

Research Article

Evaluating Medical Students Perception of Educational Environment in Lahore using the DREEM Inventory: A cross-sectional study.

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Abstract

Background: The educational environment influences medical students' learning, academic development, and overall educational experience. This study assessed undergraduate MBBS students' perceptions of the educational environment at King Edward Medical University (KEMU) and Allama Iqbal Medical College (AIMC), Lahore, using the Dundee Ready Educational Environment Measure (DREEM).

Objectives: To assess undergraduate MBBS students' perceptions of the educational environment at medical universities in Lahore using the DREEM inventory.

Methods: A descriptive cross-sectional study was conducted among 81 undergraduate MBBS students from KEMU and AIMC, Lahore, from February to July 2024. Data were collected using the 50-item DREEM Inventory through non-probability consecutive sampling. Descriptive statistics were used to summarize the scores.

Results: Among the 81 participants, 42 (51.9%) were from KEMU and 39 (48.1%) from AIMC. The mean age was 21.8 ± 1.6 years, and 43 (53.1%) were male. The overall mean DREEM score was $139.97 \pm 12.69/200$ (70.0%), indicating an educational environment that was "more positive than negative." Students' Academic Self-Perceptions had the highest relative score (85.2%), followed by Students' Perception of Teachers (77.2%). Students' Social Self-Perceptions and Perception of Learning scored 72.3% and 63.5%, respectively, while Students' Perception of Atmosphere had the lowest score (58.3%).

Conclusion: Students generally perceived the educational environment positively. Academic self-perceptions were the strongest domain, whereas perception of atmosphere was comparatively less favourable, indicating an area for further improvement.

Keywords: Medical Education; Educational Environment; DREEM; Medical Students; Pakistan

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Introduction

The educational environment is an important component of medical education and plays a substantial role in shaping students' learning experiences, academic performance, professional development, and overall well-being. A supportive educational environment can promote effective learning, student engagement, motivation, and professional growth, whereas an unfavourable environment may adversely affect students' academic and personal experiences. Therefore, assessment of the educational environment from students'

perspectives is an important component of evaluating and improving the quality of medical education.¹

The educational environment has been recognized as an important determinant of students' learning and educational experiences. Previous literature has emphasized that students' perceptions of their learning environment can provide valuable information about the quality and effectiveness of medical education.² The World Federation for Medical Education (WFME) has also emphasized the importance of an appropriate educational environment within standards for quality assurance and continuous improvement in medical education.³ Evaluation of the educational environment can therefore help institutions identify strengths and areas requiring improvement in teaching, learning, academic support, and institutional practices.⁴

The Dundee Ready Educational Environment Measure (DREEM) was developed as a standardized instrument



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for assessing students' perceptions of the educational environment.⁵ It is a 50-item inventory comprising five domains: Students' Perception of Learning (SPoL), Students' Perception of Teachers (SPoT), Students' Academic Self-Perceptions (SASP), Students' Perception of Atmosphere (SPoA), and Students' Social Self-Perceptions (SSSP).⁶ The instrument has demonstrated applicability across different medical education settings and has been used to evaluate multiple dimensions of students' educational experiences.⁷ Its use across different countries and educational contexts has also facilitated assessment of institutional strengths and areas requiring improvement.⁸

The educational environment may vary according to institutional characteristics, curriculum, teaching practices, student support, and the broader educational context. Studies conducted in different settings have demonstrated variations in DREEM scores and domain-specific perceptions among medical students.⁹ Further evidence has supported the use of DREEM for identifying specific aspects of the educational environment that may require institutional attention.¹⁰ In Pakistan, DREEM-based studies have also reported variations in students' perceptions across medical institutions.¹¹ Such findings highlight the importance of assessing the educational environment within its specific institutional and cultural context rather than assuming that findings from one setting are directly applicable to another.¹²

Despite the existing literature, locally relevant evidence regarding medical students' perceptions of the educational environment in Lahore remains limited, particularly across more than one medical institution.¹³ Assessment of the educational environment in different institutions can provide useful evidence regarding areas of strength and domains requiring further attention.¹⁴ Regular evaluation using a validated instrument such as DREEM may further support institutional quality-improvement initiatives and allow changes in students' perceptions to be monitored over time.¹⁵ Such evidence can inform educational planning, curriculum development, teaching practices, and student-support strategies.¹⁶ Therefore, the present study was conducted to evaluate the perceptions of undergraduate MBBS students regarding their educational environment at King Edward Medical University (KEMU) and Allama Iqbal Medical College (AIMC), Lahore, using the DREEM Inventory.

Methods

The study was conducted at King Edward Medical University (KEMU), Lahore, and Allama Iqbal Medical College (AIMC), Lahore. This setting allowed the inclusion of undergraduate medical students from two established medical colleges within the same city. A descriptive cross-sectional study design using quantitative methods was employed to assess students' perceptions of their educational environment and provide a snapshot of the situation during the study period. The study was conducted over a period of six months, from February to

July 2024, which included study planning, data collection, data analysis, and interpretation of the findings. The study population comprised undergraduate MBBS students enrolled at KEMU and AIMC from the first year to the final year of study, who were invited to participate. A sample size of 81 students was estimated using a 95% confidence level, 10% absolute precision, and an expected DREEM score of 70%. Participants were selected using a non-probability consecutive sampling technique. Data were collected using the 50-item, five-subscale Dundee Ready Educational Environment Measure (DREEM) Inventory, a validated tool used to assess students' perceptions of the educational environment. The five subscales comprised Students' Perception of Learning (SPoL) with 12 items, Students' Perception of Teachers (SPoT) with 11 items, Students' Academic Self-Perceptions (SASP) with 8 items, Students' Perception of Atmosphere (SPoA) with 12 items, and Students' Social Self-Perceptions (SSSP) with 7 items. Each statement was scored on a five-point Likert scale ranging from "Strongly Agree" (4), "Agree" (3), "Unsure" (2), "Disagree" (1), to "Strongly Disagree" (0). Items 4, 8, 9, 17, 25, 35, 39, 48, and 50 were reverse coded because they were negatively worded, with "Strongly Disagree" assigned a score of 4 and "Strongly Agree" assigned a score of 0.

Table 1: Guideline for interpreting the Overall and Subscale DREEM Inventory Scores (17)

Scores	Evaluation
Total Score	
0-50	Worse
50-100	noticeable Problem
100-150	Good
150-200	Outstanding
Subscales	
SPoL	
0-12	worse
13-24	Unsatisfied teaching
25-36	A more positive perception
37-48	Teaching is highly appreciated
SPoT	

0-11	worse
'12-22	Unsatisfied teaching
23-33	Satisfied teaching
34-44	Teaching is highly appreciated
SASP	
0-8	Totally hopeless
'9-16	Facing many problems
17-24	Feeling somewhat satisfied
17-24	Hopeful
SPoA	
0-12	Very Poor Atmosphere
13-24	Changing are required on many things
25-36	Hopeful about betterment of atmosphere
37-48	Confident about atmosphere
SSSP.	
0-7	Worse
'8-14	Unsuitable place
15-21	Suitable
22-28	Highly suitable

Data were cleaned, coded, and analysed using IBM SPSS Statistics version 26. Descriptive statistics were used to summarize the study variables. Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using means and standard deviations. Individual DREEM item scores were calculated according to the scoring instructions, including reverse coding of negatively worded items. Scores for each of the five DREEM subscales were calculated by summing the relevant items, and the overall DREEM

score was obtained by summing all 50 item scores. The total DREEM score ranged from 0 to 200, with higher scores indicating a more favourable perception of the educational environment. Subscale and overall scores were interpreted according to established DREEM interpretation guidelines.

Results

Demographic characteristics of participants

A total of 81 undergraduate MBBS students participated in the study. The sample was almost evenly divided between the two institutions: 42 (51.9%) students were from King Edward Medical University (KEMU) and 39 (48.1%) were from Allama Iqbal Medical College (AIMC). Males made up 43 (53.1%) and females 38 (46.9%) of the participants (Table 2, Figures 1 and 2).

All five years of the MBBS programme were represented, with 15 (18.5%) students from the first year, 16 (19.8%) from the second, 17 (21.0%) from the third, 16 (19.8%) from the fourth and 17 (21.0%) from the final year (Figure 3). The mean age of participants was 21.8 ± 1.6 years. The close balance across institution, gender and year of study suggests that the views captured are not dominated by any single group.

Table 2: Demographic Characteristics of Study Participants (n = 81)

Characteristic	n (%)
Institution	
KEMU	42 (51.9)
AIMC	39 (48.1)
Gender	
Male	43 (53.1)
Female	38 (46.9)
Year of study	
1st year	15 (18.5)
2nd year	16 (19.8)
3rd year	17 (21.0)
4th year	16 (19.8)
5th year	17 (21.0)

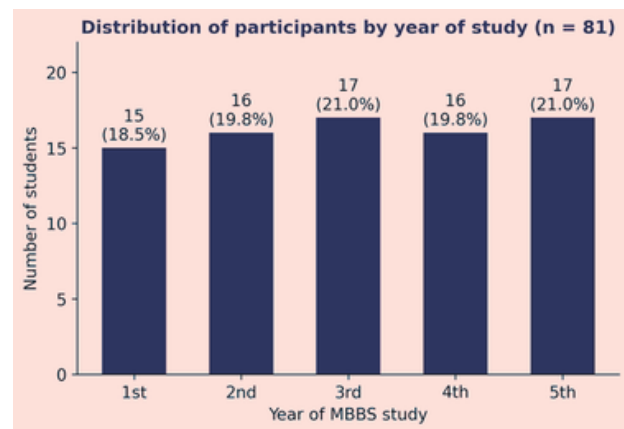
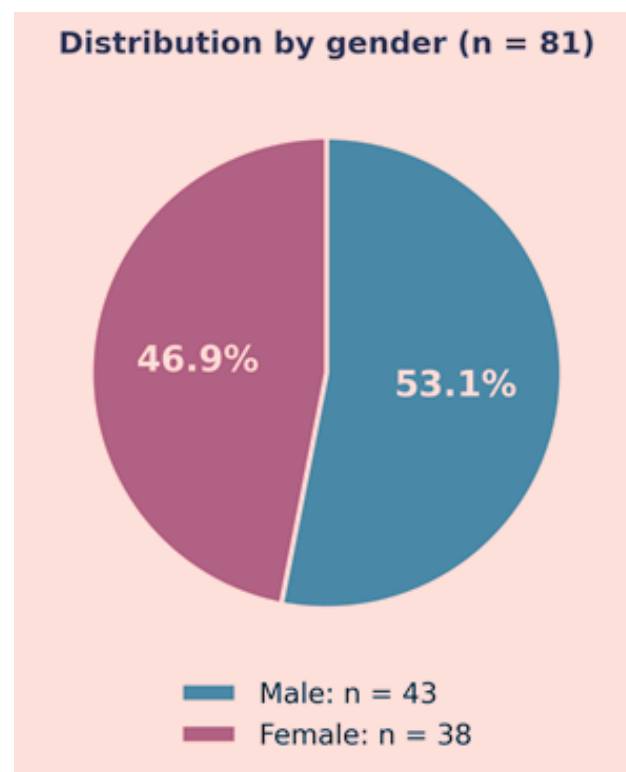
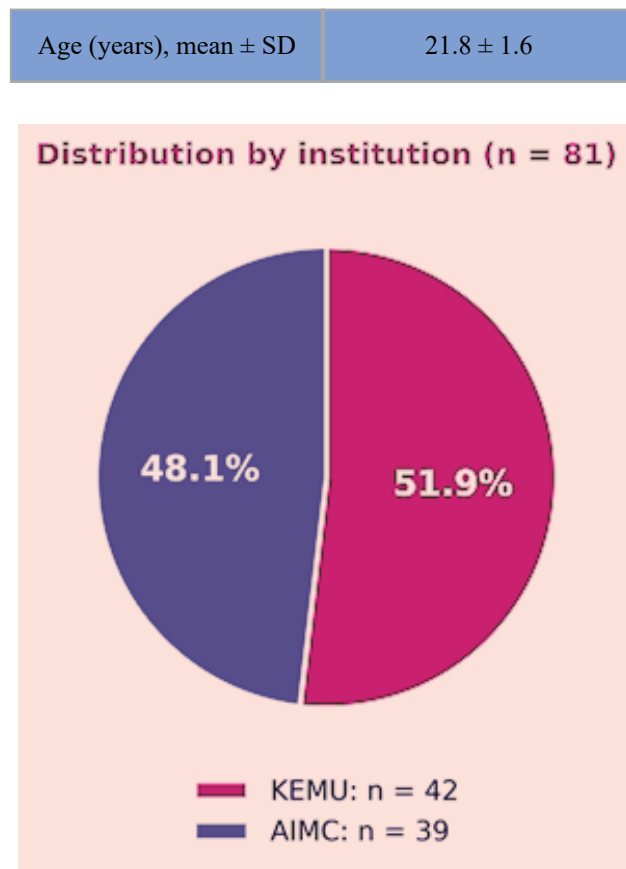


Figure 3: Distribution of participants by year of study

Overall DREEM score

The overall mean DREEM score was 139.97 ± 12.69 out of 200, which is 70.0% of the maximum possible score (Table 3). According to the DREEM interpretation guidelines, a total score between 100 and 150 indicates an educational environment that is “more positive than negative”. The students of both institutions therefore perceived their educational environment favourably overall, although the score also leaves clear room for improvement before it reaches the “excellent” range (151–200) (Figure 4). One standard deviation either side of the mean spans about 127 to 153, so most students’ scores lie in the upper half of the “more positive than negative” band.

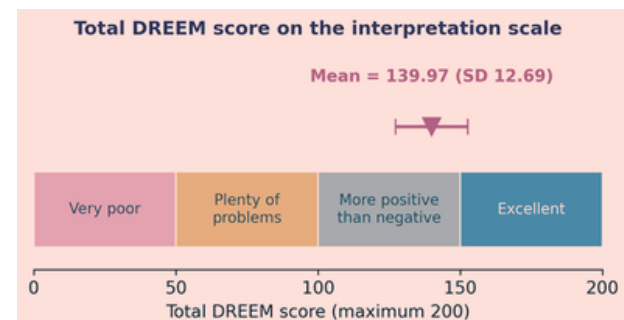


Figure 4: Total DREEM score plotted on the DREEM interpretation scale (error bar shows ± 1 SD)

DREEM subscale scores

Because the five domains have different maximum scores, they are best compared as a percentage of their maximum (Table 3, Figures 5 and 6). Students’ Academic Self-Perceptions (SASP) had the highest relative score (27.25 ± 3.32 out of 32; 85.2%), in the “hopeful” category, meaning that students generally feel confident about their academic ability. Students’ Perception of Teachers (SPoT) followed with 33.97 ± 5.80 out of 44 (77.2%), interpreted as “satisfied teaching”, showing that teaching and teachers were viewed positively.

Students’ Social Self-Perceptions (SSSP) scored 20.25 ± 5.80 out of 28 (72.3%), in the “suitable” category, indicating an acceptable social life. Students’ Perception

of Learning (SPoL) scored 30.50 ± 5.90 out of 48 (63.5%), a “more positive perception”: learning is viewed favourably but with scope to strengthen it.

The lowest relative score was for Students’ Perception of Atmosphere (SPoA), with a mean of 28.00 ± 6.20 out of 48 (58.3%), in the category “hopeful about betterment of

atmosphere”. This makes the atmosphere of the institutions the main area that students feel needs improvement, and the domain that should be prioritised. The relatively large standard deviations for SPoA, SPoL, SPoT and SSSP also show that students’ experiences varied, while opinions on academic self-perception were the most uniform (SD 3.32).

Table 3: Mean Subscale Scores and Total Score for the DREEM Inventory

DREEM domain	Maximum score	Mean $\pm$ SD	Percentage of maximum	Interpretation
Students’ Perception of Learning (SPoL)	48	30.50 ± 5.90	63.50%	A more positive perception
Students’ Perception of Teachers (SPoT)	44	33.97 ± 5.80	77.20%	Satisfied teaching
Students’ Academic Self-Perceptions (SASP)	32	27.25 ± 3.32	85.20%	Hopeful
Students’ Perception of Atmosphere (SPoA)	48	28.00 ± 6.20	58.30%	Hopeful about betterment of atmosphere
Students’ Social Self-Perceptions (SSSP)	28	20.25 ± 5.80	72.30%	Suitable
Total DREEM	200	139.97 ± 12.69	70.00%	More positive than negative

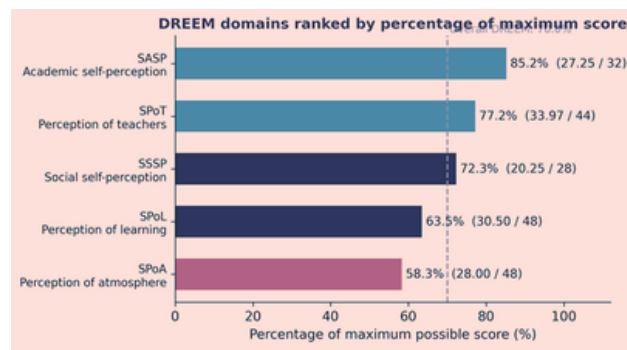


Figure 5: DREEM domains ranked by percentage of the maximum possible score (dashed line = overall DREEM score, 70.0%)

The overall DREEM score was 139.97 ± 12.69 out of 200 (70.0%), indicating that the students perceived the educational environment as “more positive than negative.” Among the five domains, Students’ Academic Self-Perceptions (SASP) had the highest relative score (85.2%), followed by Students’ Perception of Teachers (SPoT) (77.2%), indicating favourable perceptions in these areas. Students’ Social Self-Perceptions (SSSP) (72.3%) and Students’ Perception of Learning (SPoL) (63.5%) also reflected generally favourable perceptions, although there was scope for further improvement. Students’ Perception of Atmosphere (SPoA) had the lowest relative score (58.3%), indicating comparatively

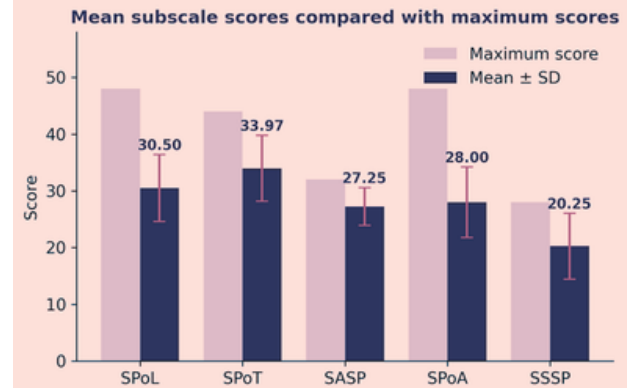


Figure 6: Mean ($\pm$ SD) subscale scores compared with the maximum score for each domain.

less favourable perceptions of the educational atmosphere and identifying this domain as an area requiring greater attention for improvement.

Abbreviations: DREEM, Dundee Ready Education Environment Measure; KEMU, King Edward Medical University; AIMC, Allama Iqbal Medical College; SPoL, Students’ Perception of Learning; SPoT, Students’ Perception of Teachers; SASP, Students’ Academic Self-Perceptions; SPoA, Students’ Perception of Atmosphere; SSSP, Students’ Social Self-Perceptions; SD, standard deviation.

Discussion

The present study assessed the perceived educational environment among 81 undergraduate MBBS students from King Edward Medical University (KEMU) and Allama Iqbal Medical College (AIMC), Lahore, using the 50-item Dundee Ready Educational Environment Measure (DREEM) Inventory. The overall mean DREEM score was 139.97 ± 12.69 out of 200, corresponding to 70.0% of the maximum possible score. According to the established DREEM interpretation guidelines, this score falls within the category indicating a generally positive educational environment. (17) The findings suggest that, overall, students at the two participating institutions perceived their educational environment favourably, although variation was observed across the five DREEM domains. Such variation is important because an acceptable overall DREEM score may coexist with specific aspects of the educational environment that require institutional attention.

The overall score observed in the present study was higher than that reported in several previous studies. A study from Pakistan published in the Pakistan Journal of Public Health reported a mean DREEM score of 107.5/200. (14) In comparison, the score of 139.97/200 in the present study represents a more favourable overall perception among the students surveyed. However, this difference should not be interpreted as evidence that one institution or educational system is definitively superior to another, because DREEM scores may be influenced by differences in study populations, institutional structures, curricula, teaching methodologies, academic support systems, student characteristics, and timing of data collection. The present study included students from two established public-sector medical institutions in Lahore, whereas previous studies may have involved different types of institutions and student populations. Consequently, comparisons between studies are useful for contextualising findings but should be interpreted with consideration of methodological and institutional differences.

International studies also demonstrate variation in overall DREEM scores. A study conducted in India reported a mean DREEM score of 107/200. (20) Another study from India reported a mean score of 114/200. (21) A study conducted in Malaysia reported a mean DREEM score of 125.3/200. (22) These scores were lower than the overall score observed in the present study. Differences may reflect variation in educational systems, institutional culture, curriculum organisation, teaching practices, student support, and the characteristics of participating students. A study conducted across Nepal and Nigeria also reported DREEM-based assessments of medical educational environments, further demonstrating the international application of the instrument and the variability of educational environments across settings. (23) In an osteopathic educational setting in the United Kingdom, a mean DREEM score of 135/200 was reported. (24) This score was relatively close to the 139.97/200 observed in the present study. These comparisons demonstrate that DREEM can provide a

common framework for describing educational environments while also highlighting the importance of interpreting findings within their specific institutional and cultural contexts.

The findings of the present study can also be interpreted at the level of individual DREEM domains. Students' Academic Self-Perceptions (SASP) had the highest relative score, with a mean of 27.25 ± 3.32 out of 32, corresponding to 85.1% of the maximum possible score. This indicates that students generally had favourable perceptions of their academic abilities, preparedness, and progress. A positive academic self-perception may reflect students' confidence in their ability to cope with the academic requirements of medical education and their perception of progress during their training. However, the present cross-sectional design does not allow the factors responsible for this favourable perception to be established. A previous study from the Annals of King Edward Medical University reported a SASP score of 17.32/32. (19) The higher score observed in the present study represents a difference between the two study populations; it should not be described as a longitudinal improvement because the participants were not followed over time.

Students' Perception of Teachers (SPoT) had a mean score of 33.97 ± 5.80 out of 44, corresponding to 77.2% of the maximum possible score. According to the interpretation framework used in the present study, this score represents a favourable perception of teaching. A previous study published in the Annals of King Edward Medical University reported an SPoT score of 23.33/44. (18) The higher score observed in the present study suggests that the participating students reported more favourable perceptions of teachers than those reported in that earlier study. Nevertheless, this finding should be interpreted cautiously because the two studies may differ in terms of participants, institutions, curriculum, timing, teaching methods, and other contextual factors. The perception of teachers is an important component of the educational environment because students' experiences of teaching are influenced not only by the delivery of academic content but also by teacher accessibility, communication, feedback, professionalism, and interpersonal interactions. Continued faculty development and structured student feedback mechanisms may therefore be useful for maintaining and strengthening positive perceptions of teaching.

Students' Perception of Learning (SPoL) had a mean score of 30.50 ± 5.90 out of 48, representing 63.5% of the maximum possible score. This score indicates a generally favourable perception of learning, although its relative percentage was lower than those of SPoT, SASP, and SSSP. A previous study published in the Annals of King Edward Medical University reported an SPoL score of 25.45/48. (18) The higher score in the present study may indicate more favourable perceptions of the learning process among the participating students. However, as with the other domains, this difference should be interpreted

eted as a comparison between study populations rather than as evidence of improvement over time. Students' perceptions of learning may be influenced by curriculum organisation, clarity of learning objectives, teaching strategies, opportunities for active participation, assessment practices, and the relationship between classroom teaching and clinical application. Periodic assessment of these factors may help institutions identify specific aspects of the learning process that could be strengthened.

Students' Social Self-Perceptions (SSSP) had a mean score of 20.25 ± 5.80 out of 28, corresponding to 72.3% of the maximum possible score. This domain was therefore within a generally favourable range, although it did not achieve the highest relative score among the five domains. A previous study from the Annals of King Edward Medical University reported an SSSP score of 14.39/28. (19) The higher score in the present study suggests a more favourable perception of the social environment among the students surveyed. Social self-perception incorporates aspects of students' social experiences, support, and sense of belonging within the educational environment. Medical education can be academically demanding, and an appropriate social environment may contribute to students' ability to cope with academic demands. Institutional measures such as student support services, opportunities for constructive peer interaction, recreational activities, and accessible academic or personal support may contribute to a supportive social environment.

Students' Perception of Atmosphere (SPoA) had a mean score of 28.00 ± 6.20 out of 48, corresponding to 58.3% of the maximum possible score. Although the absolute score falls within a favourable interpretive category according to the guidelines used in this study, SPoA had the lowest relative percentage among all five domains. This finding is important because it indicates that the educational atmosphere was the comparatively weaker domain in the present sample. A previous study published in the Annals of King Edward Medical University reported an SPoA score of 27.01/48. (18) The absolute scores were therefore relatively similar between the two studies, despite differences in the other domains. The lower relative percentage in the present study suggests that the educational atmosphere may represent an area where further institutional attention could be beneficial. Factors contributing to students' perceptions of atmosphere may include classroom climate, academic stress, timetabling, workload, physical facilities, opportunities for participation, and the overall emotional tone of the learning environment.

The comparison of the five domains provides an important perspective beyond the overall DREEM score. Although the overall score indicated a generally positive educational environment, the relative domain scores were not uniform. SASP demonstrated the highest percentage score at 85.1%, followed by SPoT at 77.2%, SSSP at 72.3%, SPoL at 63.5%, and SPoA at 58.3%. Thus, studen-

ts appeared to have particularly favourable perceptions of their academic capabilities, whereas perceptions of the educational atmosphere were comparatively less favourable. This pattern demonstrates why reporting only the total DREEM score may conceal domain-specific areas that require attention. The subscale analysis therefore provides institutions with more specific information for educational quality improvement.

Analysis of individual DREEM items further identified particular aspects of the educational environment that may benefit from institutional attention. Student accommodation services and recreational facilities were identified as areas perceived less favourably by students. These findings suggest that the educational environment extends beyond classroom teaching and includes the broader physical and social infrastructure available to students. Adequate accommodation, recreational opportunities, and student-support facilities may contribute to students' overall educational experience and well-being. Although the present study cannot establish a causal relationship between these facilities and student satisfaction or academic performance, addressing perceived deficiencies in these areas may form part of broader institutional quality-improvement strategies.

The classroom atmosphere during teaching sessions was another area identified as potentially requiring attention. A classroom environment that encourages interaction, participation, questioning, and constructive feedback may support active learning. Medical education increasingly emphasises student-centred and interactive approaches rather than exclusive reliance on passive information delivery. Therefore, institutions may consider incorporating opportunities for discussion, case-based learning, problem-solving, and appropriate student participation within teaching sessions. Such approaches should, however, be adapted to the curriculum, available resources, class size, and institutional context.

The present findings should also be interpreted in light of the strengths of the study. The use of the DREEM Inventory allowed assessment of multiple dimensions of the educational environment through a standardized instrument rather than relying on a single overall question. Inclusion of students from two medical institutions in the same city provided information from more than one institutional setting and allowed the educational environment in Lahore to be examined across two established medical colleges. Furthermore, reporting both overall and domain-specific scores provides a more detailed description of students' perceptions and identifies specific areas that may be considered in future educational planning.

This study has several limitations. First, the non-probability consecutive sampling technique may have introduced selection bias, and the sample of 81 students may not adequately represent all undergraduate medical

students at the participating institutions. Second, data were collected from only two medical institutions in Lahore, limiting the generalisability of the findings to other medical colleges in Lahore, Punjab, or Pakistan. Third, the data were collected through a self-administered Google Forms questionnaire. Because DREEM measures students' perceptions, responses may be influenced by individual expectations, recall, response tendencies, or social desirability. The manuscript should describe the survey as anonymous only if no identifying information was collected; the term "non-anonymised" should not be used unless participants could actually be identified. Fourth, the cross-sectional design provides a snapshot of perceptions during the study period and does not permit causal inference or assessment of changes in perceptions over time. Accordingly, differences between the present findings and earlier studies should not be described as improvements unless longitudinal data are available. Fifth, the study primarily used descriptive analysis and did not undertake statistical comparisons of DREEM scores according to institution, year of study, gender, or other demographic characteristics. Consequently, potentially important subgroup differences could not be assessed. Future research involving larger samples, probability-based sampling, multiple institutions from different regions, and appropriate inferential statistical analyses could provide greater insight into factors associated with students' perceptions of the medical educational environment.

From an institutional perspective, the findings suggest that educational quality improvement should consider both the academic and non-academic components of the educational environment. The relatively high SASP and SPoT scores indicate areas in which students reported favourable perceptions, whereas the lower relative SPoA score identifies the educational atmosphere as a domain that may warrant particular attention. Institutional interventions could therefore focus on classroom climate, student support, recreational and accommodation facilities, and mechanisms for obtaining and responding to student feedback. Reassessment using DREEM after implementation of such interventions could help determine whether students' perceptions change over time. Longitudinal assessment would be particularly useful because it would allow institutions to evaluate trends and examine whether educational interventions are associated with changes in students' perceptions.

Overall, the findings demonstrate that the educational environment perceived by undergraduate MBBS students at KEMU and AIMC was generally favourable, with an overall DREEM score of $139.97 \pm 12.69/200$. However, the variation among domains indicates that a positive overall score should not be interpreted as evidence that all aspects of the educational environment are equally satisfactory. Academic self-perceptions represented the highest relative-scoring domain, whereas perception of atmosphere represented the lowest. The findings therefore support continued, structured evaluation of the educational environment, with particular attention to

domain-specific concerns identified through student feedback. Further multicentre and longitudinal research would help establish whether these findings are consistent across different medical institutions and whether targeted educational interventions result in measurable changes in students' perceptions.

Conclusion

The findings indicate that undergraduate MBBS students at KEMU and AIMC, Lahore, generally perceived their educational environment positively, with an overall mean DREEM score of 139.97 ± 12.69 out of 200. Students' academic self-perceptions showed the highest relative score, while students' perception of atmosphere had the lowest. The findings highlight the importance of continued attention to the educational atmosphere, teaching practices, and social aspects of the learning environment. Regular assessment of students' perceptions using validated tools such as DREEM may help medical institutions identify areas for improvement and support the development of a more supportive and effective educational environment.

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Ethical Approval: Ethical approval was obtained from King Edward Medical University, Lahore.

Authors' Contributions:

All the authors contributed equally in accordance with ICMJE guidelines.

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