Phase wise evaluation of academic learning environment of selected medical colleges of Bangladesh

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Abstract:
Background:
Academic learning environment includes everything that happens in the educational institute. It surrounds the educational, physical, social and psychological situation in which students are immersed. It plays a significant role in the professional and moral development of the students and effectiveness of learning and educational activities. The study was conducted with an aim to evaluate the academic learning environment of selected medical colleges of Bangladesh.
Methods:
The cross sectional descriptive type of observational study was conducted among proportionately and randomly selected 358 undergraduate students of all phases of Mymensingh Medical College (MMC) and Community Based Medical College Bangladesh (CBMCB) during the period of January, 2019 to December, 2019. Data were collected by self-administered DREEM questionnaire. In addition to DREEM questions, students were asked to provide socio-demographic information. Collected data were entered into SPSS Version 21.0 and analyzed accordingly.
Results:
The results of the study revealed that among 358 students, 222 (62.01%) were from MMC and 136 (37.99%) were from CBMCB; 142 (39.66%) were male and 216 (60.34%) were female. Majority of the students (298, 83.24%) were Bangladeshi; while 40 (11.17%) from India, 15 (4.19%) from Nepal and 5 (1.40%) were from Malaysia. Overall mean DREEM score of MMC was 117.68±18.79 (58.84%) and that of CBMCB was 127.09±19.85 (63.55%). CBMCB was a better DREEM scorer than MMC (p<0.001). On interpretation, both medical colleges achieved "a more positive than negative" status. Total DREEM score was higher in female (124.13±18.96) than male (116.89±20.08) (p=0.001). Students of phase I scored more both in MMC (123.68±19.03) and in CBMCB (141.14±10.45) than other phases (p<0.05).
Conclusion*: Both medical colleges achieved "a more positive than negative" status which is just a level below the highest category of achievable scores. The authorities should consider and address the areas of problem for improvement of academic environment to 'excellent' status.*
Key words: *Academic Learning Environment, DREEM, Medical College, Bangladesh*

I. Introduction

Medical education is mostly centered on the transferal of medical knowledge and helping medical students to obtain the required skills and attitudes related with medical practice. As with professional preparation generally medical education encompasses the three domains of learning such as the cognitive, the affective and the psychomotor [1]. A comfortable, encouraging and challenging educational environment is usually considered as an essential pre-requisite for optimal learning [2]. Academic learning environment includes everything that happens in the educational institute [3]. It surrounds the educational, physical, social and psychological situation in which students are immersed. It plays a significant role in the professional and moral development of the students [4]. Educational environment also plays a vital role on effectiveness of learning and educational activities. It is an important factor for effective learning to occur and it is highlighted as a key to the delivery of a high quality medical education [5, 6]. Evidences exist that the educational environments experienced by the students has an impact on satisfaction with the study course, perceived well-

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being, aspirations and academic achievement [5, 6]. The concept of academic learning environment has been gaining attention in medical education over the last decades.

Studies have shown that the educational environment affects students' achievement, happiness, motivation, and success [7-12]. The status of the educational environment is an indicator of the effectiveness of an educational program. The educational environment subscales correlate positively with academic success and satisfaction toward educational programs [7-9]. The base to improve the health and safety of patients starts with the proficiency of health care providers. Their education is fundamental to these health initiatives [13].

In 1998, the World Federation for Medical Education highlighted the learning environment as one of the targets for the evaluation of medical education programs [13-15]. It is widely agreed among medical educators that the academic and clinical environment are important influences on the attitudes, knowledge, skills, progression, and behaviors of medical students [16, 17].

The learning environment has a powerful influence on students' learning experiences and outcomes. It dictates what, how and why students learn [18]. It influences students' level of eagerness and degree of learning success. The relationship between educational environment and students' achievement has been a fertile area of research and literature provides a proven connection between educational environment and the valuable outcomes of students' achievement, satisfaction and success [10]. Evidence from previous studies shows that students who perceive the educational climate favourably achieve higher academic success than those who perceive it negatively [16, 19].

Positive institutional profile, improved student performance, higher staff morale, increased motivation among students and quality teaching are viewed as the indicators of healthy educational environment [20]. Measurement of educational environment acts as a basis for the diagnosis of practices within an institution. As the environment is changeable, the measurement may act as a platform for making necessary modifications for better educational practices in line with the institution's own goal [21]. To evaluate the learning environment in a health professional institute like medical college, it is crucial to use a wide-ranging, valid and reliable tool. Currently the most widely used tool is the Dundee Ready Education Environment Measure (DREEM) [22] which was developed by an international Delphi panel in Dundee, Scotland. It is an international, culturally nonspecific, validated and generic 50-item inventory tool that provides medical facilities with diagnostic help for measuring the overall state of affairs in the learning environment of their college and it has been translated into various languages [23].

The students' judgement of the educational setting can be a fundamental for implementing modifications and thereby optimizing the educational environment. Effective learning corresponds positively with the students' conceptions of the educational environment, which impacts on students' learning experiences and outcomes. It influences how, why, and what students learn [24]. It is possible to assess and modify the educational environment [25]. This study assessed the medical students' perception regarding their academic environment which will help to detect limitations and to take measures for improvement of the current situation.

II. Material And Methods

Study Design: This was a cross sectional descriptive type of observational study.

Study Location: The study was conducted in Mymensingh Medical College, Bangladesh and Community Based Medical College Bangladesh.

Study Duration: The study was conducted during the period of one year from January, 2019 to December, 2019.

Sample size: 358 medical students.

Sample size calculation:

The study was conducted in purposively selected one public and one private medical college namely Mymensingh Medical College and Community Based Medical College Bangladesh. The sample size for this study was calculated online by "Raosoft sample size calculator". Total MBBS students of purposively selected public medical college i. e. Mymensingh Medical College was 1100 and total MBBS students of purposively selected private medical college i. e. Community Based Medical College Bangladesh was 650. So, Total study population was (1100+650) 1750. Considering 5% acceptable margin of error at 95% confidence interval and 50% response distribution from a total of 1,750 medical students, calculated minimum total sample size was 316.

Considering a non-response rate of 10%, a total of [316+(10X316/100)] 348 students were targeted for data collection. Finally data were collected from 358 randomly and proportionately selected students of each phase (I, II, III, IV) of each medical college.

Subjects & selection method:

One public and one private medical college were selected purposively- Mymensingh Medical College and Community Based Medical College Bangladesh. Students were selected proportionately and randomly from each phase by systematic random sampling. List of students of concern phase was collected. Sampling interval was calculated by dividing the total students of concern phase with the desired sample size of that phase. First sample was selected randomly by lottery. Consecutive samples were selected by adding the sampling interval one after another until achievement of the desired number of samples.

Inclusion criteria: Bangladeshi & foreign students of selected medical colleges who has completed or appeared in the professional examination of concerned phase (I, II, III, IV).

Exclusion criteria: Students who were not willing to participate in the study.

Method and tool of data collection:

MBBS students of four phases (I, II, III & IV) of Mymensingh Medical College and Community Based Medical College, Bangladesh were considered in this cross sectional study. Students were briefed about the study objectives, voluntary nature of participation and confidentiality of data. After taking informed verbal consent data were collected by self-administered globally accepted DREEM questionnaire which gives a total score of 200 for 50 statements. Students were asked to indicate their perceptions about each of the 50 statements on a five point Likert scale 0-4 (0=strongly disagree, 1=disagree, 2=unsure, 3= agree, 4=strongly agree).

The DREEM questionnaire contains 50 statements relating to a range of topics directly relevant to educational environment [26]. The subscales are as follows:-

1. Students' perceptions of learning (SPL): Contains 12 items with a maximum score of 48.
2. Students' perceptions of teacher (SPT): Contains 11 items with a maximum score of 44.
3. Students' academic self-perceptions (SASP): Contains 8 items with a maximum score of 32.
4. Students' perceptions of atmosphere (SPA): Contains 12 items with a maximum score of 48.
5. Students' social self-perceptions (SSSP): Contains 7 items with a maximum score of 28.

In addition to DREEM questionnaire, some socio-demographic and course related information was collected. Opinion for improvement of academic learning environment of concerned medical college was also collected from the students.

Statistical analysis:

Collected data were checked for completeness and consistency and managed accordingly. Then the data were entered into SPSS Version 21.0. The results of DREEM was considered at three levels- i) individual items, ii) subscales and iii) overall DREEM. The raw scores obtained for each items making up of the subscales were summed for each participant. Then the mean of this summed score was taken to give a subscale summary score. These were further summed up to give an overall DREEM score. Chi-square test and one way analysis of variance (ANOVA) were used to compare the averages of five subscales based on different characteristics. Subscale scores and mean DREEM scores of Mymensingh Medical College and Community Based Medical College were compared with each other.

Scoring system and Interpretation:

Scoring system of DREEM questionnaire was followed the one suggested by McAleer and Roff [3]. Each DREEM item was instructed to be scored from 0 to 4. Assignment for the scores was as: 0 (strongly disagree – SD), 1 (disagree – D), 2 (uncertain – U), 3 (agree – A), and 4 (strongly agree – SA). However, 9 of the 50 items (numbers 12, 15, 16, 21, 23, 35, 39, 45 and 49) were negative statements and asked to be scored in the reverse manner (0 for SA, 1 for A, 2 for U, 3 for D and 4 for SD). The maximum score is 200. The scheme suggested by McAleer and Roff, (2001) was used for the interpretation of the overall DREEM score [27]. Accordingly, overall scores of 0–50, 51-100, 101-150 and 151-200 were considered very poor, plenty of problems, more positive than negative and excellent, respectively (Table 1). Items with a mean score of 3.5 or more were true positive points. Items with a mean of 2.0 or less was examined more closely, as they indicate problem areas. Items with a mean between 2.0 and 3.0 were aspects of the educational environment that could be enhanced. Interpretation of domain wise score is shown in table 2.

Table 1: Interpretation of overall DREEM score

Score	Interpretation
0-50	Very poor
51-100	Plenty of problems
101-150	More positive than negative
151-200	Excellent

Table 2: Interpretation of domain wise DREEM score

Domain	Score	Interpretation
Students' perceptions of learning (SPL)	0-12	Very poor
	13-24	Teaching is viewed negatively
	25-36	A more positive approach
	37-48	Teaching highly thought of
Students' perceptions of teachers (SPT)	0-11	Abysmal
	12-22	In need of some retraining
	23-33	Moving in right direction
	34-44	Model teachers
Students' academic self-perceptions (SASP)	0-8	Feeling of total failure
	9-16	Many negative aspects
	17-24	Feeling more on the positive side
	25-32	Confident
Students' perceptions of atmosphere (SPA)	0-12	A terrible environment
	13-24	There are many issues that need changing
	25-36	A more positive atmosphere
	37-48	A good feeling overall
Students' social self-perceptions (SSSP)	0-7	Miserable
	8-14	Not a nice place
	15-21	Not too bad
	22-28	Very good socially

Ethical considerations:

No physical or psychological risk was associated with the study. Informed verbal consent was taken from all the participants prior to collection of data. Questionnaire was anonymous and confidentiality of data was maintained all through. Permission from the authority of the students was taken prior to collection of data. Ethical clearance was obtained from the Institutional Review Board (IRB) of Mymensingh Medical College (Memo no. MMC/IRB/2019/151; Date: 18.06.2019).

III. Result

A cross sectional descriptive type of observational study was conducted among 358 students of different phases of Mymensingh Medical College and Community Based Medical College, Bangladesh to evaluate the academic learning environment. Among them 222 (62.01%) were from Mymensingh Medical College and 136 (37.99%) were from Community Based Medical College, Bangladesh. Among 222 students of Mymensingh Medical College, 57 (25.68%) were from phase I, 58 (26.13%) from phase II, 53 (23.87%) from phase III and 54 (24.32%) were from phase IV. On the other hand among 136 students of Community Based Medical College, each 35 (25.74%) were from phase I, II and III and 31 (22.78%) were from phase IV. Among the total (358) students 142 (39.66%) were male and 216 (60.34%) were female. The most (298, 83.24%) of the students were Bangladeshi, 40 (11.17%) were from India, 15 (4.19%) from Nepal and 5 (1.40%) were from Malaysia. Among all the medical students 225 (62.85%) were from urban area, one fourth (92, 25.70%) were from rural area and 41 (11.45%) were from suburban area. Students from rural (67, 30.18%) and suburban (25, 11.26%) areas were more in MMC, while students from urban areas were more in CBMCB (95, 69.86%). Maximum students (293, 81.84%) reside in hostel- 199 (89.64%) of MMC and 94 (69.12%) of CBMCB. A significant number of students (59, 16.48%) lives in their own home - 17 (7.66%) of MMC and 42 (30.88%) of CBMCB. Another 5 (1.40%) students live in mess and 1 (0.28%) student lives in relative's house.

Table 3: Distribution of students by phase and Medical College (n=358)

Phase	Medical College		Total
	MMC n (%)	CBMCB n (%)	n (%)
Phase I	57 (25.68)	35 (25.74)	92 (25.70)
Phase II	58 (26.13)	35 (25.74)	93 (25.98)
Phase III	53 (23.87)	35 (25.74)	88 (24.58)
Phase IV	54 (24.32)	31 (22.78)	85 (23.74)
Total	222 (62.01)	136 (37.99)	358 (100.00)

Table 4: Distribution of students by selected socio-demographic characteristics (n=358)

Variables	Medical College		Total
	MMC n (%)	CBMCB n (%)	n (%)
Sex			
Male	105 (47.29)	37 (27.21)	142 (39.66)
Female	117 (52.71)	99 (72.79)	216 (60.34)
Country			

Bangladesh	189 (85.14)	109 (80.15)	298 (83.24)
India	18 (8.11)	22 (16.18)	40 (11.17)
Nepal	10 (4.50)	5 (3.67)	15 (4.19)
Malaysia	5 (2.25)	0 (0.0)	5 (1.40)
Location of permanent address			
Rural	67 (30.18)	25 (18.38)	92 (25.70)
Urban	130 (58.56)	95 (69.86)	225 (62.85)
Suburban	25 (11.26)	16 (11.76)	41 (11.45)
Present residence			
Hostel	199 (89.64)	94 (69.12)	293 (81.84)
Own home	17 (7.66)	42 (30.88)	59 (16.48)
Mess	5 (2.25)	0 (0.0)	5 (1.40)
Relative's house	1 (0.45)	0 (0.0)	1 (0.28)

Dundee Ready Education Environment Measure (DREEM):

Table 5: DREEM scores of five subclasses for all phases of MMC (n=222)

Domain	Phase I Mean ±SD	Phase II Mean ±SD	Phase III Mean ±SD	Phase IV Mean ±SD	Overall Mean ±SD	P (ANOVA)
Students' perception of learning (SPL)	31.12 ±6.40	30.41 ±5.96	27.60 ±6.71	25.98 ±5.28	28.84 ±6.42	<0.001
Students' perception of teachers (SPT)	26.68 ±3.72	25.98 ±4.10	26.28 ±4.01	24.98 ±4.80	25.99 ±4.19	0.176
Students' academic self-perception (SASP)	22.23 ±5.60	19.66 ±5.25	20.00 ±5.56	18.83 ±4.42	20.19 ±5.53	0.006
Students' perception of atmosphere (SPA)	28.42 ±5.97	27.90 ±6.60	27.17 ±6.27	26.93 ±4.39	27.62 ±5.87	0.524
Students' social self-perception (SSSP)	15.23 ±3.93	15.95 ±8.04	13.64 ±3.39	15.20 ±3.03	15.03 ±3.58	0.006
Total	123.68± 19.03	119.90± 19.50	114.70± 19.8	111.93± 15.26	117.68± 18.79	0.004
Interpretation on total score	More positive than negative	More positive than negative	More positive than negative	More positive than negative	More positive than negative	

Though the total score of each subclass varies in MMC, the interpretation is same for all the phases which concludes that academic learning environment is more positive than negative in MMC. Statistically significant difference of score was found in different phases in SPL, SASP, SSSP and in total score ($p<0.05$). In these domains students of phase I scored higher than other phases (Table 5).

Table 6: Comparison of subclass DREEM scores of all phases of MMC (n=222)

Domain	Phases				P (ANOVA)	Comparison phases	P (Post hoc)
	I (n=57) Mean ±SD	II (n=58) Mean ±SD	III (n=53) Mean ±SD	IV (n=54) Mean ±SD			
SPL	31.12 ±6.40	30.41 ±5.96	27.60 ±6.71	25.98 ±5.28	<0.001	I vs II	0.535
						I vs III	0.003
						I vs IV	<0.001
						II vs III	0.016
						II vs IV	<0.001
						III vs IV	0.171
SPT	26.68 ±3.72	25.98 ±4.10	26.28 ±4.01	24.98 ±4.80	0.176	I vs II	0.369
						I vs III	0.615
						I vs IV	0.033
						II vs III	0.705
						II vs IV	0.206
						III vs IV	0.108
SASP	22.23 ±5.60	19.66 ±5.25	20.00 ±5.56	18.83 ±4.42	0.006	I vs II	0.009
						I vs III	0.027
						I vs IV	0.001
						II vs III	0.729
						II vs IV	0.407

						III vs IV	0.250
SPA	28.42 ±5.97	27.90 ±6.60	27.17 ±6.27	26.93 ±4.39	0.524	I vs II	0.633
						I vs III	0.266
						I vs IV	0.182
						II vs III	0.516
						II vs IV	0.384
						III vs IV	0.830
SSSP	15.23 ±3.93	15.95 ±8.04	13.64 ±3.39	15.20 ±3.03	0.006	I vs II	0.271
						I vs III	0.018
						I vs IV	0.971
						II vs III	0.001
						II vs IV	0.262
						III vs IV	0.022
Total	123.68 ±19.03	119.90 ±19.50	114.70 ±19.8	111.93 ±15.26	0.004	I vs II	0.270
						I vs III	0.011
						I vs IV	0.001
						II vs III	0.138
						II vs IV	0.023
						III vs IV	0.436

Table 6 showed the scores of five subclasses of DREEM in different phases of MMC. In the SPL domain statistically significant difference of score was found between phase I and III (p=0.003); phase I and IV (p<0.001); phase II and III (p=0.016) and between phase II and IV (p<0.001). In the SPT domain difference of score was statistically significant only between phase I and IV (p=0.033). In the SASP domain statistically significant difference of score was found between phase I and II (P=0.009), I and III (P=0.027) and between phase I and IV (P=0.001). In the SPA domain difference of score was not statistically significant between any of the phases. In the SSSP domain statistically significant difference of score was found between phase I and III (P=0.009); between phase II and III (P=0.001) and between phase III and IV (p=0.022). Total score differ significantly between phase I and III (p=0.011), phase I and IV (p=0.001) and between phase II and IV (p=0.023).

Table 7: DREEM scores of five subclasses for all phases of CBMCB (n=136)

Domain	Phase I Mean±SD	Phase II Mean±SD	Phase III Mean±SD	Phase IV Mean±SD	Overall Mean±SD	P (ANOVA)
Students' perception of learning (SPL)	36.49 ±3.76	33.06 ±5.19	29.60 ±7.03	26.12 ±9.63	31.47 ±7.62	<0.001
Students' perception of teachers (SPT)	27.62 ±3.57	29.00 ±4.53	28.54 ±4.85	28.87 ±5.28	28.50 ±4.56	0.597
Students' academic self-perception (SASP)	26.77 ±3.51	21.00 ±5.80	18.31 ±5.63	20.68 ±3.29	21.72 ±5.66	<0.001
Students' perception of atmosphere (SPA)	33.54 ±3.74	28.83 ±7.62	25.77 ±5.83	28.06 ±6.27	29.08 ±6.61	<0.001
Students' social self-perception (SSSP)	16.71 ±2.40	15.80 ±4.01	16.83 ±2.88	15.87 ±3.26	16.32 ±3.19	0.401
Total	141.14 ±10.45	127.69 ±19.86	119.06 ±19.74	119.61 ±19.91	127.09 ±19.85	<0.001
Interpretation on total score	More positive than negative	More positive than negative	More positive than negative	More positive than negative	More positive than negative	

Though the total score of each subclass varies in CBMCB, the interpretation is same for all the phases which concludes that academic learning environment is more positive than negative in CBMCB. Statistically significant difference of score was found in different phases in SPL, SASP, SPA and in total score (p<0.001). In these domains students of phase I provided higher scores than those of other phases (Table 7).

Table 8: Comparison of subclass DREEM scores of all phases of CBMCB (n=136)

Domain	Phases				P (ANOVA)	Comparison groups	P (Post hoc)
	I (n=35) Mean ±SD	II (n=35) Mean ±SD	III (n=35) Mean ±SD	IV (n=31) Mean ±SD			

SPL	36.49 ±3.76	33.06 ±5.19	29.60 ±7.03	26.12 ±9.63	<0.001	I vs II	0.033
						I vs III	<0.001
						I vs IV	<0.001
						II vs III	0.032
						II vs IV	<0.001
						III vs IV	0.037
SPT	27.62 ±3.57	29.00 ±4.53	28.54 ±4.85	28.87 ±5.28	0.597	I vs II	0.213
						I vs III	0.405
						I vs IV	0.274
						II vs III	0.677
						II vs IV	0.909
						III vs IV	0.772
SASP	26.77 ±3.51	21.00 ±5.80	18.31 ±5.63	20.68 ±3.29	<0.001	I vs II	<0.001
						I vs III	<0.001
						I vs IV	<0.001
						II vs III	0.019
						II vs IV	0.783
						III vs IV	0.045
SPA	33.54 ±3.74	28.83 ±7.62	25.77 ±5.83	28.06 ±6.27	<0.001	I vs II	0.001
						I vs III	<0.001
						I vs IV	<0.001
						II vs III	0.035
						II vs IV	0.608
						III vs IV	0.125
SSSP	16.71 ±2.40	15.80 ±4.01	16.83 ±2.88	15.87 ±3.26	0.401	I vs II	0.233
						I vs III	0.881
						I vs IV	0.286
						II vs III	0.180
						II vs IV	0.928
						III vs IV	0.226
Total	141.14 ±10.45	127.69 ±19.86	119.06 ±19.74	119.61 ±19.91	<0.001	I vs II	0.002
						I vs III	<0.001
						I vs IV	<0.001
						II vs III	0.046
						II vs IV	0.070
						III vs IV	0.900

Table 8 showed the scores of five subclasses of DREEM in different phases of CBMCB. In the SPL domain statistically significant difference of score was found between every pair of phases (p<0.05). In the SPT domain difference of score between phases was not statistically significant at all (p>0.05). In the SASP domain statistically significant difference of score was found between all the pair of phases (p<0.05) except between phase II and IV (P=783). In the SPA domain statistically significant difference of score was found between all the pair of phases (p<0.05) except between phase II and IV (p=0.608) and phase III and IV (P=0.125). In the SSSP domain difference of score was not statistically significant between any pair of the phases (p>0.05). Total score differs significantly between all the phases except phase II and IV (p=0.070) and between phase III and IV (p=0.900).

Table 9: Comparison of domain wise mean score of MMC and CBMCB (n=358)

Domain	MMC (n=222) Mean±SD	CBMCB (n=136) Mean±SD	Total (n=358) Mean±SD	P (ANOVA)
SPL	28.84±6.42	31.47±7.62	29.84±7.00	0.001
SPT	25.99±4.19	28.50±4.56	26.94±4.50	<0.001
SASP	20.19±5.53	21.72±5.66	20.78±5.51	0.011
SPA	27.62±5.87	29.08±6.61	28.18±6.20	0.030
SSSP	15.03±3.58	16.32±3.19	15.52±3.48	0.001
Total	117.68±18.79	127.09±19.85	121.26±19.71	<0.001
DREEM %	58.84%	63.55%	60.63%	
Interpretation	More positive than negative	More positive than negative	More positive than negative	

Domain wise mean score of MMC differs significantly from that of CBMCB (p<0.05). Mean of total score of MMC (117.68; 58.84%) also differs significantly from that of CBMCB (127.09; 63.55%) (p<0.001). CBMCB was better scorer than MMC. Though the total mean score of each medical college differs, the interpretation of DREEM score is same for both MMC and CBMCB which ultimately concludes that academic learning environment is more positive than negative in both medical colleges (Table 9).

Table 10: Comparison of domain wise mean score by sex of the students of both MMC and CBMCB (n=358)

Domain	Male mean±SD	Female mean±SD	Total mean±SD	P value (ANOVA)
SPL	28.10±6.84	30.99±6.89	29.84±7.00	<0.001
SPT	25.58±4.59	27.84±4.22	26.94±4.50	<0.001
SASP	19.82±5.53	21.41±5.54	20.78±5.51	0.007
SPA	28.02±5.96	28.28±6.36	28.18±6.20	0.702
SSSP	15.37±3.44	15.62±3.52	15.52±3.49	0.520
Total	116.89±20.08	124.13±18.96	121.26±19.71	0.001

The data analysis showed that DREEM score was significantly higher in females in SPL, SPT and SASP domains (p<0.05). The total DREEM scores were also higher for females which indicated that there were statistically significant differences between perceptions of the male and female students (p=0.001) (Table 10).

Table 11: Distribution of students of both MMC and CBMCB by overall scoring category (n=358)

Scoring category**	Phases				Total n (%)	p value*
	Phase I n (%)	Phase II n (%)	Phase III n (%)	Phase IV n (%)		
Plenty of problems (51-100)	5 (5.43)	9 (9.68)	18 (20.45)	16 (18.82)	48 (13.41)	
More positive than negative (101-150)	77 (83.70)	79 (84.95)	67 (76.14)	64 (75.30)	287 (80.17)	0.016
Excellent (151-200)	10 (10.87)	5 (5.37)	3 (3.41)	5 (5.88)	23 (6.42)	
Total	92 (100.00)	93 (100.00)	88 (100.00)	85 (100.00)	358 (100.00)	

*χ^2 = 15.556; df=6; ** No student scored "very poor (0-50)"

Data analysis showed that there are significant differences among students of different phases regarding scoring category (p<0.05). No student made the extreme negative score of "very poor (0-50)". Scoring of "plenty of problems (51-100)" was more in higher phases than lower phases. "More positive than negative (101-150)" scoring was done by more than three fourth of the students of every phase. "Excellent (151-200)" score was exceptionally higher in phase I than other three phases (Table 11).

IV. Discussion

This cross sectional descriptive type of observational study was conducted among 358 medical students of different phases of Mymensingh Medical College and Community Based Medical College Bangladesh to assess the academic learning environment of these two institutions using the Dundee Ready Education Environment Measure (DREEM) questionnaire. The students provided self-response scores on various domain of academic learning environment.

The Dundee Ready Education Environment Measure (DREEM) instrument has been developed and validated for use regardless of culture and country [28]. It has been used in many settings and for several purposes, i. e. to find out how students perceive the ideal educational environment, to look at expectations of climate, to compare academic achievers and under-achievers, to compare educational environment across schools and programs, to compare educational environment at different sites within a school, to identify problem areas in an education program, to get a baseline before curriculum reform, to determine students' reactions to ongoing curricular reform and as a tool for improvement [26].

Socio-demographic characteristics of the students:

A total of 358 students were included in the study. Among them 222 (62.01%) were from Mymensingh Medical College and 136 (37.99%) were from Community Based Medical College Bangladesh. Among 222 students of Mymensingh Medical College, 57 (25.68%) were from phase I, 58 (26.13%) from phase II, 53 (23.87%) from phase III and 54 (24.32%) were from phase IV. On the other hand among 136 students of Community Based Medical College Bangladesh, each 35 (25.74%) were from phase I, II and III and 31 (22.78%) were from phase IV. In an Iranian study 35.5% students were in first year, 23.5% in second year, 24.5% in third year and 16.5% in fourth year [18].

Among 358 students 142 (39.66%) were male and 216 (60.34%) were female. Among the students of Mymensingh Medical College 105 (47.29%) were male and the remaining 117 (52.71%) were female. Among the students of Community Based Medical College, Bangladesh 37 (27.21%) were male and 99 (72.79%) were female. In the Iranian study there was almost similar proportion of male-female students; 42% were male and 58% were female [18]. Another study also found same proportion of male-female student; 41.1% male and

59.8% female [26]. An Indian study found 60.7% male and 39.3% female [29] which is dissimilar with the findings of this study.

The most (298, 83.24%) of the students were Bangladeshi, while 40 (11.17%) were from India, 15 (4.19%) from Nepal and 5 (1.40%) were from Malaysia. Among the 222 students of MMC 189 (85.14%) were Bangladeshi, 18 (8.11%) from India, 10 (4.50%) were from Nepal and 5 (2.25%) were from Malaysia. On the other hand among the 136 students of CBMCB 109 (80.15%) were Bangladeshi, 22 (16.18%) were from India and 5 (3.67%) were from Nepal. There were no student from Malaysia in CBMCB. An Indian study also found more native students where 65.8% were from Delhi and the rest were from states outside Delhi but within India [29].

Among all the medical students 225 (62.85%) were from urban area, one fourth (92, 25.70%) were from rural area and 41 (11.45%) were from sub-urban area. Students from rural (67, 30.18%) and sub-urban (25, 11.26%) areas were more in MMC, while students from urban areas were more in CBMCB (95, 69.86%). These findings may be due to the reason that more urban students of affluent society study in the private medical college like CBMCB than the rural and sub-urban students.

The study results revealed that maximum students (293, 81.84%) reside in hostel- 199 (89.64%) of MMC and 94 (69.12%) of CBMCB. A significant number of students (59, 16.48%) lives in their own home -17 (7.66%) of MMC and 42 (30.88%) of CBMCB. Another 5 (1.40%) students live in mess and 1 (0.28%) student lives in relative's house. In a medical college of Delhi, India, 67.5% students were staying in hostel [29] which was less than both MMC and CBMCB.

Comparing the DREEM scores of this study with other studies abroad:

No study in Bangladesh using DREEM instrument was found online. Probably this the first ever study with properly designed methodology in Bangladesh regarding evaluation of academic learning environment of medical colleges. The overall mean scores of MMC and CBMCB in this study were (117.68; 58.84%) and (127.09; 63.55%) respectively, both of which is better than the findings (113.5; 56.75%) of an Iranian study in seven medical science courses [18]. However, the scores were in the same range (score 101-150) and based on the DREEM interpreting guideline are considered to be more positive than negative.

A nursing school [3] of China and medical schools of Sri Lanka, Nepal, Nigeria, Saudi Arabia, the UK (Birmingham), Chile, Kuwait, Sweden, Jamaica, Trinidad, Dental School of Malaysia, International Medical University of Malaysia [30] and University of British Colombia Medical School8 got the overal DREEM score of identical range i. e. 101-150 (more positive than negative). An Indian [31] and an Australian [32] study also had the same range of score. The International University of Management (Bachelor of Nursing) [33], Indonesian nursing students [34] and several other similar studies [35-42] also found same range of score 101-150 (more positive than negative).

There are several studies that found higher overall mean DREEM scores than that of this study. A Malaysian private nursing college [43] and a nursing school in China [44] reported high mean DREEM scores of 134.42 and 131.26 respectively. A series of UK learning environment studies recorded a high mean DREEM scores of 142.91 [45]. High mean DREEM scores were also found in a study in UK at different teaching hospital centers (139.20) [46] and in seven major medical sciences courses at Monash University in Australia (137.30) [32]. This study results revealed that MMC and CBMCB have achieved "a more positive than negative" status which is just a level below the highest category of achievable scores. Though the status is same, CBMCB attained more scores in all the domains of DREEM instrument. The reasons for attaining more score of CBMCB may be firstly less number of students and sufficient number of teachers than MMC. Secondly logistics support in government medical college like MMC is often delayed or difficult to manage, whereas in CBMCB it is comparatively easier to manage.

Students of novel curricula have an inclination to exhibit more satisfaction with their educational environments in comparison to the students of traditional curricula. Higher DREEM scores tend to indicate more student-centered curricula, while those offering conventional curricula commonly score less than 120 out of 200 [15, 23, 36].

The data analysis of this study showed that DREEM score was significantly higher in females in SPL, SPT and SASP domains (p<0.05). The total DREEM scores were also higher for females which indicated that there were statistically significant differences between perceptions of the male and female students (p=0.001) which is similar to the results from studies conducted in Australia [32], Sweden [47], Nigeria [48] and Dundee Medical School, where female students' perceptions were more positive [36]. Conversely, results of this study are statistically significantly different to those of studies carried out in the Middle East [25, 49], Trinidad [42], Sri Lanka [41] and in India [31] which reported no significant sex differences between female and male [50]. This suggests that the female students perceived factors such as curriculum, structure, focus, and goals more positively than their male counterparts and that the female students appeared to be happier than the males. On

the one hand, there is long standing evidence that males and females typically exhibit different learning styles [51] which could partly explain differences in the way they learn and the environments they perceived.

The results of the study showed that there are significant differences among students of different phases regarding scoring category ($p<0.05$). No student made the extreme negative score of "very poor (0-50)". Scoring of "plenty of problems (51-100)" was more in higher phases than lower phases. "More positive than negative (101-150)" scoring was done by more than three fourth of the students of every phase. "Excellent (151-200)" score was exceptionally higher in phase I than other three phases. Perceptions of learning, the teacher and atmosphere varied according to the phase or year-level of enrollment. In this study, students in phase I of both MMC and CBMCB had the highest score, with a mean of 123.68±19.03 and 141.14±10.45 respectively. An Iranian study also found highest score in first year students with a mean of 119.73±56.86 and less scores of 111.19 to 117.58 in second, third and fourth year [18]. These findings are also in line with those in a Malaysian study [33] which noted a trend for reduced scores in the senior years. It was suggested that this trend could be due to the fact that students genuinely believed that the learning environment was deteriorating and thus were mentally tired of being a student and looking forward to leaving student life. Some researchers opined that the students' perceptions in first year could have been high initially and dissatisfaction may have crept in day by day [32, 37]. Further investigation of each course (subject) separately and perhaps individual item, is required to help clarify these differences.

V. Conclusion

Improved quality of educational environment is necessary to prepare doctors to fulfill the expectation of the society, to cope with the exponential growth of medical and scientific knowledge, to impress physicians' capability for lifelong learning, to ensure mastery in information technology and to adjust medical education to changing conditions in the health care delivery system. This study evaluated the academic learning environment of a government and a private medical college of Mymensingh district. The study results revealed that overall mean DREEM score of Community Based Medical College Bangladesh was better than that of Mymensingh Medical College. Though Community Based Medical College was a better DREEM scorer, both of the medical colleges had achieved "a more positive than negative" status which is just a level below the highest category of achievable scores. Item wise DREEM scores helped identifying the areas of limitation of both medical colleges. The study results can serve as a baseline for a quality assessment of students' perception for academic learning environment of the institutions. The results of the study can also help the policy makers and authorities to improve academic learning environment by taking necessary actions for enhancing the students' ability of learning, motivation, academic progress and sense of well-being.

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