

Challenges to Several Domains of Clinical Training From the Perspective of Anesthesiology Students

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Abstract

Background: Clinical education is a process in which students attend a clinical environment, achieve a variety of professional skills, and become prepared to solve patients' problems. Identifying problems in this domain and resolving them can be of great help in the training of students.

Objectives: This study was conducted to determine the problems concerning the clinical education of senior undergraduate students in anesthesiology at Fasa and Jahrom University of Medical Sciences.

Patients and Methods: In this cross-sectional study, 55 senior anesthesiology students were selected from Fasa and Jahrom Universities of Medical Sciences. The data collecting tool was a questionnaire. The questionnaire consisted of two parts: 8 questions concerning demographic characteristics and 63 questions concerning problems of clinical education. The second part was divided into three domains: the clinical environment (21 questions), clinical educators and school policies (31 questions), and two students' characteristics (11 questions). Data were analyzed using SPSS and descriptive statistics.

Results: The score achieved from all three domains was 67.49%, which indicated the clinical condition as desirable. The scores in the domains of clinical environment, clinical educators, and school policies and student's characteristics in the viewpoint of students were 57.07%, 71.77%, and 73%, respectively. They indicated average, good, and good conditions, also respectively. The most serious problems of all three domains were: 1) the disproportionate number of students within the physical environment of the operating room (87.3% agreement), 2) lack of balance between theoretical and practical knowledge (56.4% agreement), and 3) the simultaneous presence of medical students and their impact on clinical education (67.3% agreement).

Conclusions: In general, the clinical training of anesthesia students is in a desirable condition. The large number of students and the lack of space and facilities appeared to be the main causes of concern. To improve the quality of clinical education, increasing the number of clinical education spaces or balancing the number of students is therefore desirable.

Keywords: Training, Clinical, Student, Anesthesiology, Viewpoint

1. Background

Over the past two decades, clinical education and learning in the nursing education system have been studied (1). Clinical education can be considered as a facilitator of learning activities in a clinical environment in which the educator and the student have the same contribution; its purpose is to measure the changes in the student (2). It should prepare students to acquire basic scientific information and skills related to diagnosis, treatment, and care (3). In other words, clinical education is a process in which students attend the bedside and gradually gain the skills to solve the patient's problems using learned techniques

of logical reasoning. It is affected by several variables and factors (4).

Clinical wards, accessories, equipment, personnel, patients, and educators are the key elements that have been accepted in a clinical environment for the student's training (5). This environment plays a key role in education because theoretical education alone is not effective in learning clinical skills. Clinical learning plays an important role in increasing the practical clinical skills of the students. The clinical educational environment is the interface between theory and practice in clinical education (1).

Clinical education is of vital importance for the forma-

tion of professional identity. That is why it is called the heart of professional training (6, 7) and can easily cover 50% of an educator's training activities (8). The value of clinical training is therefore undeniable for personal and professional development and clinical skills (9). Nursing students should consider clinical training as the most important part of their education and pay attention to the problems and dissatisfactions associated with it (10). Clinical education prepares students to accept various roles in the domain of health care. These roles encompass the most important activities and purposes of nursing schools and their best realization is possible only through effective educators and the availability of necessary equipment (11). It is the duty of nursing schools to train nurses who are able to provide clinical services based on scientific principles (12).

The complexity of the clinical learning environment has led researchers to investigate various aspects of this environment. Aspects such as paying attention to individual characteristics of learners, students' satisfaction with clinical education, students' participation in physical activity, maintaining student individuality in clinical settings, clarification of student duties during clinical courses, and innovations in clinical education are considerably important (13). Research conducted abroad has suggested that the most important problems in clinical education from the student perspective involve factors such as little attention to clinical education, lack of sufficient clinical instructors, lack of coordination among clinical education faculties, facilities and performance of the hospital, lack of a permanent access to educators to meet the educational needs, and lack of student incentives (14, 15). Halter et al. (16) valued the student's perspective in clinical training for providers and planners of nursing education. Because students are the receivers of educational services and a source of detecting clinical education problems, they can be consulted on the quality of clinical education (17).

In a Delaram study (18) identified the most important weak points as a lack of coordination between personnel expectations and training objectives, disregarding the opinions of students in planning, student's lack of authority in making decisions to plan and care for the patient, an inappropriate number of students in the ward, an improper number of patients, inadequate facilities, lack of teaching aids, and assessment of students by the educators.

The researcher Ismael and the researchers Ismaili and, Ghazavi and Mehrabi pointed out that a high percentage of students believe that they have insufficient opportunity to perform to standard guidelines and must work under inappropriate clinical conditions. In addition, the students also expressed that their workloads were too heavy and

they lacked the necessary time to consult educators when responding to the needs of their training needs (19, 20). Ghodsbin also noted that students were not satisfied by the relationship between staff and students, proposing that disagreements about how educators should present theoretical and practical courses was an inhibiting factor in clinical education (20). Hemmati and Kalilzadeh (21) declared in his qualitative study that effective clinical education is influenced by three factors: educator, learning environment, and the student. In this study, effective factors in clinical training included management skills of the trainer, the physical-emotional atmosphere of the learning environment, the availability of adequate equipment and facilities, cooperation of personnel and staff with the students, and overall individual characteristics and confidence of the students.

2. Objectives

According to the studies conducted by researchers, most studies carried out in the domain of clinical training have concerned nursing and midwifery students. Unfortunately, few studies have been done on students of anesthesiology and similar fields. Since anesthesia is a new and emerging field, it seems that similar research in this field is essential.

3. Patients and Methods

In this cross-sectional study, which was conducted by the census method, all senior straight ($n = 18$) and unstraight ($n = 10$) students of anesthesiology from Jahrom University of Medical Sciences participated (total of 28). It also included senior students of anesthesiology from the Fasa University of Medical Sciences ($n = 27$). Inclusion criteria were being a straight senior student of anesthesiology and signing an informed consent form. Exclusion criteria were being a guest student or a transfer student from other universities. The aim of choosing these two universities was to increase the number of participants. Since this group of straight anesthesiology students had passed the five-term stage of internship and un-straight anesthesiology students had enough experience to transfer the attitudes, they were suitable for participation in the study.

The research tool was a questionnaire to evaluate the problems of clinical education from the perspective of anesthesiology students. The content of questionnaire was based on various studies and consisted of two parts. The first part concerned demographic characteristics and the second part concerned educational problems in three domains: the clinical environment (21 questions), educators

and policies of the school (31 questions), and the characteristics of the students (11 questions). The questions for each domain were to be answered using a three-point Likert scale (disagree, moderate, agree). These answers received scores of 1, 2, and 3, respectively. Concerning the questions addressing the three domains, if the average score was 0 - 33% of the total score of the domain, the condition was considered unfavorable; if it was 34 - 66% of the total score, it was considered average; and if it was 67 - 100%, it was considered favorable.

Content and face validity of the questionnaire were approved by academics after several modifications. Reliability was calculated after an initial study using a random sample of 20 students. This initial study had a correlation coefficient to Cronbach's alpha of 93.7%.

Questionnaires were distributed and collected after coordination with the relevant authorities and the signing of the informed consent forms by the anesthesiology students. Collected data were examined using SPSS software version 16 and descriptive statistics.

4. Results

Out of the 55 students who participated in the study, 46 (83.6%) were female and 44 (80%) were single. The mean age of the participants was (22.91 ± 1.87) . The number of students from Jahrom University of Medical Sciences was 28 (50.9%) and 27 (49.1%) were from Fasa University of medical sciences was 27 (49.1%). Some 45 (81.8%) had a straight bachelor's degree and the rest had un-straight bachelor degrees, an average GPA for the last semester (16.65 ± 1.47) , and they were studying. Some 45 (81.8%) were non-native and resided in dormitories and 15 (27.27%) students had clinical experience of 3 months to 8 years.

According to Table 1, the problems concerning clinical training in the area of the clinical environment included a disproportionate number of students present in the operating room (5), a lack of patients in the operating room for the students to assist (6), and the simultaneous presence of students from other fields in the operating room (4). The strong points of the clinical environment included a suitable relationship among the anesthesiology staff and assigning such behavior as a model (13); these items obtained higher scores than the others.

According to data concerning the clinical environment, the maximum score was 63 on the 21 items in this domain; the achieved mean score was 36.59 ± 8 . The condition of this domain was therefore considered average from the viewpoint of anesthesiology students.

According to Table 2, the major problems concerning clinical education included lack of total coordination between practical work and theoretical knowledge (2) and

conflict between educational objectives and the ward expectations (3). The strong points in this area included sensitivity of the educators concerning on-time presence of the students at bedside (22), respecting ethical principles by the educators at bedside environment (23), access to educators in operating room during internship (24), and proper connection between the educators and students with the patients and staff (18).

In this domain, the obtained mean score was 66.75 ± 14.16 out of maximum possible score of 93. Because it gained more than 66% of the total score, the condition of this domain was therefore considered good.

According to Table 3, the most serious problems concerning clinical education in the domain of students' characteristics included the presence of medical students in the operating room (10) and inappropriate influence on clinical education due to competition for clinical guidelines (9). The strong points of this domain included on-time presence of the students in the operating room (3), non-compliance with some unscientific and inaccurate measures that may sometimes be done by some of the staff in the care of patients (11), and enough confidence in carrying out related duties in a bedside environment (5).

In this domain, the mean score of 24.09 ± 4.6 was achieved out of the maximum possible score of 33. This condition was considered good from the viewpoints of the anesthesiology students as it represented 66% of maximum possible score in this domain.

In the three domains studied, problems related to the clinical environment were generally selected by the students. This was the only domain that earned an average score, while the two other domains obtained good scores. According to the data combined from all three domains, the mean score was 23.68 ± 127.56 out of maximum possible score of 189 on the 63 items, which represented more than 66% of the maximum possible score. Clinical education was therefore generally good from the viewpoint of anesthesiology students.

5. Discussion

The purpose of this study was to investigate the problems of clinical education for senior under graduate anesthesiology students from Fasa and Jahrom universities from the perspective of the students. The students evaluated educators, schools, and student characteristics in three domains of their clinical environment. The results of this study showed that the students' greatest concern for their clinical education in these three domains was related to the clinical environment. The Ghorbanian et al. (25) study revealed the different result that clinical educators were the most important concern.

Table 1. Attitude of Senior Anesthesiology Students concerning clinical Training in the Clinical Environmental^a

Variables	Disagree	Average	Agree	No Response
Atmosphere of operating room is educationally appropriate.	15 (27.3)	29 (52.7)	11 (20)	
There is enough attraction for me to be present and learn in operating room.	18 (32.7)	21 (38.2)	16 (29.1)	
My learning condition in operating room is appropriate.	13 (23.6)	29 (52.7)	12 (21.8)	1 (1.8)
Simultaneous presence of students from various fields, including nursing, medicine and so on in operating room has nonnegative effect on the quality of clinical education.	42 (76.4)	5 (9.1)	8 (14.5)	
The number of students present in the operating room is proportionate to the physical space.	48 (87.3)	4 (7.3)	3 (5.5)	
There are enough patients proportionate to the number of students.	43 (78.2)	7 (12.7)	5 (9.1)	
Due to the presence of students from other fields, you have the right amount of procedures to do.	33 (60)	18 (32.7)	4 (7.3)	
The facilities in operating room are enough to learn.	27 (49.1)	18 (32.7)	10 (18.2)	
Suitable facilities are available in the ward for students.	36 (65.5)	18 (32.7)	1 (1.8)	
There is proper management on behalf of operating room supervisor to improve learning.	26 (47.3)	18 (32.7)	11 (20)	
The operating room supervisor is a committed and compassionate to clinical training for students.	19 (34.5)	24 (43.6)	12 (21.8)	
Monitoring performance of Anesthesia staff is desirable.	26 (47.3)	15 (27.3)	14 (25.5)	
Communicating with anesthesia staff is suitable with patients and can be a model for me.	23 (41.8)	13 (23.6)	19 (34.5)	
Anesthesia personnel carry out their procedures in a standard way.	21 (38.2)	22 (40)	12 (21.8)	
Sterile issues are observed satisfactorily in operating room.	14 (25.5)	28 (50.9)	13 (23.6)	
Relationship of the staff with each other is good and can be a model for me.	14 (25.5)	23 (41.8)	18 (32.7)	
Staff relationship with students is satisfactory.	16 (29.1)	23 (41.8)	16 (29.1)	
Staff volunteered to participate eagerly to educate the students.	16 (29.1)	22 (40)	17 (30.9)	
There is no discrimination between anesthesiology students and other students on behalf of staff.	30 (54.5)	8 (14.5)	17 (30.9)	
There is no discrimination between anesthesiology students and other students on behalf of the physicians.	39 (70.9)	6 (10.9)	10 (18.2)	
Totally, I am satisfied with the clinical environment of the operating room.	24 (43.6)	26 (47.3)	5 (9.1)	

^aData are expressed as No. (%).

The most frequent problems in the clinical environment included disproportion between the physical space of the operating room and the number of students present, an insufficient number of patients for students, and the simultaneous presence of students from other fields. In the study of Ghorbanian et al. (25), 71.8% of anesthesiology and surgical technologists mentioned that an insufficient number of patients for students is one of most serious problems in clinical training. One way to enhance clinical skills is repetition and practice. Educational opportunities decrease if the number of the students is high compared to the number of patients; such an imbalance is considered one of the most serious hindrances in clinical education. Resources and patients must be available to learn the minimum (5).

Yazdankhah Fard et al. (4) reported that establishing a balance among the numbers of students accepted, community needs, and available educational resources can control the stressors and facilitate learning the essential

minimums. Moridi et al. (23) discussed a large number of students and lack of physical space as a stressor of clinical education; this naturally influences the quality of clinical education and is consistent with our study. In another study, lack of coordination between theoretical knowledge and practical skills in the clinical environment was proposed as one of the obstacles to the empowerment of nursing students in clinical education (1); this is also consistent with the results of our study, Dehghani et al. (22) also identified lack of educational facilities and opportunities as factors that negatively affect clinical education. It seems that reducing the number of new students admitted and, if possible, enhancing the clinical education environment would result in increased educational opportunities by partially removing clinical obstacles.

In the domain of educators and schools, lack of coordination between theoretical knowledge and practical education, and conflict between educational objectives and expectations of the ward from the students were the most

Table 2. Attitude of Senior Anesthesiology Students Concerning The Educators and the School^a

Variables	Disagree	Average	Agree	No Response
Students' duties are specified in the ward.	23 (41.8)	14 (25.5)	18 (32.7)	
There is a complete coordination between the oretical knowledge and practical works	31 (56.4)	15 (27.3)	9 (16.4)	
There is no conflict between educational objectives and the expectations of the ward from the students	27 (49.1)	15 (27.3)	13 (23.6)	
The educators' evaluation by the students is considered.	22 (40)	26 (47.3)	7 (12.7)	
All stages of clinical education (observation, performance along with the educator, independent performance) are observed by the educators.	12 (21.8)	19 (34.5)	24 (43.6)	
Proper time is assigned to clinical education	18 (32.7)	19 (34.5)	18 (32.7)	
The educational facilities of the ward are used appropriately.	12 (21.8)	26 (47.3)	17 (30.9)	
Sufficient supervision is applied by the college.	25 (45.5)	18 (32.7)	12 (21.8)	
Clinical educators enjoy clinical skill, knowledge, and experiences.	16 (29.1)	15 (27.3)	23 (41.8)	1 (1.8)
Clinical educators try to update their information.	17 (30.9)	19 (34.5)	19 (34.5)	
Clinical educators accept their shortcomings and try to resolve them.	17 (30.9)	17 (30.9)	21 (38.2)	
Clinical educators use modern clinical methods of education.	23 (41.8)	18 (32.7)	14 (25.5)	
Clinical educators provide appropriate opportunities to the students for learning and questions and answers	9 (16.4)	25 (45.5)	21 (38.2)	
Appropriate conferences are programmed with educational purposes by the instructor.	16 (29.1)	15 (27.3)	24 (43.6)	
Clinical instructors reduce students' anxiety appropriately	16 (29.1)	21 (38.2)	18 (32.7)	
Students' independence would be maintained by the instructor.	16 (29.1)	20 (36.4)	19 (34.5)	
The instructor trusts the students in proper positions and some duties are assigned to the students.	11 (20)	15 (27.3)	29 (52.7)	
The instructor establishes a good relationship with students, patients, and staff.	7 (12.7)	16 (29.1)	32 (58.2)	
Supervision of the instructors is appropriate.	7 (12.7)	26 (47.3)	22 (40)	
The instructors are caring and committed and make themselves responsible toward the students' education.	9 (16.4)	21 (38.2)	23 (41.8)	2 (3.6)
The instructors are able to manage and plan correctly in various clinical situations.	12 (21.8)	19 (34.5)	22 (40)	2 (3.6)
In the case students are not blamed, the instructor supports them against other staff and students.	10 (18.2)	15 (27.3)	28 (50.9)	2 (3.6)
Instructors are appropriate ethical and educational models for students.	6 (10.9)	25 (45.5)	22 (40)	2 (3.6)
Instructors respect ethical codes in clinical environment.	3 (5.5)	16 (29.1)	34 (61.8)	2 (3.6)
Instructors are sensitive for on time presence of students in bedside environment.	3 (5.5)	9 (16.4)	41 (74.5)	2 (3.6)
Instructors are available any time in operating room during internship.	6 (10.9)	15 (27.3)	32 (58.2)	2 (3.6)
Number of students under the supervision of the each instructor is sufficient.	18 (32.7)	15 (27.3)	20 (36.4)	2 (3.6)
Clinical educators are interested in clinical education and have enough patience.	7 (12.7)	22 (40)	24 (43.6)	2 (3.6)
In the case of no limitation, students' opinions are considered in planning.	10 (18.2)	20 (36.4)	23 (41.8)	2 (3.6)
In general, the performance of clinical instructors is satisfactory.	8 (14.5)	23 (41.8)	22 (40)	2 (3.6)
In general I am satisfied with the school planning in clinical environment.	21 (38.2)	21 (38.2)	11 (20)	2 (3.6)

^aData are expressed as No. (%).

serious problems. In their study, Zaighami et al. (24) concluded that a lack of coordination between theoretical knowledge and practical skills is one of the problems in clinical education; it is consistent with our study. To create more effective learning, it is therefore necessary to have coherence between theoretical and practical courses and

eliminate the educational gap between the classroom and the bedside.

In their study, Peyman et al. (5) reported that 47.8% of students declared that there is no coordination between the educational goals and the expectations of the department, which was introduced by Delaram on the behalf of

Table 3. Attitude of Senior Anesthesiology Students Concerning Student Characteristics^a

Variables	Disagree	Average	Agree	No Response
I am interested in my field.	13 (23.6)	13 (23.6)	27 (49.1)	2 (3.6)
I have enough motivation in learning materials related to my field in clinical environment.	9 (16.4)	14 (25.5)	30 (54.5)	2 (3.6)
I am present in the ward at the due time and leave on time.	2 (3.6)	7 (12.7)	44 (80)	2 (3.6)
I have no stress in the ward or it is in the lowest level.	4 (7.3)	19 (34.5)	30 (54.5)	2 (3.6)
I have enough confidence in carrying out my duties related to the clinical environment.	3 (5.5)	16 (29.1)	34 (61.8)	2 (3.6)
I do not feel weak as an anesthesiology student.	13 (23.6)	18 (32.8)	22 (40)	2 (3.6)
I do not have any humiliating experience on behalf of educators and staff.	21 (38.2)	14 (25.5)	18 (32.7)	2 (3.6)
I do not have any humiliating experience of behalf of physicians.	23 (41.8)	15 (27.3)	15 (27.3)	2 (3.6)
The presence of medical students in the operating room has no bad influence on the education of anesthesiology students.	36 (65.5)	8 (14.5)	9 (16.4)	2 (3.6)
The presence of medical students increases the quality of clinical education among anesthesiology students.	37 (67.3)	9 (16.4)	7 (12.7)	2 (3.6)
I would not follow unscientific and inaccurate measures sometimes done by a number of anesthesia personnel in taking care of the patient.	4 (7.3)	9 (16.4)	40 (72.7)	2 (3.6)

^aData are expressed as No. (%).

the majority of the students (18). Shahbazi et al. (26) also demonstrated that students believe there is no coordination between departments and students, which is consistent with our results. Ghodsbin and Shafakhah quoting from Lorry Poor writes: "In many cases, working staff can indirectly influence the clinical education and sometimes they even weaken the role and place of the educator, so specialists have named them as a hidden effective factor of clinical education" (27). In addition, educational purposes may not have been well-designed. According to researchers, developing realistic goals and appropriate facilities and conditions are effective in improving the quality of clinical education. These factors should always be considered in developing programs of clinical education (28). In the present study, students reported that more supervision would benefit their clinical education. This finding is supported by the study of Ghorbanian et al. (25) who reported that about 50% of anesthesiology students and surgical technologists reported insufficient levels of clinical training supervision.

In the domain of students' characteristics, the simultaneous presence of medical students in the ward was proposed as the biggest problem of clinical education. Due to the large number of students and the small number of patients, which was previously discussed, perhaps the lack of interaction with this group of students performing clinical activities could be identified as the source of this problem.

Another problem identified by the students was humiliating experiences in the ward. This issue, along with

the discrimination between anesthesiology students and other students by the physicians and personnel, is considered as a stressor in clinical education. Intensive stress during the training period may have a negative effect on student learning and clinical success (29). Moridi et al. (23) also indicated that humiliating experiences were stressors of clinical education, which is consistent with our study. The "professor warning in the presence of the ward staff and doctors" was identified as the maximum stressful factor. Yazdankhah Fard et al. (4), quoting from Sacky, reported that the main factors causing stress are deprecation of the students by the educator in presence of others and an ineffective relationship between the educator and student during an internship. Given that clinical educators play key roles in controlling stress, failing to motivate and support students in the clinical learning environment can perhaps be the result of the educators' heavy workload. Ghorbanian et al. (25) also reported that clinical educators play a significant role in decrease stress and increasing students 'self-esteem. High numbers of students, limited physical space, and educators with little work experience and knowledge of communication skills could contribute to such a result.

In relation to discrimination between different students by the health care team, Moridi et al. (23) also named it as a stressor in clinical education, which is consistent with our study. Effective education, especially in the bedside environment, requires an educational environment that is conducive to providing effective care to patients. Educational environments could reduce stress and enhance

the confidence of learners through mutual respect and communication. This not only facilitates learning at the bedside, but also motivates students to work in a bedside environment with the patients, all of which leads to effective patient care (5).

One strength of our study was the sample size, which benefited by accepting subjects from two universities. One of its weaknesses was the necessity of completing the questionnaire in a crowded educational program.

Therefore, developing better clinical learning spaces and balancing the number of the students to the available space is recommended to increase the quality of education. Revising the lesson curriculums to match theoretical learning with practical learning is also necessary. Furthermore, the best program should be planned to achieve the best use of the operating rooms and to prevent the simultaneous presence of students from other fields.

Positive factors that currently exist include a beneficial model for relationship among the anesthesiology staff; sensitivity of the educators to the on-time presence of students at the bedside; educators respecting ethical principles in clinical environment; access to educators in the operating room during internships; proper relationships among the educators, students, patients, staff; and the on-time presence of the students in the operating room. Existing negative factors include the practice of some unscientific procedures and failing to express enough confidence in carrying out duties. These issues should be improved and positive feedback is given when they are.

In general, clinical educators could prepare a more proper situation in the clinical environment to achieve the aims of clinical training. The education system should also assess the key factors that affect clinical education and develop systematic programs to enhance the quality of clinical education. Because of the few studies in the anesthesiology field, more studies with larger sample sizes in other Iranian universities should be conducted and clinical education problems should be assessed.

According to this study's results, the condition of the clinical education of anesthesia students was favorable. Among the domains studied, only the clinical environment was deemed average by the anesthesiology student subjects. The results revealed that limited clinical learning space and a large number of students were the most serious problems in the environment domain. In addition, a mismatching of theoretical issues with the practical (in the educator domain) and the simultaneous presence of students from other fields in the operating room (in the student domain) were the most serious factors for clinical education. Precise planning by education officials is necessary to remove present problems and enhance clinical education for medical students.

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Footnotes

Authors' Contribution: Study concept and design and drafting the manuscript: Ali Abbasi Jahromi; study supervision and drafting the manuscript: Shohreh Javadpour; data collection: Mahdi Amirkhani and Saeedeh Rahmani; technical and material support: Ali Dehghani; analysis and interpretation of data: Saeed Sobhanian; translated the manuscript: Morteza Gholami.

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