

Student's perceptions of educational environment across multiple undergraduate medical institutions in Pakistan using DREEM inventory

Nazish Imran,¹ Faiza Khalid,² Imran Ijaz Haider,³ Masood Jawaid,⁴ Muhammad Irfan,⁵ Asmah Mahmood,⁶ Muhammad IjlalHaider,⁷ Sami-ud-din⁸

Abstract

Objective: To objectively assess whether the medical education environment across Pakistan was at an acceptable standard and to determine factors influencing its perception.

Methods: The cross-sectional study was conducted from August to November 2012 at six undergraduate medical institutions across Pakistan. The Dundee Ready Education Environment Measure (DREEM) inventory having five subscales of perceptions of learning, teachers, atmosphere, academic self-perceptions and social self-perceptions was administered anonymously to all the consenting medical students. Data was analysed using SPSS 17.

Result: Of the 3045 questionnaires distributed, 2084(68.4%) were returned duly filled. Of all the respondents, 1311(63%) were females. Overall mean score found positive was 105.0±25.8 (Max: 200). Corresponding scores in the subscales were: student's perception of learning 25.1±7.2 (Max: 48); social self-perception 15.4±3.9 (Max: 28); academic self-perception 17.2±6.5 (Max: 32); perception of teachers being in need of some re-training 22.5±7.1 (Max: 44); and perception of atmosphere as having many issues needing a change 24.8±7.0 (Max: 48). Female students and pre-clinical year students perceived environment as more positive than male students (108.6±23.0 vs. 98.8±28.9 [p<0.001]) and students belonging to clinical years (108.0±24.0 vs. 03.3±26.5 [p<0.001]).

Conclusion: Highest score was found in the domain of student's social self-perceptions and lowest in the domain of student's perception of teachers. Results can be used as a basis for planning and executing remedial measures needed to improve undergraduate medical education environment in Pakistan.

Keywords: Perception, Undergraduate teaching, Educational environment, DREEM, Pakistan, Curriculum, Medical students. (JPMA 65: 24; 2015)

Introduction

Educational environment (EE) embraces everything that is happening in an institution and plays an important role in determining the success of undergraduate medical education.^{1,2} Conduciveness of medical institutions' educational environment has significant impact on medical students' attitudes, knowledge, skills and behaviours,^{1,3} with positive learning environment fostering positive attitudes towards studies.^{4,5} The body of literature regarding medical educational environment is growing steadily.^{6,7} The learning environment is considered by the World Federation for Medical Education as one of the areas that should be assessed when evaluating medical education programmes.⁸

In Pakistan, the undergraduate MBBS programme is still

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^{1,2,6}Child & Family Psychiatry Department, King Edward Medical University/Mayo Hospital, Lahore, ³Department of Psychiatry & Behavioral Sciences, Fatima Memorial College of Medicine and Dentistry, Lahore, ⁴Dow International Medical College, Dow University of Health Sciences, Karachi, ⁵Department of Psychiatry & Behavioral Sciences, Peshawar Medical College, Peshawar, ⁷Ayub Medical College, Abbottabad, ⁸Bolan medical College, Quetta.

Correspondence: Nazish Imran. Email: nazishimrandr@gmail.com

traditional in mode with very few institutions embracing concepts of student-centred activities, -problem-based learning, curriculum being community-oriented, e-learning etc.⁹ Although incorporation of modern concepts in the teaching of undergraduate curriculum are needed, but changes in any aspect of medical educational environment without clear direction can be stressful for both faculty and students. Being important stakeholders, students need to be part of the discussion and the first step may be to assess students' perceptions regarding various EE components to identify strengths and weaknesses before any major changes could be proposed. Students' perceptions of the educational climate may be influenced by the growing diversity of student population, their expectations, academic facilities and other circumstances of the institutions. This area, however, is under-researched in Pakistan and only a few studies conducted so far are limited by small sample size and representation of few institutions in one province.^{10,11}

The present study was planned to assess and compare students' perceptions for various EE components in medical institutions representing all four provinces of Pakistan. We also intended to compare the perceptions on

the basis of gender and clinical years to identify EE strengths and weaknesses.

Subjects and Methods

The cross-sectional study was conducted from August to November 2012, simultaneously in 6 medical colleges across Pakistan following approval from the ethical review board of King Edward Medical University (KEMU), Lahore. Colleges were located in major cities and all except one were public-sector institutions. The population of the study included students of all the five years who were present in the lectures on the days of data collection of the study. Prior to the administration of the questionnaire, the purpose of the study and details regarding Dundee Ready Education Environment Measure (DREEM) inventory were explained to the students. Anonymity of the participants was ensured. Students were given approximately 25 minutes to complete the inventory, and questionnaires were collected on the spot by the researchers.

The questionnaire contained demographic information, and students' perceptions of EE were assessed by DREEM, a generic, multi-cultural multi-dimensional instrument being used worldwide for gathering EE information in medical and allied institutions.^{5,7,12} Since development at Dundee University, it has been successfully validated and used in developed and developing countries, including Pakistan.^{7,10,13} It contains 50 statements measuring five dimensions of learning environment, including Students'

Perceptions of Learning (SPL), Students' Perceptions of Teachers (SPT), Students' Academic Self-Perceptions (SASP), Students' Perceptions of Atmosphere (SPA) and Students' Social Self-Perceptions (SSSP). Responses are based on five-point likert-type scale. Two types of information were obtained by this inventory; mean total score for 50 items or each of its 5 subscales, and individual item mean scores for each of the 50 items.

Data was analysed by using SPSS 17. Descriptive statistics were used to calculate mean and standard deviations (SD) of total DREEM and the five subscales. Unpaired t test was used to identify statistically significant differences between the subscales in the pre-clinical and clinical students as well as between genders. The level of statistical significance was set at $p < 0.05$.

Results

Of the 3045 questionnaires distributed, 2084(68.4%) were returned duly filled. After excluding 4(0.13%) questionnaires for missing data, the final study population stood at 2080(68.3%). Of all the respondents, 1311(63%) were females.

Overall mean score found positive was 105.0 ± 25.8 (Max: 200). Corresponding scores in the subscales were: student's perception of learning 25.1 ± 7.2 (Max: 48); social self-perception 15.4 ± 3.9 (Max: 28); academic self-perception 17.2 ± 6.5 (Max: 32); perception of teachers

Table-1: DREEM Scores and subscales.

DREEM and its subscale	Maximum score	Mean \pm SD	Percentage of maximum score	Interpretation*
All items	200	105.0 \pm 25.8	52.2	More Positive than Negative
Students' Perceptions of learning	48	25.1 \pm 7.2	53.7	A more positive perception
Students' Perceptions of teachers	44	22.5 \pm 7.1	51.1	In need of some retraining
Students' Academic Self-perceptions	32	17.2 \pm 6.5	54.0	feeling more on positive side
Students' Perceptions of Atmosphere	48	24.8 \pm 7.0	51.7	Many issues which need changing
Students' Social Self-Perceptions	28	15.4 \pm 3.9	55.1	Not too bad

* McAleer S, Roff S. A Practical Guide to using the Dundee Ready Education Environment Measure (DREEM). [Available from URL: www.gpro.co.uk/swacpo/document/dreems2.doc]
DREEM: Dundee Ready Education Environment Measure.

Table-2: Comparison of educational environment of 6 medical colleges in four provinces of Pakistan. (n=2083).

DREEM and its subscale	Institute 1 [Punjab] (n=731)	Institute 2 [Sindh] (n=586)	Institute 3 [Punjab] (n=332)	Institute 4 [Khyber Pukhtunkhwa] (n=183)	Institute 5 [Khyber Pakhtunkhwa] (n=161)	Institute 6 [Balochistan] (n=87)
All items	92.2 \pm 27.5	114.4 \pm 20.0	108 \pm 20.0	124.8 \pm 21.5	104.8 \pm 22.0	93.7 \pm 22.5
Students' Perceptions of learning	21.9 \pm 7.8	25.8 \pm 5.7	27.8 \pm 5.9	30.0 \pm 5.9	26.1 \pm 6.7	22.4 \pm 7.1
Students' Perceptions of teachers	18.8 \pm 7.5	25.4 \pm 5.6	24.2 \pm 5.1	26.9 \pm 5.9	21.8 \pm 6.4	19.4 \pm 5.7
Students' Academic Self-perceptions	15.1 \pm 5.9	18.8 \pm 4.6	16.3 \pm 4.1	21.1 \pm 13.1	19.3 \pm 5.2	16.2 \pm 4.5
Students' Perceptions of Atmosphere	22.2 \pm 6.9	28.0 \pm 6.2	24.2 \pm 6.0	29.4 \pm 6.2	21.7 \pm 6.3	22.6 \pm 6.4
Students' Social Self-Perceptions	14.1 \pm 3.9	16.3 \pm 4.0	15.7 \pm 3.6	17.3 \pm 3.6	15.8 \pm 3.5	14.1 \pm 3.0

DREEM: Dundee Ready Education Environment Measure.

Table-3: Gender difference.

DREEM and its subscale	Males	Females	P value
All items	98.8±28.9	108.6±23.0	0.000*
Students' Perceptions of learning	23.7±8.0	25.8±6.6	0.000*
Students' Perceptions of teachers	20.3±7.8	23.8±6.3	0.000*
Students' Academic Self-perceptions	16.5±8.7	17.7±4.8	0.000*
Students' Perceptions of Atmosphere	23.0±7.5	25.9±6.5	0.000*
Students' Social Self-Perceptions	15.3±3.8	15.4±4.0	0.958

Unpaired student t test used to find out significant difference.

DREEM: Dundee Ready Education Environment Measure.

Table-4: Pre-clinical and clinical years students.

DREEM and its subscale	Preclinical years	Clinical years students	P value
All items	108.0±24.0	103.3±26.5	0.001*
Students' Perceptions of learning	26.3±7.0	24.4±7.3	0.155
Students' Perceptions of teachers	23.2±6.3	22.1±7.5	0.000*
Students' Academic Self-perceptions	17.5±4.7	17.1±7.3	0.000*
Students' Perceptions of Atmosphere	25.6±6.84	24.4±7.1	0.011*
Students' Social Self-Perceptions	15.6±4.2	15.3±3.8	0.519

Unpaired student t test used to find out significant difference.

DREEM: Dundee Ready Education Environment Measure.

being in need of some re-training 22.5±7.1 (Max: 44); and perception of atmosphere as having many issues needing a change 24.8±7.0 (Max: 48) (Table-1).

In terms of institutions, mean overall and subscale scores were calculated but no specific pattern could be ascertained due to different number of respondents and many variables which may explain the differences in perceptions (Table-2).

Female students and pre-clinical year students perceived environment as more positive than male students (108.6±23.0 vs. 98.8±28.9 [$p=0.001$]) (Table-3) and students belonging to clinical years (108.0±24.0 vs. 103.3±26.5 [$p<0.001$]) (Table-4).

Discussion

An ideal medical education environment, apart from contributing towards improving emotional intelligence of students, should enable future physicians to acquire the necessary competencies and skills for their career.¹⁴ The present study is among the very few from Pakistan focusing on the important aspect of the role of EE in medical education.

In our study, students assessed overall EE in a positive way with a mean score of 105.0±25.8 out of a maximum of 200, but this was far from excellent.¹⁵ Although there is no

agreed acceptable DREEM score from literature, but medical schools with traditional systems mostly have observed to have DREEM scores close to 120. Studies from other countries in the region like Iran, Sri Lanka and Bangladesh have reported mean scores of 99.6, 107.4 and 110 respectively.¹⁶⁻¹⁸ Our results are also comparable to a previous study reporting mean DREEM score of 115 in public-sector medical institutions in Punjab.¹¹ One study observed that students in traditional medical systems are less likely to enjoy learning as a result of more teacher-centred atmosphere, and emphasis on factual learning.¹⁹ Traditional teaching is also observed to leave some students excluded from the triangle of influence.²⁰ On the other hand, much higher DREEM scores and positive EE perceptions have been reported from modern, student-centred systems like from the United Kingdom 139 as well as from countries like Chile following curriculum reforms emphasised by World Federation for Medical Education (WFME).^{8,21}

Significant scope for improvement in all five EE domains was found in our study. The lowest score was observed in students' perception of teachers, which is a cause of concern for the faculty. Teachers are role models for the students. Their actions, attitudes and enthusiasm will affect students indirectly, thus they must invest their time and energy in regular continuous medical education (CME) activities. These findings also reflect lack of staff development efforts in medical institutions in Pakistan, which needs to be addressed adequately. Students' perception of atmosphere is another EE domain that needs improvement. It appears to be related to infrastructure deficiencies. Facilities with uncomfortable seating, noisy rooms, teaching in cold or overheated rooms etc. make it difficult for students to relax and pay attention.²⁰ Many other studies have also reported lowest scores in atmosphere domain of EE, suggesting specific importance to be given to favourable physical environment to facilitate learning.^{19,2-23}

Variations in DREEM scores among different institutions were observed in our study with overall impression of institutions with better student-teacher ratio, and recent curriculum reforms or modification in line with best international practices being perceived as having friendly, more relaxed, positive EE. Educational background of students from different regions may also explain the results. In order to ensure uniformity in educational delivery and to maintain high-quality EE despite students being taught at different teaching institutions, one useful tool may be the DREEM inventory.

We also found statistically significant gender-specific variations with female students reporting more

satisfaction than their male counterparts, a trend reported in some previous studies.^{18,23-25} In sharp contrast are studies where male students rated educational milieu higher.^{3,5,26} A study from India did not show any gender-specific differences.²⁷ Findings of women having better interpersonal skills may explain their more positive perceptions of educational environment in our study.¹⁷

Students in pre-clinical years in our study rated educational environment more highly than students in the clinical years. Previous studies have shown mixed results with medical and dental students in India reporting similar results^{27,28} while students in clinical years from Iran perceiving pre-clinical EE as more positive.¹⁶

The results of the study need to be seen in conjunction with the limitation that although DREEM is the most widely used measure of EE assessment and helps in identifying strengths and weaknesses, but it does not provide us the underlying reasons for the same. Qualitative studies including in-depth interviews improve understanding and explore solutions to the perceived causes of students' dissatisfaction.²¹ Despite the limitation, the study has many strengths, including a large sample size, representation of medical institutions of all the four provinces leading to generalisability of results for public-sector institutions in Pakistan.

Conclusion

The results can be used to guide strategic planning. Certain areas that require remedial measures in EE were identified for effective management of learning especially in the students' perception of teachers and students' perceptions of atmosphere sub-domains. As learning environment affects students' motivation and achievements, regular feedback from students as to how they perceive their EE is very important. Teaching methods, curriculum changes, student-centred learning, favourable atmosphere, good support system are areas to be considered as main segments for development of EE in Pakistan. Further research to identify most appropriate interventions is also needed.

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References

- Genn JM. AMEE Medical Education Guide No. 23 (Part 1): curriculum, environment, climate, quality and change in medical education-a unifying perspective. *Med Teach* 2001; 23: 337-44.
- Lizzio A, Wilson K, Simons R. University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Stud Higher Educ* 2002; 27: 27-52.
- Roff S, McAleer S, Ifere OS, Bhattacharya S. A global diagnostic tool for measuring educational environment comparing Nigeria and Nepal. *Med Teach* 2001; 23: 378-82.
- Pimparyan P, Roff S, McAleer S, Poonchai B, Pemba S. Educational environment, student approaches to learning and academic achievement in a Thai nursing school. *Med Teach* 2000; 22: 359-65.
- Mayya SS, Roff S. Students' perceptions of the educational environment: A comparison of academic achievers and underachievers at Kasturba Medical College, India. *Educ Health* 2004; 17: 280-91.
- Roff S. Education Environment: a Bibliography. *Med Teach* 2005; 27: 353-7
- 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: 322-5.
- Riquelme A, Oporto M, Oporto J, Méndez J, Viviani P, Salech F, et al. Measuring students' perceptions of the educational climate of the new curriculum at the Pontificia Universidad Católica de Chile: performance of the Spanish translation of the Dundee Ready Education Environment Measure (DREEM). *Educ Health* 2009; 22: 112.
- Jawaid M, Ashraf J. Initial experience of eLearning research module in undergraduate medical curriculum of Dow University of Health Sciences: Development and students perceptions. *Pak J Med Sci* 2012; 28: 591-6.
- Khan JS, Tabassum S, Yousafzai UK, Fatima M. DREEM ON: Validation of the Dundee Ready Education Environment Measure in Pakistan. *J Pak Med Assoc* 2011; 61: 886-8
- Khan JS, Tabassum S, Yousafzai UK, Mukhtar O. Measuring the Medical Education in Undergraduate Medical colleges across Punjab, Pakistan. *Biomedica* 2011; 27: 14-8.
- Jiffry MT, McAleer S, Fernando S, Marasinghe RB. Using the DREEM questionnaire to gather baseline information on an evolving medical school in Sri Lanka. *Med Teach* 2005; 27: 348-52.
- Roff S, McAleer S, Harden RM, Al Qahtani M, Ahmed AU, Deza H, et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). *Med Teach* 1997; 19: 295-9.
- Divaris K, Barlow PJ, Chendea SA, Cheong WS, Dounis A, Dragan IF, et al. The academic environment: the students' perspective. *Eur J Dent Educ* 2008; 12(Suppl 1): 120-30.
- McAleer S, Roff S. A practical guide to using the Dundee Ready Education Environment Measure (DREEM). In *Curriculum, Environment, Climate, Quality and Change in Medical Education: a Unifying Perspective*. AMEE Education Guide No. 23. Dundee: Assoc Med Educ Eur; 2001
- Aghamolaei T, Fazel I. Medical students' perceptions of the educational environment at an Iranian Medical Sciences University. *BMC Med Educ* 2010; 10: 87.
- Lokuhetty MDS, Warnakulasuriya SP, Perera RIR, De Silva HTR, 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* 2010; 4: 9-16
- Nahar N, Talukder MHK, Khan MT, Mohammad S, Nargis T. Students' Perception of Educational Environment of Medical Colleges in Bangladesh. *Bangabandhu Sheikh Mujib Med Uni J* 2011; 3: 97-102.
- Al-Hazimi A, Hyiani A, Roff S. Perceptions of the educational environment of the medical school in King Abdul Aziz University. Saudi Arabia. *Med Teach* 2004; 26: 570-3.
- Hutchinson L. ABC of learning and teaching: educational environment. *BMJ* 2003; 13: 810-2.
- Whittle S, Whelan B, Murdoch-Eaton D. DREEM and beyond; studies of the educational environment as a means for its

- enhancement. *Educ Health* 2007; 20: 7.
22. Demiroren M, Palaoglu O, Kemahli S, Ozyurda F, Ayhan HI. Perceptions of Students in different Phases of Medical Education of Educational Environment. *Med Educ Online* 2008; 13: 8
 23. Al-Hazimi A, Zaini R, Al Hyiani A, Hassan N, Gunadi A, Ponnamparuma G, et al. Educational environment in traditional and innovative medical schools: A study infour undergraduate medical schools. *Educ Health* 2004; 17: 192-203.
 24. Bassaw B, Roff S, McAleer S, Roopnarinesingh S, De Lisle J, Teelucksingh S, et al. Students' perspectives on the educational environment, Faculty of Medical Sciences, Trinidad. *Med Teach* 2003; 25: 522-6.
 25. Fidelma D, McAleer S, Roff S. Assessment of the undergraduate medical education environment in a large UK medical school. *Health Educ J* 2006; 65: 149-58.
 26. Till H. Identifying the perceive weaknesses of new curriculum by means of the Dundee Ready Education Environment Measure (DREEM). *Inventory Med Teach* 2004; 26: 39-45.
 27. Abraham R, Ramnarayan K, Vinod P, Torke S. Students' perceptions of learning environment in an Indian medical school. *BMC Med Educ* 2008; 8: 20.
 28. Thomas BS, Abraham RR, Alexander M, Ramnarayan K. Students' perceptions regarding educational environment in an Indian dental school. *Med Teach* 2009; 31: e185-8.
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