third step in data analysis of the research question was to identify strategies/processes (action/interaction and emotions) by which the participants responded to in the field. Corbin and Strauss coding paradigm was used to connect the context factors to the process of clinical education of the surgical technology students.

The fourth and final step was composition or integrating categories to construct the theory.

In the present study, the theoretical story line was written using reminders and deep immersion in data and a great deal of reflection on the emerging classes derived from data analysis for the context and process. After identifying the clinical education process of surgical technology students, the researcher identified the core variable, with concentration on the main classes and their characteristics, diagrams, and classification of reminders. In fact, the central class is the main concept that connects the other concepts together and emerges with maximum clarity.^[21] The researches aiming to ensure the acceptability, reliability, and consistency of the data validated the data, according to qualitative approaches, by confirmation the data via participants, adequate time allocation for analysis, open and sympathetic communication with participants, and the review of supervisors, including the supervision of three experts in the field of qualitative research at all stages of the study.^[19,21,23,24]

Permission to conduct this study was issued by the Ethics Committee of Mashhad University of Medical Sciences based on a formal letter of introduction from the Vice Dean for Research of University of Medical Sciences, serving as the legal authority in this area (No. 940548/2015.08.15). We have placed emphasis on participants' confidentiality, their informed consent, right to exit from the study at any time, the selection of time and place of interview and anonymity. Permission, as written informed consent, was sought from the participants for the audiotaped interviews.

Results

Thirty-six interviews were conducted. The research space was the operation rooms of several educational hospitals in five universities of medical sciences [Table 1].

Data analysis was carried out using version 10 of (Udo Kuckartz, Creator of MAXQDA. We are VERBI Software, the company behind MAXQDA). In the first step of conceptual analysis, 3424 open codes, 124 primary subgroups, 51 primary groups, and 10 main groups were identified. The researcher seeks to discover the main concerns of the participants. All data analysis, review of reminders, and observations in the field showed that the main group of "students' nonacceptance in the surgical team" represents the phenomenon with which the surgical technology students are facing in their clinical education. Hence, the main concern of the first stage was the "nonacceptance of student by the surgical team" [Table 2].

Students were constantly worried about being refused by the surgical team that was rooted in the distrust of the

Table 1: Research participant characteristics

Participants	n	Age	Sex	Work experience in the operating room
Students	14	20-22	11 female 3 male	Semester 4-8
Instructors	7	35-48	5 female 1 male	3-20 years
Operation room staff	6	32-55	5 female 1 male	8-25 years
Dean of faculty	1	52	Male	-
Surgeon assistants	3	32-48	Male	4-5 years
Surgeon	1	53	Male	17 years
Head nurses OR	4	32-55	Male	15-29 years

OR=Operations room

Table 2: Main concern and subcategories

Main concern	Sub-categories of main concern
Non acceptance of student by surgical team	Cumbersome student and lowering the speed of surgery
	The probability of student error due to lack of knowledge and prerequisite skills
	The probability of un sterilization of surgery field
	Nonconstant supervision of the instructor in the operation room environment
	Nonacceptance of student by surgical team
	Excessive student stress in the real educational environment
	Inexperienced instructor

surgical team members. This concern which was raised from the very 1st day of training and lasted for the rest of education period reflected different manifestations over the different courses.

For example, Participant No. 6, an operation room staff, states in this regard, "Because of being an amateur, students are an obstacle in a way that they tie your hands and lower the pace of performance of the surgery team. And it's very boring to teach the students how they should scrub, wear surgical gloves and prepare the sterile setup for the appropriate procedure. Unfortunately, some students don't care about such things and are very lax." A student (Participant No.: 3) says, "It's our great pleasure to provide a perfect aid to surgeon and being told We are OK and well trained and also to be reliable."

The interview with a surgeon assistant also revealed the concern of nonacceptance of student by the team: "We had a student who did not even know the names of the surgical tools, he was at almost zero/basic level, and our senior assistant asked us to replace him. Because after 1 h passing, we just did incision and nothing else; he really slowed the pace of performance, and we had to replace him."

After identifying the main concern, the researcher sought to identify the context of this concern. What was the reason for nonacceptance of students by surgical team? In the data analysis for the field (second step analysis), the four main categories of the culture of the operation

room, the special educational environment, the stressful atmosphere around the training program, and the bitter education were identified as the basis of the phenomenon of “nonacceptance of student by the team,” all of which were subjected to an abstract title called the interactive and dynamic nature of the operation room [Figure 1].

The class of operation room culture consisted of four subclasses as follows: teamwork performance, gender discrimination, hierarchical structure, and tension in professional interactions as well as inappropriate interactions, duality of behaviors/avoiding setting rules and standards, and stress resulting from the surgeon’s assistant team on the education of surgical technology students.

The class of special educational environment consisted of subclasses of lack of facilities and instructor, special physical space, the value of time, presence of students of other majors at the same time in the operation room, red lines, safety and sterility rules, using of nonspecialized instructors, and interaction between caring and technical roles.

The class of stressful atmosphere included the subclasses: the special situations (closed environment) and the paradox of expectations with the reality. The class of bitter education included subclasses of the humiliating experiences and internal tensions resulting from stressful education.

Data analysis showed that clinical education in the operation room is intertwined with the concept of teamwork and hierarchical structure. The members of the surgical team can play a positive or deterrent role in training of students in terms of technical skills. Regarding this item, a student (Participant No. 9) says, “Most students say that instructor has an important role

in teaching, but I say personnel does as well. Some staff by themselves are instructor for students, since they explain all the techniques step-by-step during the surgery.” Another student (Participant No.: 15) says, “Our learning depends on the surgeon’s day and the staff’s as well which all impact our training.” It is the surgeon’s responsibility as the surgical team’s leader to protect the patient’s safety and health which requires making decisions, which in some cases seems to be unfair in the student’s point of view.

In this regard, a surgeon says, “In fact, this kind of stress is natural to a surgeon, and if student density or their slowness causes some stress to a surgeon that affects his or her work and life of a patient as well, he or she may react with any behavior. Surgeons and assistants are different in their characteristics. Some surgeons can do lots of work simultaneously, without having to deal with stress; however, for some other surgeons, it is too important to concentrate on their work, and they cannot think of anything else during the surgery. Nothing is more important to them than the patient’s life and safety, and the patient’s life is not subject to anything (Participant No.: 32, a surgeon).”

The educational environment of the operation room is one of the most inaccessible areas in hospitals, where operations are conducted behind closed doors, and is quite different from other departments. An instructor (Participant No.: 11) says, “Poor instructor, does not have enough time to simultaneously handle a large number of students in each groups of different grades of 4, 6, and 8.”

An instructor regarding this special educational environment says, “The simultaneous presence of students at different levels of education from a level zero students of third-fourth semester to assistants of year three or four and sometimes even a professor all gathered in one place, and sometimes the participation of people of inhomogeneous clinical expertise at the same time in the operation room and the fact that it’s very common for a freshman student to have difficulty working with a surgeon or a 4th-year resident.” (Participant No.: 1, an instructor).

The different educational environments of the operation room from the other sections and the coordination with the surgical team have made it more stressful to the students of surgical technology. “The activities performed in other departments are completely different from involvement with the surgical team in the operation room. Our students are often working with the first surgeon, while they don’t know so many things about surgical skills with their limited information on that and are expected to act as an expert for a surgeon.” (Participant No.: 4; an instructor).

Data analysis showed that students of this field are experiencing technical skills under tremendous stress

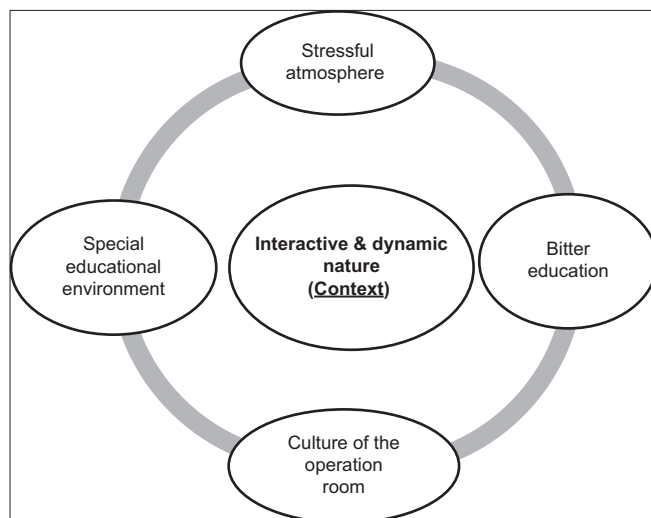


Figure 1: Context of main concern and subcategories

and pressure: *“They do not respect the students of the surgical technology at all and it is kind of lord and peasant relationship”* (Participant No.: 7; a student). One of the known stress factors for students in the operation room is the behavior of other students and staff. Disrespectful behavior of the surgical team members and occasionally, instructors, frustrates students. *“Frustration is rooted in the misconduct of the staff and surgeons and even an instructor who does not understand the students’ concerns. It means that an instructor is willing a student to work and scrub in any condition.”* (Participant No.: 15; a student).

In the third phase of the analysis, the surgical technology students’ strategies were identified. Their strategies include facing with the distrust phenomenon, and nonacceptance by the surgical team. Initially, these strategies seemed diverse and scattered. Over time, with more interviews and in depth analysis, researchers succeeded in discovering different strategies that ultimately fell into three categories [Figure 2].

The class of the efforts required to cross the wall of distrust for the student and each student’s individual approach to enter the surgical team includes having the prerequisite knowledge and skills, attempts to ensure the surgical team, satisfaction of the surgeon, and constructive interpersonal communication (professional interactions, performing duties, and obtaining prerequisite skills and knowledge).

The participants’ statements indicated that if the members of the surgical team had observed the effort, interest, and students’ perseverance into learning and had approved their work, they would be allowed to enter the team and create learning opportunities for the student. *“Depending on the student’s motivation and interest, some are more active and effective than the staff and seek work and learning opportunities. If someone is willing to work, we also have good cooperation with him or her”* (Participant No.: 12; a staff).

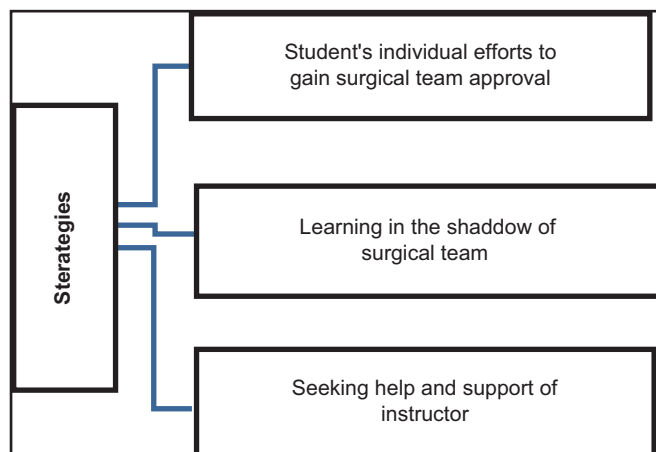


Figure 2: Strategies related to the main concern

Learning in the shadow of the surgical team members was another strategy of the students of surgical technology to be approved by the team. This strategy involves accepting the surgeon and the operating room team as the role model, stress-free training with the supportive personnel, seeking help from the amateur staff, and effect of the surgeon’s patience.

The analysis of qualitative data showed that students believed that due to the high number of surgeries and lack of enough and permanent instructor, the staff at the operation room had an important role in their training. *“The one who can give the best training is the staff of the same operation room”* (Participant No.: 15; a student). In line with this fact, another student says, *scrub nurses of that room were very helpful, they were constantly asking us for surgical tool* (Participant No. 23; a student).

The help and support that students sought from the instructor included the clinical competence of the instructor, the umbrella support and authority of the instructor, the presence and communication skill of the instructor, and the popularity and moral character of the instructor. The students addressed poor clinical experience, inadequate skills and knowledge of the instructor, and presence of instructors with other/irrelevant specialty as an obstacle to clinical education. *Not all surgeries, but in the same surgery I am in charge of, the instructor should explain me about the surgery, how should I use the tools and instruments, and after all these justifications I would be ready to join the team* (Participant No.: 16; a student).

Using each of these three strategies by students has some consequences, which have been gathered in a main category of identification, which consists of two subclasses; the feeling of belonging to the surgery team and/or passivity. The data showed that experiencing technical skills by the student and joining the surgical team can be effective in acquiring professional qualifications and a sense of belonging to the surgical team. Experiencing and engaging in surgical team activities played an important role in the success and achievement of professional identity of the students of surgical technology.

The fourth and final stage of the analysis is combination and integration of classes to construct the theory. The findings showed that in the training period, the students encountered stressful conditions due to the nonacceptance by the surgical team. As a result, they found other ways to acquire the competence and adequacy they need. Considering that each of the main categories derived from the data provided only a part of the story, but not the whole, the researchers defined the concept of *“gaining of clinical competence and approval”* as the main psycho-social process (core variable) that

connects other concepts and at the same time includes all classes, and finally, data were presented in the format of a grounded theory [Figure 3].

Discussion

The findings of this study led to the emergence of the theory of gaining of clinical competence and approval.

The data showed that the clinical education of students in this field is obtained in the context of the interactive and dynamic nature of the operation room environment, and they face stressful conditions related to the nonacceptance by the surgical team as an educational member. Then, they turn to some approaches to be accepted by surgical team and acquire the competence and adequacy they need. Gaining competence and approval was the main

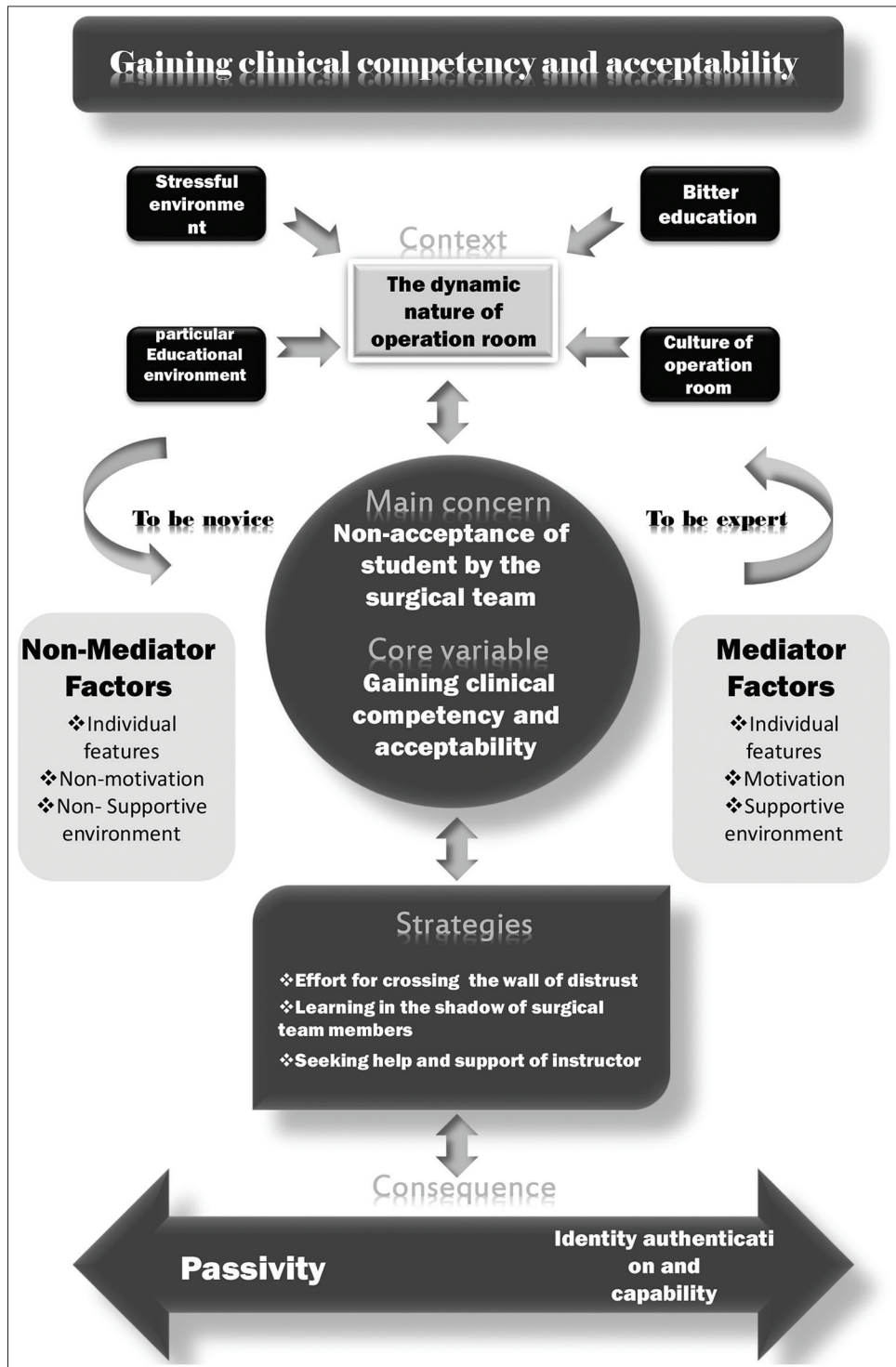


Figure 3: Conceptual model "gaining of clinical competence and approval"

social process and a central concept that the students of surgical technology used to take a role in the surgical team, would create more opportunities for learning and developing professional skills.

Lee defined empowerment as a background for increasing dialogues, critical thinking, activity in small groups and pointed out that allowing activities to move beyond the sharing and refinement of experiences, thinking, seeing, and negotiating are the main components of empowerment.^[25] The findings of the present study confirmed the impact of environmental, cultural, and social factors on students' learning and further indicated that student's individual efforts were one of the main strategies for taking the role in the surgical team that has already mentioned in the theory of gaining competence and approval. Bundara's social cognitive theory concentrates on learners' individual characteristics, behavioral and environmental patterns,^[26] social factors, and backgrounds in which learning and developing of behavior occur.^[27]

Based on social learning theory, learning takes place in the interaction and observation of others in a social context. Learning from surgical team members and interaction with them was a concept that the current theory also referred to. In the present study, the interactive and dynamic nature of the operation room environment and its culture, special and stressful educational environment, and bitter education were identified as affecting factors in student education. The contents obtained from the grounded theory study of Memarian *et al.* (2006), regarding the factors affecting nurses' clinical competence acquirement and internal or individual factors, included processes and factors such as knowledge and skills, ethical issues, task conscientiousness, accountability, and responsibility. Other contents were organizational or external factors that included the clinical and educational environment, retraining programs, job permits, control and supervision, and an efficient educational system.^[28]

According to the findings of this study, the most important challenges of the students of surgical technology include facing with the stressful environment and conflicting role acceptance with the reality, and humiliating experiences. It could be said that the students of surgical technology are considering the clinical education as a bitter experience. A qualitative study conducted in clinical environment of operation rooms in the United States, Finland, and the United Kingdom in 2004 showed that overall, the experience of being in the surgical team was a very different and short experience and teamwork skills were not done systematically. The students in the operation room environment were experiencing bad feeling, so they were dependent to

other people. Gaining membership with the surgical team resulted from active training process and accepting the atmosphere and team environment. Working as a team member was provocative and challenging.^[7] Despite the differences in the health system of these countries with Iran, students of the other countries had similar experiences with the Iranian surgical technology students regarding their engagement with the surgical team. Amanda Henderson's research on the effect of environmental situation on students' mental and psychological conditions and subsequent learning showed that students in clinical environment with favorable clinical support achieved higher skills and abilities.^[29]

Newton *et al.* also assessed the relationship between staff and students and the factors influencing the efficiency of clinical environments.^[30] In this study, students described the stressful situation confronting with the environment, organization of the operation room, using advanced technologies and equipment, operation room's crowdedness, as well as close relationship with surgical team members as inappropriate. The dominant themes in the qualitative study of Lingard *et al.* were of the operation room environment, including time, security, sterilization, resources, roles, and situations. Usually, each procedure had one to four stressful incidents with a pulsatile impact and these stresses were exerted to other members of the team and the environment as well. The surgical trainee was either withdrawn of the surgical team in response to these tensions, or derided by them, both of which were negative indicators for team communication.^[6] The present study showed that use of staff or head nurses as an instructor due to lack of enough instructors in the surgical technology department led to incomplete training and confusing of students. Other studies also mention the lack of qualified instructors and the use of nonspecialized instructors, regardless of their ability and expertise, as clinical educational problems.^[3,9,14,31]

Data analysis showed that urgency of situation and time limitation may lead to inappropriate behaviors of team members toward a less experienced student. Riley and Manias believe that operation room has its own special patient care settings and is one of the inaccessible places in the hospital, with the area's division as the following: unlimited, semi-limited, and limited with different defined physical activities in each division.^[32]

Limitations

Qualitative research may be partially influenced by the researcher's personal biases and idiosyncrasies. With continuous engagement with data and its confirmation by the participants as well, rigor was easily

maintained. Of note, detail information was mentioned in methodology section.

Study novelty

For the first time in Iran, grounded theory was used to exploring the process of education in operating room students based on the experiences all of educational stake holders in the field of operative room. The findings inform us about the structure, process and training problems in operating room.

Conclusion

The results of this study based on the existing facts and using grounded theory showed that the situation of operation room is different from the other sections of the hospital. Gaining surgical team membership and capacity and professional competence of operative room technology students were increased with an experienced and teaching-oriented instructor, student's individual efforts, and learning of surgical team member.

Acknowledgments

The present article is extracted from a PhD dissertation approved by Mashhad University of Medical Sciences (MUMS) Vice-Chancellor for Research (approval code: 940548) and financially supported by MUMS and School of Nursing and Midwifery, Mashhad, Iran. The authors thank all the teachers, students and operation room staff who contributed to this research despite their lack of time.

Financial support and sponsorship

The present study is financially supported by Mashhad University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest.

References

1. Ministry of Health of Iran. Educational program of Bachelor of Science in Surgical Technology. General profile, program, course syllabus and evaluation method. In: Program. Second edition. Islamic Republic of Iran Ministry of Health and Medical Education High Council of Medical Sciences Programming. Ministry of Health of Iran; 2015.
2. Moattari M, Ramazani S. Nursing students' perspective toward clinical learning environment. *Iran J Med Educ* 2009; 9:137-45.
3. Zardosht R, Karimi Moonaghi H. Just trust me: The essential demand of operating room students. *Future Med Educ J* 2018; 8:3-5.
4. Lotfi M, Zamanzadeh V, Sheikhalipour Z. Effect of peer clinical teaching method on the education of operating room students. *Nurs Educ* 2012;1:78-83.
5. Karimi Moonaghi H, Zardosht R, Razavi ME, Ahmady S. Perceived challenges by the Iranian Baccalaureate Surgical Technology students in their clinical education: A qualitative study. *Int Peer Rev Open Access J Rapid Publ* 2017;10:542-50. [DOI: 10.21786/bbr/10.3/31].

6. Lingard L, Reznick R, Espin S, Regehr G, DeVito I. Team communications in the operating room: Talk patterns, sites of tension, and implications for novices. *Acad Med* 2002;77:232-7.
7. Silén-Lipponen M, Tossavainen K, Turunen H, Smith A. Learning about teamwork in operating room clinical placement. *Br J Nurs* 2004; 13:244-53.
8. Silen-Lipponen M, Tossavainen K, Turunen H, Smith A, Burdett K. Teamwork in Operating Room Nursing as Experienced by Finnish, British and American Nurses. *Diversity in Health and Social Care*; 2004. p. 1.
9. Zardosht R, Karimi Moonaghi H, Razavi ME, Ahmady S. The challenges of clinical education in a baccalaureate surgical technology students in Iran: A qualitative study. *Electron Physician* 2018; 10:6406-16.
10. Farnia F, Abaszadeh A, Borhani F. Barriers to developing the nurse-patient relationship in operation room: A qualitative content analysis. *J Qual Res Health Sci* 2013; 2:76-89.
11. Skoczylas LC, Littleton EB, Kanter SL, Sutkin G. Teaching techniques in the operating room: The importance of perceptual motor teaching. *Acad Med* 2012;87:364-71.
12. Abedi HA, Heidari A, Salsali M. New graduate nurses' experiences of their professional readiness during transition to professional roles. *Iran J Med Educ* 2004; 4:69-78.
13. Bahrani Babaheidary T, Sadati L, Golchini E, Mahmudi E. Assessment of clinical education in the Alborz University of Medical Sciences from surgical technology and anesthesiology students' point of view. *Alborz Univ Med J* 2012; 1:143-50.
14. Dehghani H, Dehghani K, Fallahzadeh H. The educational problems of clinical field training based on nursing teachers and last year nursing students view points. *Iran J Med Educ* 2005;5:24-33.
15. Delaram M. Clinical Education from nursing students' point of view in Shahrekord University of Medical Science. *Iran J Med Educ* 2009; 6:129-35.
16. Ghorbanian N, Abdollahzadeh Mahlani F, Kazemi Haki B. Effective factors on clinical education quality anesthesiology and operating room students view. *Educ Strateg Med Sci* 2014;6:235-9.
17. Roshanzadeh M, Toleyat M, Mohammadi S. Clinical evaluation tool for operating room students: Development and measurement of reliability and validity. *Iran J Med Educ* 2015;15: 98-110.
18. Fakhri-Movahedi A, Salsali M, Negarandeh R, Rahnavard Z. Exploring contextual factors of the nurse-patient relationship: A qualitative study. *Koomesh* 2011; 1:23-34.
19. Glaser B. *Discovery of Grounded Theory: Strategies for Qualitative Research*. USA: Routledge; 2017.
20. Charmaz K, Belgrave LL. *Grounded Theory*. India. Wiley Online Library; 2007.
21. Corbin J, Strauss A. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. Thousand Oaks California. 2008.
22. Cutcliffe JR. Methodological issues in grounded theory. *J Adv Nurs* 2000;31:1476-84.
23. Holloway I, Galvin K. *Qualitative Research in Nursing and Healthcare*. USA and UK: John Wiley & Sons; 2016.
24. Peyrovi H, Oskouie F. *Qualitative Research in Nursing*. Tehran: Iran University of Medical Sciences & Health Services; 2005. p. 376.
25. Lee J. *The Empowerment Approach to Social Work Practice: Building the Beloved Community*. New York: Columbia University Press; 2001.
26. Hartzell JD. Adult learning theory in medical education. *Am J Med* 2007;120:e11.
27. Bastable SB. *Nurse as Educator: Principles of Teaching and Learning for Nursing Practice*. New York. Jones and Bartlett Learning; 2003.
28. Memarian R, Salsali M, Vanaki Z, Ahmadi F, Hajizadeh E. Factors

Zardosht, *et al.*: Student concerns in the operating room

- affecting the process of obtaining clinical competency. J Zanjan Univ Med Sci 2006; 14:40-9.
29. Henderson A, Twentyman M, Heel A, Lloyd B. Students' perception of the psycho-social clinical learning environment: An evaluation of placement models. Nurse Educ Today 2006; 26:564-71.
 30. Newton JM, Jolly BC, Ockerby CM, Cross WM. Clinical learning environment inventory: Factor analysis. J Adv Nurs 2010; 66:1371-81.
 31. Tazakori Z, Mehri S, Mobaraki N, Dadashi L, Ahmadi Y, Shokri F, *et al.* Factors affecting on quality of clinical education perspective of operation room students. J Health Care 2015; 17:128-36.
 32. Riley R, Manias E. Foucault could have been an operating room nurse. J Adv Nurs 2002; 39:316-24.