



Perception of Students on the Educational Environment of Mashhad Dental School based on the DREEM Questionnaire during 2020-2021

Neda Eslami^{1,2}; Samira Farzin³; Athar Nasserri Mojarad^{4*}

¹Dental Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

²Associate Professor, Department of Orthodontics, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran

³Dentist, Private Practice, Mashhad, Iran

⁴Post-graduate Student, Department of Orthodontics, School of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran

*Corresponding author: Athar Nasserri Mojarad. Mashhad Dental School, Vakil Abad Blvd, Park Square, Mashhad, Iran

Email: nasserri.mojarad@gmail.com

Received: 2022 May 2; Revised: 2022 May 25; Accepted: 2022 May 30

Abstract

Aim: The aim of this study was to assess perception of students on the educational environment of Mashhad Dental School using the DREEM questionnaire.

Methods: In this cross-sectional study, 427 DREEM questionnaires were completed by dental students attending Mashhad Dental School during the academic year of 2020-2021. The questionnaire contained five different domains including: student perceptions of learning, student perceptions of teachers, student academic self-perception, student perception of the educational atmosphere, and students social self-perception. The overall score and the scores of each domain of the DREEM questionnaire were then compared among the students. Independent t-test and Mann-Whitney test were used for statistical analysis. $P < 0.05$ was set as significant.

Results: Both the total score and the score of each domain of the DREEM questionnaire were all less than 2. Comparing the mean scores of each domain, basic sciences students had significantly higher scores in the "student perception of learning" domain than clinical sciences students. The mean overall score of DREEM and each domain were not significant between the two sexes. There were no questions in the "acceptable" status, 36 questions were in the "problematic", and 14 were "in need of attention" status.

Conclusion: This study showed that students attending the Mashhad Dental School do not have a positive perception of the educational environment. Therefore, more coherent educational planning is required to improve the quality of the educational environment.

Keywords: Educational environment, DREEM questionnaire, students.

1. Background

The perception of students on their educational environment and the quality of education they receive affects their academic performance. In 1998, the World Federation of Medical Education emphasized the role of the learning environment as an indicator when evaluating medical education programs (1,2). In recent years this subject has been studied in medical education (3), however, this issue has received less attention in dentistry (4,5). Moreover, since behavioral determinant to learning can be attributed to the learning environment, the conclusions of assessing this

issue can be used as a diagram to illustrate the students' perception of their environment. Understanding these perceptions and attitudes can have a great impact on their academic achievement (6). Learning is the interaction between teacher and student that leads to relatively permanent and long-lasting behavioral changes in students in three areas of knowledge, skills, and attitudes (7).

Various tools have been designed for measuring medical educational environment. One of the models proposed for quantitative measurement of the educational environment was developed in 1997 by Dr. Roff at the University of Dundee in Scotland, which is called

the DREEM (Dundee Ready Educational Environment Measure). This model is used as a diagnostic tool for diagnosing curriculum problems as well as the effectiveness of changes in education or identifying the difference between the real and the desired environment. It also provides valuable information to educational administrators (8).

In 2017, Hassanabadi et al. surveyed the perception of medical students on learning environment at Rafsanjan University of Medical Sciences using the DREEM questionnaire. They found the educational environment as semi-optimal for students. Therefore, they concluded that more attention to the learning environment and more accurate planning was necessary to improve the educational environment (9). In 2017, Sayadi et al. assessed perception of students on the educational environment of the Kurdistan University of Medical Sciences based on the DREEM model. They concluded that a small percentage of students reported the educational environment as very unfavorable (10). In 2016, Chamani et al. examined the stressors of the educational environment on students of the Mashhad Dental School. This study showed the importance of reducing stress especially in third year students who have just entered the pre- and clinical courses. The study also informed professors and staff of the need to review the clinical science education program (11).

The aim of the present study was to assess students' perceptions of the educational environment of the Mashhad Dental School based on the DREEM questionnaire, which was conducted during the 2020-2021 academic year.

2. Methods

This cross-sectional study was performed at the Mashhad Dental School (Iran), and was approved by the regional ethics committee (MUMS.DENTISTRY.REC1399.047). Participants included all students of dentistry in the first to sixth year of education at the Mashhad Dental School during the academic year of 2020-2021. The DREEM questionnaire was provided to participants in the form of paper or online. Data from the questionnaire was collected without name and personal details. The questionnaire used was the Persian translation of the original DREEM questionnaire. The validity and reliability of the Persian version was confirmed by Aghamolaei and Fazel (7).

The DREEM questionnaire consists of 50 questions, and the participants answered each

question based on the Likert scale. The score of 4 indicates "completely agree", 3 "agree", and 2 "no comment", 1 "disagree", and zero strongly disagree and the overall score of the questionnaire varies from zero to 200. The higher the score, the more positive the students' perception of the educational environment. Collected data was analyzed with SPSS software version 24.

The questionnaire includes 5 different domains:

Students' perception of learning (12 questions)

Students' perception of teachers (11 questions)

Students' academic self-perception (8 questions)

Students' perception of the educational atmosphere (12 questions)

Students' social self-perception (7 questions)

Mean score of 3.5 or higher indicates the strengths and positive perception of students regarding the educational environment. Mean score of 2 or lower indicates a negative perception of students regarding the educational environment. An average score of 2 to 3 indicates that those items are in need of attention and should be improved. Reverse coding was required for items 4, 8, 9, 17, 25, 35, 39, 48, and 50. The overall DREEM score and the scores of each domain were compared according to sex, year of education, and among clinical and basic science students.

Normality of data was analyzed using the Shapiro-Wilk test. The independent t- or Mann-Whitney U-test was used to compare the DREEM scores between males and females, and also between the students taking clinical or basic medical courses (p value ≤ 0.05 is statistically significant).

3. Results

In this study, 427 students including 221 females (51.8%) and 206 males (48.2%) with questionnaire response rates of 70% answered the DREEM questionnaire. Of these, 85 participants (19.9%) completed basic medical science courses, and 342 individuals (80.1%) completed clinical courses. Demographic characteristics of participants are shown in Table 1.

	Variable	Number (%)
Sex	Male	221 (51.8)
	Female	206 (48.2)
	Basic sciences	85 (19.9)
Education Level	Clinical sciences	342(80.1)

The result of the Shapiro-Wilk test for the normality of the data distribution of the studied quantitative variables are presented in Table 2.

There was not a significant difference between the two sexes regarding mean score of DREEM ($P=0.66$). Also, none of the domains of DREEM

questionnaire showed a significant difference between males and females. (Table 4).

Table 2. The result of the Shapiro-Wilk test for the normality of the data distribution of the studied quantitative variables

Variable		Overall Grade		First Domain		Second Domain		Third Domain		Forth Domain		Fifth Domain	
		P. value	Distribution	P. value	Distribution	P. value	Distribution	P. value	Distribution	P. value	Distribution	P. value	Distribution
Sex	Male	0.031	n.n	0.019	n.n	0.089	n	0.214	n	0.401	n	0.68	n
	Female	0.002	n.n	0.395	n	0.279	n	0.001	n.n	0.059	n	0.295	n
Section	Basic Sciences	0.354	n	0.813	n	0.871	n	0.038	n.n	0.821	n	0.601	n
	Clinical Sciences	0.001	n.n	0.007	n.n	0.134	n	0.002	n.n	0.112	n	0.061	n

n, normal distribution nn, non-normal distribution

On the other hand, the average score of “students' perception of learning” was significantly higher in students of basic sciences compared to clinical sciences (p = 0.019). The overall score and the score of other domains were not significant

(Table 5).

According to Table 6, both total score and the score of each domain of the DREEM questionnaire were all less than 2, which indicates the existence of a problem in the educational environment.

Table 3. Mean overall score of DREEM and its sub-domains

DREEM domains	Mean± SD	Min- Max
Students' perception of learning	1.98 ± 0.58	0.42 - 3.92
Students' perception of teachers	1.90 ± 0.51	0.18 - 3.55
Students' academic self-perception	1.85 ± 0.59	0.00 - 3.88
Students' perception of the educational atmosphere	1.87 ± 0.51	0.17 - 3.58
Students' social self-perception	1.89 ± 0.61	0.29 - 3.57
Overall score	1.90 ± 0.44	0.26 - 3.40

Table 4. Comparison of mean score of each domain between women and men

variable	group	number	mean	S.D	min	max	median	Mann-Whitney U-test result
Students' perception of learning	Male	206	1.98	0.59	0.42	3.92	2.00	Z=0.26 P=0.796
	Female	221	1.98	0.58	0.50	3.58	2.00	
Students' perception of teachers	Male	206	1.91	0.50	0.18	3.00	1.91	T=0.45 P=0.656
	Female	221	1.89	0.52	0.45	3.55	1.91	
Students' academic self-perception	Male	206	1.83	0.57	0.00	3.38	1.88	Z=1.11 P=266
	Female	221	1.86	0.60	0.00	3.88	1.88	
Students' perception of educational atmosphere	Male	206	1.85	0.50	0.17	3.17	1.83	T=0.75 P=0.453
	Female	221	1.89	0.51	0.25	3.58	1.92	
Students' social self-perception	Male	206	1.90	0.60	0.57	3.57	1.93	T=0.27 P=0.789
	Female	221	1.88	0.62	0.29	3.43	1.86	
Total score	Male	206	1.90	0.43	0.26	3.22	1.91	Z=0.43 P=0.669
	female	221	1.91	0.45	0.38	3.40	1.94	

Table 5. Comparison of the mean scores of the fields between the basic and clinical sciences

variable	group	number	mean	S.D	min	max	median	Mann-Whitney U-test result
Students' perception of learning	Basic science	85	2.11	0.70	0.42	3.75	2.08	Z=2.34 P=0.019
	Clinical science	342	1.95	0.55	0.50	3.92	1.92	
Students' perception of teachers	Basic science	85	1.81	0.54	0.18	3.18	1.82	T=1.84 P=0.066
	Clinical science	342	1.92	0.50	0.45	3.55	1.91	
Students' academic self-perception	Basic science	85	1.80	0.66	0.00	3.13	1.88	Z=0.36 P=0.717
	Clinical science	342	1.86	0.57	0.00	3.88	1.88	
Students' perception of educational atmosphere	Basic science	85	1.89	0.57	0.17	3.42	1.92	T=0.35 P=0.726
	Clinical science	342	1.87	0.49	0.25	3.58	1.83	
Students' social self-perception	Basic science	85	1.84	0.60	0.57	3.43	1.86	T=0.85 P=0.394
	Clinical science	342	1.90	0.61	0.29	3.57	2.00	
Total score	Basic science	85	1.90	0.53	0.26	3.22	1.96	Z=0.34 P=0.733
	Clinical science	342	1.90	0.42	0.38	3.40	1.92	

Table 6. Mean scores of each question of the DREEM questionnaire

Question	Mean	SD	Condition
1. I am encouraged to participate in teaching sessions.	1.79	1.12	Problematic
2. Professors have sufficient mastery of scientific content.	1.61	1.16	Problematic
3. In this college, there is a suitable support system for students who suffer from stress.	2.33	1.28	Need attention
4. I am too tired to enjoy this course	2.13	1.18	Need attention
5. Learning strategies that worked for me before continue to work for me now.	1.92	1.10	Problematic
6. The teachers espouse a patient-centered approach to consulting.	1.83	1.04	Problematic
7. The teaching is often stimulating.	2.01	1.15	Need attention
8. The teachers ridicule their students.	1.80	1.10	Problematic
9. The teachers are authoritarian.	2.08	1.15	Need attention
10. I'm sure I will pass this year's lessons successfully.	1.64	1.17	Problematic
11. The atmosphere is relaxed during consultation teaching	1.88	1.12	Problematic
12. The school has a good schedule.	1.95	1.30	Problematic
13. Teachers' teaching is student-centered.	2.02	1.15	Need Attention
14. I am rarely bored on this course.	1.85	1.20	Problematic
15. I have good friends in college.	1.66	1.31	Problematic
16. The teaching helps to develop my competence.	1.75	1.08	Problematic
17. I am able to concentrate well.	2.08	1.16	Need Attention
18. Professors communicate well with patients.	1.81	1.06	Problematic
19. My social life is good.	1.68	1.25	Problematic
20. The teaching is well focused.	1.83	1.13	Problematic
21. The teaching helps to develop my confidence.	1.59	1.14	Problematic

22. I feel I am being well prepared for my profession.	1.87	1.08	Problematic
23. The atmosphere is relaxed during lectures.	1.81	1.06	Problematic
24. The teaching time is put to good use.	2.03	1.18	Need Attention
25. Teaching relies too much on purely scientific content.	2.15	1.09	Need Attention
26. Last year's work has been a good preparation for this year's work.	1.94	1.11	Problematic
27. I am able to memorize all I need.	1.90	1.16	Problematic
28. I seldom feel lonely.	1.83	1.18	Problematic
29. The teachers are good at providing feedback to students.	2.17	1.13	Need Attention
30. In this school, I have the opportunity to improve my skills in communicating with others.	1.76	1.14	Problematic
31. In this college, I have learned a lot about creating understanding and empathy.	1.90	1.15	Problematic
32. Professors provide constructive criticism.	1.97	1.09	Problematic
33. I feel comfortable in teaching sessions socially.	1.86	1.18	Problematic
34. The atmosphere is relaxed during seminars/tutorials.	1.89	1.13	Problematic
35. I find the experience disappointing.	1.86	1.15	Problematic
36. I am able to concentrate well.	1.88	1.15	Problematic
37. Teachers use clear examples in their teaching.	1.83	1.13	Problematic
38. In this college, the learning objectives of each lesson are clear to me.	2.04	1.16	Need Attention
39. Teachers get angry in the classroom.	2.06	1.05	Need Attention
40. Teachers come to class well prepared.	1.68	1.11	Problematic
41. Skills in solving problems in this school will improve.	1.88	1.13	Problematic
42. The enjoyment outweighs the stress of studying medicine	1.76	1.20	Problematic
43. The atmosphere motivates me as a learner.	1.81	1.14	Problematic
44. Teachers teach in a way that encourages me to learn.	1.95	1.11	Problematic
45. Most of what I have to learn is related to my future job as a doctor.	1.97	1.23	Problematic
46. I am satisfied with my place of residence (dormitory or home) at this university.	1.74	1.26	Problematic
47. In this school, long-term learning is given more importance than short-term learning (and memorization).	2.24	1.22	Need Attention
48. The teaching is too teacher-centered.	2.07	1.13	Need Attention
49. I feel I can ask or ask any question I want to.	1.92	1.14	Problematic
50. I feel able to ask the questions I want.	2.02	1.06	Need Attention

4. Discussion

In present study, 427 dental students including 221 females (8.51%) and 206 males (2.48%) answered the DREEM questionnaire. The scores of students in basic sciences were significantly higher than clinical sciences only in the "students' perception of learning" domain. Mean total score of the DREEM questionnaire was lower in men, but the difference was not statistically significant. None of the responses were "acceptable" and all of the responses were either "problematic" or "in need of attention".

There are some previous studies on the evaluation of the medical educational environment (12-15); however, there are limited studies in relation to dental students, especially in Iran. Therefore, in the present study, students' perceptions of the educational environment were

assessed based on the DREEM questionnaire in an Iranian dental school (Mashhad, Iran).

Kargozar et al. (16) evaluated the educational problems of the Mashhad Dental School in a qualitative study in which 25 dental students participated. According to the students, the most important educational problems of the Mashhad Dental School were lack of adequate education on professional ethics, the inadequacy of educational facilities in phantoms and wards, poor condition of the library, and lack of definite criteria for ranking and scoring the students. Evaluating the condition of the educational environment is one of the determining factors in academic success (17-19). Getting regular and periodic feedback from students greatly affects their success along with satisfaction with the educational environment. Therefore, it is essential for evaluating the current curriculum as well as successfully implementing the

new curriculum (20).

Dundee Ready Educational Environment Measure (DREEM), developed by Dr. Roff at the University of Dundee in Scotland in 1997, is one of the models proposed for quantitative measurement of the learning environment. This model is used as a diagnostic tool for curriculum problems as well as evaluating the effectiveness of changes in education or identifying the difference between the real and the desired environment. It can provide valuable information to educational administrators. It is designed specifically for medical schools and other health professions. Due to the high validity and reliability of the DREEM questionnaire, this tool was used to evaluate the educational environment in the present study (8).

The average score of students' perception of learning in students of basic sciences was significantly higher than clinical sciences. Similarly, in the Ostapczuk study, dental students in clinical courses had a more negative assessment of the educational atmosphere (13). Also, the study by Kossioni et al. showed that dental students' perceptions of the educational environment were more positive before entering clinical wards (15). The reason for this finding may be related to work pressure and stress of clinical wards.

Chamani et al. (11) examined the stressors of the dental environment in clinical students of the Mashhad Dental School and showed a significant difference in the mean overall stress score between students of different years. In line with this finding, Meshki et al. showed that students of nursing and midwifery (98 people), health (57 people), paramedicine (62 people), and medicine (17 people) had more satisfaction with the educational environment in the theoretical courses compared to the clinical courses (21). In contrast to these studies, Aghamolaei and Fazel studied medical students' perceptions of the educational environment at Bandar Abbas University of Medical Sciences and showed that students who took clinical courses had a more positive understanding of most subdomains of DREEM (7).

Khashayar Honaramiz Fahim et al. evaluated the educational environment from the viewpoints of medical and dental students of Shahed University based on the DREEM model in the year 2021. This study concluded that the students' perception of the educational environment was semi-desirable. These results can be used to better understand and resolve educational environment issues.

Fathi et al. examined the perceptions of nursing and midwifery students at the Kurdistan University of Medical Sciences regarding their educational environment. The results showed that in total, 8.19%

of the students evaluated the educational environment of the faculty as semi-desirable (with many problems) and 8.75% as somewhat desirable (more positive than negative). Only 1% of nursing students and 2.72% of midwifery students perceived the educational environment as somewhat favorable (more positive than negative) (23).

In 2017, Hassanabadi et al. surveyed medical students' perceptions of the learning environment at the Rafsanjan University of Medical Sciences. The quality of education for most students was assessed as semi-desirable (9). In 2014, Meshki assessed students' perceptions of the learning environments of the Gonabad University of Medical Sciences. The average total DREEM score for students was 108.52 out of 200, which indicated a more positive perception (21).

Foster et al. tested the DREEM questionnaire in a dental educational setting in New Zealand. In this study, the scores of each of the questionnaire areas were generally acceptable (14). Kossioni et al. examined students' perceptions of the educational environment in a dental school in Greece. The overall average DREEM score in this study was 56% (15). The reason for different results may be related to the different levels of satisfaction and expectations of students, and the different system of dental education in other countries.

Sex did not affect the total scores of the DREEM questionnaire in our study. Similarly, in the study of Ali et al., age, sex, and race did not have a significant effect on the overall score of DREEM (12). Also, Kossioni et al. showed that sex did not have a significant effect on the overall mean score of DREEM (15). Similar to these findings, Hassanabadi et al. showed that the general atmosphere of education perceived by medical students was not affected by sex, marital status, and age (9). In contrast, in another study by Ali et al. sex did not significantly affect the overall mean score of DREEM; however, women perceived the subdomain of "atmosphere of the educational environment" as significantly more positive.

The Mashhad Dental School is second-ranked in Iran. Evaluation of the conditions of the educational environment is one of the determining factors in academic success, and receiving regular and periodic feedback from students, greatly affects their success and satisfaction. On the other hand, gaining knowledge in this field is essential for evaluating the current curriculum as well as the successful implementation of the new curriculum, which can also be used in strategic planning. The educational environment of Mashhad Dental School has not been investigated until now. This research can provide valuable information for

stakeholders in revising the dental curriculum and can be taken into account to improve the dental education environment.

The cross-sectional nature of the study could be mentioned as the limitation of the study. Future long-term studies on the dental educational environment in different universities of Iran is recommended.

Conclusion

Both the total score and the score of each domain of the DREEM questionnaire were all less than 2, which indicated the existence of a problem in the educational environment. There was not a significant difference between the two sexes regarding mean score of DREEM. All responses were in the "problematic" or "in need of attention" status. This implies that educational administrators of the Mashhad Dental School should pay serious attention to improve the educational environment of the Dental School.

References

- Hammond SM, O'Rourke M, Kelly M, Bennett D, O'Flynn S. A psychometric appraisal of the DREEM. *BMC Med Educ* 2012;12(1):1-5. doi: 10.1186/1472-6920-12-2.
- Miles S, Leinster SJ. Medical students' perceptions of their educational environment: expected versus actual perceptions. *Med Educ* 2007;41(3):265-72. doi: 10.1111/j.1365-2929.2007.02686.x. PMID: 17316211.
- Palomo-López P, Becerro-de-Bengoa-Vallejo R, Calvo-Lobo C, Tovaruela-Carrión N, Rodríguez-Sanz D, Losa-Iglesias ME, et al. Student perceptions of the education environment in a Spanish medical podiatry school. *J Foot Ankle Res* 2018;11(1):1-10. doi:10.1186/s13047-018-0252-7.
- Soemantri D, Herrera C, Riquelme A. Measuring the educational environment in health professions studies: a systematic review. *Med Teach* 2010;32(12):947-52. doi: 10.3109/01421591003686229. PMID: 21090946.
- Divaris K, Barlow P, Chendea S, Cheong W, Dounis A, Dragan I, et al. The academic environment: the students' perspective. *Eur J Dent Educ* 2008;12(1):120-30. doi: 10.1111/j.1600-0579.2007.00494.x.
- Abraham R, Ramnarayan K, Vinod P, Torke S. Students' perceptions of learning environment in an Indian medical school. *BMC Med Educ* 2008;8(1):1-5. doi: 10.1186/1472-6920-8-20.
- Aghamolaei T, Fazel I. Medical students' perceptions of the educational environment at an Iranian Medical Sciences University. *BMC Med Educ* 2010;10(1):1-7. doi: 10.1186/1472-6920-10-87.
- Abraham RR, Ramnarayan K, Pallath V, Torke S. Perceptions of academic achievers and under-achievers regarding learning environment of Melaka Manipal Medical College (Manipal campus), Manipal, India, using the DREEM Inventory. *South-East Asian J Med Educ* 2008; 2: 18-24.
- Hassanabadi M, Zare-Bidaki M, Rezaeian M. Medical Students' Perceptions of the Educational Environment in Rafsanjan University of Medical Sciences in 2016. *JRUMS* 2017; 16(5):465-478.
- Sayadi M, Vahhabi A, Vhabi B, Sayyad S, Moradi M, Rasoulabadi M, et al. A Survey of Kurdistan University of Medical Sciences Students' Perception of the Educational Environment Based on the DREEM Model in 2015. *S J Nursing Midwifery and Paramedical* 2017;2(4): 56-67. doi: 10.29252/sjnmp.2.4.56.
- Omidkhoda M, Chamani A, Gholizadeh M. Evaluation of Stressful Factors among Dental Clinical Students of Mashhad (Iran) Dentistry School: 2016-2017. *Future Med Educ J* 2016;6(4):15-22. doi: 10.22038/FMEJ.2016.8266.
- Ali K, McHarg J, Kay E, Moles D, Tredwin C, Coombes L, et al. Academic environment in a newly established dental school with an enquiry-based curriculum: perceptions of students from the inaugural cohorts. *Eur J Dent Educ* 2012;16(2):102-9. doi: 10.1111/j.1600-0579.2011.00728.x. PMID: 22494309.
- Ostapczuk M, Hugger A, de Bruin J, Ritz-Timme S, Rotthoff T. DREEM on, dentists! Students' perceptions of the educational environment in a German dental school as measured by the Dundee Ready Education Environment Measure. *Eur J Dent Educ* 2012;16(2):67-77. doi: 10.1111/j.1600-0579.2011.00720.x. PMID: 22494304
- Foster Page LA, Kang M, Anderson V, Thomson WM. Appraisal of the Dundee ready educational environment measure in the New Zealand dental educational environment. *Eur J Dent Educ* 2012;16(2):78-85. doi: 10.1111/j.1600-0579.2011.00725.x. PMID: 22494305.
- Kossioni AE, Varela R, Ekonomu I, Lyrakos G, Dimoliatis I. Students' perceptions of the educational environment in a Greek Dental School, as measured by DREEM. *Eur J Dent Educ* 2012;16(1):73-8. doi: 10.1111/j.1600-0579.2011.00678.x. PMID: 22251357.
- Gharaei SH, Kargoza S, Amirchakhmaghi M, Gholami H. Students' Viewpoints of Mashhad Dental School about Educational Problems a Qualitative Study. *Educ Strategy Med Sci* 2015;8(2):123-130.
- Genn J. AMEE Medical Education Guide No. 23 (Part 1): Curriculum, environment, climate, quality and change in medical education—a unifying perspective. *Med Teach* 2001;23(4):337-44. doi: 10.1080/01421590120063330. PMID: 12098379.
- Genn J. AMEE Medical Education Guide No. 23 (Part 2): Curriculum, environment, climate, quality and change in medical education—a unifying perspective. *Med Teach* 2001;23(5):445-54. doi: 10.1080/01421590120075661. PMID: 12098364.
- Roff S. The Dundee Ready Educational Environment Measure (DREEM)—a generic instrument for measuring students' perceptions of undergraduate

- health professions curricula. *Med Teach* 2005;27(4):322-5. doi: 10.1080/01421590500151054. PMID: 16024414.
20. Bouhaimed M, Thalib L, Doi SA. Perception of the educational environment by medical students undergoing a curricular transition in Kuwait. *Med Princ Pract* 2009;18(3):204-8. doi: 10.1159/000204351. PMID: 19349723.
21. Moshki M, Dehnoalian A, Shareinia M. Medical students' perceptions of learning environments in Gonabad University of Medical Science. *J Med Educ Dev* 2014;7(16):116-126.
22. Honaramiz Fahim, K., Johari, Z. Evaluation of educational environment in viewpoints of medical and dental students of Shahed University based on DREEM model in the year 2021. *Daneshvar Medicine* 2022;30(1):46-58. doi: 10.22070/daneshmed.2022.15220.1130
23. Fathi M, Valiee S. Nursing, Midwifery and Operations Room students' perception of the educational environment of Kurdistan University of Medical Sciences. *Educ Strategy Med Sci* 2019;12(3):12-22.