

Undergraduate Medical Students' Perception of Academic Environment in Bangladesh: A Gender-Wise and Phase-Wise Evaluation

Sharmista Bhattacharjee^{1*}
Pragwa Permita Chakraborty²
Mohammed Nasim Uddin Chowdhury³

¹ Department of Anatomy
Marine City Medical College
Chattogram, Bangladesh.

² Department of Physiology
Rangamati Medical College
Rangamati, Bangladesh.

³ Department of Physiology
Southern Medical College Hospital
Chattogram, Bangladesh.

Abstract

Background: Medical education has undergone significant reforms globally with an aim to produce competent doctors. The evaluation of academic environments is crucial in maintaining quality of medical education. Students' perceptions of academic environments are crucial as they influence behavior and success. This study aims to assess gender-wise and phase-wise variations in undergraduate medical students' perceptions of academic environments in Bangladesh which may provide insights for improvement.

Materials and methods: This cross-sectional study involved 400 students (Phase 1 to phase 4) from four medical colleges in Bangladesh, selected through random sampling. The Dundee Ready Education Environment Measure (DREEM) questionnaire was used to collect data. The genders and phases were compared by independent t-test and ANOVA, respectively, with the aid of SPSS.

Results: Both gender-wise and phase-wise analysis showed a positive perception of overall environment and individual domains. Female students rated SPL ($p=0.01$), SPT ($p=0.00$), SPA ($p=0.03$) and DREEM ($p=0.00$) significantly higher than males. Phase 1 and 4 showed significant differences in SPL ($p=0.01$) and DREEM ($p=0.04$) while phase 2 and 4 revealed significances in SPT ($p=0.04$), SASP ($p=0.01$), SPA ($p=0.03$) and DREEM ($p=0.01$).

Conclusion: Findings from this study may provide guideline to curriculum planners and administrators of the medical colleges for further improvement of academic environment.

Key words: Academic environment; Gender; Phase.

INTRODUCTION

Medical education has undergone many reforms in the last two decades to prepare the doctors to cope up with needs of the society and new scientific knowledge. These reforms are necessary to produce academically and professionally competent doctors. World Federation for Medical Education (WFME) has proposed the evaluation of academic environment as one of the targets to maintain the quality of medical education.¹ The quality of academic environment is known to have an impact on quality of teaching, learning and student outcome. Therefore, academic environment has garnered a lot of importance in medical education.²

Students' perception of academic environment is also gaining increasing importance as a measure to provide quality learning and training. The educators can assess the efficacy of a new curriculum and its impact on academic environment on the basis of students' perception. Such evaluations are helpful in modifying the curriculum as means of improving academic environment to satisfy students' needs.^{3,4} The academic environment is known to have an impact on students' behaviour and success.⁵ The measurement of academic environment shed light on the strengths and weaknesses of the existing educational framework, ultimately fostering improvement in performance of both faculty and student.⁶

*Correspondence to:

Dr. Sharmista Bhattacharjee
Associate Professor
Department of Anatomy
Marine City Medical College
Chattogram, Bangladesh.
Mobile : +88 01715 50 18 60
Email : sharmista201@gmail.com

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Many inventories are being used worldwide to measure the overall academic environment or the parts of it. The present study has been designed on Dundee Ready Educational Environment Measure (DREEM). DREEM is recognized as a universally validated and reliable tool to measure academic environment. It allows the educators to identify the ever-changing challenges and to make an informed response to fulfill the objectives of medical education.⁷ DREEM has been used to compare overachievers and underachievers and institutions from home and abroad.^{8,9} It is also helpful to measure perceptions of academic environment after curricular reform, to analyze gender-based and phase-based variations and to assess the strengths and weaknesses of environment.¹⁰⁻¹³

There is an increase in the number of medical schools in Bangladesh as well as all over the world. These medical colleges often lack adequate fund, academic and institutional facilities to formulate an effective educational program and academic environment.¹⁴ There is a need for continuous assessment of academic environment in these institutions to discover any perceived lacks which may compromise quality of education. The MBBS program in Bangladesh has duration of five years. The phase 1 (1.5 year) is dedicated to study of preclinical subjects. In phase 2 & 3 (1 year each) students learn paraclinical subjects along with clinical classes. Phase 4 (1.5 year) is solely dedicated to clinical subjects. This study aims to assess the academic environment to determine the gender-wise and phase-wise variations in perception among undergraduate medical students. The findings of this study may provide a basis for further discussions and future researches to improve the quality of medical education and academic environment in public and private sectors in Bangladesh.

MATERIALS AND METHODS

The five-year MBBS course in Bangladesh is divided in four phases. This study is a multi-centered, cross sectional study which included 400 students from Marine City Medical College, Southern Medical College, Rangamati Medical College and Cox's Bazar Medical College in Bangladesh by random sampling from the students who volunteered to participate. Total 100 students from each medical college were chosen out of which 25 students contributed from each phase (1, 2, 3 & 4) of MBBS course. The researchers explained about the process and confidentiality of data before taking informed written consent. The students who were unwilling to participate or absent in the class were excluded. The permissions from the institutional review board and the principals of the institutions were taken beforehand. The respondents were provided with Dundee Ready Education environment Measure (DREEM) in at the beginning of a scheduled lecture class on different occasion. They were asked to fill it on the spot and return it after 30 minutes.

The 50 item DREEM inventory consists of five domains.

a) Students' Perceptions of Learning (SPL) -12 items, maximum score is 48.

b) Students' Perceptions of Teachers (SPT)-11 items, maximum score is 44.

c) Students' Academic Self-Perceptions (SASP)-8 items, maximum score is 32.

d) Students' Perceptions of Atmosphere (SPA)-12 items, maximum score is 48.

e) Students' Social Self-Perceptions (SSSP)-7 items, maximum score is 28.

The item, domain and DREEM scores were interpreted according to the guideline given by Roff et al.⁴ All items were rated on a scale of 0 to 4, with scores of 4, 3, 2, 1, and 0 corresponding to "strongly agree," "Agree," "Uncertain," "Disagree," and "Strongly disagree," respectively. Reverse scoring was applied to the 9 negative items. The DREEM questionnaire generates a total score of 200, interpreted as follows: 0-50: 'Very Poor', 51-100: 'Plenty of Problems', 101-150: 'More Positive than Negative' and 151-200: 'Excellent'.¹² The data were analyzed using SPSS. Mean and standard deviations of all domain and DREEM were calculated. The mean scores of male and female students were compared by independent t test and ANOVA was used to find out the variations among phases. Tukey's post hoc test was applied to find out the source of difference among phase 1, 2, 3 & 4 students. The significance was set at $p < 0.05$.

RESULTS

Table I Gender-wise comparison of Domain and DREEM undergraduate medical students

Domain	Gender	Mean (SD)	p (t test)
	Male (n=149)		
	Female (n=255)		
. SPL	Male	32.74 (6.17)	0.01*
	Female	34.27 (5.07)	
. SPT	Male	29.25 (5.45)	0.00**
	Female	30.86 (4.48)	
. SASP	Male	21.16 (4.15)	0.03*
	Female	22.09 (3.63)	
. SPA	Male	30.3 (6.34)	0.17 ns
	Female	31.16 (5.48)	
. SSSP	Male	16.35 (3.32)	0.99 ns
	Female	16.35 (3.15)	
DREEM score	Male	129.71 (19.09)	0.00**
	Female	136.13 (18.31)	

● SPL: Students' Perceptions of Learning, SPT: Students' Perceptions of Teaching, SASP: Students' Academic Self-Perceptions, SPA: Students' Perceptions of Atmosphere, SSSP: Students' Social Self-Perceptions, DREEM, Dundee Ready Education Environment Measure, $p < 0.05^*$, significant, $p < 0.005^{**}$, highly significant.

Table I showed comparisons of mean domain scores and DREEM scores of male and female students. Based on the

mean DREEM scores, both groups perceived the academic environment as more positive than negative. The mean scores of five domains also showed a positive perception among both groups. But female students rated SPL (p=0.01), SPT (p=0.00), SPA (p=0.03) and DREEM (p=0.00) significantly higher than their male counterparts. No significant differences were found between two groups in terms of SPA and SSSP domains.

Table II Phase-wise comparison of Domain and DREEM in undergraduate medical students

Domain	Phases				p (ANOVA)	Comparison (Post hoc)	
	1	2	3	4		groups	(Post hoc)
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)			
	n=100	n=100	n=100	n=100			
SPL	35.73 (5.36)	35.23 (5.07)	34.2 (5.31)	33.45 (5.13)	0.01*	1 vs. 2	0.96 ns
						1 vs. 3	0.16 ns
						1 vs. 4	0.01*
						2 vs. 3	0.5 ns
						2 vs. 4	0.1 ns
						3 vs. 4	0.71 ns
SPT	31.22 (4.93)	31.81 (4.93)	30.51 (4.1)	30.06 (4.58)	0.04*	1 vs. 2	0.78 ns
						1 vs. 3	0.68 ns
						1 vs. 4	0.29 ns
						2 vs. 3	0.2 ns
						2 vs. 4	0.04*
						3 vs. 4	0.9 ns
SASP	22.37 (3.54)	22.85 (3.96)	21.49 (3.79)	21.16 (3.67)	0.01*	1 vs. 2	0.78 ns
						1 vs. 3	0.35 ns
						1 vs. 4	0.1 ns
						2 vs. 3	0.05 ns
						2 vs. 4	0.01*
						3 vs. 4	0.9 ns
SPA	32.11 (5.72)	32.58 (5.52)	31.12 (5.0)	30.43 (5.75)	0.03*	1 vs. 2	0.9 ns
						1 vs. 3	0.57 ns
						1 vs. 4	0.14 ns
						2 vs. 3	0.24 ns
						2 vs. 4	0.03*
						3 vs. 4	0.79 ns
SSSP	16.58 (3.5)	16.76 (3.15)	16.14 (3.05)	15.97 (3.15)	0.27 ns	1 vs. 2	0.9 ns
						1 vs. 3	0.74 ns
						1 vs. 4	0.53 ns
						2 vs. 3	0.52 ns
						2 vs. 4	0.31 ns
						3 vs. 4	0.9 ns
DREEM score	137.67 (18.04)	139.23 (18.01)	133.46 (16.96)	131.07 (18.24)	0.00**	1 vs. 2	0.9 ns
						1 vs. 3	0.34 ns
						1 vs. 4	0.04*
						2 vs. 3	0.1 ns
						2 vs. 4	0.01*
						3 vs. 4	0.75 ns

● SPL: Students’ Perceptions of Learning, SPT: Students’ Perceptions of Teaching, SASP: Students’ Academic Self-Perceptions, SPA: Students’ Perceptions of Atmosphere, SSSP: Students’ Social Self-Perceptions, DREEM, Dundee Ready Education Environment Measure, p<0.05*, significant, p<0.005**, highly significant.

Table II showed the total DREEM scores of phase 1 (Score=137.67) phase 2 (Score=139.23) phase 3 (Score=133.46) and phase 4 (Score=131.07). The DREEM scores indicate that students of all phases have more positive than negative perception about overall academic environment. The comparison between phases revealed significant differences between phase 1 and 4 (p=0.04) and phases 2 and 4 (p=0.01). All the five domain scores also showed positive perceptions about those domains from students of all phases. However, significant difference was found only between phase 1 and 4 (p=0.01) in SPL domain. The difference of score was statistically significant only between phase 2 and 4 in the SPT (p=0.04), SASP (p=0.01) and SPA (p=0.03) domains. There were nosignificant differences between any comparison groups in SSSP domain.

DISCUSSION

In the present study, female students were found to have significantly higher score in SPL (p=0.01) SPT (p=0.00), SASP (p=0.03) subscales and total DREEM scores (p=0.00) while compared to their male counterparts (Table I). The SPA and SSSP did not show any significant gender differences in mean scores though female students received higher mean scores for these domains also (Table I). These findings indicate that female students perceived elements such as curriculum, focus, teaching and learning goals in a more positive light compared to their male peers, resulting in a higher level of satisfaction among female students than males.¹² There are evidences suggestive of the influence of academic environment on students’ satisfaction and academic success.¹⁵ It is necessary to implement remedial measure aiming to offer academic and social support to the male students to improve their perception.

Atwa et al.¹⁶ in Egypt revealed similar findings in terms of female students having significantly higher scores for SPL, SPT, SASP and DREEM score. A study in United Kingdom also found gender based differences in mean scores of environment subscales. Their findings are supportive of the present study with the female students having higher mean scores in all domains and significantly higher score in SPT domain. However, they also found significantly higher score for female students in SPA domain which is dissimilar to our study.¹¹ In UK students, better perception of the SPA domain may have resulted from adopting innovative teaching, creating a relaxed environment and organizing course materials logically and sequentially.

The studies investigating the gender based variations in perceptions of academic environment worldwide reported

contrasting results. A study performed in Saudi Arabia concluded that male students are happier about their academic environment in comparison to their female counterparts. The male students scored significantly higher than females in SPL, SASP and SSSP subscales.¹⁷ Park et al.¹⁸ in Korea also reported similar findings with males having significantly higher scores in SPA, SASP and SSSP domains. On the other hand, other studies in Canada, Korea and Saudi Arabia found no significant differences in the perceptions between male and female students.^{5,19,20} The findings of both studies are dissimilar with the present study. The differences in cultural background of the students, personal choices, academic culture and facilities could explain the discrepancies, leading to variations in abilities and approaches to adapting to the environment.

The higher scores of female students in domain and DREEM scores in present study could be attributed to differences in learning styles which may influence the perceptions of the academic environment. Learning is not solely reliant on the transmission of knowledge from teacher to student, it is also dependent on the need of the individual learner. The learning styles of individual students and teaching style of teachers must be compatible for students to achieve academic success.²¹ Their different way of learning may partly explain different perceptions of environment in general.¹⁵ Therefore, teachers in medical colleges may need sufficient training in different learning styles and appropriate teaching methodologies to address the needs of each student. However, it's worth noting that the higher scores among females might also stem from more positive interactions between female students and teachers. The teachers should be more accessible and approachable while interacting with students to promote better communication.²² Traditionally, female students tend to show more deference toward teachers which may have been helpful in student-teacher communication and compliance with teaching styles.

In SPL domain, significant difference was found only between phase 1 and 4 ($p=0.01$) (Table II). The phase 2 and 4 showed significant differences in the SPT ($p=0.04$) SASP ($p=0.01$) and SPA ($p=0.03$) domains. There was no significant difference between any comparison groups in SSSP. The DREEM score was found to be significantly different between phase 1 and 4 ($p=0.04$) and phase 2 and 4 ($p=0.01$). These findings do not completely agree with Ferdous et al. in Bangladesh where authors found significant differences between multiple phases in SPL, SSSP and DREEM scores in a government medical college.¹² They found significant difference between one pair of comparison group in SPT and SSSP domains while no significant difference was there between any groups in SPA domain. The same study found different results for a private institution.¹² These discrepancies in results from studies performed among students of different medical colleges in Bangladesh may stem from differences in subjective

perceptions of learning experiences among students of different medical colleges due to perceived lack in teaching and learning strategies, infrastructure and logistic facilities.

The present study did not find consistent decrease in scores throughout the advanced phases of study except in SPL domain. The phase 2 (3rd year) students scored higher than students of other phases in SPT, SASP, SPA, SSSP domains and total DREEM scores. Mohsena et al. also observed similar trend where phase 2 students scoring higher in all domains and DREEM scores except in SPT.¹³ Though Ferdous et al. found consistent increase in all domain and DREEM scores throughout the advanced phases except SSSP in a government institution, they did not find such consistent pattern among students of a private institution.¹² The studies conducted in Korea also revealed contrasting findings.^{18,19} The findings of current study differ from Kim et al. who reported higher scores in all domains and total DREEM score for 1st year students except SPT where students of 3rd year excelled.¹⁹ The study conducted by Park et al. did not find such consistent pattern of higher scores among 1st and 3rd year students across all the domain scores and DREEM scores which is dissimilar to current study.¹⁸ The results of the two studies are comparable to those of the current study in that none of them demonstrated a consistent increase in domain scores and DREEM scores as the students progressed through higher phases of study. Our findings also differ from the results of Kohli & Dhaliwal, which reported that the DREEM score steadily decreases as the school year increases.²³

There was statistically significant difference between phase 2 and 4 in the SPT, SASP, SPA and DREEM scores. When the phase 2 students transition from phase 1, they get introduced to clinical subjects. They avail of opportunities to apply what they have learned in phase 1. This opportunity may boost their motivation, focus, and interest, resulting in a more positive perception of their environment compared to students in phase 4.¹⁷ The phase 1 students achieved significantly higher scores than phase 4 students in SPL domain and DREEM scores. This can be attributed to the heightened motivation to learn following their successful admission to a medical college.²⁴ It was also not possible for them to give authentic and critical response to some of the items in the questionnaire due to their lack of clinical experience.⁵ The decreased perception among phase 3 and 4 students may be attributed to various factors including a lack of confidence in achieving success, insufficient resources and facilities, the extensive syllabus, prolonged study hours, perceived lack of competence for future role and uncertainty about future. The traditionally prevailing authoritarian and inflexible environment adds to the pressure.²⁵ It is necessary to review curriculum, reduce workload and offer academic and psychological support to boost the morale of phase 3 and phase 4 undergraduate medical students.

LIMITATIONS

The numbers of female students are more than males. Item-wise analysis of the domains of academic environment was not done.

CONCLUSION

The students from both gender and all the phases found the overall academic environment to be more positive. The gender-wise and phase-wise perception scores of all domains of environment also showed a positive perception. However, male students and students of phase 3 and 4 perceived the academic environment as less favourable. These circumstances demand further discussions and investigation to improve gender-wise and phase-wise perceived inadequacies in academic environment. The orientation of faculties in newer concepts of medical education, friendly environment, adequate infrastructure and instruments, academic and social support system may lead to better academic perception and professional outcome.

RECOMMENDATIONS

Similar study with large sample size (Involving more medical colleges) is needed to reflect the perception of academic environment in Bangladesh.

DISCLOSURE

All the authors declared no competing interest.

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