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Amendable challenges and barriers in clinical education from perspectives of surgical technology, anesthesiology students, and clinical instructors of Mazandaran University of Medical Sciences

Background: Clinical education is the most critical component of surgical technology and anesthesiology student's education. Therefore, this study was designed to determine the amendable challenges and barriers of clinical education from the viewpoints of operating room and anesthesia students and clinical instructors.

Methods: In this descriptive cross-sectional study, 132 students (surgical technology and anesthesiology) and 17 clinical instructors of Sari Allied School were selected by consensus method. Data collection was performed using the Demographic and researcher-made questionnaire about the amendable challenges and barriers of clinical education. Data were analyzed by SPSS software version 20.

Results: From the viewpoints of students, the most challenge and barrier was "lack of suitable space for clinical education". Also, the most amendable barriers were "lack of clinical educators". From the clinical educators' perspective, the most challenges and barriers to clinical education were respectively; a large number of students in the ward and low motivation of students for teaching.

Conclusion: The challenges and obstacles that can be corrected in clinical education from the perspective of surgical technology and anesthesiology students were the lack of instructors in the clinic. And from the point of view of clinical educators, there were a large number of students in the clinic; however, there was less motivation for students to learn. It is necessary to improve the quality of clinical education in these two fields and improve education.

Key words: Clinical training, Educational challenges, Surgical technology, Anesthesiology, Students

تحديات و عوائق قابلة للتعديل في التعليم السريري من وجهة نظر طلاب التكنولوجيا الجراحية و طلاب التخدير و المعلمين السريريين في جامعة مازندران للعلوم الطبية

الخلفية: التعليم السريري هو العنصر الأكثر أهمية لتعليم الطلاب في مجالين دراسيين تكنولوجيا الجراحة والتخدير. لذلك، تم تصميم هذه الدراسة لتحديد التحديات والعوائق القابلة للتعديل في التعليم السريري من وجهة نظر طلاب تكنولوجيا الجراحة و طلاب التخدير و المعلمين السريريين.

الطريقة: في هذه الدراسة الوصفية المقطعية، تم اختيار ١٣٢ طالبًا (التكنولوجيا الجراحية والتخدير) و ١٧ مدربًا سريريًا من كلية ساري للعلوم الطبية بطريقة الإجماع وإجراء جمع البيانات باستخدام الاستبيان الديموغرافي و الباحث حول التحديات القابلة للتعديل و الحواجز في التعليم السريري. تم تحليل البيانات بواسطة برنامج SPSS الإصدار ٢٠.

النتائج: من وجهة نظر الطلاب، كان التحدي الأكبر و العائق هو "عدم وجود مساحة مناسبة للتعليم السريري". أيضًا، كانت أكثر الحواجز التي يمكن تعديلها هي "قلة عدد المعلمين السريريين" و من وجهة نظر المعلمين السريريين، كانت معظم التحديات والعوائق أمام التعليم السريري على التوالي؛ كثرة عدد الطلاب السريريين و ضعف الدافع التعليمي للطلاب.

الخلاصة: التحديات والعقبات التي يمكن تصحيحها في التعليم السريري من وجهة نظر طلاب تكنولوجيا الجراحة و طلاب التخدير كان قلة عدد المدرسين في العيادة. و من وجهة نظر المعلمين السريريين، كان عظم عدد الطلاب في العيادة مع ضعف الدافع التعليمي للطلاب. من الضروري تحسين جودة التعليم السريري في هذين المجالين و تحسين التعليم.

الكلمات المفتاحية: التدريب السريري، التحديات التربوية، تقنيات الجراحية، التخدير، الطلاب

چالش ها و موانع قابل اصلاح آموزش بالینی از دیدگاه دانشجویان تکنولوژی جراحی اتاق عمل، هوشبری و مربیان بالینی دانشگاه علوم پزشکی مازندران

زمینه و هدف: آموزش بالینی حیاتی ترین رکن آموزش دانشجویان اتاق عمل و هوشبری را به خود اختصاص داده است؛ بنابراین این مطالعه با هدف تعیین چالش ها و موانع قابل اصلاح آموزش بالینی از دیدگاه دانشجویان اتاق عمل و هوشبری و مربیان بالینی تدوین گردید.

روش: در این مطالعه توصیفی-تحلیلی، ١٣٢ دانشجوی (اتاق عمل و هوشبری) و ١٧ مربی بالینی دانشکده پیراپزشکی ساری به روش نمونه گیری در دسترس انتخاب شدند. جهت جمع آوری اطلاعات شامل از پرسشنامه اطلاعات و پرسشنامه محقق ساخته چالش ها و موانع قابل اصلاح آموزش بالینی استفاده گردید. جهت تجزیه تحلیل داده ها از نرم افزار SPSS نسخه ٢٠ استفاده گردید.

یافته ها: از دیدگاه دانشجویان، بیشترین چالش ها و موانع مرتبط به: نبود فضای مناسب برای آموزش در بالین بود. همچنین، بیشترین مانع قابل اصلاح از دیدگاه دانشجویان مربوط به کمبود مربیان در بالین بود. از دیدگاه مربیان بالینی، بیشترین چالش ها و موانع آموزش بالینی به ترتیب شامل: تعداد زیاد دانشجویان در بالین و انگیزش پایین دانشجویان جهت یادگیری بود.

نتیجه گیری: چالش ها و موانع قابل اصلاح آموزش بالینی از دیدگاه دانشجویان تکنولوژی جراحی اتاق عمل و هوشبری کمبود مربیان بالینی و از دیدگاه مربیان بالینی تعداد زیاد دانشجویان در بالین و انگیزش پایین دانشجویان جهت یادگیری بود که لازم است با تعدیل کیفیت آموزش بالینی در این دو رشته برطرف شده و آموزش ارتقاء یابد.

واژه های کلیدی: آموزش بالینی، چالش های آموزشی، تکنولوژی جراحی، هوشبری، دانشجویان

مازندران یونیورسیتی آف میڈیکل سائنس میں آپریشن روم میں سرجری ٹکنالوجی اور (اینسٹیسی سیا) بے ہوشی کے طلبا نیز کلینیکل مدرسین کی نظر میں موجود قابل اصلاح رکاوٹیں اور چیلنج

بیک گراؤنڈ: اس تحقیق میں ایک سو بیس طلباء اور سترہ اساتذہ نے شرکت کی۔ ان طلباء اور اساتذہ کا تعلق ساری پیرا میڈیکل فیکلٹی سے تھا۔ طلباء اور اساتذہ کی نظر جاننے کے لئے ایک سوالنامہ بنایا گیا جس میں کلینیکل تعلیم کے لئے درپیش رکاوٹوں اور چیلنجز کے تحت سوالات کئے گئے تھے۔ دینا کا تجزیہ ایس پی ایس ایس ٹونفی سافٹ ویئر سے کیا گیا۔

نتیجے: طلباء کی نظر میں کلینیکل تعلیم کے لئے مناسب فضا کا نہ ہونا سب سے اہم رکاوٹ قرار دی گئی تھی، اس کے علاوہ طلباء نے یہ بھی کہا کہ اساتذہ کی کمی بھی ایک اہم مشکل ہے جسے حل کیا جانا چاہیے۔ کلینیکل ٹیچروں کی نظر میں طلباء کی زیادہ تعداد اور تعلیم سے فرار کرنا اہم رکاوٹیں ہیں۔

سفارش: آپریشن روم میں سرجری ٹکنالوجی اور (اینسٹیسی سیا) بے ہوشی کے طلبا نیز کلینیکل مدرسین کی نظر میں موجود قابل اصلاح رکاوٹیں اور چیلنجز سے یہ پتہ چلتا ہے کہ طلباء اور اساتذہ کی جانب سے بتائی گئی رکاوٹوں کو دور کیا جائے تاکہ تعلیمی معیار میں پیشرفت ہو سکے۔

کلیدی الفاظ: کلینیکل تعلیم، رکاوٹیں، آپریشن روم، بے ہوشی

INTRODUCTION

As a general rule, universities are considered as a knowledge-producing and transferring entity, as well as a manpower supply specialist in the community which continuously examine their present status and analyze the issues in order to identify bottlenecks and their causes and provide practical solutions to improve the quality of education (1).

Clinical education is an essential and important part of medical education, without which it would be difficult or impossible to train qualified and competent people (2).

Clinical teaching can be considered as learning facilitating activities in a clinical setting in which clinical instructors and students are equally involved and aim to make measurable changes within the student (3).

In fact, the aim of clinical education is to teach how to apply theoretical knowledge in real clinical situations and provide an opportunity to institutionalize the physician and nursing role in students (2), so that all students at the end of their study course will be able to carry out the various skills they have learned (4).

Although the role of clinical and theoretical education in teaching medical students is relatively similar, but for medical students, especially surgical technology and anesthesiology students, the clinical education have great importance to educate these two fields (5).

It is important to note this fact about clinic that, the clinic is the only part to create integrity between theoretical knowledge and clinical practice (6). In fact, no matter how well-suited the quality of instruction is provided, this training is not fixed unless appropriate clinical education is provided (7).

Research in the field of clinical education problems suggests that clinical education should identify the factors affecting the quality and quantity of clinical education and identify the negative or inhibitory factors of education as educational problems (3).

A study in Iran showed that, according to students, teachers, and staff of health centers there is not an optimal coordination between theoretical learning and clinical services in health centers (8).

Understanding the amendable barriers of clinical education seems essential (9). Accordingly, and based on the studies conducted, the barriers of clinical education include stress, lack of facilities in the department, degrading experiences in the clinical setting, lack of experienced mentors for training in the clinical education environment, and the lack of cooperation of the healthcare team (10-12).

On the other hand, paying attention to the views of students about their expected clinical learning environment has a role in increasing their motivation and learning levels (13).

Accordingly, in a clinical evaluation of nursing students about problems and clinical educators, students stated that their greatest concern was the lack of relevance of the clinical evaluation form to the internship situation, the disparity of equipment and facilities available in the area for training students, and disproportion of department capacity to the number of students (14).

Considering the importance of clinical education in shaping

the basic skills and professional capabilities of medical students and considering the operating room and anesthesia applicability, it is concluded that in recent years many faculties of medical sciences tend to assess the clinical education status as a basic element of their plans (15, 16).

Unfortunately, most of the research related to clinical education is in the field of quality assessment or addressing its barriers, and little attention has been paid to barriers that can be corrected and repaired. Reporting these cases to educational and hospital administrators can have important results in removing barriers and shortcomings of clinical education. Therefore, the purpose of this study is to examine the challenges and barriers that can be corrected from the perspective of students and clinical instructors.

METHODS

In this descriptive cross-sectional study that was performed in Mazandaran University of Medical Sciences, all students of the surgical technology and anesthesiology and clinical instructors of the Sari Allied School of Mazandaran University of Medical Sciences were enrolled. The study was carried out over 6 months from February to July 2019. The inclusion criterion was a minimum of 1 year of experience in clinical teaching for clinical instructors and spending at least one semester in the operating room as an apprenticeship for students; however, the unwillingness to participate was consider as the exclusion criterion. 132 students of surgical technology and Anesthesiology (Response Rate (RR):88%) and 17 clinical instructors (RR:68%) were selected through consensus sampling.

The data gathering tool was a researcher-made questionnaire based on studies in clinical education (6, 17, 18). The first part included demographic information including age, gender, academic field, and the second part included a questionnaire for assessment the perspective of students and trainers. Clinical features of the barriers in clinical education included 4 areas of clinical instructors' performance (12 items), students' performance (7 items), management and planning (9 items) and personnel (8 items), and the third part of questionnaire included investigation of amendable challenges and barriers of clinical education from viewpoints of students and mentors.

It should be noted that in the second part of the evaluation form, there were differences between students and trainers. In the students' section, there were three areas of clinical instructors' performance, management and planning, and personnel, and in the clinical instructors' section three fields of student performance, management and planning, and personnel were sounded. The validity of this questionnaire was done using the face and content validity, i.e., the questionnaire was given to 10 faculty members of Mazandaran University of Medical Sciences, and after collecting the comments, the relevant comments were applied by considering their correctional comments. The reliability of the questionnaire was determined using Cronbach's alpha test ($r = 0.94$).

This study was approved by the Ethical Research Committee of Mazandaran University of Medical Sciences. The questionnaires were distributed among the participants

without mentioning the name in the study and the participants were assured of the confidentiality of the information. Data were analyzed by SPSS software version 20 using descriptive statistics independent t-test, and Chi-square.

This study was approved by the Research Committee of Mazandaran University of Medical Sciences (IR.MAZUMS.REC.1398.5611).

RESULTS

The mean age of students in this study was 23/42 ± 6.1 years. 53 (40.2%) students were male and 79 (59.8%) were female. 82 (62.1%) of the participants were students of the

surgical technology and 50 (37.9%) were anesthesiology students. On the other hand, the mean age of clinical educators was 43.2 ± 8.04 years. 47.1% of clinical educators were male and 52.9% were female. The average work experience of clinical educators was 18.67 ± 9.29 years. 52.9% of them were operating room trainers and 47.1% of them were anesthesia trainers. 76.5% of the trainers had a bachelor degree, 17.6% had a master degree, and 5.9% had a PhD. Regarding to the challenges and barriers of clinical education based on students' opinion, the most mentioned barriers were related to the area of management and planning (77.11%), personnel (72.12%), and clinical educators' performance (59.84%) (table 1).

Table 1. Students' opinion about clinical education challenges and barriers in Sari Allied school

Opinion	Domain	Challenges	Percentage
Students	Management and planning	Lack of suitable space for education and conferences in the clinic	(89.7%)
		Weakness and disorder in clinical planning	(85.6%)
		Shortage of equipment in the clinic	(84.1%)
		High rate of students in the clinic	(81.1%)
		Lack of clinical educators	(80.3%)
		Lack of coordination between offered courses and clinical work	(75.8%)
		Lack of clarity in clinical assessment in the clinic	(72.7%)
		Less coordination between the faculty and hospital	(69.7%)
		Limited cases in the operating room	(56.8%)
	Personnel	Unsatisfactory habits by personnel in the operating room	(69.7%)
		Lack of support for students in the clinic	(67.9%)
		Lack of feedback to students	(67.4%)
		Inappropriate treatment with students	(65.2%)
		Inappropriate patient care by staff	(62.9%)
		Lack of respecting rights of patients by staff	(62.1%)
		Feeling of low professional commitment	(61.4%)
		Inappropriate treatment with clinical educators	(39.4%)
	Performance of clinical instructor	Inconsistency between practical training and theoretical education with clinical education	(71.2%)
		Discriminating between students by clinical educators	(67.4%)
		Nonobservance of the clinical education	(67.4%)
		Lack of paying attention of the trainer to the educational needs of the students in the field of clinical education levels	(65.9%)
		Lack of emphasis of the educators on pre study	(64.4%)
		Not informing students about their strengths and weaknesses about apprenticeship	(64.4%)
		Not using modern form of educational methods by educators	(62.9%)
		Expectations of students for doing untrained skills	(60.6%)
		Emphasis on theoretical lesson in apprenticeship hours	(59.1%)
Lack of giving feedback to the student during the internship period	(53%)		
Inconsistency of clinical education with the patient's needs	(52.3%)		
Assigning heavy and difficult tasks to students	(29.5%)		

From the perspective of clinical instructors, the most challenging domains were students' performance (27.5%), management and planning (24.5%), and personnel (14.63%) respectively. (table2).

Also, from viewpoints of students, the most amendable domains were management and planning (73.8%), clinical

instructors' performance (70.26%), and personnel (68%) respectively.

And finally from clinical instructors' perspective, the most amendable domains were management and planning (26.03%), students' performance (24.62%), and personnel (14.63%), respectively (table 3).

Table 2. Clinical instructors' opinion about clinical education challenges and barriers in Sari Allied school			
Opinion	Domain	Challenges	Percentage
Clinical instructor	Students performance	Students' low motivation	-48.30%
		Lack of decision-making power independently in the field of performing technical skills	-31%
		Lack of timely presence of students in the operating room	-27.60%
		Lack of cooperation between students	-24.10%
		Lack of student support by other students in the operating room	-20.70%
		Poor students' literacy	-20.70%
		Students inadequate learning strategies	-20.70%
	Management and planning	High rate of students in the clinic	-58.60%
		Lack of suitable space for education and conferences in the clinic	-41.40%
		Shortage of equipment in the clinic	-31%
		Weakness and disorder in clinical planning	-24.10%
		Shortage of clinical educators	-24.10%
		Less coordination between the faculty and hospital	-20.70%
		Limited cases in the operating room	-20.70%
	Personnel	Lack of clarity in clinical assessment in the clinic	-13.80%
		Lack of coordination between offered courses and clinical work	-6.90%
		Unsatisfactory habits by personnel in the operating room	-24.10%
		Lack of support for students in the clinic	-24.10%
		Lack of feedback to students	-20.70%
		Inappropriate treatment with students	-17.20%
		Inappropriate treatment with clinical educators	-13.80%
Feeling of low professional commitment	-10.30%		
Inappropriate patient care by staff	-6.90%		
Lack of respecting rights of patients by staff	-6.90%		

Table 3. Students and clinical instructors' opinion about amendable challenges and barriers in Sari Allied school			
Opinion	Domain	Amendable barriers	Percentage
Students	Management and planning	Shortage of clinical educators	-84.80%
		Weakness and disorder in clinical planning	-84.80%
		Lack of coordination between offered courses and clinical work	-79.50%
	Performance of clinical instructors	Lack of emphasis of the educators on pre study	-82.60%
		Inconsistency between practical training and theoretical education with clinical education	-76.50%
		Not informing students about their strengths and weaknesses about apprenticeship	-75%
	Personnel	Unsatisfactory habits by personnel in the operating room	-76.50%
		Lack of feedback to students	-72%
		Lack of respecting rights of patients by staff	-72%

Table 3. Continued			
Opinion	Domain	Amendable barriers	Percentage
Clinical instructors	Management and planning	High rate of students in the clinic	-51.70%
		Lack of suitable space for education and conferences in the clinic	-37.90%
		Shortage of equipment in the clinic	-31%
	Students performance	Students' low motivation	-41.40%
		Lack of timely presence of students in the operating room	-27.60%
		Lack of decision-making power independently in the field of performing technical skills	-27.60%
		Lack of support for students in the clinic	-24.10%
	Personnel	Unsatisfactory habits by personnel in the operating room	-24.10%
		Lack of feedback to students	-24.10%

To compare the perspective of surgical technology and anesthesiology students about the challenges and barriers, there was a significant relationship between students' perspective and management and planning barriers ($p=0.039$); however, more surgical technology students complained about management and planning than anesthesiology students.

There was not a significant relationship between students' perspective and personnel and clinical instructors' performance ($p=0.709$), ($p=0.967$) respectively.

To compare students' perspective about amendable barriers in clinical education, there was a significant relationship between students' perspective and management and planning ($p=0.046$); therefore, more surgical technology students believed that these challenges and barriers will be amendable than anesthesiology students; but there was not a significant relationship between students' perspective and personnel and clinical instructors' performance ($p=0.437$), ($p=0.769$) respectively.

To compare clinical instructors' perspective about the challenges and barriers, there was not a significant relationship between clinical instructors' perspective about management and planning, students' performance, and personnel ($p=0.124$), ($p=0.124$), ($p=0.344$) respectively.

And finally there was not also a significant relationship between clinical instructors' perspective about amendable barriers in management and planning, students' performance and personnel domains ($p=0.353$), ($p=0.158$), ($p=0.460$) respectively.

DISCUSSION

In this research, the amendable challenges and barriers of clinical education based on viewpoints of surgical technology and anesthesiology students and clinical instructors were examined in four domains of clinical instructors' performance, students' performance, management and planning, and personnel.

One of the most challenging barriers based on surgical technology and anesthesiology students' perspective was management and planning, and based on clinical trainers' points of view was students' performance. In this regard, the

results of this study was in consistent with the study of Moghadarikoosha et al (19) which stated the most challenging barriers from nursing students' perspective were goals and program in the internal surgical group, nonalignment of students' education with training goals in the department in the pediatric group, the lack of coordination between the theoretical knowledge and clinical activities in the mental group, inappropriate training time in the department and management group, and the lack of holding daily conferences in the clinical setting to increase the students' academic ability.

Also, Dehghani et al (20) which studied about clinical education problems in the field from clinical instructors' and nursing students' viewpoints, concluded that planning, job description, and coordination between faculty and medical units at Yazd- Shahid Sadoughi Nursing and Midwifery Faculty are relatively desirable from the trainers' and nursing students' viewpoints, and there is no shortage of instructors, but the lack of equipment and appropriate educational and welfare opportunities to practice skills, lack of scientific background in department, student's unwillingness and escape from clinical work, and lack of proper skill in patient care, the efficacy of clinical education in this period are difficult.

On the other hand, Bahrami Babaheidary et al (21), in a study examining the challenges of clinical education from the perspective of surgical technology and anesthesiology students, found that the goals and educational programs were the most challenging and the least challenging areas of clinical education in monitoring and evaluation; the results of Bahrami Babaheidary et al study were in line with the viewpoints of the students in this study from the viewpoint of being challenging in the field of planning and management, while the results of Bahrami Babaheidary et al study regarding to monitoring and evaluation, differed substantially from the result of this study. Unclear monitoring and evaluation was one of the most challenging in this study; but Bahrami Babaheidary et al considered this area to be the least challenging.

The lack of clarity of the evaluation process in the clinic was a significant barrier in this study, which should consider it

importantly with process of evaluating the students' strengths and weaknesses, so the students seek to resolve their weaknesses and increase their strengths. In this regard, the results of this study were consistent with the results of Heidari (22), Tahernezhad (23) and Omidvar (24) studies.

In this research, from the clinical instructors' points of view, the most challenging barrier was the students' motivation and their interest in learning clinical skills. The results of this study were compared with Rahimi and Ahmadi (3) study. On the other hand, Shafie et al (25) provided a way to increase students' interest in learning at the clinic. Based on their perspective of passing affairs to students and transferring responsibility to them, supporting the students by the trainer and creating the opportunity to repeat the various skills were considered as facilitating factors to learn clinical skills for students.

According to the trainers and students in this study, one of the serious challenges and barriers to clinical education was the mismatch between practical training and theoretical education with clinical education, or, in other words, the gap between theoretical and practical education. The results of this study were consistent with Duff (1), Azemian (2), Zilembo (7), Ip WY(13) studies. Lack of proper equipment in clinic was a significant barrier in this research, which was consistent with Omidvar (24) and Masoodi (26) studies.

The performance of clinical instructors as a guideline for students to learn clinical skills was one of the most challenging barriers in this study. According to students' opinion, in this study, the inability of the trainer to use modern educational methods was a serious challenge to clinical education, which these results coincided with Rahimi and Ahmadi (3) study.

Finally, a domain that was regarded by students as well as by educators as a challenge and barrier to clinical education was personnel, among which students and mentors considered the staff s' misconduct to students and lack of support and lack of giving appropriate feedback to students as a challenges and barrier of clinical education; the result of this study is in line with Jokar et al (27), Alavi et al (28) and Pournamdar et al (29) studies.

It seems that the large number of medical students and the lack of educational infrastructure, including the severe shortage of educational hospitals in most cities of Iran, is one of the most important causes of mismanagement and planning of medical universities to set up internships for

medical students. And professionalism in students is considered as a result of which subsequently causes clinical dissatisfaction among students.

From the viewpoints of students, the most challenges and barriers was "lack of suitable space for clinical education", and from the clinical instructors' perspective the most challenges and barriers to clinical education were respectively the "large number of students in the ward and low motivation of students for teaching".

Despite many challenges and barriers to clinical education, students and clinical instructors in Sari Allied School of Mazandaran University of Medical Sciences believed that many of these barriers can be remedied. In this regard, the collaboration of students, clinical educators, hospital staff, and responsible managers is crucial. At the same time, by reducing these challenges and barriers and improving the quality of clinical education, training of skilled and trained personnel is possible. This improves the quality of health care; therefore, it is recommended to conduct research with an interventional approach to improve the quality of clinical education.

The limitations of this study are the absence of open questions in the questionnaire and the lack of investigation of clinical education status in other faculties of Mazandaran University of Medical Sciences. Therefore, it is suggested that the researchers conduct a wide-ranging study of clinical education in Medical Universities of Iran.

Ethical considerations: Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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