ORIGINAL ARTICLE

Students' perception of the educational environment in medical college: a study based on DREEM questionnaire

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Purpose: The educational environment (EE) plays a very important role in effective student learning. The Dundee Ready Education Environment Measure (DREEM) is a validated tool to assess the EE. This study aimed to collect baseline information about our medical student's perception of the EE, and to identify areas of strengths and weaknesses as well as scope for improvements in the current EE.

Methods: Medical students and interns were included in this cross-sectional study. The DREEM questionnaire was used to measure students' perceptions about the EE, which has five domains: students' perceptions of learning; students' perceptions of teachers; students' academic self-perceptions; students' perceptions of atmosphere; and students' social self-perceptions. Students were asked to respond using a 5-point Likert-type scale. Data was analyzed using suitable tests and statistical significance was set at $p<0.05$.

Results: The mean global DREEM score was 123/200. All students had more positive than negative academic self-perception (21.24/32), perception of atmosphere (29.21/48), and perception of learning (28.99/48), while their social self-perception (17.48/28) was not too bad and perception of teachers (26.71/44) moved in the right direction. The fifth semester students perceived EE more positively than other semester students.

Conclusion: The present study revealed that all students perceived their EE positively. The positive points were that teachers were knowledgeable, that students had good friends, and they were confident about passing their exams. Problem areas observed were authoritarian teachers, overemphasis on factual learning, overly teacher-centered teaching, teachers getting angry, and the need for a support system for stressed students.

Key Words: Teachers, Learning, Atmosphere, Academic, Social self-perception

Introduction

The "educational environment" (EE) defined as everything that happens within the classroom, department, faculty, or university is crucial in determining the success of undergraduate medical education [1,2]. Perception of the EE is directly related to the motivation, satisfaction, and effective learning of medical students. The learning experience in a medical institute can bring about a lifelong change in the students' knowledge, attitudes, and practices. Medical education is currently transforming from a teacher-centric to a student-centric approach, where the teacher's role is to facilitate learning by providing content and a positive learning environment. Understanding student's perceptions about the EE plays a vital role in planning and implementing a holistic curriculum. It will also help the stakeholders

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and the teaching faculty to introspect and to take corrective measures to maintain a high quality EE.

Several methods have been used by medical educators to assess and analyze student's perceptions about the specific EE in medical institutes. The Dundee Ready Education Environment Measure (DREEM) is a highly generic and internationally validated study tool used to assess student's perceptions about their EE [3]. Being medical teachers, we are constantly thinking about improving the medical education or curriculum by adding or modifying the teaching learning methods. However, very little information is known to us about student's views on these aspects. This motivated us to assemble the baseline data on student's perceptions about the EE of our medical institute and to identify areas of strengths and weaknesses as well as scope for improvements in the current EE.

Subjects and methods

The present study was a cross-sectional, questionnaire based study involving undergraduate medical students from fifth, seventh, and ninth semesters and interns of the academic year 2015 to 2016 from Terna Medical College, Navi Mumbai, India. A total of 322 students were approached for the study after receiving approval from the Institutional Ethics Committee (TMC/PHARM/TEC-506/2015/014). Students who were willing to participate were enrolled in the study.

1. Questionnaire

The DREEM questionnaire was used as a measure of students' perceptions about the EE. The DREEM is a 50-item inventory involving statements related to the EE with a maximum score of 200 and the following five domains:

(1) Students' perceptions of learning (SPL): 12 items; maximum score, 48
(2) Students' perceptions of teachers (SPT): 11 items; maximum score, 44
(3) Students' academic self-perceptions (SASP): 8 items; maximum score, 32
(4) Students' perceptions of atmosphere (SPA): 12 items; maximum score, 48
(5) Students' social self-perceptions (SSSP): 7 items; maximum score, 28

The participating students were provided an explanation about the study purpose and the DREEM questionnaire and a consent form was administered to them. Students were asked to read each statement carefully and to respond using a 5-point Likert-type scale ranging from strongly agree (4) to strongly disagree (0). Incomplete questionnaires were excluded from the study. Reverse scoring was used for the nine negative items (4, 8, 9, 17, 25, 35, 39, 48, and 50) where strongly agree was scored 0 and strongly disagree scored 4. The McAleer and Roff practical guideline [4] was used to interpret the results: an overall score of 0 to 50 as very poor, 51 to 100 as plenty of problems, 101 to 150 as more positive than negative, and 151 to 200 as excellent. The individual DREEM items were interpreted as follows: items having a mean score of $\geq$3.5 are real positive points, $\leq$2 indicate problem areas, and between 2 and 3 are aspects of the environment that could be improved.

2. Statistical analysis

The data was compiled in an MS Office Excel spreadsheet. Means and standard deviations were calculated. Total scores and the domain scores for all semester students were calculated. Data was analyzed using the statistical package SPSS version 20.0 (IBM Corp., Armonk, USA). One-way analysis of variance with a post hoc Tukey-Kramer multiple comparisons test

was used to identify the significant differences between subgroups. A p-value of less than 0.05 was considered significant.

Results

The DREEM questionnaire was given to 322 students. The overall response rate was 85.71% (276/322). Fourteen questionnaires were incomplete, hence they were excluded from the study, and a total of 262 questionnaires were analyzed. Table 1 shows the demographic details of the participating students.

The global DREEM score of our medical students was 123/200. The fifth semester students perceived the EE most positively, with the highest global DREEM score of 135/200. The global scores of the ninth semester students were lowest (117/200). For all students, the highest scores were recorded for the SASP domain (21.24/32, 65.63%), followed by SSSP (17.48/28, 60.71%), SPA (29.26/48, 60.41%), SPT (26.71/44, 59.09%), and lastly SPL (28.99/48, 58.33%).

When comparing the global and different domain scores of all semester students, students studying paraclinical subjects (fifth semester) had significantly more positive perceptions of the EE than students from

Table 1. Demographic Details of the Students Participated in the Present Study

Variable	5th semester (n=96)	7th semester (n=92)	9th semester (n=84)	Intern (n=50)	Total (n=322)
Respondent (with completed questionnaire)	80 (91.67)	62 (67.39)	76 (90.47)	44 (88)	262 (85.71)
Age (yr)	20.66±0.96	21.87±0.77	22.99±2.50	23.25±0.66	22.05±1.29
Gender					
Male	31	33	38	19	121
Female	49	29	38	25	141
Accommodation					
Hostel	39	16	36	11	102
Home	41	46	40	33	160

Data are presented as number (%) or mean±standard deviation.

Table 2. Comparison of Mean Domain Scores of Fifth, Seventh, and Ninth Semester Students and Interns

DREEM domains (maximum score)	5th semester	7th semester	9th semester	Intern	Significant difference between domain scores of semester
SPL (48)	32.70±5.45	27.02±0.98	26.93±0.91	28.54±5.50	5:7[c], 5:9[c], 5:IN[b]
SPT (44)	29.10±5.61	26.18±0.91	25.17±0.85	25.79±4.77	5:7[a], 5:9[b], 5:IN[a]
SASP (32)	23.06±4.02	19.77±0.61	20.45±0.59	21.34±3.64	5:7[c], 5:9[b]
SPA (48)	31.43±6.23	28.76±0.85	28.21±0.94	27.84±6.57	5:9[a], 5:IN[a]
SSSP (28)	18.75±3.01	17.29±0.49	16.80±0.53	16.59±3.30	5:9[b], 5:IN[a]
Global score (200)	135.05±20.03	119.00±3.49	117.60±3.27	120.11±19.91	5:7[c], 5:9[c], 5:IN[b]

Data are presented as mean±standard deviation.
SPL: Students' perceptions of learning, SPT: Students' perceptions of teachers, SASP: Students' academic self-perceptions, SPA: Students' perceptions of atmosphere, SSSP: Students' social self-perceptions.
One-way analysis of variance followed by post hoc Tukey-Kramer multiple comparisons test was applied. Statistical significance was present as [a]$p<0.05$, [b]$p<0.01$, and [c]$p<0.001$.

clinical branches (seventh ninth semesters, and interns) as shown in Table 2. It was found that none of the items had scores above 3.5. The three highest scored items were 10 (I am confident about my passing this year), 15 (I have good friends in this school), and 2 (The teachers are knowledgeable), which received scores of 3.35, 3.32, and 3.02, respectively. The items that received the lowest scores were items 9 (The teachers are authoritarian), 25 (The teaching over- emphasizes factual learning), 39 (The teachers get angry in class), and 48 (The teaching is too teacher-centered), with scores of 1.84, 1.87, 1.87, and 1.94, respectively. The individual item scores of all semesters were tabulated in Table 3.

Table 3. DREEM Item Scores for the Different Semester Students

Domain	Item	5th semester (n=80)	7th semester (n=62)	9th semester (n=76)	Intern (n=44)	Total (n=262)
SPT	2. The teachers are knowledgeable	3.40±0.54	2.82±0.77[c]	2.76±1.02[c]	3.05±0.60	3.02±0.81
	6. The teachers are patient with patients	2.49±0.90	2.29±0.82	2.43±1.01	2.71±0.59	2.46±0.88
	8. The teachers ridicule the students	2.40±1.04	2.42±1.02	2.32±1.18	2.23±0.89	2.36±1.05
	9. The teachers are authoritarian	2.00±1.10	2.03±0.92	1.58±1.23	1.73±0.87	1.84±1.08
	18. The teachers have good communications skills with patients	3.00±0.71	2.67±0.88	2.65±1.10	2.82±0.82	2.79±0.90
	29. The teachers are good at providing feedback to students	2.89±0.73	2.24±1.16[b]	2.24±1.15[c]	1.96±0.96[c]	2.39±1.06
	32. The teachers provide constructive criticism here	2.60±0.84	2.19±1.09	2.12±1.05[b]	2.73±0.73[d,h]	2.39±0.98
	37. The teachers give clear examples	2.83±0.88	2.52±0.98	2.41±1.08[a]	2.43±0.87	2.56±0.98
	39. The teachers get angry in class	1.79±1.19	2.23±1.17	1.97±1.21	1.32±0.91[f,g]	1.87±1.18
	40. The teachers are well prepared for their classes	3.05±0.76	2.29±0.98[c]	2.38±1.17[c]	2.45±0.87[b]	2.58±1.01
	49. The registrars irritate the course organizers	2.63±0.99	2.47±1.05	2.32±1.26	2.39±0.72	2.46±1.06
SPL	1. I am encouraged to participate in class	2.91±0.62	2.50±0.80[a]	2.45±0.96[b]	2.66±0.83	2.64±0.83
	7. The teaching is often stimulating	2.80±0.80	2.03±0.96[c]	2.24±1.11[b]	2.52±0.79[d]	2.41±0.98
	13. The teaching is student-centered	2.75±0.88	2.24±1.11[a]	2.12±1.24[b]	2.29±0.98	2.38±1.08
	16. The teaching is sufficiently concerned to develop my competence	3.05±0.75	2.58±1.09[a]	2.37±1.07[c]	2.77±0.80	2.69±0.98
	20. The teaching is well focused	3.06±0.72	2.24±1.02[c]	2.34±1.07[c]	2.41±0.89[b]	2.55±0.99
	21. I feel I am being well prepared for my profession	2.79±0.79	2.21±1.03[b]	2.19±1.20[b]	2.68±0.88	2.46±1.03
	24. The teaching time is put to good use	2.82±0.81	1.81±1.07[c]	2.10±1.18[c]	2.27±0.76[a]	2.28±1.06
	25. The teaching over-emphasizes factual learning	1.74±1.04	1.81±0.96	1.80±0.97	1.91±0.91	1.87±1.18
	38. I am clear about the learning objectives of the course	2.94±0.83	2.61±0.99	2.91±0.88	2.86±0.73	2.84±0.88
	44. The teaching encourages me to be an active learner	2.96±0.85	2.39±1.05[b]	2.29±1.18[c]	2.23±0.99[c]	2.51±1.06
	47. Long term learning emphasizes over short term	2.74±0.88	2.57±0.93	2.33±0.99[a]	2.23±0.86[a]	2.49±0.94
	48. The teaching is too teacher-centered	2.14±1.18	2.03±1.01	1.79±1.16	1.71±1.05	1.94±1.12

(Continued to the next page)

Table 3. (Continued)

Domain	Item	5th semester (n = 80)	7th semester (n = 62)	9th semester (n = 76)	Intern (n = 44)	Total (n = 262)
SASP	5. Learning strategies which worked for me before continue to work for me now	2.74 ± 0.76	2.15 ± 1.02[c]	2.37 ± 1.09	2.57 ± 0.55	2.46 ± 0.93
	10. I am confident about my passing this year	3.41 ± 0.67	3.19 ± 0.81	3.43 ± 0.87	3.34 ± 0.48	3.35 ± 0.74
	22. The teaching is sufficiently concerned to develop my confidence	2.89 ± 0.76	2.47 ± 1.07	2.03 ± 1.21[c]	2.55 ± 0.95[g]	2.52 ± 1.18
	26. Last year's work has been a good preparation for this year's work	2.65 ± 0.76	2.40 ± 0.91	2.65 ± 1.22	2.39 ± 0.81	2.55 ± 0.96
	27. I am able to memorize all I need	2.65 ± 0.86	2.07 ± 1.04[b]	2.03 ± 1.28[b]	2.46 ± 0.79	2.30 ± 1.06
	31. I have learned a lot about empathy in my profession	2.95 ± 0.78	2.66 ± 0.97	2.67 ± 1.16	2.75 ± 0.78	2.77 ± 0.95
	41. My problem solving skills are being well developed here	2.91 ± 0.78	2.34 ± 0.96	2.36 ± 1.10	2.46 ± 0.85	2.54 ± 0.97
	45. Much of what I have to learn seems relevant to a career in healthcare	2.86 ± 0.76	2.50 ± 0.97	2.79 ± 1.02	2.84 ± 0.37	2.75 ± 0.86
SPA	11. The atmosphere is relaxed during the ward teaching	2.73 ± 0.98	2.59 ± 0.86	2.37 ± 1.06	2.45 ± 0.82	2.55 ± 0.96
	12. This school is well time-tabled	2.86 ± 1.07	2.00 ± 1.20[c]	2.12 ± 1.45[b]	2.27 ± 1.17	2.34 ± 1.28
	17. Cheating is a problem in this school	2.33 ± 1.27	2.00 ± 1.05	2.34 ± 1.51	2.00 ± 1.01	2.20 ± 1.27
	23. The atmosphere is relaxed during lectures	2.56 ± 0.91	2.71 ± 0.99	2.41 ± 0.13	2.25 ± 0.94	2.50 ± 1.00
	30. There are opportunities for me to develop interpersonal skills	2.59 ± 0.82	2.48 ± 1.08	2.37 ± 1.24	2.59 ± 0.87	2.50 ± 1.03
	33. I feel comfortable in class socially	2.78 ± 0.86	2.63 ± 0.95	2.53 ± 1.01	2.57 ± 0.95	2.63 ± 0.94
	34. The atmosphere is relaxed during seminars/tutorials	2.68 ± 0.89	2.65 ± 0.91	2.54 ± 1.10	2.0 ± 1.09[b,e,g]	2.52 ± 1.02
	35. I find the experience disappointing	2.73 ± 0.93	2.34 ± 1.13	2.41 ± 1.11	2.46 ± 0.73	2.50 ± 1.01
	36. I am able to concentrate well	2.71 ± 0.72	2.45 ± 0.88	2.50 ± 1.13	2.73 ± 0.66	2.59 ± 0.89
	42. The enjoyment outweighs the stress of the course	2.58 ± 0.99	2.34 ± 1.10	2.13 ± 1.39	1.96 ± 1.01[a]	2.29 ± 1.17
	43. The atmosphere motivates me as a learner	2.74 ± 0.95	2.37 ± 1.15	2.22 ± 1.21[a]	2.23 ± 0.89	2.42 ± 1.09
	50. The students irritate the teachers	2.16 ± 1.21	2.19 ± 1.24	2.28 ± 1.57	2.34 ± 1.12	2.23 ± 1.31
SSSP	3. There is a good support system for students who get stressed	2.38 ± 0.94	1.98 ± 1.08	1.82 ± 1.29[a]	1.98 ± 1.07	2.05 ± 1.12
	4. I am too tired to enjoy the course	2.64 ± 1.01	2.24 ± 1.04	1.97 ± 1.37[b]	2.16 ± 0.94	2.27 ± 1.14
	14. I am rarely bored on this course	2.10 ± 1.22	1.94 ± 1.13	1.95 ± 1.23	2.18 ± 1.19	2.03 ± 1.19
	15. I have good friends in this school	3.25 ± 0.91	3.21 ± 0.96	3.46 ± 0.77	3.39 ± 0.49	3.32 ± 0.83
	19. My social life is good	3.15 ± 0.93	2.94 ± 0.92	2.96 ± 1.27	2.61 ± 1.19	2.95 ± 1.09
	28. I seldom feel lonely	2.29 ± 1.07	2.24 ± 1.30	1.91 ± 1.35	2.05 ± 1.09	2.13 ± 1.22
	46. My accommodation is pleasant	2.95 ± 0.79	2.74 ± 1.09	2.74 ± 1.30	2.23 ± 1.27[b]	2.72 ± 1.13

Data are presented as mean ± standard deviation.

SPT: Students' perceptions of teachers, SPL: Students' perceptions of learning, SASP: Students' academic self-perceptions, SPA: Students' perceptions of atmosphere, SSSP: Students' social self-perceptions.

One-way analysis of variance followed by post hoc Tukey-Kramer multiple comparisons test was applied. Statistical significance was present when compared with the 5th semester as [a]$p<0.05$, [b]$p<0.01$, and [c]$p<0.001$; when compared with the 7th semester as [d]$p<0.05$, [e]$p<0.01$, and [f]$p<0.001$; and when compared with the 9th semester as [g]$p<0.05$, [h]$p<0.01$.

Discussion

We used the DREEM inventory as a tool to study the perceptions of our students about their EE. The total duration of the undergraduate course curriculum in our institute is five and half years and is divided into three phases: preclinical for first (first and second semester), paraclinical for second (third to fifth semester), and clinical for third year (sixth to ninth semester), followed by an internship for 1 year.

The mean overall DREEM score of our students was 123/200, which indicates a more positive perception of the EE. Several studies across the world have reported DREEM scores in the ranges of 101 to 139 [5,6,7,8,9,10,11,12]. Many of the items involved in the DREEM questionnaire are related to clinical encounters between doctor and patient, about which students in preclinical subjects are naive. Hence, the purposeful exclusion of preclinical branch students and the inclusion of paraclinical (fifth semester) and clinical branch (seventh, ninth, and interns) students made our study findings more rational and evocative. Comparisons between different semester students revealed that the global DREEM score as well as the domain scores of fifth semester students were significantly more positive than other semester students. Similar findings were reported by several studies [5,10,13]. The fifth semester students studying paraclinical subjects along with clinical postings may be more enthusiastic about their future clinical knowledge and perceived the EE more positively. Focused group discussion with advanced semester students revealed that the vast clinical curriculum, the linking between theoretical knowledge and its clinical application, the need for a large amount of clinical exposure, and examination stress made students feel the EE towards less positive side.

Our students scored highest in the domain of academic self-perception and felt it towards positive side. The students scored uniformly highest for item 10 (I am confident about my passing this year). Similar findings were reported by Aghamolaei and Fazel [13] and Gade and Chari [14]. Students being exposed to many formative examinations as well as the student-friendly nature of the examination pattern might also have helped to develop the student's confidence. The majority of students felt that their learning is relevant to their health care needs and that they have learnt about empathy.

Student's social self perception was not too bad. Fifth semester students scored significantly higher in this domain as well as for items 3 (there is good support system for the stressed out students) and 4 (I am too tired to enjoy the course). However, several researchers [13,15] reported very low scores (0.9 and 1.1) for item 3 compared to our score (2.05). This difference in results was probably due to the well-established mentoring program that helps students to have informal interactions with mentors who guide them to overcome stressful situations with proper perspectives. The students from clinical branches felt that there was no support system for stressed out students and they become bored during the course. Focused group discussion with these students revealed that they find it difficult to interlink the vast theoretical knowledge and its clinical applications in order of their incidence, relevance, and importance in our set-ups.

All students perceived the institutional atmosphere positively. The students felt that the teaching atmosphere was relaxed, comfortable, and that they were able to concentrate well. Several obstacles such as unavailability of specific cases, lack of time or interest to teach by clinicians, and their patient-first approach might have resulted in the relatively lower score for item 12 by clinical branch students.

Student's perception of teachers moved toward the right direction as they fifth semester students scored significantly higher in items 2 (Teachers are knowledgeable), 29 (Teachers are good at providing feedback to the students), 32 (Teachers provide constructive criticism), 37 (Teachers give clear examples), and 40 (Teachers are well prepared for their classes) than other semester students. Students, on the other hand, felt that teachers were authoritarian and that they get angry. Similar findings were reported by many researchers in their studies [5,10,11,16,17,18]. There is a need to increase the training of teaching faculty staff about the changing demands of medical students and the shift from traditional to innovative teaching methods where teachers play the role of a facilitator rather than just a knowledge provider.

Students had more positive perceptions of learning. Students agreed that they were clear about their learning objectives, were encouraged to participate in teaching sessions, and were able to develop the desired competence. However, they felt that the teaching overemphasizes factual learning and it is teacher centered which is echoed by several other studies [5,10,13,16,17,18].

One of the limitations of our study is that the study tool that we used provided fixed options; hence, some aspects that affect the EE of our institution might have been missed. Second, for these types of studies, a qualitative interview may have covered all the aspects of the EE that were overlooked in our study. The focused group discussion with a few participants revealed that the length of the questionnaire and framing of a few questions was too exhausting for them; yet, only 14 participants returned incomplete questionnaires. The DREEM in its existing design may not be completely suitable to cover all aspects of medical education and a local version that is more suitable to our set up is desirable. This is the first evaluation of students' perception of the EE at our institution; thus, this baseline data will be useful to monitor the effects of curricular transformation over a period of time in the future.

To conclude, the overall perception of our students about the EE was positive. The fifth semester student's perception was more positive than that of the clinical branch students. The positive points were that teachers are knowledgeable; students have good friends; and they were confident about passing their exams. Problem areas observed were authoritarian teachers, overemphasis on factual learning, too teacher-centered teaching, and teachers getting angry in class. The areas with scope for improvement and the areas of weakness will be addressed with a positive perspective to improve and strengthen the EE in our institute.

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