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Evaluation of the clinical educational environment based on the DREEM model from the viewpoint of the OR students

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Abstract:

BACKGROUND: The most important part of learning happens in the clinic. To determine the differences between the real educational environment and the desirable environment, the DREEM[1] model is used. The present study was conducted to evaluate the clinical educational environment based on the DREEM model from the viewpoint of the OR[2] students of the Lorestan University of Medical Sciences.

MATERIALS AND METHODS: The present descriptive-analytical cross-sectional study evaluated the viewpoint of 118 students of operation room (OR) technology using the DREEM (Dundee Ready Educational Environment Measure) questionnaire in the hospitals affiliated with the Lorestan University of Medical Sciences during the second semester of 2020. The DREEM questionnaire has 50 statements and is divided into five sections, which are rated on a five-point Likert scale (0–4). The data were analyzed using frequency distribution tables, mean and standard deviation indices, Mann-Whitney and Kruskal-Wallis tests. Data analysis was conducted using IBM SPSS Statistics 22.0. IBM Corp.; 2013. and the level of significance was set at 0.05.

RESULTS: The total perception of the students of the clinical educational environment was good and excellent in 73.8% of the cases and of the subscales was also good (50.8%–63.2%). There was a significant relation between the total score of students' perception of the clinical educational environment and age ($Z = 5.618$, $P < 0.001$), semester ($\chi^2 = 43.929$, $df = 3$, $P < 0.001$), internship hospital ($\chi^2 = 12.948$, $df = 6$, $P = 0.044$) and also the mean score of the subscales ($P < 0.001$). As the GPA[3] and interest in the major increased, the mean score of total perception and its subscales also increased except for perception from the educators ($P < 0.05$).

CONCLUSION: According to the results, the studied students had a positive perception of the clinical educational environment. It is recommended that the scientific foundation of the educators, the physical facilities of the operating rooms, and social communication should be strengthened to improve the care, treatment, and educational services. It will be useful to use the results to improve the accreditation level of medical centers.

Keywords:

Education, DREEM, learning environment, operating room

1 Dundee Ready Educational Environment Measure
2 Operation Room
3 Grade Point Average

Background

The complicated process of learning is based on increasing students' learning.[1] The environment and basis of higher education have various capacities for students' learning and knowledge creation.[2] A great part of professional learning completes in the clinic and one of

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the most important effective factors in it is the dominant environment in education that would strengthen positive behaviors toward educational improvement by creating motivation. In other words, its measurement would provide a comprehensive and systematic picture of the education process which is necessary for improving the quality of medical education.[3]

About 50% of the educational activities in medical faculties are assigned to clinical activities. Therefore, the focus must be on the learning needs of the students and providing an appropriate educational environment for improvement and assuring their competence in clinical skills.[4] The clinical environment is the main core of education and contains the place for education and learning theoretical and practical courses. Students' feedback on the educational environment is an important factor in the success of education and sufficient learning. The World Federation for Medical Education believed that the evaluation of the educational environment is an important factor in evaluating the educational curriculum and learning.[5] The clinical environment contains all the cognitive, cultural, social, psychological, emotional, educational, and motivational factors.[6] Paying more attention and giving importance to the education of skills for the students have a great effect on professional learning in clinical education.[7]

Studies have shown that problems such as unclarity of clinical goals, lack of coordination between theoretical courses and clinical activities, lack of a developed internship program, insufficient familiarity of the professors with methods of group clinical teaching, the unreality of the performed evaluations, the tension in the clinic, lack of self-confidence, inappropriate relationships, insufficient facilities, and lack of learning assist tools would prevent the achievement of the goals of clinical education.[8,9] Therefore, determining the problems in clinical education and taking measures for correcting them, would lead to an improvement in the quality of medical services.[9]

Evaluation is an important pillar in educational programs and could guide education from the static mode into the dynamic mode.[10] One of the evaluation tools for the educational environment that has been used widely since 1997 for problems of educational programs and also for the effectiveness of change in education or determining the differences between the real educational environment and desirable environments is DREEM (Dundee Ready Educational Environment Measure) model.[11] Operation room (OR) technology major is one of the important majors in medical sciences which requires high professional and scientific skills. One of the practical methods for evaluating the quality of clinical education in this major is reviewing the viewpoints of the students.[12] Despite the conducted research in the country for evaluating the problems of clinical education, due to the differences in educators, students, and educational systems in each academic institute, short-term evaluation of the problems of clinical education separately for each institute seems necessary; because applying the achieved results, could have an important role in the qualitative and quantitative improvement of clinical education.[13] Since the educational environment has a significant impact on the effectiveness of the OR students' education, and according to studies, the evaluation of the clinical environment of the operating room has been given less attention,[3,8] to create a new and comprehensive approach to the sensitive and important environment of surgery and the operating room, the present study was conducted to evaluate the environment of clinical education based on DREEM model from the viewpoint of OR students of Lorestan University of Medical Sciences.

Materials and Methods

Study design and setting

In the present descriptive-analytical cross-sectional study, the study population included all the bachelor's students of OR technology at all the hospitals affiliated with the Lorestan University of Medical Sciences in the second semester of 2020.

The inclusion criteria were willingness to participate in the study and being a student in the 4th to 8th semester of continuous OR technology or the second to 4th semester of discontinuous OR technology. In case of unwillingness to participate in the study, samples were allowed to withdraw from the study at any stage.

Study participants and sampling

The sampling method was the complete enumeration of all the intended students (146) during the period of the study. Students engaged in internships completed the study tool (124). Finally, 118 questionnaires were completed and received (Response rate = 81%).

Data collection tool and technique

The data gathering tool was a two-part standard DREEM questionnaire. The first part contained demographic characteristics and the second part contained 50 questions in 5 domains: 12 questions for students' perception of learning, 11 questions for students' perception of the professors, 8 questions for students' perception of their own scientific ability, 12 questions for students' perception of the educational environment, and 7 questions for students' perception of the social condition of the education. Questions were scored based on a 5-point Likert scale including totally agreed (4 points), agreed (3 points), not sure

(2 points), disagreed (1 point), and totally disagreed (0 points). A total final score within the range of 0-0 was considered as an undesirable viewpoint, within 51–100 was considered semi-desirable, within 101–150 was considered desirable, and within 151–200 was considered completely desirable.

Each of the domains was categorized into four ranks. In the domain of learning, scores from 0 to 12 was considered very weak, 13 to 24 was a negative viewpoint toward learning, 25 to 36 was a positive viewpoint toward learning, and 37 to 48 was satisfaction with learning. In the domain of professors, scores from 0 to 11 was undesirable, 12 to 22 was requiring re-education, 23 to 33 was moving in the right path, and 34 to 44 was the desirable model. In the domain of students' perception of their own scientific ability, scores from 0 to 8 was a feeling of complete failure, 9 to 16 was various negative dimensions, 17 to 24 was satisfactory, and 25 to 36 was assured and encouraging. In the domain of the educational environment, scores from 0 to 12 was a horrible and terrifying environment, 13 to 24 required many changes in the educational environment, 24 to 36 was a more positive approach, and 37 to 48 was an overall good viewpoint. In the domain of students' perception of the social condition of education, scores from 0 to 7 was a really bad condition, 8 to 14 was an inappropriate environment, 15 to 21 was not too bad, and 22 to 28 was a really good society.[5,14]

This questionnaire has been used in Iran several times and its reliability and validity have been approved.[3] The total Cronbach's α for this questionnaire is 0.88 and for its domains of learning, professors, scientific ability, educational environment, and social condition were respectively 0.75, 0.72, 0.71, 0.73, and 0.71.[15]

Data were analyzed using frequency distribution tables, mean, standard deviation, and Mann-Whitney and Kruskal-Wallis tests. Data were analyzed using IBM SPSS Statistics 22.0. Armonk, NY: IBM Corp.; 2013 at a significant level of 0.05.

Ethical consideration

After the approval of the research project (1161), an ethics code was obtained from the ethics committee of the university (IR.LUMS.REC.1399.038). Explaining the goals of the study, obtaining informed consent, assuring of the confidentiality of the data, registering the data without the name, and respecting the principle of secrecy, were observed.

Results

About 118 students completed the questionnaire and returned it to the researcher. Table 1 shows the demographic characteristics of the participating students [Table 1].

Table 1: Demographic characteristics of the participating students

Characteristics		No.	Percent
Age	Less than 20	3	2.5
	20–30	95	80.5
	Higher than 30	20	16.9
Semester	4th continuous bachelor	34	28.8
	6th continuous bachelor	34	28.8
	8th continuous bachelor	28	23.7
	2nd discontinuous bachelor	5	4.2
	4th discontinuous bachelor	17	14.4
Hospital	Shohaday-e-Ashayer	39	33.1
	Shahid Rahimi	19	16.1
	Asali	7	5.9
	Shahid Madani	9	7.6
	Social services	11	9.3
	Imam Jafar Sadegh	12	10.2
	Shahid Valian	21	17.8
Gender	Female	75	63.6
	Male	43	36.4
Interest in major	Very low	9	7.6
	Low	13	11.0
	Moderate	40	33.9
	High	46	39.0
	Very high	10	8.5
GPA of the passed courses	Lower than 15	4	3.4
	15 to 16.99	64	54.2
	17 and higher	50	42.4

Table 2 shows students' perception level of the clinical educational environment and its subscales based on the DREEM model.

Table 3 shows the mean score for each of the subscales of perception of the clinical educational environment (DREEM model) of the study students based on their demographic characteristics.

Mann-Whitney/Kruskal-Wallis test showed a significant statistical relation between the mean score of the subscale of perception of learning and age ($P < 0.001$, Z=5.363), semester ($P < 0.001$, df = 3, $x^2 = 42.116$), gender ($P = 0.014$, Z = -2.457) and interest in major ($P = 0.003$, df = 4, $x^2 = 15.861$). The mean perception of learning was higher among students older than 30 (35.7) than among students younger than 30 (24.4). The mean score of perception of learning was higher in female students (27.9) than in male students (23.5).

There was a significant statistical relation between the mean score of the subscale of perception of professors and age ($P < 0.001$, Z = 5.047), semester ($P < 0.001$, df = 3, $x^2 = 35.410$), and hospital ($P = 0.019$, df = 6, $x^2 = 15.151$). The mean score of perception of professors was higher

Table 2: Students' perception of the clinical educational environment based on the DREEM model and its subscales

Level of perception from clinical educational environment		No.	Percent	Mean±standard deviation	Range
Perception of learning	Weak (very weak)	8	6.8	26.31±8.487	9-45
	Moderate (negative viewpoint toward learning)	39	33.1		
	Good (Positive viewpoint toward learning)	57	48.3		
	Excellent (satisfaction with learning)	14	11.9		
Perception of professors	Weak (undesirable)	0	0	27.44±7.057	13-43
	Moderate (need for re-education)	38	32.2		
	Good (On the right path)	56	47.5		
	Excellent (desirable model)	24	20.3		
Perception of their own scientific ability	Weak (feeling of total failure)	2	1.7	20.06±5.066	6-31
	Moderate (various negative domains)	25	21.2		
	Good (satisfactory)	73	61.9		
	Excellent (assured and encouraging)	18	15.3		
Perception of the educational environment	Weak (horrible and terrifying environment)	0	0	29.17±6.351	14-46
	Moderate (many items must be changed)	29	24.6		
	Good (more positive approach)	75	63.6		
	Excellent (total positive viewpoint)	14	11.9		
Perception of social condition of educational environment	Weak (too bad)	6	5.1	15.88±4.440	6-27
	Moderate (inappropriate)	41	34.7		
	Good (not too bad)	60	50.8		
	Excellent (real good society)	11	9.3		
Total score of perception	Weak	0	0	118.86±27.079	68-189
	Moderate	31	26.3		
	Good	73	61.9		
	Excellent	14	11.9		

Table 3: The mean score of perception of the clinical educational environment and subscales in the students based on demographic characteristics

Demographic Characteristics		Mean±standard deviation					
		Perception of learning	Perception of professors	Perception of their own scientific ability	Perception of educational environment	Perception of social condition of educational environment	Total score of perception
Age	18–30	24.4±7.7	25.9±6.5	19.1±4.8	27.7±5.5	15.1±4.1	112.2±23.2
	Higher than 30	35.7±5.7	35.0±4.3	25.0±3.3	36.2±5.6	20.0±3.7	151.7±20.1
Semester	4th continuous bachelor	26.1±7.7	27.3±6.7	20.6±4.5	28.5±5.2	15.6±3.6	118.1±22.3
	6th continuous bachelor	22.9±7.1	25.7±5.6	17.7±4.6	26.4±5.1	14.9±4.6	107.4±20.3
	8th continuous bachelor	22.7±6.8	23.7±6.6	18.3±4.5	27.5±5.4	14.0±3.8	106.1±21.8
	2nd and 4th discontinuous bachelor	36.5±4.9	35.1±4.2	25.1±3.4	36.8±5.1	20.4±3.2	153.9±18.2
Hospital	Shohaday-e-Ashayer	25.6±7.4	27.4±6.1	20.3±3.8	27.8±5.7	15.9±3.4	116.9±21.3
	Shahid Rahimi	25.9±8.9	29.2±6.9	19.6±5.4	30.3±5.7	16.4±4.3	121.5±26.8
	Asali	30.1±9.7	25.4±9.2	23.1±4.3	32.7±5.8	16.9±3.8	128.3±30.7
	Shahid Madani	29.3±10.3	29.2±8.3	21.7±4.9	31.8±8.7	17.1±6.0	129.1±36.7
	Social services	32.0±8.3	33.5±7.0	23.3±5.3	34.4±7.7	18.4±5.0	141.5±31.3
	Imam Jafar Sadegh	26.0±5.1	22.5±5.7	17.7±5.3	28.4±3.9	14.1±5.0	108.7±17.3
	Shahid Valian	22.7±9.2	25.5±6.1	18.0±5.6	26.1±5.4	14.2±4.7	106.5±26.6
Gender	Female	27.9±8.1	28.1±7.3	20.8±5.0	30.2±6.5	16.8±4.2	123.9±27.3
	Male	23.5±8.5	26.2±6.4	18.7±4.9	27.3±5.7	14.3±4.5	110.0±24.5
Interest in major	Very low	19.7±5.6	25.2±8.1	18.2±4.3	26.1±3.3	12.7±2.1	101.9±13.2
	Low	28.8±10.5	27.2±9.1	21.5±5.1	31.2±7.6	16.2±5.6	124.7±35.7
	Moderate	28.1±8.4	29.5±6.9	20.9±4.4	30.6±6.5	17.2±3.9	126.2±25.9
	High	24.3±7.7	26.2±6.3	18.5±5.4	27.4±6.1	14.8±4.6	111.1±25.6
	Very high	31.3±6.6	27.7±6.6	23.9±3.8	31.9±4.5	18.2±2.9	133.0±19.4
GPA of the passed courses	Lower than 17	25.1±8.7	27.9±7.0	19.5±5.3	28.3±6.1	15.1±4.4	115.9±27.1
	17 and higher	27.9±8.1	26.8±7.2	20.8±4.7	30.3±6.5	16.9±4.4	122.9±26.7

in students older than 30 (35.0) than in students younger than 30 (25.9).

Mann-Whitney/Kruskal-Wallis test showed a significant statistical relation between the mean score of the subscale of perception of their own scientific ability and age ($P < 0.001$, Z = 4.923), semester ($P < 0.001$, df = 3, $x^2 = 34.174$), hospital ($P = 0.049$, df = 6, $x^2 = 12.530$) and interest in major ($P = 0.027$, df = 4, $x^2 = 10.954$). The mean score of perception of their own scientific ability was higher in students older than 30 (25.0) than in students younger than 30 (19.1).

There was a significant statistical relation between the mean score of the subscale of perception of the educational environment and age ($P < 0.001$, Z = 5.064), semester ($P < 0.001$, df = 3, $x^2 = 35.891$), hospital ($P = 0.009$, df = 6, $x^2 = 17.117$), gender ($P = 0.016$, -2.401), interest in major ($P = 0.023$, df = 4, $x^2 = 11.319$) and GPA of the passed courses ($P = 0.045$, Z = 2.006). The mean score of perception of the educational environment was higher in students older than 30 (36.2) than in students younger than 30 (27.7). The mean score of perception of the educational environment was higher in female students (30.2) than in male students (27.3).

Mann-Whitney/Kruskal-Wallis test showed a significant statistical relationship between the mean score of perception of the social condition of education and age ($P < 0.001$, Z = 4.482), semester ($P < 0.001$, df = 3, $x^2 = 30.081$), gender ($P = 0.004$, Z = -2.911), interest in major ($P = 0.006$, df = 4, $x^2 = 14.555$), and grade point average (GPA) of the passed courses ($P = 0.025$, Z= 2.240). The mean score of perception of the social condition of education was higher in students older than 30 (20.0) than in students younger than 30 (15.1). The mean score of perception of the social condition of education was higher in female students (16.8) than in male students (14.3).

Mann-Whitney/Kruskal-Wallis test showed a significant statistical test between the mean score of total perception of the educational environment and age ($P < 0.001$, Z= 5.618), semester ($P < 0.001$, df = 3, $x^2 = 43.929$), hospital ($P = 0.044$, df = 6, $x^2 = 12.948$), gender ($P = 0.012$, Z= -2.517) and interest in major ($P = 0.005$, df = 4, $x^2 = 14.924$). The mean score of total perception of the educational environment was higher in students older than 30 (151.7) than in students younger than 30 (112.2). The mean score of total perception of the educational environment was higher in female students (123.9) than in male students (110.0).

Discussion

Evaluation of the learning-educational environment as an index could be used in the process of educational management and effectiveness. The present study was conducted to evaluate the clinical educational environment based on the DREEM model. The mean score of total perception (118.86) indicated the overall positive viewpoint of the students toward the clinical educational environment. The achieved total mean score in the present study was lower than the achieved score in similar studies conducted nationally and internationally, such as the studies by Brown *et al*.[15] in Australia (137 out of 200), Sharifi *et al*.[11] in Tehran (143.08 out of 200), Zolfaghari *et al*.[16] in Birjand (155.03 out of 200), and Vatankhah *et al*.[17] in Kerman (159.18 out of 200). This difference might indicate a better theoretical and clinical educational environment and ongoing self-evaluation of the educational system at those medical faculties. But in similar studies in Hormozgan (39.104)[13] and Tehran (99.6),[18] the mean score of total perception was lower than the present study.

In the present study, a significant relation was observed between the total and subscales of perception of the clinical educational environment mean scores with age. The total and subscales' mean score of perception were higher among participants who were older than 30 than those who were younger than 30. Study of Zolfaghari *et al*.[16] (2015) was in line with the present study. Study by Palmgren *et al*.[19] (2011) in Scandinavia and Hassanabadi *et al*.[10] (2015) showed that, unlike the present study, from the viewpoint of the students, the overall educational environment had no significant relation with students' age.

According to the results, the mean score of total perception and subscales was higher in students of discontinuous bachelor and then in students of the 4th semester of continuous bachelor. In other words, the total score of perception of the clinical educational environment and its subscales decreased in students of a continuous bachelor as their semester got higher. In India, Thomas *et al*. (2009) compared the educational environment between first and last year students of dentistry. According to the results, both groups had a negative viewpoint toward the social condition. Also, both groups agreed on the self-centered performance of the professors.[12] Some studies have not reported any significant relation between the score of perception of the clinical educational environment and semester in all subscales, which was not in line with the present study.[10,19,20]

According to the results, the total mean score of perception and its subscales was higher in female students than in male students. Some studies reported no significant difference between the two genders.[10,19,21,22] But results of the study by Moosavi *et al*.[23] were in line with the present study. They believed that this

difference was due to the higher critical spirit in female students and considered it as the importance of gender in determining educational needs.

Results indicated that, as the interest in majors increased, the total scores of perceptions and their subscales also increased. Jalili *et al*.[22] (2015) mentioned interest in the field of clinical psychology students as the reason for the increase in the learning subscale. Zolfaghari *et al*.[16] (2015) also consider students' interest in clinical departments as the reason for the difference in students' attitudes. One of the characteristics of a capable professor is to make students interested in the profession.[24]

Results also indicated that an increase in GPA led to an increase in the total score of perception and its subscales except for the perception of the professor. In other words, students with GPAs higher than 17 had a less positive perception of the professors than the students with a GPA lower than 17. According to studies by Hassanabadi *et al*.[10] (2015), the total educational environment and its subscales were not influenced by students' GPA, which was not in line with the results of the present study.

Limitations and recommendation

The small number of participants and performing the study in one medical university were the limitations of the present study. Furthermore, due to the coronavirus (Covid-19) pandemic, according to the regulations by the Ministry of Health, changes were made in the time and method of performing the internship courses, which might have an effect on the results of the present study.

It is recommended that to achieve more certain results for making decisions at the macro level of education and optimizing educational environments, the present study would be repeated on larger scales and in more normal conditions.

Conclusion

Results of the present study showed that OR students of Lorestan University of Medical Sciences had a positive viewpoint toward their clinical educational environment. Results also indicated the need for empowering the professors and optimizing the clinical educational environments for OR students. Therefore, using these results for empowering the scientific foundation of the professors and equipping the ORs and improving its physical facilities, and enhancing social relationships in the OR, the ground for providing better educational services and consequently better care and medical services could be prepared.

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Conflicts of interest

There are no conflicts of interest.

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