A study of medical students' perceptions of their learning environment

✉Parajuli SR[1], Acharya CP[2], Manandhar V[3], Rajbanshi R[4]
1. Department of Forensic Medicine, Manipal Teaching Hospital, Pokhara, Nepal
2. Department of Medicine, Manipal Teaching Hospital, Pokhara, Nepal
3. Department of Community Medicine, Manipal Teaching Hospital, Pokhara, Nepal
4. Department of STEAM Education, School of Education; KUSOED, Nepal

ABSTRACT

Introduction: The learning environment within an institution encompasses the academic atmosphere experienced by both students and educators, which significantly influences learning outcomes. A positive learning environment promotes engagement, collaboration, and professional growth. The Dundee Ready Education Environment Measure (DREEM) is a globally recognized tool for evaluating educational climates in health professions education. This study utilized the DREEM-12 questionnaire to assess medical students' perceptions of their learning environment at Manipal Teaching Hospital.

Methods: A cross-sectional study was conducted among 175 undergraduate MBBS students from different academic years. Participants completed the DREEM-12 questionnaire via Google Forms. Domain scores were calculated by summing individual item responses, and overall scores were interpreted based on established guidelines.

Results: The study included nearly equal proportions of male (45.7%) and female (54.3%) participants, with a mean age of 22.4 ± 2 years (range: 18–27). The mean scores for each domain were as follows: Students' Perception of Learning (SPL): 5.4 ± 1.9, Students' Perception of Teachers (SPT): 7.1 ± 2.6, Students' Academic Self-Perception (SASP): 7.6 ± 2.4, Students' Perception of Atmosphere (SPA): 4.2 ± 2.1, Students' Social Self-Perception (SSSP): 3.4 ± 2.1. The total mean score was 27.7 ± 8.9, indicating a "more positive than negative" perception.

Conclusion: Students generally viewed their learning environment favorably, though perceptions varied by academic year. Clinical-year students reported greater challenges than their pre-clinical peers, suggesting that evolving academic pressures influence their experiences. Despite these differences, students maintained confidence in their academic abilities.

Keywords: learning environment, perception, students.

INTRODUCTION

The learning environment within an educational institution encompasses the academic atmosphere experienced by both students and faculty members. This environment plays a pivotal role in determining the effectiveness of the learning process, significantly influencing student outcomes. An optimal learning environment fosters engagement, collaboration, and professional growth while creating a supportive atmosphere where all participants feel valued, respected, and intellectually safe.[1]

In such positive educational settings, students are encouraged to take intellectual risks, ask questions freely, and express their ideas without fear of judgment. Faculty members contribute to this environment by establishing clear expectations, providing constructive feedback, and facilitating meaningful interactions that promote reflection enhances student motivation, stimulates creativity, develops critical thinking skills, and cultivates a genuine love for learning, all of which contribute to improved academic performance and overall well-being.[2-5]

Corresponding author:
Dr. Sudhir Raman Parajuli
Department of Forensic Medicine
Manipal Teaching Hospital
Email: sudhir.parajuli@manipalpokhara.edu.np

The Dundee Ready Education Environment Measure (DREEM)

Developed by Roff et al. in 1997, the DREEM has become a globally recognized tool for assessing educational environments, particularly in health professions education. This validated instrument provides comprehensive insights into students' perceptions of their learning experience, with specific relevance to undergraduate medical education.[1]

The DREEM-12 is an abbreviated version of the original 50-item inventory that maintains strong psychometric properties while offering greater practicality.2 It evaluates five key domains through twelve items:
Students' Perception of Learning (SPL): 2 items (Maximum score: 8)
Students' Perception of Teachers (SPT): 3 items (Maximum score: 12)
Students' Academic Self-Perception (SASP): 3 items (Maximum score: 12)
Students' Perception of Atmosphere (SPA): 2 items (Maximum score: 8)
Students' Social Self-Perception (SSSP): 2 items (Maximum score: 8)
The instrument employs a 5-point Likert scale ranging from 0 (strongly agree) to 4 (strongly disagree), with a maximum possible score of 48 points.

The DREEM instrument provides multidimensional insights into the learning environment through its individual subscales and composite score. Higher domain scores typically reflect more favorable perceptions of the educational setting, while lower scores highlight potential areas requiring attention and improvement. Educators and researchers utilize this assessment tool to diagnose institutional strengths and weaknesses, inform targeted curriculum enhancements and optimize the overall educational experience.[3]
As a psychometrically validated instrument, the DREEM serves as an effective tool for both internal quality assurance processes and external program evaluations. Its comprehensive design enables systematic assessment of various aspects of the learning environment, facilitating evidence-based decision-making for educational improvement.[4]

This study was conducted with the objectives to assess MBBS students' perceptions of their learning environment and to compare perceptions across genders, nationalities, and academic years. This study identifies strengths and weaknesses in the current educational environment, offering evidence-based recommendations for enhancing medical training at Manipal Teaching Hospital.

METHODS

A cross-sectional study was conducted among first to final year MBBS students and interns of Manipal College of Medical Sciences, Pokhara after getting ethical approval from the Institutional Review Committee of Manipal College of Medical Sciences (MCOMS/ICR/617/GA). The study employed the DREEM-12 questionnaire, which was administered digitally via Google Forms and distributed through WhatsApp groups to the students. Receiving responses from the students was considered as providing consent for the study. All 175 responses received between August to September 2024 were included for the study.

The collected data was entered in MS-Excel 2021, cleaned, coded and then exported to SPSS version 21.0. Variable scores were summed up to get each domain score and interpreted as
- very poor (0–12),
- plenty of problems (13–24),
- more positive than negative (25–36),
- or excellent (37–48)

The individual DREEM items were interpreted as follows:
- Items having a mean score of ≥3.5 are real positive points,
- ≤2 indicates problem areas, and
- Between 2 and 3 are aspects of the environment that could be improved

Guide for interpreting individual scale scores
Domain Score attained by the student
SPL
- 0–2 Very poor
- 2–4 Teaching is viewed negatively
- 4–6 A more positive approach
- 6–8 Teaching is highly thought of

SPT
0–2 Abysmal
- 4–6 In need of some retraining
- 7–9 Moving in the right direction
- 10–12 Model course organizers

SASP
- 0–3 Feeling of total failure
- 4–6 Many negative aspects
- 7–9 Feeling more on the positive side
- 10–12 Confident

SPA
- 0–2 A terrible environment
- 3–4 There are many issues that need changing
- 5–6 A more positive atmosphere
- 7–8 A good feeling overall

SSSP
- 0–2 Miserable
- 3–4 Not a nice place
- 5–6 Not too bad
- 7–8 Very good socially

Frequencies and percentages were calculated for categorical variables, while mean and standard deviation were calculated for continuous variables. Unpaired test and ANOVA were used to compare the domain scores across different genders, nationalities, and academic years, taking a p-value less than 0.05 as statistically significant.

RESULTS

This study assessed learning environment perceptions among 175 medical students with balanced gender representation (45.7% male, 54.3% female) and a mean age of 22.4±2 years (range: 18-27). The cohort primarily consisted of Nepalese students (61.1%), followed by Indian (34.3%) and Sri Lankan (4.6%) participants. Academic year distribution showed first-year (28.6%) and fourth/final-year students (27.4%) as the largest groups, with second-year (17.7%) and third-year (14.3%) students comprising smaller proportions of the sample population (table 1).

The mean scores (±SD) for both individual items and domain scores are presented in Table 2. Analysis revealed the following domain scores: SPL averaged 5.4 ± 1.9, SPT scored 7.1 ± 2.6, SASP showed 7.6 ± 2.4, SPA registered 4.2 ± 2.1, and SSSP averaged 3.4 ± 2.1. The total mean score of 27.7 ± 8.9 suggests an overall learning environment that is more positive than negative.

Gender-based comparisons of domain scores revealed a statistically significant difference in the Students' Social Self-Perception (SSSP) domain (p-value 0.011), with male students scoring higher (3.8 ± 2.1) than their female counterparts (3.0 ± 2.0). While male students also showed slightly higher total scores (28.2 ± 8.2) compared to females (27.2 ± 9.5), this difference did not reach statistical significance (Table 3).

Table 1. Background and educational characteristics of participants

Characteristics		**Frequency**	**Precent**
Sex	Female	95	54.3
	Male	80	45.7
	Total	175	100.0
Age (years)	Mean± SD (min, max)	22.4 ± 2 (18, 27)	
Nationality	Indian	60	34.3
	Nepalese	107	61.1
	Sri Lankan	8	4.6
	Total	175	100.0
Year of Study	First Year	50	28.6
	Second Year	31	17.7
	Third Year	25	14.3
	Fourth/Final Year	48	27.4
	Intern	21	12.0
	Total	175	100.0

Table 2: Distribution of scores of DREEM 12 items

Domain	S.N	Items	Item Scores (Mean ± SD)	Domain/ total Scores (Mean ± SD)
SPL	1	The teaching helps to develop my confidence	2.6 ± 1	5.4 ± 1.9
	2	The teaching encourages me to be an active learner	2.7 ± 1	
SPT	3	The course organizers are knowledgeable	2.8 ± 1	7.1 ± 2.6
	4	The course organizers have good communication skills with student	2.1 ± 1.1	
	5	The course organizers give clear examples	2.2 ± 1	
SASP	6	I feel I am being well prepared for my profession	2.4 ± 1	7.6 ± 2.4
	7	My problem-solving skills are being well developed here	2.4 ± 1	
	8	Much of what I have to learn seems relevant to a career in healthcare	2.8 ± 0.9	
SPA	9	I am able to concentrate well	2 ± 1.1	4.2 ± 2.1
	10	The atmosphere motivates me as a learner	2.1 ± 1.3	
SSSP	11	There is a good support system for students who get stressed	1.3 ± 1.2	3.4 ± 2.1
	12	My social life is good	2.1 ± 1.3	
Total Score	-	-	-	27.7 ± 8.9

Table 3: Comparison of total and Domain Scores across gender

Domains	Female	Male	p-value
SPL	5.4 ± 1.9	5.3 ± 1.9	0.733
SPT	7.1 ± 2.7	7.2 ± 2.6	0.886
SASP	7.6 ± 2.6	7.6 ± 2	0.962
SPA	4.1 ± 2.1	4.3 ± 2	0.391
SSSP	3 ± 2	3.8 ± 2.1	0.011
Total score	27.2 ± 9.5	28.2 ± 8.2	0.454

Table 4: Comparison of Total and Domain Scores across Nationality

Domains	Indian	Nepalese	Sri Lankan	Total	p-value
SPL	5.2 ± 1.9	5.5 ± 2	4.9 ± 1.7	5.4 ± 1.9	.521
SPT	7.2 ± 2.7	7 ± 2.6	8.3 ± 1.6	7.1 ± 2.6	.432
SASP	7.7 ± 2.7	7.6 ± 2.2	8.3 ± 1.9	7.6 ± 2.4	.744
SPA	4.2 ± 2.3	4.2 ± 2	3.8 ± 2.2	4.2 ± 2.1	.838
SSSP	3.2 ± 2	3.5 ± 2.1	2.6 ± 2.7	3.4 ± 2.1	.358
Total score	27.4 ± 9.6	27.8 ± 8.7	27.8 ± 6.8	27.7 ± 8.9	.961

Table 5: Comparison of total and domain scores across year of study

Domains	First Year	Second Year	Third Year	Fourth/Final Year	Intern	Total	p-value*
SPL	5.5 ± 1.8	5.1 ± 1.7	5.6 ± 2.1	5.4 ± 2.2	5 ± 1.8	5.4 ± 1.9	.801
SPT	7.9 ± 2.5	5.8 ± 2.3	7.4 ± 2.4	7.4 ± 2.6	6.2 ± 2.8	7.1 ± 2.6	.002
SASP	8.4 ± 2.6	6.7 ± 1.6	7.4 ± 2.5	8 ± 2.3	6.8 ± 2.2	7.6 ± 2.4	.011
SPA	5 ± 2.1	3.4 ± 2.1	4 ± 1.7	4.3 ± 2.1	3.4 ± 2.1	4.2 ± 2.1	.004
SSSP	4.3 ± 2.3	2.5 ± 1.9	3.4 ± 2.3	3.2 ± 1.9	2.9 ± 1.4	3.4 ± 2.1	.003
Total score	31 ± 9.5	23.6 ± 5.8	27.6 ± 9.3	28.3 ± 8.9	24.4 ± 7.8	27.7 ± 8.9	.002

Table 4 presents the comparative analysis of domain and total scores across different nationalities. The data reveal that Nepalese students achieved higher scores in both the SPL and SSSP domains, whereas Sri Lankan students scored higher in the SPT and SASP domains. It should be noted that none of these inter-group differences reached statistical significance.

Table 5 highlights the comparative analysis of domain scores across academic years. The results demonstrate a statistically significant variation in total scores ($p = 0.002$), with first-year students achieving the highest mean score (31 ± 9.5). This was followed by fourth/final-year students (28.3 ± 8.9), with third-year students, interns, and second-year students showing progressively lower scores. Notably, first-year students consistently outperformed their senior counterparts across all domains, with these differences reaching statistical significance for all domains except SPL.

DISCUSSION

This study employed the validated DREEM-12 questionnaire to assess medical students' perceptions of their educational environment at a Nepalese private medical college. Our findings contribute to the growing body of literature on medical education quality, while revealing important insights about contextual factors influencing student experiences.

The overall DREEM score of 27.7 (More Positive than Negativ) aligns remarkably with results from Ahmedabad, India, suggesting commonalities in medical education experiences across South Asian contexts.[2,6-7] This consistency is particularly noteworthy given our study represents only the second published application of the DREEM-12 instrument, building on the methodological innovation of the Ahmedabad study.

Domain-specific analysis revealed students' strongest perceptions related to their academic abilities (SASP domain), contrasting with the study where teaching quality (SPT) scored highest. This divergence likely reflects institutional differences in curriculum design and teaching methodologies. The relative weakness in SSSP scores across both studies indicates a potential universal challenge in medical students' social adaptation.[8,9]

Gender comparisons showed male students reporting significantly better social integration (SSSP), possibly reflecting cultural dynamics in medical education or differences in support network utilization. While total scores showed no significant gender difference, this finding suggests targeted support for female students' social wellbeing may be beneficial.[10]

Nationality-based analysis, though not statistically significant, revealed intriguing patterns: Nepalese students perceived stronger learning environments and social support, while Sri Lankan students rated teaching quality and academic self-concept higher. These variations may stem from differing educational backgrounds or cultural expectations regarding medical training.[3,7,11]

The progressive decline in positive perceptions from first-year through clinical years is particularly concerning. First-years' optimistic views (mean score: 31) likely reflect initial enthusiasm, while the subsequent drop mirrors growing academic pressures and clinical responsibilities. The significant difference ($p=0.002$) underscores the need for structured transition support as students' progress through their medical education.[12,13]

Our findings carry several important implications for medical education practice and future research. The consistently lower scores in SSSP across all cohorts underscore an urgent need for institutions to strengthen mental health services and social support systems, potentially through peer mentoring programs and enhanced counseling services. The observed variations in SASP and SPT compared to the Ahmedabad study suggest valuable opportunities for inter-institutional collaboration and exchange of teaching methodologies to enhance curriculum delivery.[2,14] The significant decline in positive perceptions among clinical-year students highlights the necessity for structured transition programs that address the unique challenges of this critical phase in medical training. Furthermore, the identified differences in perceptions based on gender and nationality warrant deeper investigation through qualitative research approaches to better understand the cultural and social dynamics underlying these variations, which could inform

more targeted interventions to support diverse student populations.

CONCLUSIONS

The overall perception of the learning environment among students was more favorable than unfavorable. However, their views were not static and often shifted as they progressed through in academic journey. Those in the clinical years, for instance, faced increasing challenges and pressures, which led to a more negative perception of their experiences compared to their pre-clinical peers. In contrast, students in the pre-clinical sciences, who were yet to encounter the demands of clinical training, often maintained a more optimistic outlook. Despite these variations, students generally retained confidence in their academic abilities, believing in their capacity to succeed even as they navigate the evolving difficulties of their education. This confidence may stem from their prior achievements and adaptability, though the growing demands of later years can sometimes test their resilience.

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