

## **Perception of undergraduate medical students to the existing learning environment, India**

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### **Abstract**

The learning environment of a medical institution is measurable and can be changed to enhance the quality of medical education. DREEM (Dundee Ready Education Environment Measure) is a valid and reliable tool to measure the learning environment. The study aims to know the perception of medical students about the existing learning environment and to find the problem areas in it. A cross-sectional study was conducted on 300 medical students of the third, sixth and seventh semesters, studying at ESIC Medical College. DREEM questionnaire was used to know the students' perception of the existing learning environment. Descriptive statistics and one-way ANOVA were used to analyze the data. Overall mean DREEM score for all academic years was  $123.90 \pm 21.6$ . Mean domain scores of, Students' Perception of Learning (SPL), Students' Perception of Teachers (SPT), Students' Academic Self Perception (SASP), Students' Perception of Atmosphere (SPA), Students' Social Self Performance (SSSP) were  $30.79 \pm 5.42$ ,  $28.01 \pm 4.96$ ,  $20.87 \pm 4.24$ ,  $30.33 \pm 6.71$ ,  $16.74 \pm 4.20$  respectively. Comparison of the mean domain scores among three semesters was found to be statistically significant. The items, the teaching over emphasized factual learning (q25), unable to memorize the required content (q27), and the stress of the course (q42) had mean item scores of 1.68, 1.87 and 1.98 respectively. This study showed that the majority of students had "more positive than negative" perceptions, interpreting that the institution provides a reasonably good learning environment. However, it identifies certain problem areas that need to be addressed to enhance the quality of medical education.

**Keywords:** Learning environment, DREEM, Problem areas

## **1. Introduction**

Every medical student must have an opportunity to learn in a positive environment, enjoy the learning process, feel comfortable, and content within it. The learning environment of an institute is defined as everything that is happening in the classroom, department, faculty, or university (Genn JM,2001). It includes the educational, physical, social, and psychological aspects of the medical course that plays a significant role in the professional and moral development of the medical students( Kennedy C, 2013).It involves the students' perceptions of the available support structures, level of autonomy in their learning, their emotional response, and the inherent meaning they find in the education process (Marshall RE,1978).

A positive learning environment fosters a healthy relationship between teachers and students. It encourages self-directed learning among the students and has an impact on students' perception of wellbeing( Roff S, 2005), academic achievements(Jamaiah I, 2008) and their future aspirations. An excellent educational environment reflects a quality curriculum. Thus, all medical education programs should emphasize on improving their learning atmospheres. Various tools including qualitative approaches by Seabrook (SeabrookM.A,2004)and questionnaires by Audin (Audin, K., Davy, J. & Barkham, M, 2003) have been utilized for evaluating the learning environment of an institution. But the most reliable and valid tool for assessing the learning environment of an institution is the one developed by an international Delphi panel in Dundee, Scotland called DREEM`Dundee Ready Education Environment Measure (Roff S,2005). DREEM not only finds the perception of medical students about the learning environment but also compares them across students of various phases of the MBBS course. It also finds the strengths and deficiencies in the learning environment. A systematic review, by Soemantri concluded that DREEM is the best tool for evaluating medical students' perceptions of the learning environment . (Soemantri D, Herrera C, Riquelme A, 2010).

## **2.Significance Of The Study**

The students' perception of various components of the learning environment and their influence on the learning process is variable. Thus, if we evaluate how various elements in the learning environment of a given institution are perceived by the students and teachers, we can modify them, to enhance the quality of medical education.

## **3.Review Of Related Studies**

Riquelma Etal in their study reported that the school's educational climate was generally perceived positively by students, although they viewed the school's social environment less favourably. Specific areas identified by students as needing improvement included an overloaded curriculum and inadequate student supports. (Riquelme A, Oporto M, Oporto J, Méndez J I, Viviani P, Salech F, Chianale J, Moreno R, Sánchez I, 2009).

Kohli concluded in their study using the DREEM questionnaire that improvement is required across all domains of the educational environment at their institution and Students, particularly of the eighth semester, perceived the teaching negatively. The lowest scores were given to the support system, burdensome course content, and factual learning; thus, a hybrid curriculum that includes problem-based learning might provide students with stimulating learning; structured clinical teaching with

specific curricular objectives, as well as mentoring of senior students by faculty and near-peers, might improve the learning environment for senior students(Kohli V and Dhaliwal U , 2013).

### **4.Objectives Of The Study**

1. To know the medical students' perception of the existing learning environment
- 2.To compare the perceptions among the students' in different phases of the MBBS course and
- 3.To find the strengths and weaknesses in the existing learning environment.

### **5.Hypotheses Of The Study**

- Medical students perceptions about the existing environment are moderate
- There is no significant difference between perceptions of learning environment and different phases of the MBBS Course
- There is no significant difference in strengths and weaknesses of the existing learning environment

### **6.Population And Sample**

A cross-sectional study was conducted in the Department of Medical Education at ESIC Medical College, Telangana, India during November- December 2019. Employees State Insurance Corporation (ESIC) Medical College, under the aegis of ESI Corporation, Ministry of Labour and Employment, Government of India, is an MCI permitted Medical College and Hospital located in Hyderabad, Telangana, a southern state in India. The College which is affiliated to Kaloji Narayana Rao University of Health Sciences, Warangal was approved by the Medical Council of India (MCI) in the year 2016 and has an intake of 100 students every year. Presently this Medical College caters to 400 medical students in different phases of the MBBS course. All the students (regular batch and repeaters) who have passed at least one of the university examinations in the past 3 years (3rd, 6th, and 7th semesters of MBBS course) were included in the study. (N=300) Institutional Ethical Clearance was obtained (IEC No-ESICMC/F0144/11-2019).

### ***Procedure and Data Collection***

The students were oriented about the study through a didactic lecture. An online DREEM questionnaire was generated and shared through WhatsApp and Email to all the students who consented to the study. The responses were collected through the same process. DREEM is a 50-item closed question questionnaire in which each item (question) falls into one of the 5 domains, Students Perception of Learning (SPL), Students Perception of Teachers (SPT), Students Academic Self Perception (SASP), Students Perception of Atmosphere (SPA), Students Social Self Performance (SSSP). Each item is marked on a 5-point Likert scale- scoring 4 for Strongly Agree (SA), 3 for Agree (A), 2 for Uncertain (U), 1 for Disagree (D), and 0 for Strongly Disagree (SD). 9 out of 50 items (Questions 4, 8, 9, 17, 25, 35, 39, 48, and 50) are negative statements and scored in the reverse order (0-strongly agree to 4-strongly disagree).

The responses were analyzed at 3 levels- overall mean DREEM scores, the mean scores for each domain, and the mean scores for each item. The maximum overall DREEM score calculated was 200 while the maximum domain scores were 48, 44, 32, 48, and 28 for SPL, SPT, SASP, SPA, and SSSP respectively. Interpretation of the learning environment was done using the guide given by Roff in 2002. A score of 0 – 50 indicated a "very poor, 51–100 an environment with "plenty of problems, 101 to 150 an environment which is 'more positive than negative," while 151 – 200 indicated an "excellent" environment. All the scores were calculated and compared among the 3 academic year students. Specific strengths and weaknesses in the learning environment were assessed by interpreting the mean scores of individual items in the questionnaire. Items with a mean score of 3.5 or more were considered as strengths and those with a mean score of 2 or less were considered as problem areas in the learning environment.

### 6.1.Statistical Techniques Used in the Present Study

Descriptive statistics such as frequency, mean and standard deviation, and one-way ANOVA for comparisons were used.

### 6.2.Data Analysis and Interpretation

Out of 300 medical students, 263 participated in the study with a response rate of 87.6%. The overall mean DREEM score was 123.90±21.6. Out of 263 students 212 (80.6%) students perceived that the existing learning environment was more positive than negative, 2/263 (0.8%) felt that it had plenty of problems, 23/263 (8.7%) perceived that the learning environment was excellent. Comparisons among different phases of the MBBS course showed that 71(79%),77(81%), and 64(82%) of the students from the third, sixth and seventh semesters had overall positive perceptions about the learning environment. Analysis of mean domain scores was done for different semesters and compared. Table 1 gives the details of semester wise comparisons of SPL, SPT, and SASP.

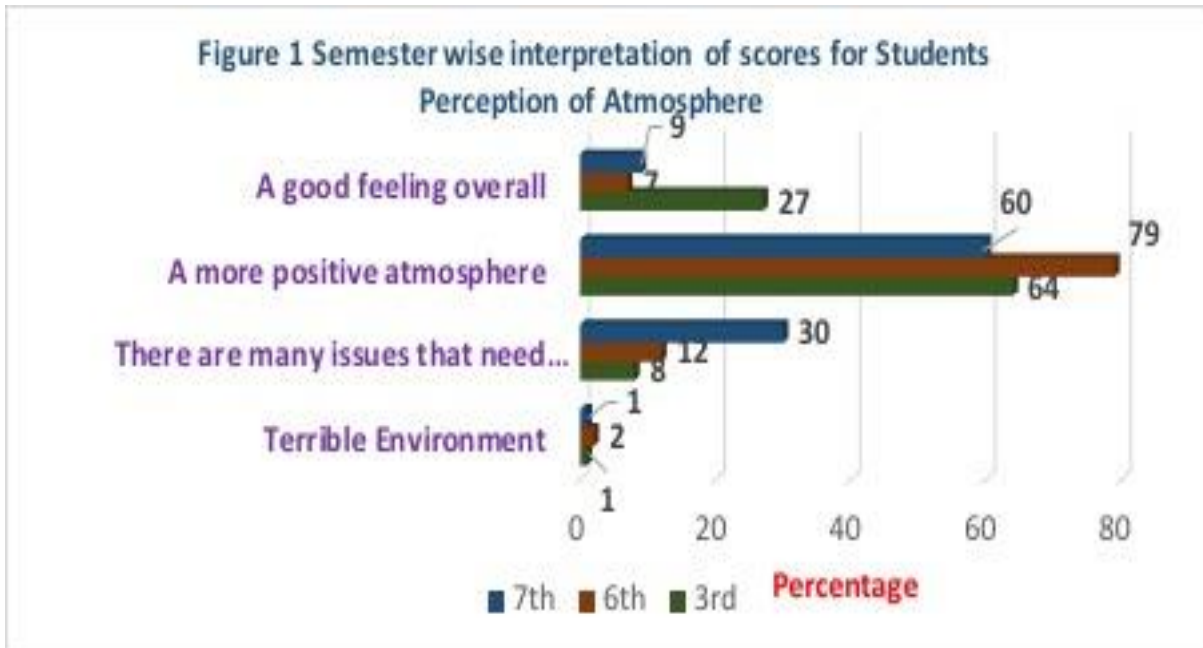
**Table 1: Semester wise interpretation of subscale scores in SPL, SPT and SASP**

Domain	3 <sup>rd</sup> semester (n=90)	6 <sup>th</sup> semester (n=95)	7 <sup>th</sup> semester (n=78)
<b>SPL</b>			
• Very Poor	0 (0%)	1(1%)	1 (1%)
• Teaching Viewed negatively	4 (5%)	10(11%)	13(17%)
• A more positive approach	<b>71(79%)</b>	<b>76(80%)</b>	<b>61(78%)</b>
• Teaching highly thought of	15(16%)	8(8%)	3(4%)
<b>SPT</b>			
• Abysmal	1(1%)	1(1%)	1(1%)
• In need of some retraining	3(3%)	8(8%)	7(9%)
• Moving in the right direction	<b>67(75%)</b>	<b>82(86%)</b>	<b>67(86%)</b>
• Model Teachers	19(21%)	4(5%)	3(4%)
<b>SASP</b>			
• Feeling of total failure	0(0%)	0(0%)	2(3%)
• Many negative aspects	7(8%)	8(8%)	14(18%)
• Feeling of more on positive side	<b>61(68%)</b>	<b>75(79%)</b>	<b>54(69%)</b>
• Confident	22(24%)	12(13%)	8(10%)

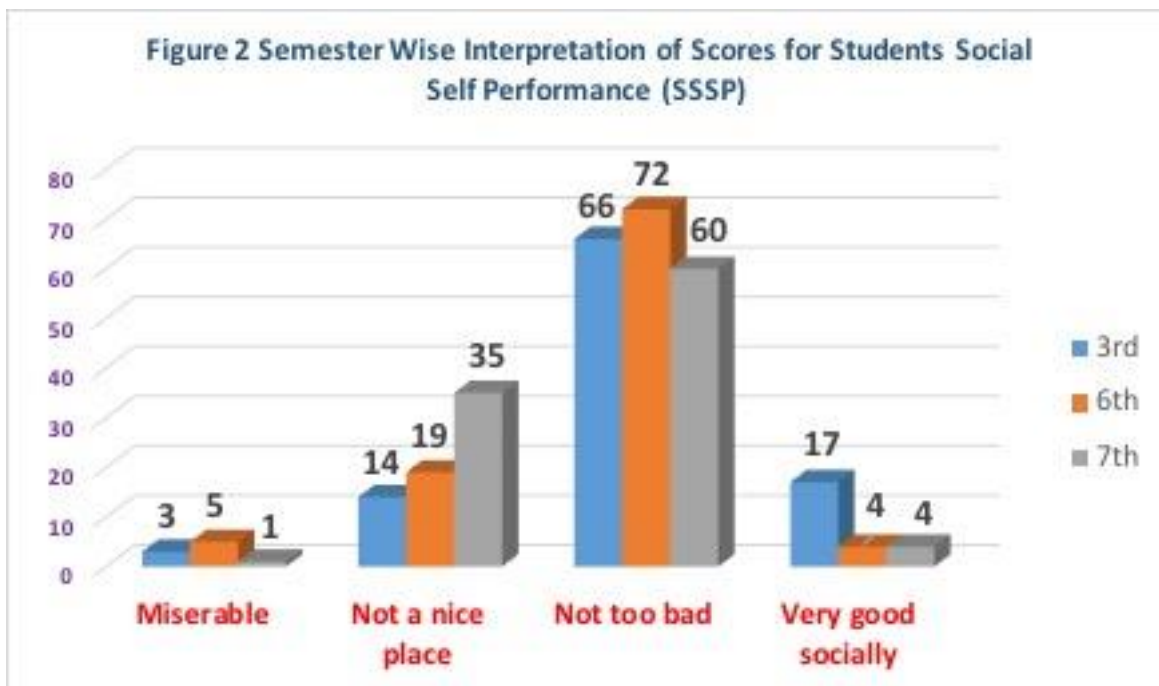
## Perception of undergraduate medical students

The study found that 71(79%) students in the 3rd semester, 76(80%) in the 6th semester and 61(78%) in the 7th semester had a more positive perception about learning (SPL). 67(75%), 82(86%), and 67(86%) students in 3rd, 6th, and 7th semesters respectively considered that teaching was moving in the right direction. Students' academic self-perception was felt more on the positive side among 61(68%), 75(79%), and 54(69%) students in the 3rd, 6th, and 7th semesters respectively. Students' Perception of the atmosphere (SPA) and Student's Social Self-Perception (SSSP) for all three semesters is detailed in Figure 1 and Figure 2.

**Fig 1: Semester wise interpretation of scores for student’s perception of atmosphere**



**Fig 2: Semester Wise interpretation of Scores for Students Social Self Performance**



***Comparison of the overall mean DREEM score and domain mean scores across different semesters***

Semester wise analysis of overall DREEM mean scores showed that the highest mean score was reported in 3<sup>rd</sup> followed by 6<sup>th</sup> and 7<sup>th</sup>-semester students. Comparison of the domain mean scores showed a statistically significant association among the students of different semesters. The details are represented in Table 2.

**Table 2 Semester wise comparisons of overall and domain mean score**

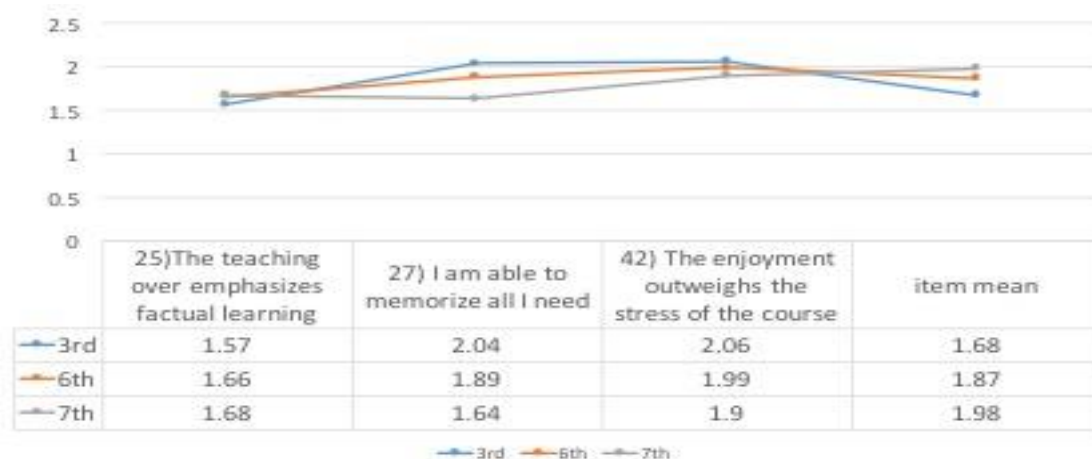
<b>Domains</b>	<b>3<sup>rd</sup> semester (n=90)</b>	<b>6<sup>th</sup> semester (n=95)</b>	<b>7<sup>th</sup> semester (n=78)</b>	<b>Total (n=263)</b>	<b>p value</b>
<b>SPL</b>	32.53 $\pm$ 5.14	30.81 $\pm$ 5.26	28.75 $\pm$ 5.27	30.79 $\pm$ 5.42	0.0001
<b>SPT</b>	29.87 $\pm$ 5.51	27.83 $\pm$ 5.51	26.10 $\pm$ 4.24	28.01 $\pm$ 4.96	0.0002
<b>SASP</b>	22.26 $\pm$ 3.87	20.67 $\pm$ 3.64	19.50 $\pm$ 4.83	20.87 $\pm$ 4.24	0.008
<b>SPA</b>	29.91 $\pm$ 5.62	28.63 $\pm$ 5.68	27.11 $\pm$ 5.14	30.33 $\pm$ 6.71	0.005
<b>SSSP</b>	17.57 $\pm$ 3.61	16.67 $\pm$ 3.81	15.92 $\pm$ 2.82	16.74 $\pm$ 4.20	0.005
<b>Overall score</b>	<b>132.1<math>\pm</math>21.2</b>	<b>123.01<math>\pm</math>20.38</b>	<b>115.50<math>\pm</math>20.16</b>	<b>123.90<math>\pm</math>21.6</b>	<b>0.0001</b>

***Items (questions) with highest and lowest mean scores in each domain***

DREEM inventory considers items with a mean score of 3.5 or more as positive points i.e., strengths in the learning environment, and those with a mean score of 2 or less as problem areas that need to be addressed. The main strengths in the learning environment according to our study are the students' confidence about passing their examination (q10), teachers' are knowledgeable (q2), and learning empathy in the professional course(q31) with mean item scores of 3.94,3.84 and 3.74 respectively.

Problem areas identified in our study are teaching over emphasized factual learning (q25), unable to memorize the required (q 27), and stress of the course (q42) with mean item scores of 1.68, 1.87 and 1.98 respectively (Figure 3)

**Figure 3: Items with mean scores of  $\leq 2$  : Problem areas**



This study was conducted to know the perception of medical students to the learning environment in a medical college which has received a Letter of Permission from the Medical Council of India in 2016. Our Medical College which is located in the heart of the city, not only caters to MBBS students with general merit (eligibility through an all India common entrance test) but also children of insured persons with ESI corporation. Thus, it has students belonging to different socio-economic and geographic strata.

DREEM inventory is used as an evaluation tool to detect deficiencies in the educational environment and to compare the experiences among different groups working in such a system. It is also been used to determine the relationship between the educational environment and other measures operating in it (Miles S, Swift, Leinster SJ, 2012).

The response rate among the medical students belonging to the 3rd,6th, and 7th semester in our study was 87.6%. The overall mean DREEM score was found to be  $123.90 \pm 21.6$  which interprets that the students have "a more positive than negative" perception about our learning environment.

Semester wise comparison of the mean domain scores for SPL was  $32.53 \pm 5.14$ ,  $30.81 \pm 5.26$ , and  $28.75 \pm 5.27$  for 3rd, 6th, and 7th semester respectively. Similar comparisons for SPT, SASP, SPA and SSSP for 3rd,6th and 7th semester was: ( $29.87 \pm 5.51$ ,  $27.83 \pm 5.51$ ,  $26.10 \pm 4.24$ ), ( $22.26 \pm 3.87$ ,  $20.67 \pm 3.64$ ,  $19.50 \pm 4.83$ ), ( $29.91 \pm 5.62$ ,  $28.63 \pm 5.68$ ,  $27.11 \pm 5.14$ ), ( $17.57 \pm 3.61$ ,  $16.67 \pm 3.81$ ,  $15.92 \pm 2.82$ ) respectively. These comparisons were statistically significant. The mean scores for each domain were found to be significantly higher in the 3rd semester followed by the 6th and 7th semesters. The domain with the highest mean score was SPL ( $30.79 \pm 5.42$ ) followed by SPA and SPT. SSSP had the least mean domain score ( $16.74 \pm 4.20$ ).

Similar findings were reported in a study conducted by **Tadessa** et al. on 106 undergraduate students at Adis Ababa [Ethiopia]. The overall mean DREEM score was 130.73 interpreting a positive perception of the students to their learning environment. SPL had the highest mean domain score (31.73) followed by SPA (31.53) and SPT (29,08) (Ayalew Zewdie Tadesse, Selamawit Alemayehu and Dejene Tagesse, 2019) On the contrary, a study conducted by Arezou Farajpour among medical students of Iran, found an overall mean DREEM score of  $93.7 \pm 23.4$  interpreting that the students had

mixed perceptions about their learning environment ranging from an environment with plenty of problems to a more positive environment. The highest mean domain score found in this study was student's perception of educational environment  $22 \pm 7$  followed by SPT  $22 \pm 5.8$ , SPA  $18.5 \pm 7$ , SSSP  $15.5 \pm 4$ , and the least SASP  $15.4 \pm 5.4$  (Farajpour A, Raisolsadat SMA, S Moghadam S, Mostafavian Z, 2017). Riquelme et al in their study on Chile medical college students found a response rate of (90.5%). The overall mean DREEM score was  $127.5 \pm 20.9$  and the domain with the highest mean score was SASP ( $22.3 \pm 4.1$ ). The domain with the lowest mean score was SSSP ( $15.9 \pm 4.0$ ) which is similar to our study. The overall mean scores were significantly lower for 5th-year medical students ( $119.3 \pm 20.2$ ) compared to 3rd and 4th-year students  $-128.8 \pm 21$  &  $132.5 \pm 19.7$  respectively (Riquelme A, Oporto M, Oporto J, Méndez J I, Viviani P, Salech F, Chianale J, Moreno R, Sánchez I, 2009). Sandhya Sharma, in a study at a private Medical College of Udaipur [Rajasthan], had reported a more positive perception of medical students to the educational environment with an overall mean DREEM score of  $118.39 \pm 13.97$  and  $112.46 \pm 21.19$  among the students of 1st and 2nd-year medical course. SPT had the highest mean domain score followed by SPL and SPA. Both the groups were not satisfied with their Social Self-perception (Sharma S, Kaur M, 2016).

The variation in the DREEM scores in different countries and settings can be explained by factors like curriculum adopted in government and private institutions, available infrastructure, and approach of the management to medical education.

Our study focused on the items with the mean scores of  $\geq 3.5$  and  $< 2$  to find the strengths and problem areas in the learning environment respectively. Three items with a mean score of  $\geq 3.5$  were- students' confidence about passing the exams, knowledgeable teachers, learning empathy in the medical profession. The items with a mean score  $< 2$  included- teaching over emphasized factual learning, unable to memorize the subject and stress during the medical course.

Similar to ours, Varun Kohli in a study on undergraduate medical students of the University of Delhi, found three highest-rated items- knowledgeable teachers, having good friends, and confidence about passing exams. Poor support system for stressed students, unable to memorize, and over-emphasis on factual learning were identified as problem areas in his study (Kohli V and Dhaliwal U, 2013). Patil AA and Chaudhari VL in their study at Terna Medical College, Navi Mumbai found that none of the items had scores above 3.5. However, the positive points identified by the students were the teachers are knowledgeable, students have good friends, and their confidence about passing the exams. The problem areas observed in their study were authoritative teachers, overemphasis on factual learning and more teacher-centered learning (Patil AA and Chaudhari VL, 2016). In the study mentioned earlier, which was conducted at Adis Ababa, Ethiopia documented that the items with a mean score of  $< 2$  required immediate intervention. These include- the course organizers ridiculing their students, the problem of cheating in the course, and lack of a good support system for stressed out students (Ayalew Zewdie Tadesse, Selamawit Alemayehu and Dejene Tagesse, 2019).

The SPL domain of our study identified that teaching overemphasized factual learning. This could have been due to the practice of traditional methods of learning in some of the departments of the college. Innovative teaching methods like problem and case-based learning can be introduced to make learning more interesting for the students. Our study also identifies the difficulty of the students to memorize everything which could be due to the overloaded syllabus and the traditional assessment



methods. Stressful experiences of the students can be reduced by strengthening the social support system of the institute. Emotional fatigue of the students can be reduced by encouraging peer mentoring and also by enhancing the mentee-mentor relationship.

### 7. Recommendations

We recommend that innovative teaching and learning methods to be implemented to make learning more interesting for the students. Students should be encouraged for self-directed learning to raise confidence levels. Teachers should be motivated to refreshen their knowledge and skills by participating in internal and external faculty development programs. Peer mentoring and social support should be extended to all students to yield productive learning. This is the pioneer study in our medical college and hence serves as a study to evaluate the changing trends in the learning environment over a period of time.

The results are not conclusive as it is a cross-sectional study and is a reflection of medical students during the study period. These reflections might change over a period of time. To get a better picture of the learning environment, there is a need to sustain such studies. Despite using DREEM inventory in its original form and a simplified language, the response rate of the students was 87.6%. This could be because the DREEM inventory was digitally circulated to the students and the researcher was not available to clarify their doubts at the time of submission.

### 8. Conclusions

Our study had the majority of the item scores in "a more positive than negative" range interpreting that the institution provides a reasonably good educational environment. It also identifies certain problem areas that need to be addressed to enhance the quality of medical education in the institution.

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