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Brief Report

Assessing the Educational Climate in Operating Rooms at Teaching Hospitals Affiliated with Birjand University of Medical Sciences from the Perspectives of Operating Room and Anesthesiology Students

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Abstract

Background: The educational environment is defined as the academic atmosphere within a university from the perspectives of all its members, and the clinical environment, as an indispensable and vital component of clinical education, plays a crucial role in achieving educational goals.

Objectives: The present study aimed to assess the educational environment of operating rooms in teaching hospitals affiliated with Birjand University of Medical Sciences.

Methods: This descriptive-analytical cross-sectional study was conducted on 266 undergraduate operating room and anesthesiology students at Birjand University of Medical Sciences in 2023. Sampling was performed in a convenience and purposeful manner from eligible educational departments. The Iranian Measure of Operating Theater Educational Climate (IMOTEC) questionnaire was employed for data collection. Data were analyzed using Mann-Whitney U and Kruskal-Wallis tests in SPSS software at a 95% confidence level.

Results: The mean score of the operating room educational climate was assessed as favorable (68.68 ± 19.48). Among the demographic variables, it was reported that age and academic semester had significant relationships with the mean score of the operating room educational climate (P = 0.026).

Conclusion: Most operating room and anesthesiology students at Birjand University of Medical Sciences perceived the operating room educational climate as favorable. However, it is advisable for responsible authorities to make decisions that improve the quality of education and minimize educational disparities across centers.

Keywords: Education; Operating Room; Teaching Hospital; Students

Background

The educational environment, defined as the academic atmosphere within a university from the perspectives of all its members, is widely recognized for its impact on student success, satisfaction, and achievement (1). In universities of medical sciences, clinical education constitutes a fundamental and crucial component across all disciplines. This form of education enables students to apply theoretical concepts in practice through interaction with instructors and the clinical environment (2). It is important to note that the learning of medical students in clinical environments is largely influenced by the effectiveness of this educational environment. Inadequate planning in this area can culminate in challenges, ultimately resulting in deficient professional skills and reduced efficacy among graduates (3). Experts in medical education believe that the educational environment, despite its intangible

nature, has a fundamental, real, and pervasive impact on student learning. This environment profoundly influences students' learning experiences, and a positive educational environment is crucial for effective learning (4). As a suitable clinical environment, the operating room provides a valuable opportunity for students to develop and advance clinical skills related to preoperative, intraoperative, and postoperative care. This allows them to integrate their theoretical knowledge with practical application and enhance their proficiency through practice and repetition (5). Paying attention to the essential point that operating room and anesthesiology students must be trained in a clinical environment due to the nature of their fields makes it essential for educational centers to further strengthen the clinical skills of such students (6). A study by Towliat et al. revealed that one of the most significant challenges in clinical education, from the perspectives of operating room students, is the educational environment (7). Similarly, in a study by Negash and Hanago, the attitudes of anesthesiology students toward their educational environment were positive but not excellent, suggesting a need for further efforts to improve the educational environment and enhance students' academic success (8). In this regard, research has consistently recommended continuous evaluation of the educational environment's quality as a fundamental step in improving educational quality (9).

Given the existing research and the importance of the educational environment, particularly in clinical education, and considering that the operating room serves as a site for student clinical education, this study aims to assess the educational environment of operating rooms at teaching hospitals affiliated with Birjand University of Medical Sciences.

Objectives

The present study aimed to assess the educational environment of operating rooms in teaching hospitals affiliated with Birjand University of Medical Sciences.

Methods

Research Design: This descriptive-analytical, cross-sectional study was conducted in the academic year 2023 to assess the educational environment of operating rooms at teaching hospitals affiliated with Birjand University of Medical Sciences from the perspectives of operating room and anesthesiology students.

Participants and Sampling: The study population comprised all undergraduate anesthesiology and operating room students who were undertaking their practicum and internship in the operating room environment. The sample size was estimated to be 266 participants, based on the standard deviation (SD) of the operating room climate assessment variable in Qiyami Keshtgar and Hosseini Zijood's research (10), with an effect size of 0.1 and a significance level of 0.05, utilizing Equation 1. All students from the third semester onwards were included in the study via census sampling.

Equation 1

$$n = \frac{N \times \sigma^2 \times Z^2_{1-\frac{\alpha}{2}}}{(N-1)\times d^2 + \sigma^2 \times Z^2_{1-\frac{\alpha}{2}}}$$

$$N = 266,\ \sigma = 14.32,\ d = 0.1,\ \alpha = 0.05$$

The inclusion criteria included a willingness to participate in the study and the completion of at least one operating room internship credit. Consequently, students in their first and second semesters were excluded from the research. The exclusion criteria included incomplete questionnaires (more than 20% of questions unanswered) and students who were transfer or guest students.

Instruments

The Iranian Measure of Operating Theater Educational Climate (IMOTEC), a localized version of the Surgical Theater Educational Environment Measure (STEEM), was utilized as the assessment instrument. This questionnaire comprises two sections. The first section gathers demographic information (including age, gender, and academic semester). The second section consists of 30 questions. The quality of the educational climate is assessed across five domains: Coaching (14 questions), interaction with operating room staff (5 questions), learning opportunities (5 questions), workload (3 questions), and support (3 questions).

The IMOTEC questionnaire uses a five-point Likert scale, ranging from 0 to 4 (0 = strongly disagree, 1 = almost disagree, 2 = almost agree, 3 = agree, and 4 = strongly agree). This 30-item questionnaire has a total score range of 0 to 120. The scoring for the educational climate is evaluated as follows: A score in the first range (0-29.9) indicates a highly unfavorable educational climate; a score in the second range (30-59.9) signifies an unfavorable climate; a score in the third range (60-89.9) represents a favorable climate; and a score in the fourth range (90-120) denotes a highly

favorable educational climate. The validity and reliability of the IMOTEC questionnaire were examined in a study by Karami et al., in such a way that content validity confirmed its validity, and its reliability was reported as 0.85 using Cronbach's alpha (11). In the present study, the reliability of each dimension and the total scale was also calculated, yielding a Cronbach's alpha of 0.93. Additionally, the Cronbach's alpha values for the dimensions of coaching, interaction with operating room staff, learning opportunities, workload, and support were 0.97, 0.83, 0.76, 0.71, and 0.84, respectively.

Data Collection Methods

The researcher personally introduced themselves to the students, explained the study's purpose and methodology, and then provided questionnaires to those willing to participate. Students completed the questionnaires self-reportingly in the presence of the researcher. Necessary explanations regarding data confidentiality and non-judgment were provided to the participants to control for confounding factors.

Central tendency and dispersion indices, along with frequency tables, were utilized for data analysis. Due to the non-normal distribution of some variables, non-parametric tests, such as Mann-Whitney and Kruskal-Wallis, were employed. Ultimately, data were analyzed using SPSS version 26 (IBM Corporation, Armonk, NY).

Results

A total of 266 individuals participated in the present study [189 women (71.1%) and 77 men (28.9%); mean age = 21.68 ± 1.25 years]. Among them, 161 (60.5%) were operating room students and 105 (39.5%) were anesthesiology students, ranging from the third to the eighth academic semester (Appendix, Table 1). The assessment of the operating room educational climate revealed that the mean score of the operating room educational climate from the students' perspectives was 68.68 ± 19.48, indicating a favorable level (Appendix, Table 2). Additionally, analyses showed that 57.5% (n = 153) of the students believed that the operating room educational climate was at a favorable level (Appendix, Table 3).

According to the Kolmogorov-Smirnov test results, the total score of the operating room educational climate is a non-normally distributed variable (P = 0.002). Consequently, the accuracy of all hypotheses was examined using non-parametric tests. Accordingly, no significant association was observed between gender and the mean score of the operating room educational climate (P = 0.799), whereas a significant association was found between age and the mean score of the operating room educational climate (P = 0.026). Moreover, a significant association was observed between academic semester and the mean score of the operating room educational climate (P < 0.001) (Table 1).

Data analysis revealed a significant difference in the mean scores of the operating room educational climate across various hospitals in the province (P < 0.001). Hazrat-e-Rasoul Hospital in Ferdows recorded the highest mean score, while Imam Reza Hospital in Birjand had the lowest.

A significant difference was observed in the mean scores of the coaching domain across various hospitals in the province (P < 0.001). The highest mean score for this domain, from the students' perspectives, was reported at Chamran Hospital in Ferdows. Similarly, a significant difference was found in the interaction with operating room staff domain among the province's hospitals, with Hazrat-e-Rasoul Hospital in Ferdows exhibiting the highest mean score. Furthermore, significant differences were identified in the learning opportunities domain across the hospitals (P = 0.033), where Chamran Hospital in Ferdows had the highest mean score.

However, no significant difference was noted in the mean scores of the workload domain among various hospitals (P = 0.214), though Hazrat-e-Rasoul Hospital in Ferdows showed the highest mean in this domain. Finally, no significant difference was observed in the support domain across the hospitals (P = 0.949). Nevertheless, Imam Khomeini Hospital in Tabas recorded the highest mean score in this domain (Table2).

In the present study, a significant difference was observed in the mean scores of the operating room educational climate between anesthesiology and operating room fields of study (P < 0.001). The operating room field of study reported a higher mean score of 72.43 ± 16.25, indicating that operating room students perceived the operating room climate as more favorable than anesthesiology students. Moreover, a significant difference was observed between operating room and anesthesiology fields of study in the coaching domain, with operating room students evaluating the operating room educational climate to be more favorable (mean score = 10.82 ± 37.88).

In the interaction with operating room domain staff, no significant difference was found between the two fields of study (P = 0.875). Operating room and anesthesiology fields of study also exhibited a significant difference in the learning opportunities domain, with operating room students again assessing the educational climate more positively (mean score = 9.78 ± 3.99). However, there were no significant differences in the workload (P = 0.209) and support (P = 0.073) domains between the two fields of study. With the exception of workload, operating room students rated the operating room educational climate better than anesthesiology students in all other domains (Table 3).

No significant difference was found in the mean total score of the operating room educational climate based on the type of operating room across the province's hospitals (P = 0.248), though the highest mean belonged to the ophthalmology operating room. Similarly, within the coaching domain, there was no significant difference among the hospital operating room types (P = 0.328); however, the neurosurgery operating room had the highest mean. No significant difference was observed in the interaction with operating room staff domain across operating room types (P = 0.598), with the ophthalmology operating room again showing the highest mean in this domain. Similarly, in the learning opportunities domain, no significant difference was observed among hospital operating room types (P = 0.624), yet the ophthalmology operating room had the highest mean. Regarding the workload domain, no significant difference existed between operating room types either (P = 0.886); however, the highest mean in this domain belonged to the urology operating room. Finally, in the support domain, there was no significant difference among hospital operating room types (P = 0.968), though the neurosurgery operating room demonstrated the highest mean in this domain (Table 4).

Discussion

The present study aimed to assess the operating room educational climate in teaching hospitals from the perspectives of operating room and anesthesiology students at Birjand University of Medical Sciences in 2023. The results showed that the mean total score of the IMOTEC questionnaire was 68.68 ± 19.48. Given the IMOTEC questionnaire's score range of 60-89.9, this score indicates a favorable climate, with over 57% of students perceiving the operating room educational climate as favorable. No significant association was found between gender and the mean score of the operating room educational climate. However, age and academic semester exhibited significant relationships with the mean score of the operating room educational climate. Moreover, the results revealed significant differences in the mean scores of various dimensions of the educational climate, as well as the mean total score of the operating room educational climate, across different hospitals in the province. Notably, Hazrat-e-Rasoul Hospital in Ferdows had the highest mean score, while Imam Reza Hospital in Birjand had the lowest.

Compared to previous domestic studies that utilized the IMOTEC questionnaire (10, 12), the mean scores in the current research were lower than those reported in the aforementioned studies (10, 12). However, the findings remain within the favorable range according to the questionnaire's classification, which aligns with existing literature.

Furthermore, the coaching domain obtained the highest score in this study, consistent with the findings of the previously mentioned research (10, 12).

Some studies utilizing different instruments to assess the operating room educational climate (1, 13, 14) align with the findings of the present research. Afrazandeh et al. reported students' favorable perspectives toward the learning environment, with findings indicating a positive attitude toward instructors (13). Similarly, Faghani et al.'s study, which investigated the educational climate from the perspectives of all students in the Faculty of Nursing, Midwifery, and Paramedicine, concluded that the overall educational climate was favorable based on the calculated total score (14). Additionally, in a study, Nasiri Ziba et al. reported a favorable quality of the educational environment from the perspectives of undergraduate operating room students (1).

The majority of students at Ardabil University of Medical Sciences across various educational groups (residents, operating room, and anesthesiology) assessed the operating room educational climate as moderate, with no specific domains deemed favorable. They attributed this perception to factors, such as non-educational staff behavior and perspectives, confusion in learning educational content, students' insufficient self-confidence, and a lack of collaborative and respectful atmosphere from physicians (15), which contradict the present study findings. Similarly, Elebute et al. reported that most surgical residents were

dissatisfied with their operating room educational climate (16).

In the present study, a significant relationship was observed between age and the total score of the operating room educational climate, which aligns with the findings of Kamali et al.'s study (12).

In the present study, students in lower academic semesters (3, 4, and 5) held more positive perspectives toward the educational climate compared to their peers in higher semesters. This finding aligns with Afrazandeh et al.'s research (14). Conversely, Mahoney et al.'s study reported greater satisfaction with the operating room environment among senior surgical interns than among junior students (17).

The results of Qiyami Keshtgar and Hosseini Zijood's research revealed a significant relationship between academic semester and the students' perspectives so that students in higher academic semesters perceived support in the operating room environment as more favorable, while those in lower semesters reported the coaching domain as more favorable (10).

Based on the present study's findings, the mean score of the operating room educational climate was higher among female students compared to male students; however, this difference was not statistically significant, which aligns with the results reported by Mohammadi et al. (18). In the present research, a significant difference was observed in the mean score of the operating room educational climate across various hospitals within the province. Conversely, no significant difference was found in the mean total score of the operating room educational climate based on the operating room type within the province's hospitals. The findings of Qiyami Keshtgar and Hosseini Zijood's research indicated no significant difference in the assessment of the operating room educational climate among the educational-therapeutic centers of Zahedan University of Medical Sciences (10), which is not consistent with the results of the current study.

Variations in research findings can be attributed to several factors, including the diversity of educational groups studied, the use of different research instruments, disparities in the facilities and resources of clinical-educational environments, inconsistencies in educational programs and teaching techniques employed by clinical instructors, the presence of multiple instructors, and differences in students' attitudes, motivation, and scientific and practical skills. Therefore, it is recommended that further studies be conducted using other standardized instruments for assessing the educational climate, and that these studies include other student groups present in the operating room, such as resident students. Additionally, it is suggested that research be undertaken to investigate the operating room educational climate both with and without the presence of an instructor (e.g., in preceptorship or mentorship models).

One limitation of the present study was gaining the trust of students for questionnaire completion. They were assured that confidentiality would be maintained and their responses would not affect their evaluations. Additionally, due to the large number of questionnaire items, sufficient time was allocated to students to ensure accurate responses. Despite these limitations, the current study assessed the perspectives of operating room and anesthesiology students within multiple hospitals at the university level.

Conclusion

The findings of the current study demonstrate that most operating room and anesthesiology students at Birjand University of Medical Sciences perceive the operating room educational climate as favorable.

Supplementary Material(s): is available here [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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Conflict of interests: There is no conflict of interest.

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Table 1. The association between the operating room educational climate and the students' demographic characteristics using Mann-Whitney and Kruskal-Wallis tests

Variable	Group	Mean (SD)	First Quartile	Median	Third Quartile	Test Statistic	P-Value
Gender	Male	68.32 (18.64)	58	71	81	-0.245	0.799
	Female	68.83 (19.86)	57.5	70	82.5		
Age (year)	Less than 20	72.40 (12.71)	65	75	81	1.303	0.521
	20-23	68.19 (20.17)	57	69	82		
	More than 23	67.44 (21.73)	51.8	70	85		
Semester	3	89.50 (9.35)	82	90.5	97.8	44.352	< 0.001
	4	75.44 (13.65)	66	78	84		
	5	81.93 (17.61)	72	81	97.3		
	6	60.81 (20.86)	47	61	77.8		
	7	63.73 (15.04)	53	63	78		
	8	67.02 (19.26)	5	67.5	80.8		

SD: Standard deviation

Table 2. Comparison of the mean scores of the Iranian Measure of Operating Theater Educational Climate (IMOTEC) domains across various hospitals in the province using the Kruskal-Wallis test

Domain	Hospital Name	Mean (SD)	First Quartile	Median	Third Quartile	Test Statistic	P-Value
Total score	Chamran	80.39 (10.63)	74	80.5	88	37.789	< 0.001
	Hazrat-e-Rasoul	85.17 (9.56)	75	84.5	95.5		
	Valiy-e-Asr	58.58 (20.22)	35	61	74		
	Razi	63.72 (25.54)	47	71	80		
	Imam Reza	63.29 (17.80)	43.3	66	78		
	Shohaday-e-Qaen	69.89 (18.15)	57	68	82		
	Imam Khomeini, Tabas	76.52 (13.01)	67.5	76	85.5		
Coaching	Chamran	44.53 (5.39)	43.3	47	48	64.806	< 0.001
	Hazrat-e-Rasoul	44.17 (5.78)	40.5	46.5	48		
	Valiy-e-Asr	25.82 (12.84)	16.5	26	40		
	Razi	31.74 (16.39)	18	39	45		
	Imam Reza	31.64 (12.74)	18	36	42		
	Shohaday-e-Qaen	35.06 (10.37)	27	35	46		
	Imam Khomeini, Tabas	41.72 (6.07)	37	43	47.5		
Interaction with operating room staff	Chamran	13.28 (4.74)	10	14	17	24.831	< 0.001
	Hazrat-e-Rasoul	16.83 (2.56)	14	17	19.3		
	Valiy-e-Asr	10.69 (5.29)	5.5	12	15		
	Razi	10.13 (5.07)	7	10	15		
	Imam Reza	10.48 (3.79)	7.3	10	13		
	Shohaday-e-Qaen	12.69 (3.85)	10	12	16		
	Imam Khomeini, Tabas	10.38 (4.68)	7	10	13		
Learning opportunities	Chamran	10.17 (3.63)	7.3	10	12	13.708	0.033
	Hazrat-e-Rasoul	8.67 (3.88)	5	10.5	11.3		
	Valiy-e-Asr	8.48 (3.91)	5	9	11		
	Razi	9.08 (5.05)	3	9	13		
	Imam Reza	8.12 (4.19)	5	8	12		
	Shohaday-e-Qaen	8.97 (4.67)	6	9	12		
	Imam Khomeini, Tabas	11.4 (2.93)	9.5	11	13.5		
Workload	Chamran	5.03 (2.85)	3	4	7	8.344	0.214
	Hazrat-e-Rasoul	8.33 (3.83)	3.8	10	11.3		
	Valiy-e-Asr	6.76 (2.62)	5	6	9		
	Razi	5.67 (3.29)	3	6	8		
	Imam Reza	5.96 (2.47)	4	6	7		
	Shohaday-e-Qaen	5.98 (3.42)	3	5	8		
	Imam Khomeini, Tabas	5.52 (3.39)	3	6	9		
Support	Chamran	7.39 (1.74)	6.3	7	9	1.651	0.949
	Hazrat-e-Rasoul	7.17 (2.79)	5.8	7.5	9.3		
	Valiy-e-Asr	6.82 (2.53)	6	7	8		
	Razi	7.10 (2.14)	6	7	9		
	Imam Reza	7.25 (2.43)	6	7	9		
	Shohaday-e-Qaen	7.19 (2.22)	6	7	9		
	Imam Khomeini, Tabas	7.55 (1.84)	6	8	8.5		

SD: Standard deviation

Table 3. Comparison of the mean scores of the Iranian Measure of Operating Theater Educational Climate (IMOTEC) domains across various hospitals in the province using the Kruskal-Wallis test

Domain	Hospital Field of Study	Mean (SD)	First Quartile	Median	Third Quartile	Test Statistic	P-Value
Total score	Anesthesiology	62.93 (22.49)	45	64	80	-3.499	< 0.001
	Operating room	72.43 (16.25)	61	74	82.5		
Coaching	Anesthesiology	30.29 (13.97)	18	30	43.5	-4.441	< 0.001
	Operating room	37.88 (10.82)	31.5	42	47		
Interaction with operating room staff	Anesthesiology	11.29 (5.13)	7.5	12	15	-0.157	0.875
	Operating room	11.68 (4.26)	9	11	15		
Learning opportunities	Anesthesiology	8.22 (4.58)	4	8	11	-3.011	0.003
	Operating room	9.78 (3.99)	7	10	12		
Workload	Anesthesiology	6.24 (3.29)	4	6	9	-1.258	0.209
	Operating room	5.68 (2.92)	3	6	8		
Support	Anesthesiology	6.89 (2.41)	6	7	8.5	-1.794	0.073
	Operating room	7.42 (2.02)	6	8	9		

SD: Standard deviation

Table 4. Comparison of mean scores of the operating room educational climate based on operating room types at hospitals affiliated with Birjand University of Medical Sciences Using the Kruskal-Wallis test

Domain	Operating Room Type	Mean (SD)	First Quartile	Median	Third Quartile	Test Statistic	P-Value
Total score	Orthopedics	67.54 (18.12)	57	68	81	6.656	0.248
	Neurology	69.51 (25.58)	56	76	85		
	Gynecology	66.29 (19.75)	54	65	82.5		
	General	69.21 (15.78)	60	68	81		
	Ophthalmology	77.95 (12.11)	70.8	76.5	90.8		
	Urology	68.83 (18.62)	53.8	75.5	80.5		
Coaching	Orthopedics	34.54 (12.44)	25	38	46	5.787	0.328
	Neurology	35.43 (15.54)	26	42	47		
	Gynecology	32.54 (13.55)	22	34	44.5		
	General	35.30 (12.07)	30	35	42.5		
	Ophthalmology	40.80 (7.72)	36.8	42.5	47		
	Urology	35.72 (10.28)	24.5	36	47		
Interaction with operating room staff	Orthopedics	11.22 (4.12)	8	11	15	3.670	0.598
	Neurology	11.11 (5.28)	8	11	16		
	Gynecology	11.51 (5.07)	7	13	16		
	General	12.12 (3.97)	9	13	15		
	Ophthalmology	13.10 (3.82)	9.3	12.5	17		
	Urology	11.28 (5.41)	8	9.5	16.5		
Learning opportunities	Orthopedics	8.67 (4.29)	5	9	12	3.496	0.624
	Neurology	9.81 (5.28)	5	9	14		
	Gynecology	9.25 (3.69)	7	10	12		
	General	8.97 (3.86)	6.5	10	11		
	Ophthalmology	10.25 (3.69)	8	11	12		
	Urology	8.78 (4.83)	4.5	9	12.3		
Workload	Orthopedics	2.86 (2.80)	4	6	7	1.720	0.886
	Neurology	5.81 (3.39)	3	6	8		
	Gynecology	5.85 (3.01)	3	6	8.5		
	General	5.48 (2.93)	3	6	7		
	Ophthalmology	6.55 (3.46)	3.3	6	10		
	Urology	6.56 (3.76)	3.8	5.5	10		
Support	Orthopedics	7.26 (2.19)	6	7	9	0.931	0.968

	Neurology	7.36 (2.01)	6	7	9		
	Gynecology	7.15 (2.27)	6	7	9		
	General	7.33 (2.37)	6	8	9		
	Ophthalmology	7.24 (1.80)	6	7.5	8.8		
	Urology	6.50 (2.66)	4.8	7.5	8.3		

SD: Standard deviation

Appendix 1. Determining the frequency of participants' demographic variables

Variable	Group	Frequency (%)
Gender	Male	77 (28.9)
	Female	189 (71.1)
Academic semester	3	10 (3.8)
	4	79 (29.7)
	5	14 (5.3)
	6	100 (37.6)
	7	11 (4.1)
	8	52 (19.5)
Operating room type	Orthopedics	87 (32.7)
	Neurology	47 (17.7)
	Gynecology	61 (22.9)
	General	33 (12.4)
	Ophthalmology	20 (7.5)
	Urology	18 (6.8)
Field of study	Anesthesiology	105 (39.5)
	Operating room	161 (60.5)
Hospital	Chamran	36 (13.5)
	Hazrat-e-Rasoul	6 (2.3)
	Valiy-e-Asr	33 (12.4)
	Razi	39 (14.7)
	Imam Reza	56 (21.1)
	Shohaday-e-Qaen	67 (25.2)
	Imam Khomeini, Tabas	29 (10.9)
Age (year)	Less than 20	43 (16.2)
	20-23	168 (63.4)
	More than 23	54 (20.4)

Appendix 2. Determination of central tendency and dispersion indices of the operating room educational climate domains from the students' perspectives

Domain	Mean (SD)	Minimum	Maximum	First Quartile	Median	Third Quartile
Coaching	34.88 (12.69)	0	48	26.8	39.5	46
Interaction with operating room staff	11.52 (4.62)	0	20	8	11	15
Learning opportunities	9.16 (4.29)	0	20	6	9	12
Workload	5.90 (3.08)	0	12	3	6	8
Support	7.21 (2.19)	0	12	6	7	9
Total score	68.68 (19.48)	0	111	58	70	82

SD: Standard deviation

Appendix 3. Frequency of the operating room climate assessment status from the students' perspectives

Operating Room Climate Assessment	Frequency (%)
Highly unfavorable	7 (2.6)
Unfavorable	70 (26.3)
Favorable	153 (57.5)
Highly favorable	36 (13.5)