

DETERMINING THE QUALITY OF EDUCATIONAL CLIMATE ACROSS FOUR UNDERGRADUATE DENTAL COLLEGES IN RAWALPINDI/ISLAMABAD USING THE DREEM INVENTORY

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ABSTRACT

Objectives. To investigate the perception of current educational environment and to compare the learning environments of different dental educational institutions.

Materials and Methods: It is a cross sectional study in which Dundee Ready Education Environment Measure (DREEM) Questionnaire; a measure of educational environment is used. It was carried out in 4 different dental colleges across Rawalpindi and Islamabad. The DREEM questionnaire was administered to 1st, 2nd, 3rd and 4th year undergraduate students (n =380) in the academic year of 2013/2014. Data were entered and analyzed using SPSS version 20.0.

Results: Out of 400 students, 380 students participated in the study (response rate of 95%). The mean total score for the 4 institutions was 120 out of total score of 200. For institution A, the score was 125.4 ± 18.6 SD, for institution B, the score was 124.9 ± 21.8 SD, for institution C, the score was 119 ± 18.9 SD and for institution D, the score was 109.7 ± 24.2 SD out of a total score of 200. The average DREEM score of preclinical group was 115 and clinical group was 124 out of 200 for all the colleges.

Conclusion: Students in this study reported a positive perception of their educational environment in all 4 dental institutions and the domain scores were also satisfactory. Certain areas need further exploration and improvements, which should serve as a decision support mechanism for educationists in rationalizing their priorities for reforms.

Keywords: DREEM inventory, dental schools, educational environment, perception, undergraduates

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INTRODUCTION

With the advancing teaching methodologies there is a need to evaluate perceptions of the educational environment of the dental colleges across Pakistan. Educational environment embraces everything undergoing in an institute and constitute a major factor of success of the undergraduate medical or dental education. It plays a major role in the professional development of the students and affects their learning experiences,

achievements, motivation and success.¹ Effective management of learning and teaching process is supported by understanding the educational environment and incorporating appropriate changes and remedies where required. Systematic feedback and assessment is very vital for the development of a fruitful and meaningful curriculum. A variety of methodologies and instruments have been used to explore the educational environment, including qualitative, quantitative and mixed method paradigm, but many of these instruments do not take into account the modified curriculum changes and educational strategies. Studies regarding the assessment of the educational environment have been conducted in various disciplines like nursing, medicine, physiotherapy in different countries using the DREEM (Dundee Ready Educational Environment Measure) instrument.^{2,3} Roff et al. developed the 50 item Dundee Ready Educational Environment Measure with a panel of nearly 100 international medical educators and 1000 students

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to measure and diagnose undergraduate educational climates in health professionals in 1997.⁴⁻⁶ DREEM has been found to be highly reliable in diverse settings and is a valid tool showing good psychometric properties.⁷⁻⁹ It is intended to be universal and a cultural free inventory. Its translated versions are being used worldwide. It has contributed to establishing a greater understanding of the professional healthcare educational environment. In a review article it was stated, after reviewing 40 publications from 20 countries that DREEM is used in evaluation for diagnostic purposes, comparison between different groups and comparison with ideal/expected scores.^{10,11}

The objective of this study is to assess the student's perception of their respective educational environment and to identify the strengths and explore the shortcomings in the educational environment, which should be remediated. We also aimed to compare the educational environment of the 4 dental institutes of Rawalpindi/Islamabad.

MATERIAL AND METHODS

A cross sectional study was conducted from September 2014 to December 2014 simultaneously in, A, Islamic international dental college Islamabad, B, Margalla Institute of Health sciences Islamabad, C, Islamabad Medical and Dental college Islamabad, D, Armed forces institute of Dental College Rawalpindi, following the approval from the ethical review board of the Ripah University Pakistan. Internationally validated English version of the DREEM (Dundee Ready Educational Environment Measure) questionnaire was used for data collection. Using the convenience sampling technique the questionnaire was distributed among the 1st, 2nd, 3rd and 4th year students from all the four colleges in the academic year of 2013/2014. The participation was voluntary and the questionnaire was anonymous. Sample size was considered to be 25 students from each year. Prior to the distribution of the questionnaire the purpose of study and details regarding the DREEM inventory were explained to the students.

DREEM inventory is a multicultural and multi-dimensional instrument being used worldwide for gathering educational environment information in medical and allied institutions. It gives a total global score of 200 for 50 items. Each item is scored 0–4 (4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree, and 0 = strongly disagree) on a 5–point likert scale. There are 9 negative items (Items 4, 8, 9, 17, 25, 35, 39, 48, and 50) scored in a reverse manner; high scores on these items indicate disagreement. The guidelines for interpreting the overall DREEM score are: 0–50, very poor; 51–100, many problems; 101–150, more positive than negative; and 151–200, excellent. To indicate the different areas

of the educational environment, the DREEM items are grouped into 5 subscales:

- Students' Perception of Learning (SPoL) has 12 items, with a maximum score of 48 (satisfactory score = 24).
- Students' Perception of Teaching (SPoT) has 11 items, with a maximum score of 44 (satisfactory score = 22).
- Students' Academic Self-Perception (SASP) has 8 items, with a maximum score of 32 (satisfactory score = 16).
- Students' Perception of Atmosphere (SPoA) has 12 items, with a maximum score of 48 (satisfactory score = 24).
- Students' Social Self-Perception (SSSP) has 7 items, with a maximum score of 28 (satisfactory score = 14).

Items with a mean score of 3.5 or more are true positive points. Items with a mean of 2.0 or less indicate problem areas. Items with a mean between 2.0 and 3.0 are aspects of the educational environment that could be enhanced.²

For data analysis, all data was entered in SPSS version 20.0. One way ANOVA followed by Tukey's test was used to compare global scores and mean domain scores among the educational years of all the colleges. Separately the global scores were also compared between the preclinical and clinical years of all the colleges to assess the problem areas more specifically. For this purpose independent t test was applied. Descriptive statistics were also used to calculate mean and standard deviation for all the items. The level of statistical significance was set at $p < 0.05$.

RESULTS

The response rate from institution D was 99%, institution B was 90%, from institution A and C was 96%. The overall average age of the participants was 20.8 years. The average DREEM score for all the 4 institutes was 120 out of 200. Table 1 shows the DREEM global and subscale mean scores for all the colleges. For institution A, the global score was 125.4 (SD = 18.6), for institution B, the score was 124.9 (SD = 21.8), for institution C, the score was 119 (SD = 18.9) and for institution D, the score was 109.7 (SD = 24.2) out of a total score of 200. The highest global score was achieved by institution A and the lowest score was obtained by institution D. However the DREEM score of all the colleges indicate that the students' perceptions of the educational environment of their respective college were more positive than negative. The total mean scores

Table 1: Comparison of mean scores among all the colleges along with their significant differences

DREEM domain	Colleges Mean \pm SD (Percentage)				P value	Significant difference between colleges
	A	B	C	D		
Students perception of learning (/48)	31.5 \pm 4.8 (65.6%)	30.2 \pm 5.6 (62.9%)	27.5 \pm 6 (57.2%)	25.8 \pm 6.4 (53.7%)	0.001	A:D, P=0.001; B:D, P=0.001; A:C, P=0.001; B:C, P=0.014
Students perception of teachers (/44)	27.1 \pm 5.6 (61.5%)	27.5 \pm 4.8 (62.5%)	26.6 \pm 4.8 (60.4%)	25 \pm 5.5 (56.8%)	0.009	A:D, P=0.03; B:D, P=0.013
Students academic self perception(/32)	21.6 \pm 4.5 (67.5%)	21.2 \pm 5.9 (66.2%)	20 \pm 4.7 (62.5%)	18.6 \pm 5.4 (58.1%)	0.001	A:D, P=0.001; B:D, P=0.005
Students perception of atmosphere(/48)	28.9 \pm 6.2 (60.2%)	29.3 \pm 6.7 (61%)	28.2 \pm 6 (58.7%)	25 \pm 7.9 (52%)	0.001	A:D, P=0.001; C:D, P=0.004; B:D, P=0.001;
Students social self perception (/28)	16.1 \pm 3.5 (57.5%)	16.6 \pm 2.9 (59.2%)	16.4 \pm 3.8 (58.5%)	15.2 \pm 3.9 (54.2%)	0.036	B:D, P=0.049
Total score (/200)	125.4 \pm 18.6 (62.7%)	124.9 \pm 21.8 (62.4%)	119 \pm 18.9 (59.5%)	109.7 \pm 24.2 (54.8%)	0.001	A:D, P=0.001; C:D, P=0.012; B:D, P=0.001

*One Way Anova followed by Tukey's test

Table 2: Comparison of mean scores between preclinical and clinical year students of all the colleges

Colleges	Preclinical years Mean \pm SD	Clinical years Mean \pm SD	P value
A	119 \pm 17.7	133 \pm 17	0.001*
B	118.2 \pm 14.1	130.4 \pm 25	0.008*
C	115.6 \pm 17	122.3 \pm 20.2	0.083
D	108.8 \pm 25.7	110.6 \pm 22.9	0.701

*Independent t Test used to find significant difference

of the DREEM subscales for all the colleges show more positive perception of the educational environment with institution D giving lowest scores in all subscales and institution A giving highest scores in the subscale SPoL and SSAP while institution B scoring highest points in SPoT, SPoA and SSSP subscales. The global mean scores were obtained utilizing the pool data from two student groups including preclinical and clinical year groups stating that there was a significant difference in the scores obtained by each group in institution A and institution B as shown in Table 2. The average DREEM score of preclinical group was 115 and clinical group was 124 out of 200 for all the colleges.

Table 3 shows the individual item analysis of DREEM according to the 5 different subscales. Of the 50 items on the DREEM inventory, 39 items had mean score between 2 and 3 and could be improved to enhance the educational environment. A total of 9 items scored below 2. These were identified as problem areas, which require great attention to explore and rectify any underlying problem. Only 2 items scored above 3, which

indicated real positive points, but it can be said that there are no absolute real positive aspects of educational environment for all the colleges. The three most highly rated items were 'the teachers are knowledgeable', 'the teachers are well prepared for their class' and 'I have good friends in this school'. The three items that students had greatest problem with were 'there is a good support system for student who get stressed', 'the teacher over emphasizes factual learning' and 'the teachers are authoritarian'.

DISCUSSION

Dipping my toe into water of educational research, I have used DREEM inventory to measure students' perception of their educational environment. The guidelines provided by McAleer and Roff in 1997 were used for the interpretation of the scoring results.⁵ This study is among the very few studies conducted in dental section in Pakistan as this area is under-researched. All the four institutes included in this study run a teacher centered, traditional discipline based curricula. Recognition and reforms of the educational environment

Table 3: Over all mean scores of all the 50 items of DREEM inventory

Domain items	Mean score	Standard deviation	Domain items	Mean score	Standard deviation
Students Perception of Learning					
1 I am encouraged to learn in class	2.77	0.93	26 Last year's work has been a good	2.51	1.02
7 The teaching is often stimulating	2.65	0.95	preparation for this year's work		
13 The teaching is student-centered	2.35	0.98	27 I am able to memorize all I need	2.22	1.05
16 The teaching is sufficiently concerned to develop my competence	2.46	0.97	31 I have learned a lot about empathy in my profession	2.66	0.90
20 The teaching is well focused	2.68	0.95	41 My problem solving skills are being	2.52	1.02
22 The teaching is sufficiently concerned to	2.40	1.03	well-developed here		
develop my confidence			45 Much of what I have to learn seems	2.76	0.93
24 The teaching time is put to good use	2.76	0.83	relevant to a career in medicine		
25 The teaching over-emphasizes factual learning*	1.54	0.92	Subtotal score	20.36	5.26
38 I am clear about the learning objectives of the course	2.53	0.96	Students Perception of Atmosphere		
44 The teaching encourages me to be an	2.39	1.00			
active learner			11 The atmosphere is relaxed during the ward	2.18	1.07
47 Long-term learning is emphasized over	2.41	1.05	teaching		
short-term			12 This school is well time-tabled	2.42	1.11
48 The teaching is too teacher-centered*	1.80	0.97	17 Cheating is a problem in this school*	1.92	1.11
Subtotal score	28.73	6.18	23 The atmosphere is relaxed during the	2.44	1.07
			lectures		
Students Perception of Teachers			30 There are opportunities for me to	2.34	1.06
			develop inter-personal skills		
2 The teachers are knowledgeable	3.08	0.84	33 I feel comfortable in class socially	2.66	0.92
6 The teachers are patient with the patients	2.83	0.88	34 The atmosphere is relaxed during	2.52	0.99

Determining the quality of educational climate across four undergraduate.....

8 The teacher ridicule the students*	2.17	1.14	seminars/tutorials		
9 The teachers are authoritarian*	1.57	0.90	35 I find the experience disappointing-	2.24	1.06
18 The teachers have good communication	2.80	0.87	36 I am able to concentrate well	2.44	0.95
skill with patents			42 The enjoyment outweighs the stress of	1.85	1.27
19 The teachers give clear examples	2.48	1.03	studying medicine		
feedback to students			43 The atmosphere motivates me as a learner	2.39	1.04
32 The teachers provide constructive	2.29	1.01	49 I feel able to ask the questions U want	2.39	1.11
criticism here			Subtotal score	27.80	6.98
37 The teachers give clear examples	2.68	0.87			
39 The teachers get angry in class*	1.72	1.16			
40 The teachers are well prepared for their class	2.88	0.90	Students Social Self Perception		
50 The students irritate the teachers*	2.05	0.25			
Subtotal score	26.52	5.32	3 There is a good support system for	1.51	1.23
			students who get stressed		
Students Academic Self Perception			4 I am too tired to enjoy this course*	1.84	1.09
			14 I am rarely bored on this course	1.84	1.11
5 Learning strategies which worked	2.32	1.041	15 I have good friends in this school	3.06	0.99
for me before continue to work for me now			19 My social life is good	2.86	1.02
10 I am confident about my passing this year	2.81	0.98	28 I seldom feel lonely	2.18	1.22
21 I feel I am being well prepared for my	2.56	0.95	46 My accommodation is pleasant	2.78	1.04
profession			Subtotal score	16.07	3.68

*Negative item; low score indicates agreement

are required to achieve the appropriate changes in the culture of traditional style of teaching. The DREEM inventory allows the areas of concern in the educational environment to be highlighted. As is observed in this study the scores of all 5 domains reflected positive perception of the educational environment by students of all the 4 colleges, however these ratings indicated that there is ample room for improvement in all the domains. According to the overall mean scores in the

5 domains, 9 items were scored below 2 which show problem areas. 6 of them were the negative items. In students perception of learning the items, "the teaching overemphasizes factual learning" and "the teaching is too teacher centered" were the targeted problem areas. This is the basic problem in the traditional discipline based curricula. The institute could train teachers on modern teaching designs and assessment methods to drive active learning among students. With the current

emphasis on self-directed and life-long learning the role of teachers has been modified as a facilitator in providing the students with necessary attitudes and skills required for learning. However, in the domain of student's perception of teachers, "the teachers are authoritarian" and "the teachers get angry in class" were the two items, which received, deprived scores indicating a compromised educational environment.

The domain of student's academic self-perception showed satisfactory results as all the items scored above 2 although some enhancements for better and a progressive environment are necessary. "Cheating is a problem in this school" and "the enjoyment outweighs the stress of studying medicine" are the two lowest scoring items in the domain student's perception of atmosphere. Critical review of these two issues is necessary to overcome them. In students social self-perception the lowest scoring items were "there is a good support system for students who get stressed", "I am too tired to enjoy this course" and "I am rarely bored on this course". These results show that immense work is needed to provide the students with a controlled environment, which is less stressful and excites the students to acquire knowledge. This could be done by incorporating new learning methodologies, extracurricular activities and modifying the traditional curriculum according to the needs of the major stakeholders that is, the students. It is necessary to strengthen these identified areas for effective management of learning. In the item level data analysis, only two items scored above 3. The students expressed that the teachers are knowledgeable and that they have good friends in school. These results are consistent with other studies conducted in Sri Lanka, India and Sweden.^{1,4,12,13}

The overall mean score of this study is 120 out of 200 indicating that students perceived their educational environment to be more positive than negative. A study conducted by Zaini R et al in Saudi Arabia showed mean score of 107.¹⁴ Al-Mohaimeed conducted such a study in Saudi Arabia and resulted into DREEM score of 112.¹⁵ Sri Lanka has also shown such comparative studies, all showing more positive educational environment.¹² A study involving UHS affiliated medical colleges in Pakistan showed an average DREEM score of 125.¹⁶ Imran N conducted a study in 6 undergraduate medical institutions across Pakistan. Overall mean score of all the colleges was 105.¹⁷ Dow University of Health Sciences reported the DREEM mean score of 114.4.¹⁸ In a comparative study, the remote area college of Punjab showed mean score of 90.4 as compared with 113 scored in the urban area college.¹⁹ A study from UK showed a DREEM score of 139/200 which was higher than the other reports.²⁰ In contrast to a study

conducted in Pakistan,⁸ the students in clinical years in this study rated educational environment more highly as compared to the students in preclinical years. The study conducted in a German dental school showed that overall perception of the educational environment was positive. Although students in the clinical part of course rated the atmosphere more negatively, but their academic self-perception more positively than preclinical students.²¹

Qualitative studies are also necessary to go in depth of the reasons of students' dissatisfaction because DREEM only creates a snapshot of the student's perception of their educational environment.²²

limitations

Our educational environment is different from the west so the results of our study may not be applicable to other institutes worldwide. Secondly this study used a predetermined questionnaire, which might have left some factors that have an impact in our educational setups.

CONCLUSION

Students in this study reported a positive perception of their educational environment in all 4 dental institutions and the domain scores were also satisfactory.

RECOMMENDATIONS

Certain areas need further exploration and improvements, which should serve as a decision support mechanism for educationists in rationalizing their priorities for reforms. We need to ensure a favorable educational environment to the dental students in which they can achieve better academic performance and professional growth. This study might contribute in planning improved curricular strategies thus introducing a hybrid curriculum, which stimulates student's learning process.

REFERENCES

1. Kohli V, Dhaliwal U. Medical students' perception of the educational environment in a medical college in India: a cross-sectional study using the Dundee Ready Education Environment questionnaire. *J EducEval Health Prof.* 2013; 10(5): 203-9.
2. Arzuman H, Yusoff MS, Chit SP. Big Sib students' perceptions of the educational environment at the school of medical sciences, Universiti Sains Malaysia, using Dundee ready educational environment measure (DREEM) inventory. *Malays J Med Sci.* 2010 Jul; 17(3): 40-47.
3. Ousey K, Stephenson J, Brown T, Garside J. Investigating perceptions of the academic educational environment across six undergraduate health care

- courses in the United Kingdom. *Nurse Educ Pract*. 2014 Jan 31; 14(1): 24-29.
4. Pai PG, Menezes V, Srikanth AM, Shenoy JP. Medical students' perception of their educational environment. *J Clin Diagn Res*. 2014 Jan; 8(1): 103-8.
 5. Roff S, McAleer S, Harden RM, Al-Qahtani M, Ahmed AU, Deza H, Groenen G, Primparyon P. Development and validation of the Dundee ready education environment measure (DREEM). *Med Teach*. 1997; 19(4): 295-99.
 6. Roff S, McAleer S, Skinner A. Development and validation of an instrument to measure the post-graduate clinical learning and teaching educational environment for hospital-based junior doctors in the UK. *Med Teach*. 2005 Jun 1; 27(4): 326-31.
 7. Sajid F, Rehman A, Fatima S. Perceptions of Students of The Learning Environment Studying An Integrated Medical Curriculum. *JSurg Pak (International)*. 2013 Apr; 18(2): 86-91.
 8. Yusoff MS. The Dundee ready educational environment measure: a confirmatory factor analysis in a sample of Malaysian medical students. *Int J Humanit Soc Sci*. 2012; 2(16): 313-21.
 9. Jakobsson U, Danielsen N, Edgren G. Psychometric evaluation of the Dundee ready educational environment measure: Swedish version. *Med Teach*. 2011; 33(5): 267-74.
 10. Miles S, Swift L, Leinster SJ. The Dundee Ready Education Environment Measure (DREEM): a review of its adoption and use. *Med Teach*. 2012; 34(9): 620-34.
 11. Miles S, Leinster SJ. Medical students' perceptions of their educational environment: expected versus actual perceptions. *Med Educ*. 2007; 41(3): 265-72.
 12. Lokuhetty MD, Warnakulasuriya SP, Perera RI, De Silva HT, Wijesinghe HD. Students' perception of the educational environment in a Medical Faculty with an innovative curriculum in Sri Lanka. *South-East Asian J Med Educ*. 2011; 4(1): 9-16.
 13. Palmgren PJ, Lindquist I, Sundberg T, Nilsson GH, Laksov KB. Exploring perceptions of the educational environment among undergraduate physiotherapy students. *Int J Med Educ*. 2014; 5: 135-46.
 14. Zaini R. Use of Dundee Ready Educational Environment (DREEM) for curriculum needs analysis in the Faculty of Medicine and Medical Sciences at Umm Al-Qura University, Saudi Arabia. (Masters dissertation, Centre for Medical Education, University of Dundee, Scotland). 2003.
 15. Al-Mohaimeed A. Perceptions of the educational environment of a new medical school, Saudi Arabia. *Int J Health Sci*. 2013; 7(2): 150-56.
 16. Khan JS, Tabasum SA, Yousafzai UK, Mukhtar OS. Measuring the medical education environment in undergraduate medical colleges across Punjab, Pakistan. *Biomedica*. 2011; 27(1): 14-18.
 17. Imran N, Khalid F, Jawaid M, Haider II, Irfan M, Mahmood A. Determining the medical education environment across multiple undergraduate teaching sites in Pakistan using the DREEM inventory. *J Pak Med Assoc*. 2015; 65(1): 24-28.
 18. Jawaid M, Raheel S, Ahmed F, Aijaz H. Students' perception of educational environment at Public Sector Medical University of Pakistan. *J Res Med Sci*. 2013; 18(5): 417-21.
 19. Anwar MS, Anwar I, Ghafoor T. Medical students' perceptions of educational environment in remote and urban area medical colleges. *Adv Health Prof Educ*. 2015; 1(1): 5-10.
 20. Varma R, Tiyaagi E, Gupta JK. Determining the quality of educational climate across multiple undergraduate teaching sites using the DREEM inventory. *BMC Med Educ*. 2005; 5(1): 8-15.
 21. Ostapczuk MS, Hugger A, De Bruin J, Ritz-Timme S, Rothhoff 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.
 22. Whittle SR, Whelan B, Murdoch-Eaton DG. DREEM and beyond; studies of the educational environment as a means for its enhancement. *Educ Health*. 2007; 20(1): 7-10.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

- Khan K:** Main idea.
Sohail K: Data collection and critical review of the whole article.
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Jamil M: Statistics.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.