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The challenges of clinical education in a baccalaureate surgical technology students in Iran: a qualitative study

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Abstract

Background: Clinical education is an integral part of the surgical technology curriculum, in which students combine and integrate knowledge, skills, attitudes, values and philosophies of the profession. It is difficult to learn and adapt to different types of skills and roles in the operating room environment.

Objective: This qualitative study examines the difference between the clinical education of Surgical Technology and other clinical settings, and the challenges faced by students in the field, within the course.

Methods: This was a qualitative content analysis study conducted in 2016. The participants in this study were 16 baccalaureate surgical technology students of the University for Medical Sciences in Khorasan Razavi province. A semi-structured interview method was run to collect the required data. The sampling was initially purposive, then in the snowball method which continued until data saturation. All interviews were recorded, then transcribed, and analyzed using a continuous comparative method and conventional qualitative content analysis method.

Results: From the deep and rich descriptions of the participants, three themes including "stressful environment", "controversy between anticipation of role and reality", and "humiliating experiences" as well as a general theme of "bitter education" were obtained.

Conclusion: Students' orientation before attending the operating room, accompanying, supporting, and a full-time attendance of the specialist instructor, strengthening the prerequisite knowledge and skills for the students in this field, teaching ethics, and professional interactions, play an important role in the student's acceptance of the operating room, in the surgery team and the improvement of the quality of clinical education of these students.

Keywords: Baccalaureate surgical technology students, Clinical education, Challenges

1. Introduction

The operating room experts are an important member of the health team who are in close contact with surgeons, anesthesiologists and nurses to provide optimal care for patients (1). Clinical education is an integral part of the surgical technology curriculum in which students integrate knowledge, skills, attitudes, values, and philosophies of the profession (2). The clinical environment includes all the conditions and impacts that affect learning, including cognitive, social, cultural, emotional, motivational, and learning factors (3). It is difficult to learn and adapt to

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different types of skills and roles in the operating room environment, because students have to learn a lot of interventions in the surgical process before, during, and after the operation. The teaching and learning process in the operating room environment is different from and more complex than other clinical environments, because in addition to the three elements of patient, professor, and student, other factors including: surgeon, anesthesiologist, surgery ward, and operating room staff (4), teamwork and interdisciplinary collaboration, the variety of procedures in the operating room, workload, large and heavy responsibilities, the speed of action and the high precision, the rapid entry and exit of patients, the unpredictability of work in many cases, occurrence of acute and severe emergency situations (5), simultaneous occurrence of dangers in the operating room, and simultaneous and close interaction between the members of the surgical team, and the specific culture governing the environment can differentiate clinical education in the operating room (6). The operating room relies on effective multidisciplinary teamwork that creates a dynamic and challenging environment and reflects the difference in the environment of the operating room with other clinical environments (7). The operating room educational group faces a shortage of instructors trained in masters or doctorate degrees in all educational centers of the country. Accordingly, in a bulk of clinical settings, the training of these students is traditionally handed over to head nurses and operating room staff. Given the lack of awareness of the educational affairs of this group, students have faced serious problems. Student clinical education in the operating room is affected by teamwork. Each member of the surgical team collaborates with one's work skills, knowledge and experience. The inaccuracy of each member of the team or low speed of some members result in an interruption in the procedure, an increase in tension, and puts the patients' safety at risk (8). This can have an enormous impact on the training of a novice and inexperienced student in the surgical team. This field is dependent on practical and clinical skills, so that the first mistake in surgery can be the last mistake and leave an irreparable lesion for the patient (9). It seems that the clinical education context of the students of the operating room is different due to the different conditions of the patients, the operating environment, and communications and interactions of the members of the surgical team with different specializations with other clinical environments, and this can make the experience of students' clinical education bitter or pleasant. Most foreign studies in the field of clinical education of the operating room have so far, been conducted on team interaction, with the aim of revealing the nature of communication among the members of the operating room team (nurse, surgeon, anesthesia) in order to determine the communication models, stressful issues, and their effects on novice people. The status of the clinical education of the operating room has been studied in several different studies in Iran, including the effective factors in clinical education, the performance of instructors, the facilities and equipment suitable for clinical education, and the collaboration of department management with the instructor (10), learning opportunities, support for learning and evaluation (9), goals and curriculum, deals with students, educational environment, monitoring and evaluation (11, 12). Students and educators had different views on these factors. In general, clinical education, especially clinical education in the operating room, due to special and different conditions from other sections, is a multi-faceted phenomenon with unknown dimensions and components. To study and understand this conceptual framework, quantitative methods are not adequate given the particular aspects of education. It seems necessary to apply qualitative approaches that have a holistic view on the issue and address the desired phenomenon and examine all aspects of education (13). The experts believe that the data of qualitative studies are subjective and are formed by the perceptions and beliefs of the participants in the study. Qualitative research in a comprehensive naturalistic framework allows us to explain and reveal the depth, richness and complexity of human life. Insight into this process leads to the growth and development of perception of the patient's needs and issues, guiding the emerging theory and building nursing knowledge. (13, 14). In this regard, the researchers tried to study the clinical education difference with other clinical environments and the challenges that students encountered during the coursework, conducting a qualitative study.

2. Material and Methods

The present study was a qualitative study (part of a larger study) that was conducted to explore and reveal the students' experiences of the clinical education problems and challenges in the operating room, with a qualitative content analysis approach, in 2014-16. The environment of this study was the places where the researchers could have access to the participants or the participants liked to cooperate in the study. The participants consisted of 16 students from different academic levels in various university centers in Khorasan Razavi province, who were rich in information and were willing to report on their experiences. In this study, the selection of participants was initially carried out using a purposive sampling technique, then the sampling continued until data saturation i.e. until new codes were found in the last three interviews, or in other words, until no new code or data were obtained and all the conceptual levels were completed.

The participants had the following characteristics: they were able to communicate and had completed at least one internship; students were from the third to the eighth grade (five students from Mashhad, two students from Sabzevar, three students from Gonabad, four from Torbat Heydarieh, and two students from Neyshabur). In this research, data collection was done using a semi-structured interview method. The interview initiated with general questions and continued based on the responses of the participants. After the participant's justification about the goals of the plan and informed consent, the data were collected using a semi-structured interview. First, a list of interview questions was prepared to make the interview progress in line with the research goal. Thus, the interview began with a number of open questions with regard to the interview guide, and further exploratory questions were used to achieve greater clarity. The main questions asked of the participants were:

- What factors and conditions make you feel that you have not received enough internship today?
- Tell me a bad experience of your internship in the operating room?
- Who is considered as the deterrent factor in your education in the operating room?
- Who provides the learning environment in the operating room for you? And how?

A total of 17 interviews (16 primaries and one supplementary interview) continued until data saturation i.e. until no new code was obtained in the last 3 interviews. The study lasted from July 2015 to December 2016 for 18 months. In this study, data analysis was coded based on qualitative content analysis and using conventional content analysis approach, and the concepts were extracted. The data analysis process was performed in seven steps according to the Graneheim and Lundman method. In the first step, all the interviews were recorded and in the second step they were transcribed. In the third step, the decision was made on the analysis unit; before the coding, the text of the interviews was read several times as the analysis unit, the semantic units were read and reviewed several times, and the statements that were not relevant to the study, were deleted. In the fourth step, the units were first defined, and then the proper codes for each semantic unit were written. In the fifth step, the codes were categorized in terms of conceptual and semantic similarity in an inductive manner, and compressed as far as possible. The data reduction process was carried out in all units of analysis and subcategories.

In the sixth step, the codes were placed in the main classes that were more general and conceptual, and finally, in the seventh step, the themes were abstracted. It is worth noting that, while analyzing, changes were made regarding the content and class name that should be expressed in terms of its contents. The analysis flow was repeatedly updated with the addition of each interview and the classes were modified. To facilitate the process of data analysis, listing and categorization, repeated comparison of different data, and queries retrieval, MAXQDA software version 10 was used (15). To increase the credibility and reliability of the results, the methods used by Cuban and Lincoln (cited in Polit and Hungler) were used. These two researchers postulated that four criteria of confirmability, credibility, dependability, and transferability were required for the consistency and strength of qualitative data (13, 15). Therefore, in addition to ensuring the confirmability, credibility, dependability, and transferability, continuous engagement with data and confirmation of data by the participants, the allocation of sufficient time to study and the open and sympathetic relationship with the participants were also considered other factors of data validation of the study. To determine the dependability, the two members of the research team coded the interviewers separately. Inter-rater reliability of 85% of the opinions was obtained. Finally, precision was taken into collecting, implementing, and recording data and allocating sufficient time for data collection. In the field of transferability, manuscripts, interviews and analysis units along with the original codes extracted from the participation of the parties and their complementary comments were made, and necessary modifications were made and the suggested points were considered. In addition, two eminent professors in the field of qualitative research supervised all stages of the study process. Using the combination of methods (interviews and notes in the field) along with sampling with maximum variance i.e. interviewing students from different academic grades from different educational centers, increased the confirmability, dependability, credibility, and transferability of the data. In addition to describing the background of the study, the necessary explanations for the participants and using their direct quotes in this regard was performed. Ethical considerations in this study were: obtaining a moral approval for conducting research from the Medical Ethics Committee of Mashhad University of Medical Sciences, explaining the objectives of the research, the purpose of using a voice recorder, and the method of collecting data for the participants and attracting their cooperation, obtaining a written consent form for informed participation and attention to the main points including explanation of the research, the purpose of the research, the expression of the criteria for selecting the research sample, the benefits of participating in the research, ensuring the preservation of anonymity, answering questions, the right to refuse to continue the research, sufficient information and ensuring the participants that interview texts are confidential.

3. Results

According to the findings of the study, the number of participants: 16 (11 females, 5 males), age: 20-24 years old (mean 22 years old), educational semester: 3rd to 8th, educational centers (Gonabad, Sabzevar, Neyshabur, Mashhad), rich and deep contributors, analyzing data and notes in the field, led to the emergence of 12 classes and 3 main categories, and eventually, a core theme (Table 1). The themes were extracted from student opinions about the challenges of clinical education in the operating room

Table 1. Main theme, categories and classes extracted from participants' opinions

Classes	Main categories	Main theme
Informal and different interactions of team members	A stressful environment	Bitter education
Challenging educational environment		
A shortage or absence of instructor		
Importance of the time, the emergency of the time and moments		
Misinterpretation of the profession	controversy between anticipation of role and reality	
The effect of technical load of the operating room on the self-image of the student		
Ignoring the student's dignity	Humiliating experiences	
Education with aggression		
Lack verbal and nonverbal interaction of the team members with the student		
Surgical technology student; an uninvited guest or a humiliated being		
Internal stress resulted from stressful education (disappointment, confusion, incompetence, sadness, anxiety, and animosity)		

3.1. Themes # 1: A stressful environment

The first theme that was extracted from students' statements was a stressful environment that included classes: unofficial and varied interaction of the team members, lack or absence of an instructor, a challenging educational system, and worthwhile time. This category refers to the special conditions governing the operating room and its distinction with other sectors.

3.1.1. *Informal and different interactions of team members*

Operating chambers, due to teamwork and simultaneous entry and exit of patients, create close links among the surgical team members, which can be effective in increasing or decreasing the learning opportunities of the operating room students. "We do not have good professional interactions and communication. I am not so good in the city. I do not know why there are lots of struggles in the operating room. The personnel in one room do not conduct themselves well with those of the other room. They now struggle with each other. I do not know why. The doctor came in while he was nervous and has struggled with others, especially with the students. Why is this in one way and that in another way? There is no proper culture at all to modify such behaviors. For example, we say that Mr. so and so's job is good, he said that that one is not a good man. They just backbite each other" (Participant N0.15). Due to the different characteristics of individuals in managing their internal stress, some surgeons relay stress from their surgery to the patient, the team members and even the students. One thing that is lost in the operating room is morality, i.e. no one is moral, not the surgeon nor the staff (Participant No.15). Although it may be true that we had not chosen a good field of study, this should not be a reason for the doctor to have any behavior with me. We do our job and the surgeon shouts at us again. That is why you did not get the right hemostats? Why did not you get the blood sample well? The patient is bleeding. In fact, either the patient suffers from high blood pressure, or the surgeon tore it apart, but he shouts at me. These behaviors have made me feel frustrated and anxious (Participant No.15).

3.1.2. *A shortage or absence of instructor*

The transfer of clinical education to head nurses and staff of the operating room, and lack of knowledge of education and assessment have generally faced students with many problems. "The field of the operating room is one of the disciplines that we do not now have a professor, whose field is the master of the operating room in the city; we do not have an instructor who has the basis of the operating room, and there are mostly nurses or anesthetists" (Participant No. 6). The use of unprofessional instructors in this field has prevented students from receiving comprehensive education, and some have to rely on the ward staff to learn specialized techniques that increase the

likelihood of receiving false or non-scientific information. One student says: "Because most of our instructors are supervisors, they cannot supervise well, because they are not present, and they are very busy. We had a supervisor who came at ten o'clock and had a supervisor who did not come at all" (Participant No.7). The absence of a specialist instructor in the operating room will lead to a shift in the training burden of the staff, which is sometimes unlikely for staff. "The main thing is that we do not have is an operating room expert, and most nurses teach us the theories in the field. For example, we always looked for a scrub nurse to explain to us, and usually the staff would say, if you do not have the professor to explain to you, in fact, our professor was not in the operating room, and he did not know whether or not he was able to explain to us "(Participant No. 3). A large number of students and a low instructor's opportunity for continuous monitoring and attendance in all rooms have prevented the student from receiving adequate training for the purposes of the course. "However, depending on the hospital, and because we did not have a special instructor, the head nurse would check us there. If we arrived late, nothing special would happen and we would behave in any way, not according to the goals. I do not remember at all that we had washing because it was not the instructor who controlled what we were doing (Participant No.11).

3.1.3. *Challenging educational environment*

A well-structured clinical environment has no hierarchy and is usually associated with good teamwork and communication. Since the operation room does not allow the continuous presence of the instructor and the supervision on the student's work, and they must be present in all rooms, the staff and the team members can influence the student's learning process and play the role of either facilitators or deterrents. "I do not know whether it was their morals or their stress that made us realize that we did not know anything, for example, they told us to just look and not work, or we could be at 7th semester asking us if we knew how to take off gloves. Well, that kind of behavior was very insulting to the students. But there was also a series of places where many staff members said they had to learn, and since they had to learn, they had to go to an operation. There were some instances where they asked us if we knew how to do something or not. Because we were at 7th or 8th semester, we would come to know that we were sure we knew that" (Participant No.10). Sometimes unprofessional behavior and improper interactions make the student feel less comfortable with his or her field of study. "The disrespect of the staff and the surgeon to us, the students, have caused me to not love the discipline at all, not only the discipline but also the hospital. I now think that I will get my master's degree and teach only the theory and not go to the hospital either" (Participant No. 9). The responsibility of the team, as well as the safety and survival of the patient on the shoulders of the surgeon can lead to stress and incongruous behavior in the student's education, so that they lose the opportunity to experience technical skills. Like the case: "The operation room of thorax, we were happy to go to the thoracic surgery room because before we did not experience thoracic surgery. First, there were fights between the surgeon and staff and system. But then, after the operation began and we wanted to go there, the staff said that the surgeon would not let us go in. He was upset, I said, it depends on the surgeon. Whether he is in a good mood or not. All of this will interfere with our education "(Participant No. 15). Excessive expectations of the student make it difficult for them to feel safe in the clinical environment. "The work pressure is too high and the atmosphere is so bad. Their expectation of the students is too high. In its operating rooms, all the staff of that room, talk badly about the room's staff, talking badly about the nanny's head in every room you go to. In the same way, there is no good and healthy atmosphere "(Participant No. 2). Some staff members of the operating room not only do not consider participation in education as part of their duties, but do not cooperate with the instructor to educate the students and to provide some facilities or to make the students participate in the surgery team and transfer their experience in the absence of the instructor. They sometimes have inappropriate conduct and create an unfavorable atmosphere for students and instructors. "A number of staff members only wanted us to go to the operating room because they wanted us to do the work. Such presence in the operating room was not educational at all, nor did they explain anything to us. They told us that we did not wash our hands and asked us to do so and they explained to us how to do that from outside. This member of staff would make the students nervous, that is, if they were coming to the operating room 3 or 4 times before noon, they would say all of these actions were handed over to the student and their only help was to tell us what to do. This would bother the students very much" (Participant No. 4). Since the students are beginners and lack teamwork experience with the skilled team members, they experienced a lot of stress in the operating room. "Most of the surgeons have complaints about the students, and even though I know that they were novices at first, they did not care, they were scolding us for nothing, asking us why we didn't work with tools, for example, to learn well?" (Participant No. 7). Students acknowledge that some internships are unnecessary and repetitive, and objectives are unclear to them. I do not know why they repeat a series of repetitive courses. They do not need to repeat so much, for example, when we were at semester 5, we went to the women's surgery room for two or three weeks, again, at semester 7, we went there three weeks. Well, although we have rotation in operating rooms, our instructor asked us to go to a female operating room. We are not supposed to be gynecologists. We do not know about the exact purpose of the internship, and all of this is a recurrence (participant No. 2).

3.1.4. *Importance of moments*

Due to the large number of patients and the rapid entry and exit, students do not actually have the opportunity to get acquainted with the surgical sets, and make use of the instructor's explanations as to how they are used, because the next patient is immediately entered and the surgery set should be washed and sterilized in CSR. "Well, we want to work with the equipment after the operation, but the staff do not let us do so and say they want to have them washed in CSR. So, it is not motivating to students." (Participant No.7). Another student said "it's not like the instructor teaches us everything, the instructor cannot do that. They are so busy that they do not have time to do so"(Participant No.3).

3.2. Themes # 2: The controversy between the anticipation of a role and reality

Our second theme reflects a change in the perception that students had in their minds. Students practice the attitude and the image of the operating room on the basis of images from previous experiences in their minds, or they have picked them up through the media or the community.

3.2.1. *Misinterpretation of the profession*

A student's mental image may change when entering the operating room, and previous images will be replaced by actual and new images; in fact, the moment of entry into the operating room, due to entry into an ambiguous environment and fear of unknowns in this environment, has an important impact on the student's image of his discipline. "The first time I got into the operating room, I was very surprised, for example, a lot of noise from the end of the hall, or they were singing or listening to music" (Participant No.9). "The first time I went to the operating room, I was really stressed. I was very surprised. I thought that the operating room was a relaxed, regular and quiet place, and it was closed and enclosed all around, but I saw that it was very busy and crowded." (Participant No 2). Sometimes students' perception of a clinical situation is different from the previous one. "We thought we were going to stand next to a surgeon, and work with them" (Participant No.6). Sometimes, this change of image is induced by professors and authorities: "We just talked with our staffers. They told us that the field can last for only two years but they make it last for four years. We asked them why they did not transfer this to the authorities. They said that there were some incentives that they want you to study for 4 years. Some people say they want to lower the course but I believe that we are capable of ours. They told the truth that it could last for two years. They said, even your practice is not required that you do not learn anything" (Participant No. 7).

3.2.2. *The effect of the operating room's technical load on the student's self-image*

Work-centered governance in the operating room and since the initiation of the surgical procedure are accomplished with many things. This expectation and accompaniment with the skilled team may make the inexperienced and low speed student stressed and even feel more incompetent than team members. "It was so great that I just made it disorganized, I could not control myself. It was a stress that I did not know I had to take forceps, or whether I had to put gas on it or not. I should now prepare my gas pots very quickly. My head was completely out of control. I was disappointed (Participant No. 3). The operating room environment is usually work-centered and it is also expected that the surgical technology student will have skill roles. Because of the short-term presence of patients in this section, roles of care are neglected, or the anesthetic staff are in charge of care. This kind of behavior makes the student feel that theoretical materials are not applied in the clinical setting. "But in the operating room, what the surgeon expects is good practice, and it is good to be able to move forward, and perhaps reduce the stress of the surgeon, and the surgeon can trust you, trust is the most important thing in the operating room. Students should be able to get the surgeon's trust so that the surgeon can work better with them" (Participant No. 12).

3.3. Humiliating experiences

This theme includes the classes of lack of dignity of the student, training with aggression, lack of verbal and non-verbal communication of the team members with the student, the operating room student, uninvited guest, or being humiliated, and the stresses inherent in stressful education.

3.3.1. *Ignoring student's dignity*

Baccalaureate surgical technology students believe that respecting and retaining the personality of the people is very important. The high position of the surgeon should not allow him to disrespect the students "Some surgeons did not let us even go to their office, and said that the students caused infection, like some gynecologists. It mostly depends on the moralities of the surgeon as to whether the student in the operating room plays the role of a supporter, and everything that happens there is the responsibility of the student. I myself saw that the staffer unsterilized something but he said the student did that, and the staffer misused the situation there" (Participant No.2). Student statements have shown that respecting students is one of the important factors influencing their education. Students in the operating room have no mutual respect and there is only the role of the lord and layman. (Participant No. 7). "I was

in the surgery emergency room and I did not care for a moment, I delayed in giving the device, the surgeon fought and nodded, but then he taught me, it was better he said that with a better tone" (Participant No.6). Students believe that positive atmosphere, support on the part of the instructor, and appropriate treatment of staff and surgeons are the most important features of a good educational environment. The surgeon's inadequate treatment of delayed or misleading surgical instruments has led to the passage and sometimes the removal of the student from the role of scrub nurse. "They nag a lot, they have very bad behaviors. For example, just making a mistake, I am really afraid to even give the wrong instrument. I'd rather tell a staff member that if something went wrong, they would tell the staff something." (Participant No. 3). "Frustration derived from staff misconduct, surgeon, and even the instructor who does not understand us. That means the instructor wants to go to work and leave the scrub students in any circumstances" (Participant No. 15).

3.3.2. *Training with aggression*

The special operating room conditions, the speed of operation of the surgical team members, and the importance of maintaining the safety and well-being of the patients, make the team members, especially the surgeon, sensitive to and responsive to the inexperienced student. "For example, for the emergency surgery that we had undergone, the surgeon fought us well, then he taught us, it is better for us use our minds than to fight, or to behave badly, and until the end of our lives, it seems to us that this surgeon treated me badly" (Participant No. 12). Students state that alerting mistakes with mildness will make students feel more secure and relaxed. "I get upset, but if they say with a good tone that this is wrong, even afterwards, I will thank them, but with a good tone, but some surgeons use a bad tone, and I went crying out of the room the day that the surgeon quarreled" (Participant No.10). Respecting the student's personality and maintaining peace can play an effective role in raising the student's motivation and consequently, educating the students. "It does not matter whether one is the student of the operating room, anesthetist, nurse, or a doctor. Everyone has a personality. I do not know why the atmosphere in the operating room is like this, and that is just what is going to lose my discipline, as surgeons just seeing themselves, of course, that they are not like that, maybe 50% of them. But, well, I am a student of the operating room, I have character like them, "(Participant No. 15).

3.3.3. *Lack of verbal and non-verbal communication of team members with students*

Sometimes, because of the patient's emergency conditions or due to lack of management of their internal stress, the assistants are not able to communicate with the students in the operating room, which in turn causes students to feel incompetent or demotivated: "They look at the students in a strange way, when they do not look at you at all and laugh with their staff, and we are like a kid in a corner and we are not going to say anything" (Participant No. 7).

3.3.4. *Uninvited guests or humiliated beings*

Students in the first courses of internship are prone to make mistakes due to inexperience and lack of familiarity with the operating room space, the fear of unknowns and ambiguities of the environment, and the use of advanced technologies. Evidently, the blame from the team members and in front of others will lead to a sense of humiliation. "I thought that I was an extra, being that was humiliated and they said every single mistake was on the part of the student" (Participant No. 9). Sometimes, the surgeon does not give students the opportunity to learn and, with the smallest mistake of the students, asks the staff to replace the student. "Look, they see in this way, the staff's vision, I mean. They think that students bring about a series of problems. The surgeon asks why the student does this, why do the staff not do the action instead of the student? "(P. 2).

3.3.5. *Internal stresses caused by stressful education: (fear of infection, anxiety, incompetence and confusion and frustration)*

Students in this environment may have experiences that have positive or negative effects on their learning and even their professional future. "For example, I help her with heart and soul, but she asks me if I have come to help; what you are doing then? These behaviors have made me nervous to just not come to internship for the next week. Now I feel that everyone here tells the students to do whatever they like" (Participant No.15).

3.3.5.1. *Fear of infection*

Most students are afraid of being infected through blood and body fluids, and these fears motivate students to go ahead and experience clinical skills. For example, one student said: "I am a student now. I should not go to such operations, or if I go, I must take good care of myself. Usually, my instructors ask us not to go there, even one of my masters who completed the project, said that he would not go to such operations" (Participant No. 3)

3.3.5.2. *Anxiety, feeling of incompetence and confusion*

Complexity of clinical experience in the operating room, due to unpredictable conditions of the environment and fear of unknowns, causes tension and anxiety among students. "Soon after I went to the third term and went to work in the operating room, under the supervision of the instructor, but I had a lot of stress" (Participant No. 5). The surgeon's expectation of attending and assisting the surgeon, while working with staff and having the skills of surgical techniques as much as a staff member, is a major factor in the frustration and confusion of the students.

"Some surgeons make you lose your head and expect us to work like a staff member, which sometimes causes us hate the field" (Participant No. 14). Sometimes the student's basic and scientific work is faced with opposition from the staff and causes a feeling of student confusion. "I tell them that I'm so comfortable and I know where everything is by systematically putting the stuff on the Mayo table. Staff say your table becomes disorganized if you put them in this way and you will become confused and they do not accept the standard layout. I just remain silent because even if I object to that, nothing will happen. They are doing their own thing. You cannot do anything when they put together the things which are on your table. "(Participant No. 12)."You just do your work, the surgeon shouts! For example, when they shout about why you do not get the right hemostat, why don't you get the blood sample well, and that the patient is bleeding, the students feel disappointed and feel that they do not know anything. Indeed, either the patient has high blood pressure or the surgeon tore the vein apart, but he shouts at me again and again" (Participant No.10). One of the known stressors for students in the operating room is the behavior of others. "Interactions and behavior of the staff of the operating room, i.e. how the staff is behaving is important. It has happened to me that I washed their hands in a number of operations within one day and did a lot of work, but in the last operation, the staff and the surgeon said something and I got upset. In fact, my whole day was ruined". Confirming this, another student said "it's true that they are sensitive to their work, but the culture must be made that they should keep cool and do not despise. When they behave in a bad way, we cannot do the work well." (Participant No. 16).

3.3.5.3. *Feeling disappointed*

Humiliating behavior and conduct of the surgical team, such as threatening a student, sometimes disappoints students. "It is a little disappointing, they behave in a very bad way, and for example, a surgeon sometimes shouts about why the student is in the room. This behavior is a little humiliating. I am disappointed. "(Participant No. 9). Another disadvantage of students in their field is the lack of a difference in the employment of capable people with people without qualifications. "But they have heard a lot of mischief about their field of study and become disappointed. They say: let it go. The students have noticed that the staff knows nothing and passing their training course and taking a lot of money. They know nothing. They put their hands in sterile liquid, and when I shout that it is sterile, they say who cares. When the students see such actions, they become discouraged. The students say they are passing their training course and we are trying to learn and are passing our training course but there is no difference between us" (Participant No. 7).

4. Discussion

According to the results of this study, the most important challenges of the baccalaureate surgical technology students in the clinical environment were facing stressful environment, controversy between the anticipation of a role and the reality and humiliating experiences. It can be said that the students of the operating room consider clinical education as a bitter experience. Clinical education in medical sciences, such as nursing, has been studied from a variety of dimensions; however, limited studies have been conducted on clinical education in the field of the operating room. We tried to use, in spite of many studies about clinical education, the studies conducted in the operating room environment. In this study, students described confrontation with the space and the specific organization of the operating room; the use of advanced technologies and equipment, congested and crowded rooms, the close communication of students with the members of the surgical team to carry out the work of the patient, and the clinical support of the staff and the members of the surgical team as inappropriate. While in the study by Bahrami and others, students in the operating room had a high degree of cooperation and staffing, and in general, they described the status of clinical education as desirable. One of the reasons for students' satisfaction with the approach of staff in Bahrami research can be related to the use of staff working in those centers as the instructors (11, 16). The research by Amanda Henderson on the impact of environmental conditions on students' mental and psychological conditions and subsequent learning outcomes showed that students in clinical settings with favorable clinical support, achieved higher skills and abilities (17). Jennifer et al. also evaluated the relationship between staff and students and the factors influencing the efficiency of clinical environment (18). The results of the study by Abedini et al. suggested the lack of welfare facilities, the lack of proper educational space for training, the lack of use of educational aids in the clinical setting, and the lack of experienced instructors for teaching in the clinical setting as the problems of clinical education from the students' point of view (19). In this study, it was found that due to the lack of instructors in the educational group of the operating room, staff or head nurses were responsible for their training in a period of training for these students. Other studies also highlight the lack of qualified instructors, and the use of instructors regardless of their ability and expertise as clinical education problems (20). Students, in the present study, stated the ignoring of students' dignity and attack to personality during their studies by team members and especially the surgeon, which could be due to the students' low experience and mistakes, the emergency conditions of patients, the simultaneity of team members with the same level of education and the

importance of safety and life of patients. In the study by Ghorbanian and colleagues, students assessed the behavior of the staff and staff collaboration with the students as inappropriate (9). Data from this study revealed the loss of learning opportunities due to the lack of specialized training instructors and the use of non-specialized instructors in the operating room. In their study, Tabrizi et al. reported that the presence of an instructor and a professor during an internship, along with students, had the most direct or indirect impact on the quality of education (21). Based on the research findings of Khazaie et al. on the situation of the clinical education of the operating room baccalaureate, the majority of students estimated the opportunity to learn, support for learning and assessment in an average level (9). In the present study, the students were surprised on arrival to the operating room, by special organizations and advanced technologies, informal behavior of team members and their role as an operating room expert, and that they were not consistent with their previous perception of the operating room. Tazakori et al., by examining the factors affecting the quality of clinical education from the viewpoint of the operating room students, concluded that factors such as lack of students' positive attitude towards their field and lack of interest and willingness of students to practical learning in the clinic, the unfamiliarity of staff with professional ethics, the collaboration of the operating room staff with the students in clinical education were of the greatest importance among the factors influencing the quality of clinical education (22). In the study by Dehghani et al., deficiencies such as lack of appropriate scientific field in the ward, student unwillingness, and uncertainty in the absence of the instructor were reported as problematic factors in internship (23). In the study of Ghorbanian et al., the most important weaknesses in clinical education were lack of adequate supervision in the education process and lack of student decision-making power in planning and caring for patients. Most students considered the role of instructors effective in reducing the stress of the clinical environment and increasing their self-esteem and their effectiveness (9). Maintaining the patient's life and safety, avoiding mistakes, and performing a patient's surgery with the least complication and high speed of operation, makes the beginner and inexperienced student operate with high-speed and skilled team members, stressed and possibly error-prone. Due to the fact that working in the operating room is a team and specialized work, every person working in the operating room plays their role according to their profession, and in this space, they expect their students to work in the operating room as members of the team. The absence of an instructor in the operating room also makes the students feel deserted and find themselves uninvited guests of the operating room. The study by Ghayyaswandiyan et al. indicated that most students reported lack of cooperation between the ward and the inappropriate treatment of some staff, and expressed concerns about work with the patient, their lack of support in the absence of the instructor, and even lack of satisfaction with internship (24). In their research, Tazakori et al. showed that the distrust of instructors and surgeons to students caused their reluctance to learn clinical skills (23). The unwritten surgeon's dominance over the surgical team and the lack of stress management and lack of communication skills in some surgeon's assistants, cause stress to the operating room students, and even some students are relieved from being part of the surgical team. The operating room is in a state of constant pressure and complexity (25), and its care is apparently done by a few professional teams (26). Research data from Farnia et al. showed that the controversy between the roles and work of the team members of the surgical team can affect the communication of individuals (25). According to the data obtained, the differences in the operating room environments with the admissions sections in terms of working conditions, workforce, structural conditions, and organizational climate and organizational culture can play a role in communications and interactions. In addition, the time constraints of emergency situations can shadow the inappropriate behavior of team members towards an inexperienced student. Studies have shown that students' expectations for learning opportunities, clinical skills and a sense of belonging and respectfulness, time spent on clinical counseling, and students' trust in students are not always met (22, 23). The strong influence of doctors on educational centers, students' unwillingness (26), and gaining negative experiences, such as the ineffectiveness of clinical instructors and fear in the clinical setting, have been mentioned as barriers to learning (27).

5. Conclusions

The present qualitative study findings provide a better understanding of the challenges of clinical education in this field due to research in actual contexts and the in-depth study of clinical education in the operating room. In general, this study has clarified some of the hidden and unspoken angles of clinical education in this environment that little attention is paid to by quantitative research. The results of this study showed that the presence of students in the operating room in this section is stressful due to its specific conditions and organization. The overcrowding of the operating rooms in educational hospitals and the simultaneous heterogeneous clinical experience, dynamic and variable conditions of patients, and the expectation of the technical role of students lead to the emergence of behaviors that affect students' education and acceptance as a member of the surgical team. Orienting the students before attending the operating room, accompanying and supporting them, the full-time presence of a specialist, strengthening the knowledge and skills of the students in this field, and teaching ethics and professional interaction

play an important role in the acceptance of the surgical technology student in the surgical team and promotion of the quality of education in these students.

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There is no conflict of interest to be declared.

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References:

1) Operating room and anesthesia, Introduction of operation room. Available from: http:// www.mums.ac.ir/ornanesn/fa/historyor.
2) Mohammadpour Y. Understanding of the clinical learning environments: the gap between the expected and the actual environment. Journal of Oroomieh Nursing & Midwifery Journal. 2012; 9(2): 102-11.
3) Moattary M, Ramazani S. Perspective of nursing students' clinical learning environments. Iranian Journal of Medical Education. 2010; 9(2): 145-37.
4) Lotfi M, Zamanzadeh W, Sheikh Ali Pour Z. Effect of peer clinical teaching method on the education of operating room students. Nursing Education. 2012; 1(1): 78-83.
5) Dunn S, Hansford B. Undergraduate nursing students' perceptions of their clinical learning environment. J Adv Nurse. 1997; 25(1): 299-306.
6) Farneya F, Abbaszadeh A, Borhanif F. inhibiting factors associated patient care in the operating room: a qualitative content analysis. Journal of Health Sciences Research. 2013; 2 (1): 90-7.
7) False Silen-Lipponen M, Tossavainen K, Turunen H, Smith A. Learning about teamwork in operating room clinical placement. British Journal of Nursing. 2004; 13(24): 244-53.
8) Lingard L, Reznick R, Espin S. Team Communications in the Operating Room: Talk Patterns, Sites of Tension, and Implications for Novices. Academic Medicine. 2002; 77(3): 232-7. doi: 10.1097/00001888-200203000-00013.
9) Khazaei J, Zarouj H, Abbasi A. Qualification of Clinical Education of operation room in Bachelor degree from the perspective of students and educators in this field at the University of Medical Sciences, in Semnan. J Educ Ethics Nurs. 2014; 3(3): 39-46.
10) Ghorbanian N, Abdollahzadeh Mahlani F, Kazemi Haki B. Effective Factors on Clinical Education Quality; Anesthesiology and Operating Room Students View. Bimonthly Educe Strategy Med Sic. 2014; 6(4): 235-9.
11) Bahrami T, Sadat LE, Mahmoudi Golgini E. Evaluate the clinical training of students' views in the operating room and anesthesia. Alborz University of medical scienes and health. 2014; 1(3): 143-50.
12) Hossein KM, Fatemeh D, Fatemeh OS, Katri VJ, Tahereh B. Teaching style in clinical nursing education: A qualitative study of Iranian nursing teachers' experiences. Nurse Educ Pract. 2010; 10(1): 8-12. doi: 10.1016/j.nepr.2009.01.016. PMID: 19251481.
13) Burns N, Grove SK. Understanding nursing research, building an evidence-based practice. 7th edition. St. Louis: Saunders Elsevier; 2007.
14) Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurse Educ Today. 2004; 24(2): 105-12. doi: 10.1016/j.nedt.2003.10.001. PMID: 14769454.
15) Mayring P. Qualitative Content Analysis. Forum: Qualitative Social research. 2000; 1(2): 25-30.
16) Fakhr-Movahedi A, Salsali M, Negarandeh R, Rahnavard Z. Exploring contextual factors of the nurse-patient relationship: A qualitative study. Koomesh. 2011; 13(1): 23-35.
17) Henderson A, Twentyman M, Eaton E. Student's Perception of the psychosocial Clinical Learning Environment: An Evaluation of Placement Models. Nurse Education Today. 2006; 26(7): 561-71.

18) Newton JM, Jolly BC, Ockerby CM, Cross WM. Clinical Learning Environment Inventory: Factor analysis. J Adv Nurs. 2010; 66(6): 1371-81. doi: 10.1111/j.1365-2648.2010.05303.x. PMID: 20546367.
19) Abedini S. Clinical Education problems from nursing Students' Point of View in Hormozgan University of Medical Science. Journal of Hormozgan university of Medical sciences. 2008; 12(4): 249-53.
20) Rahimi A, Ahmadi F. Barriers of Clinical Education and improvement ways related from nursing teacher s' Point of View in Tehran s' nursing Faculties. Iranian Journal of Medical Education. 2005; 5(2): 73-80.
21) Tabrizi J, Mardani I, Kalantari H, Hamzehei Z. Clerkship from the perspective of students of health services management and family health in Tabriz University of Medical Sciences. Iranian Journal of Medical Education. 2011; 10(4): 439-51.
22) Tazakori Z, Mehri S, Mobaraki N, Dadashi L, Ahmadi Y, Shokri F, et al. Factors Affecting on Quality of Clinical Education from Perspectives of Operating Room Students. Journal of Health and Care. 2016; 17(2): 128-36.
23) Dehghani H, Dehghani K, Fallahzadeh H. The educational problems of clinical field training based on nursing teachers and last year nursing student's viewpoints. Iranian Journal of Medical Education. 2005; 5(1): 24-33.
24) Ghyasvndyan Sh. The effect of "Clinical Teaching Associate" Model (CTA) on the quality of nursing students' clinical education at Tehran University of Medical Sciences. Journal of Medicine and Purification. 2004; 52: 10-7.
25) Reynolds J, Carnwell R. The nurse-patient relationship in the post-anaesthetic care unit. Nurs Stand. 2009; 24(15-17): 40-6. doi: 10.7748/ns2009.12.24.15.40.c7439. PMID: 20162906.
26) Karimi Moonaghi H, Mirhaghi A, Oladi S, Emami Zeydi A. A journey across an unwelcoming field: A qualitative study exploring the factors influencing nursing students' clinical education. 2015, 9 (4):7, 6p
27) O'Driscoll M, Allan H, Smith P. Still looking for leadership–Who is responsible for student nurses' learning in practice? Nurse Education Today 2010; 30(2):212-7