Review Article

Medical Students' Perception of Education Environment in Clinical Postings

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Introduction : Educational environment is a major factor that determines curriculum effectiveness.

Aims: This study aimed to assess the perception of a single batch of MBBS students of a North Indian Medical College, towards the existing education environment in clinical postings and the changes in this perception at different points of exposure.

Methods : It was a longitudinal, descriptive study using DREEM questionnaires to assess the education environment and its domains. Questionnaires were provided to 197 students of the MBBS batch of 2015 at the end of their clinical postings in 4th/5th, 6th/7th, 8th and 9th. Responses were assessed for each domain using one-way ANOVA test. Mean item scores, domain scores, and global scores were calculated and compared.

Results : The average global score was 133.24 ± 6.79, i.e. more positive than negative.There was, however, a highly significant decline (P<0.001) of total scores from 4th to 9th semester with the lowest domain score for the students' social self-perception. The major problem areas uncovered include poor support system for stressed students, angry and authoritarian teachers and factual nature of the curriculum. Further, students in their 9th semester felt that teachers were more likely to get angry during teaching sessions as compared to 4th.

Conclusion : There is a need for improvement across all the domains of the education environment. However, particular attention must be given to the students' perception of teachers and social self-perception.

[*J Indian Med Assoc* 2021; **119(2):** 26-30]

Key words **: Education Environment, DREEM, Clinical Subjects, Medical Education.**

Editor's Comment :

- **Educational environment is a major factor that determines curriculum effectiveness.**
- **Our longitudinal, descriptive study aimed to assess the perception of a single batch of MBBS students of a North Indian Medical College, towards the existing education environment in clinical postings and the changes in this perception at different points of exposure using standardized DREEM questionnaires.**
- **The average global score was 133.24 ± 6.79, ie, more positive than negative.**
- **There was, however, a highly significant decline (P<0.001) of total scores from 4th to 9th semester and several problem areas were identified.**
- **There is a need for improvement across all the domains of the education environment, with particular attention to be given to the students' perception of teachers and social self-perception.**
- **Also, regular feedback must be taken from students in order to improve the effectiveness of the education environment.**

The current Bachelor of Medicine, Bachelor of Surgery course in India is 4.5 years and 9 semesters. First two semesters focus on preclinical subjects, in semesters 3, 4 and 5 students learn para-clinical subjects while being initiated into clinical subjects and semester 6 onwards is clinical subjects. This traditional framework lacks a structured mechanism for student feedback.

Over time, reports from developing countries including India, indicate medical students' dissatisfaction with current curriculum, teaching methods and educational environment[1,2]. A need exists to produce more innovative and sustainable model.

Educational environment is one of the major factors that determine effectiveness of a curriculum[3]. Assessment of this environment is thus a good measure of curriculum effectiveness and students' acceptance.

Over time, methodologies have been developed to assess education environment, including qualitative methods like questionnaires[4-7]. Dundee Ready Education Environment Measure (DREEM) developed by International Delphi Panel (1997) is one such standardized, culturally nonspecific, widely accepted questionnaire for gauging student attitude towards learning environment in healthcare coursework[8-10]. Several studies have been conducted in India, especially as the need for improving the curriculum was felt[11,12], highlighting students' negative perception towards various domains. There remains a need for studies with larger group of students and longer time periods to accurately assess the current Indian curriculum.

Additionally, keeping in mind the long duration of medical curriculum, an overall improvement in education environment can be achieved when each subject studied over the course's duration is assessed and its shortcomings addressed.

Clinical postings are introduced in earnest in 4th semester, till the final semester with final examinations taking place after 3.5 years of study. Clinical subjects include Medicine, Surgery, Pediatrics and Obstaetrics and Gynecology. The Medical Council of India provides a broad outline for curriculum planners and how to achieve this is left to individual institutions.

In our institution, the undergraduate curriculum aims at imparting

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Received on : 12/09/2020
Accepted on : 13/10/2020

cognitive, psychomotor and communication skills by lectures, tutorials and clinical sessions. Postings in the clinical set up start in the 4th semester aiming at providing experiential learning opportunities. These postings are structured comprehensively: initial clinical postings in 4th/5th and 6th/7th semesters sensitize students towards the subjects, patient population and common medical problems faced by them (Table 1). Informal evaluation is done in 4th semester, while formative assessment with grading is done in later semesters, each followed by individual and collective feedback sessions.

This study aimed to assess the education environment of clinical postings of the existing medical curriculum in a specific batch of students, and the changes in this perception at different points of exposure throughout their course. It also aimed to identify the problem areas, hence allowing course organizers to address them

Methodology :

This was a longitudinal, descriptive, student on student study conducted in a North Indian Medical College. Based on convenience sampling, all students of MBBS batch of 2015, comprising of 197 at the beginning of their 4th semester were recruited. The study was conducted over a period of three years, from January, 2017 to December, 2019, till the said batch appeared for their final professional examinations. Out of 197 subjects, 2 left the study (1 was held back and 1 failed to maintain regular attendance in the posting).

Students were enrolled after obtaining informed consent, with the freedom to withdraw at any time during the course of study, without it being reflected in their evaluation.

The students were provided with DREEM questionnaires after they had finished all the postings in clinical departments for the semester during their 4th/5th, 6th/7th, 8th and 9th semesters. The questionnaire, consisting of 50 statements, was responded to using a 5-point Likert scale. Incomplete questionnaires and students who failed to return the forms were excluded from the study. All questionnaires were anonymous and complete privacy was maintained by using a student specific unique identification number.

The quantitative data was entered in Microsoft Excel spreadsheet (Microsoft Co., Redmond, WA, USA) and SPSS ver. 20.0 (SPSS Inc, Chicago, IL, USA) was used for statistical analysis. Total scores for each domain and overall score (out of 200) was calculated on the basis of the DREEM score card for each semester, individually and combined.

To identify drawbacks in the education environment, items with a mean score below 2 were taken as problem areas requiring improvement, items with a mean score between 2 and 3 were considered as those that could possibly be improved on, and items with a mean score of 3 and above were considered as positive. One-way ANOVA test was used to compare global scores and mean domain scores amongst the semesters. P values < 0.05 were at 95% confidence interval was considered as significant.

Results :

The mean global DREEM score over all the semesters was 133.24 ± 6.79. Table 2 shows global DREEM score for individual semesters, individual domain wise scores in each semester, their average overall score and domain and interdomain trends over the course of the study.

Fig 1 shows the most highly rated positive and negative statements and their difference between 4th/5th and 9th semesters. In addition, there was a significant decline in students' perception that the course was well timetabled from 4th/5th (3.39 ± 0.28) to 9th semester (2.52 ± 0.20), (P<0.05). Students consistently marked the statement "teachers overemphasize on factual learning" below 2 and there was no significant change in this perception throughout. Fig 2 shows changes in perception for individual domains between the 4th/5thand the 9th semesters.

Discussion :

Students' perception of education environment is indicative of its effectiveness and also influences their academic performance[3]. It may also help identify lacunae and hence, help in modification and improvement of the curriculum. A positive educational environment is essential for a positive learning outcome[13]. We determined undergraduate medical students' perception of education environment in their clinical postings in the existing curriculum and changes in this perception over a period of 3 years using the DREEM questionnaire.

Students, with a global score of 133.24 ± 6.79, rated the education environment as being "more positive than negative" (Table 2). The total average global score was highest after 4th/5th semester, following which there was a progressive fall in the scores up to 8th semester, suggesting a decline in the students' perception of education environment. This could be indicative of increasing work load and stress amongst the students. It was, however, followed

Table 1 — *Semester-wise structure of Clinical postings*

MBBS Semester	Stage of learning	Duration	Details of exposure	Formative assessment
4th/ 5th	Early	4 weeks	History taking and Examination	None
6th /7th	Early Intermediate	4 weeks	Clinical exposure, rotation between units	OSCE
8th	Late Intermediate	4 weeks	Mentored by 1 unit (6 d/week with OPD)	Ward leaving (long case) + instruments/ drugs viva
9th	Final	4 weeks	Clinical exposure, rotation between units	Ward leaving (long case) + instruments/ drugs viva

Note : OPD - Outpatient Department, OSCE - Observed Structured Clinical Examination.

Table 2 — *Average Dundee Ready Education Environment Measure (DREEM) score for the different domains expressed as scores and percentages for different semesters and total average score for each domain over the period of the entire Pediatrics curriculum for the purpose of comparison. P is comparison with the baseline, i.e. 4th semester scores. P# is when compared to the scores of the previous semester. * P<0.05 and ** P<0.001. $P<0.05 when domains U, V, W and X were compared with domain Y, ie, U vs Y (P = 0.04), V vs Y (P = 0.02), W vs Y (P =0.08) and X vs Y (P = 0.35)*

Areas	Total Score		4/5th Sem	6/7th Sem	8th Sem	9th Sem	Average
U	48	n	34.11 ± 0.41	31.97 ± 0.28	30.72 ± 0.24	31.44 ± 0.29	32.27 ± 1.71
		%	71.06	66.66	64	65.5	66.79$
		P		0.12	0.1	0.36	
V	44	n	29.19 ± 0.52	30.54 ± 0.54	29.56 ± 0.51	26.64 ±0.56	29.76 ±0.70
		%	67.95	69.41	67.18	60.57	68.18$
		P		1	1	1	
W	32	n	22.33 ± 0.22	21.63 ± 0.32	20.85 ± 0.33	18.19 ± 0.28	21.60 ± 0.74
		%	69.78	67.59	65.16	56.84	64.84
		P		0.51	0.69	0.29	
X	48	n	34.89 ± 0.85	31.58 ± 0.26	30.58 ± 0.25	24.39 ± 0.42#	31.68 ± 1.16
		%	68.52	65.79	63.71	50.81	62.2
		P		0.06	0.52	0.01	
Y	28	n	17.97 ± 0.41	16.96 ± 0.41	15.88 ±0.45	13.81 ± 0.12	16.16 ± 1.05
		%	64.18	60.57	56.71	49.32	60.49
		P		0.49	0.36	0.23	
Z	200		141.14 ±15.55	133.06 ±19.31	127.65 ± 20.54	131 ± 10.80	133.24 ± 6.79
		P		0.0004**	0.0003**	0.0003**	
		P#		0.0004**	0.008*	0.12	

Note : Here, U = Students' Perception of Learning, V = Students' Perception of the Course Organizers, W = Students' Academic Self Perception, X = Students' Perception of Atmosphere, Y = Students' Social Self Perception and Z = Total average DREEM Score.
The interpretation of total average score is done based on the guidelines provided by Roff et al, where a score of 0-50 is interpreted as very poor, 51-100 as having plenty of problems, 101-150 as more positive than negative and 151-200 as excellent.

by a non-significant rise in the score at the end of 9th semester. This could be explained by an increase in study hours put in by the students as a result of approaching examinations leading to an improvement in perception of the learning environment.

Important problem areas identified included dissatisfaction with timetabling of postings, absence of a support system, angry and authoritarian teachers, inability to memorize and concentrate, factual nature of coursework and the absence of a support system. Students, however, also reported that teachers were knowledgeable and had good communication skills with patients and that teaching was patient centered. Table 3 shows the interpretation of the individual domain scores as per DREEM guidelines.

Total average global score observed in this study is higher than those of other similar Indian studies[11,12,14-16] and those conducted in other developing countries[6,7,17-19]. It was, however, found to be similar to that reported by a study done in New Zealand[20]. Similar global scores were observed by Medical Colleges with teacher centered, factual curriculum[21,22], whereas, centers with student centered, problem-based learning showed higher scores[23-25].

A cross sectional study conducted in a similar North Indian medical college on students studying in various semesters, had an average global score of 101. It, similarly, observed lowest scores for the support system available to students and found that students had a negative perception of teaching and found the stress on factual learning and the course content to be

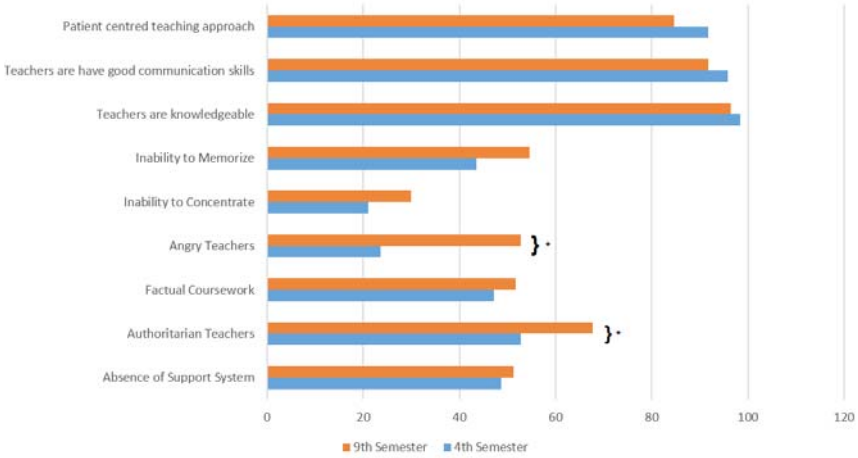

Fig 1 — Graph showing statements with the highest and the lowest scores and the changes in their perception between 4th and 9th semesters. There was a significant increase in the perception among students that teachers were authoritarian and were more likely to get angry during teaching sessions. *P<0.05

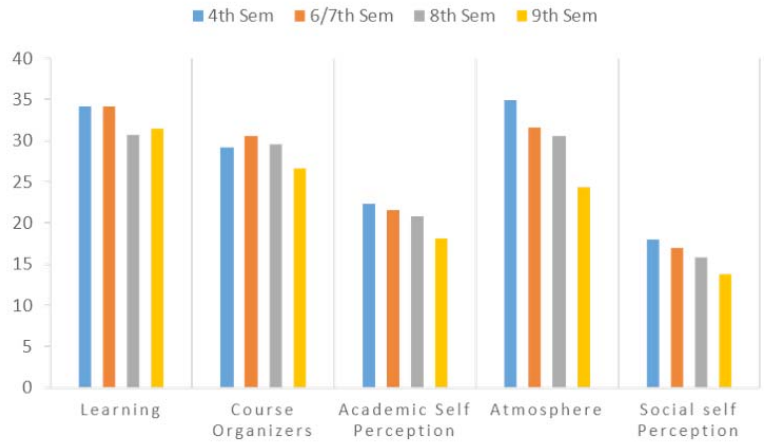

Fig 2 — Graph showing the change in the cumulative scores of different individual domains from 4th to 9th semester. A significant decline was observed in students' perception of atmosphere from 4th to 9th semester. *P<0.05

bothersome[14].

Sunkad *et al* reported that their students, as ours, found the education environment to be more positive than negative[15]. Abraham *et al* found that early semesters seemed to find education environment more positive than later semester students[22].

Another Indian study reported that the social atmosphere for students was not congenial and they were stressed[26]. Similar findings were also seen in other states[16,27]. The students further complained that they were unable to memorize all that was needed of them[27]. Naser *et al* found the learning environment was perceived positively by students but they felt that the course emphasized on factual learning and was not well timetabled and that the atmosphere during clinical teaching was not relaxed[28].

Gupta *et al* performed a cross sectional study on medical students of 2nd to 4th semesters and unlike our study, observed that teaching was teacher-centric, burdensome and boring. Another study done specifically for education environment in the subject Community Medicine, reported that students were too bored to enjoy their course[12].

Based on the results of the present study, the lacunae that were identified can be addressed by introducing innovative teaching techniques including problem-based learning[29] and computer based cognitive representation[30], better timetabling of clinical postings and integration of teaching amongst various Departments[2]. Introduction of a strong support system is essential for the students considering the stressful nature of the curriculum. Institution of a mentor-mentee system and inclusion of extracurricular activities into the academic framework may provide a possible solution[31]. Regular student feedback and participation allows them to become stakeholders in their education and further, may help strengthen the curriculum as well its effectiveness.

Limitations :

Our study, having been performed on the same cohort, helped assess the overall perception to education environment and the changes in it with each passing semester. However, being limited to clinical postings in a single batch and a single institution in a single city of North India, is not representative for the entire country. A multicentric study is hence, desirable. Further, the DREEM questionnaire has a fixed number of statements that cannot be modified. Some students also complained that the questionnaire was too long and bothersome to fill.

Conclusion :

This study showed that the education environment in clinical postings in our institution is more positive than negative. It identified several positive areas; however, a few problem areas were also identified across all domains. Addressing these issues and suitably modifying the curriculum based on students' feedback may help

Table 3 — *Key for the interpretation of the individual domain scores as per the Dundee Ready Education Measure (DREEM) guidelines and the results from our study*

Domain	Scores	Interpretations	Our Interpretation
Students' Perception of Learning	0-12	Very Poor	A more positive perception
	13-24	Teaching is viewed negatively	
	25-36	A more positive perception	
	37-48	Teaching highly thought of	
Students' Perception of Course Organizers	0-11	Abysmal	Moving in the right direction
	12-22	In need of some retraining	
	23-33	Moving in the right direction	
	34-44	Model course organizers	
Students' Academic Self Perception	0-8	Feelings of total failure	Feeling more on the positive side
	9-16	Many negative aspects	
	17-24	Feeling more on the positive side	
	25-32	Confident	
Students' Perception of Atmosphere	0-12	A terrible environment	A more positive attitude
	13-24	There are many issues which need changing	
	25-36	A more positive attitude	
	37-48	A good feeling overall	
Students' Social Self Perception	0-8	Feelings of total Failure	Many negative aspects
	9-16	Many negative aspects	
	17-24	Feeling on the more positive side	
	25-32	Confident	

improve the education environment and hence, help improve its effectiveness. Further, routine feedbacks at fixed periods of time, may help identify improvements as well as new problem areas as and when they develop.

Financial Support and Sponsorship : None.

Conflicts of Interest : There are no conflicts of interest.

References

1 Nabilou B, Khorasani-Zavareh D — The bridge between real and ideal: Students perception on quality gap in reality and their educational expectations. *Iran Red Crescent Med J* 2014; **16(9):** e14254.
2 Adlakha V, Jha T, Sahoo P, Muralidharan A, Bachani D — Students' perception of lacunae in medical education in India, and suggestions for reforms. *Natl Med J India* 2018; **31(1):** 29-31.
3 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.
4 Seabrook MA — Clinical students' initial reports of the educational climate in a single medical school. *Med Educ* 2004; **38(6):** 659-69.
5 Audin K, Davy J, Barkham M — University quality of life and learning (UNIQoLL): An approach to student well-being, satisfaction and institutional change. *J Furth High Educ* 2003; **27(4):** 365-82.
6 Sobral DT — Medical students' self-appraisal of first-year learning outcomes: Use of the course valuing inventory. *Med Teach* 2004; **26(3):** 234-8.
7 Al Rukban MO, Khalil MS, Al-Zalabani A — Learning environment in medical schools adopting different educational strategies. *Educ Res Rev* 2010; **5(3):** 126-9.
8 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(4):** 295-9.
9 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.
10 Pimparyon 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(4):** 359-65.
11 Pai PG, Menezes V, Srikanth, Subramanian AM, Shenoy JP — Medical students' perception of their educational environment. *J Clin Diagnostic Res* 2014; **8(1):** 103-7.
12 Gupta S, Gupta A, Verma M, Kaur H, Kaur A, Singh K — The attitudes and perceptions of medical students towards basic science subjects during their clinical years: A cross-sectional survey. *Int J Appl Basic Med Res* 2014; **4(1):** 16-9.
13 Hutchinson L — ABC of learning and teaching: Educational environment. *BMJ* 2003; **326(7393):** 810-2.
14 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 Educ Eval Health Prof* 2013; **10:** 5.
15 Sunkad MA, Javali S, Shivapur Y, Wantamutte A — Health sciences students' perception of the educational environment of KLE University, India as measured with the Dundee Ready Educational Environment Measure (DREEM). *J Educ Eval Health Prof* 2015; **12:** 37.
16 Bhosale U — Medical students' perception about the educational environment in western Maharashtra in medical college using DREEM scale. *J Clin Diagnostic Res* 2015; **9(11):** JC01-JC04.
17 Sundus A, Nadir HM, Faisal IM, Nida Y, Talha FM, Fatiha I, *et al* — Medical students perception of their medical environment-expected versus actual perceptions - a cross sectional study. *J Pak Med Assoc* 2014; **64(2):** 230-6.
18 Kim H, Jeong H, Jeon P, Kim S, Park YB, Kang Y — Perception Study of Traditional Korean Medical Students on the Medical Education Using the Dundee Ready Educational Environment Measure. *Evidence-based Complement Altern Med* 2016; **2016:** 6042961.doi: 10.1155/2016/6042967.
19 Roff S, McAleer S, Ifere OS, Bhattacharya S — A global diagnostic tool for measuring educational environment: Comparing Nigeria and Nepal. *Med Teach* 2001; **23(4):** 378-82.
20 Foster PLA, Kang I, Anderson VR, Thomson WM, Meldrum AM, Moffat SM — Changes in Bachelor of Oral Health students' perceptions of their dental education environment. *N Z Dent J* 2013; **109(4):** 134-40.
21 Al-Ayed IH, Sheik SA — Assessment of the educational environment at the College of Medicine of King Saud University, Riyadh. *East Mediterr Heal J* 2008; **14:** 953-59.
22 Abraham R, Ramnarayan K, Vinod P, Torke S — Students' perceptions of learning environment in an Indian medical school. *BMC Med Educ* 2008; **8:** 20.doi:10.1186/1472-6920-8-20.
23 Demirören M. Perceptions of Students in Different Phases of Medical Education of Educational Environment: Ankara University Faculty of Medicine. *Med Educ Online* 2008; **13:** 8.doi: 10.3885/meo.2008.Res00267.
24 Zawawi AH, Elzubeir M — Using DREEM to compare graduating students2 perceptions of learning environments at medical schools adopting contrasting educational strategies. *Med Teach* 2012; **34(Suppl1):** S25-31.
25 Edgren G, Haffling AC, Jakobsson U, McAleer S, Danielsen N — Comparing the educational environment (as measured by DREEM) at two different stages of curriculum reform. *Med Teach* 2010; **32:** e233-e238.
26 Thomas BS, Abraham RR, Alexander M, Ramnarayan K — Students' perceptions regarding educational environment in an Indian dental school. *Med Teach* 2009; **31:** e185-e186.
27 Patil AA, Chaudhari VL. Students' perception of the educational environment in medical college: a study based on DREEM questionnaire. *Korean J Med Educ* 2016; **28(3):** 281-8.
28 Naser SM, Biswas A, Nandy M, Niyogi S, Biswas G, Das AK — Perception of students regarding educational environment in a medical college in eastern region of India. *J Indian Med Assoc* 2012; **110(11):** 800-802.
29 Imanieh MH, Dehghani SM, Sobhani AR, Haghighat M — Evaluation of problem-based learning in medical students' education. *J Adv Med Educ Prof* 2014; **2(1):** 1-5.
30 Wu B, Wang M, Johnson JM, Grotzer TA — Improving the learning of clinical reasoning through computer-based cognitive representation. *Med Educ Online* 2014; **19:** 25940.. doi:0.3402/meo.v19.25940.
31 Bhatia A, Singh N, Dhaliwal U. Mentoring for first year medical students: humanising medical education. *Indian J Med Ethics*. 2013; **10:** 100-3.