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## FEMALE PERSPECTIVE ON QUALITY OF MEDICAL EDUCATION EVALUATION IN INDIA

Monica Verma<sup>1</sup>, Abhishek Soni<sup>\*2</sup>, Himanshu Madaan<sup>3</sup>, Ashuma Sachdeva<sup>1</sup>, Vasudha Dhupper<sup>1</sup> and Sumit Sachdeva<sup>4</sup>

Department of Biochemistry<sup>1</sup>, Department of Radiation Oncology<sup>2</sup>, Department of Ophthalmology<sup>4</sup>, Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak - 124001, Haryana, India.

Department of Biochemistry<sup>3</sup>, Kalpana Chawla Medical College, Karnal - 132001, Haryana, India.

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### Correspondence to Author:

**Dr. Abhishek Soni**

Associate Professor,  
Department of Radiation Oncology,  
Pandit Bhagwat Dayal Sharma Post  
Graduate Institute of Medical  
Sciences, Rohtak - 124001, Haryana,  
India.

**E-mail:** abhisheksoni246@gmail.com

**ABSTRACT: Background:** The medical educational environment affects the mental and professional growth of female and male students in many ways. This may be measured by many tools but Dundee Ready Education Environment Measure (DREEM) tool is a globally validated and accepted tool to assess the educational environment in a medical college. **Methods:** The present study was conducted at Kalpana Chawla Government Medical College, Karnal, Haryana, India. The MBBS undergraduate female and male students were enrolled in the study and the DREEM tool was used to assess and compare educational climate among them. **Results:** A total of 246 students participated in the study out of which 95 (38.62%) were females. The overall mean score was 2.43±0.62, which was interpreted as an educational aspect that could be further enhanced. The total DREEM score was 121.6 (60.8%), which was interpreted as more positive than negative. The mean age of the females was 19.63±1.54 vs 19.69±1.61. More than 50% were female students in 2<sup>nd</sup> phase. The females scored maximum in academics (70.97% vs 56.66% in males). Females felt socially less secure (53.5% vs 65.04% in males). **Conclusion:** Dreem tool is a very effective tool to comparatively evaluate the educational environment of female and male students of a medical college. The medical college was interpreted to move in the right direction with a scope of improvement. The results of this study will help the medical institute to resolve the gender disparities (if any) and to plan and implement measures to enhance the education environment among female as well as male students.

**INTRODUCTION:** The educational environment around a medical student influences the students' academic progress as well as their behavior and well-being<sup>1</sup>. In a medical college, there is a drastic change in the educational environment for the medical students, especially for the freshers; in terms of educational and social relationships.

This medical educational learning environment is used to get affected by plenty of factors, like infrastructure, social relationships, educational delivery, learning climate, institutional culture, and many other factors<sup>2,3</sup>.

This transition in the educational climate has different impacts on female and male medical students. This is the duty of medical college teachers particularly in phase I, to provide a practical, receptive, and comfortable educational environment to the medical students. The World Federation of Medical Education (WFME), in 1998, depicted a system to evaluate the medical

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education program by assessing the learning environment<sup>4</sup>. A challenging, warm and supportive educational environment is usually considered essential for optimal learning<sup>5</sup>. Globally, many criteria have been adopted to measure the educational environment. Out of these different criteria, Dundee Ready Education Environment Measure (DREEM) tool is the one that is most commonly used<sup>6</sup>. Roff *et al* in 1997, first published the DREEM tool. It was unanimously concluded that the DREEM tool is valid and generic and it is not specific to any culture for evaluating the educational environment<sup>4,7</sup>.

This tool can measure strengths as well as weaknesses in the educational environment of medical students. The DREEM questionnaire consists of five subscales as Students' perceptions of learning/teaching (SPL; 12 items), Students' perceptions of teachers (SPT; 11 items), Students' academic self-perceptions (SASP; 8 items), Students' perceptions of the atmosphere (SPA; 12 items) and Students' social self-perceptions (SSSP; 7 items)<sup>7</sup>.

The DREEM tool also acts as a feedback system and various domains of students can be easily explored and the areas of concern can be easily addressed. The present study aimed to compare the educational climate in females and males in a medical college using Dundee Ready Education Environment Measure (DREEM) tool.

## MATERIALS AND METHODS:

**Study Design:** This was a descriptive, prospective, and cross-sectional study. The study was conducted at Kalpana Chawla Government Medical College in Karnal, Haryana. The MBBS undergraduate students from various phases 1, 2 and 3 (part 1 and 2) were included in the study. The study made use of the DREEM tool which is a validated and reliable tool to measure educational climate. This tool was first created by the Delphi Process in Dundee, Scotland, UK. It got translated into a lot of languages globally and thence adopted by various institutions<sup>2</sup>. For the present study, the proforma of the 50-item DREEM tool was prepared on Google Docxin English language and a link was forwarded to the undergraduate students after taking due consent. Institutional ethical committee clearance was obtained for the present study.

The undergraduate medical students were assured that participation in this study is entirely a voluntary step and that non-participation in it would not have any adverse repercussions on their medical college academics. All the responses to this DREEM tool were collected.

**Methodology:** The 50-item DREEM questionnaire was used in the present study. The DREEM tool has five subscales and each subscale has further different items/questions in them<sup>7</sup>.

The five subclasses were - Students' perceptions of learning/teaching (SPL; 12 items), Students' perceptions of teachers (SPT; 11 items), Students' academic self-perceptions (SASP; 8 items), Students' perceptions of the atmosphere (SPA; 12 items) and Students' social self-perceptions (SSSP; 7 items). Each item was scored 0–4 on a five-point Likert scale and the scoring was done as 4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree, and 0 = strongly disagree.

Nine items (item numbers 4, 8, 9, 17, 25, 35, 39, 48 and 50) were scored in a reverse manner with scoring as 0 = strongly agree, 1 = agree, 2 = uncertain, 3 = disagree & 4 = strongly disagree. For these 9 items, the higher the score, the more negative the feedback was. The overall score was 200 & different scores were interpreted as 0-50 = very poor; 51-100 = plenty of problems; 101-150 = more positive than negative; and 151-200 = excellent<sup>8</sup>.

Individual DREEM items/questions were further analyzed by calculating their mean score (with standard deviation). The items with a mean score equal to or more than 3.5 were true positive and indicated a near-perfect domain. The items with a mean score equal to or less than 2.0 indicated some problem areas and were inspected closely. The items with a mean score between 2.0 to 3.5 indicated aspects of the educational climate that could be enhanced<sup>9</sup>. The maximum score for the different subclasses of the DREEM tool were; SPL: 48, SPT: 44, SASP: 32, SPA: 48, and SSSP: 28. **Table 1** summarizes the data adopted for interpretation of the overall score of various domains. The mean and standard deviation (SD) were calculated for individual items.

**TABLE 1: VARIOUS SCORES AND THEIR INTERPRETATION FOR VARIOUS SUBCLASSES OF THE DREEM TOOL**

Dreem tool subclasses	Scores and interpretation			
	0-12	13-24	25-36	37-44
Students' perception of learning	Very poor	Negative	A more positive approach	Teaching highly thought of
Students' perception of teachers'	0-11 Abysmal	12-22 In need of some retraining	23-33 Moving in the right direction	34-44 Model teachers
Students' academic self-perception	0-8 A feeling of total failure	9-16 Many negative aspects	17-24 Feeling more on the positive side	25-32 Confident
Students' perception of atmosphere	0-12 Terrible environment	13-24 Many issues need to change	25-36 A more positive atmosphere	37-48 A good feeling overall
Students' social self-perception	0-7 Miserable	8-14 Not a nice place	15-21 Not too bad	22-28 Very good socially

**RESULTS:** The overall mean score was  $2.43 \pm 0.62$  in this study, and it was interpreted that the educational aspect could be further enhanced. The total score was 121.6 out of 200 (60.8%), which was interpreted as more positive than negative. **Table 2** shows the number of male and female students and their ages who participated in the present study. A total of 246 medical students took part in this study. The total number of students in the first, second, third and fourth years were 77, 44,

65 and 60 respectively. A total of 151/246 (61.38%) students were males and the rest 95(38.62%) were females. The number of female students in first, second, third and fourth years respectively were 30, 24, 21 and 20. In MBBS 2<sup>nd</sup> phase, more than 50% were females; in the rest of the phases, females were <50%. The mean age of the entire cohort was 19.66 years. The mean age of females was  $19.63 \pm 1.54$  vs  $19.69 \pm 1.61$  in males, not statistically significant ( $p=0.45$ ).

**TABLE 2: TOTAL NUMBER OF FEMALE AND MALE STUDENTS (N=246) IN DIFFERENT MBBS PHASES**

Year	Number of students	Male (%)	Female (%)	Age years (Mean±SD)
1	77	47 (61.04%)	30 (38.96%)	17.96±0.59
2	44	20 (45.45%)	24 (54.55%)	18.70±0.73
3	65	44 (67.69%)	21 (32.31%)	20.62±0.49
4	60	40 (66.67%)	20 (33.33%)	21.50±0.55
Total	246	151 (61.38%)	95 (38.62%)	19.66±1.58

**Table 3** demonstrates the mean value of different domains of the DREEM tool and the overall educational climate among females and males in the college. The interpretation of the total mean scores was done according to McAleer and Roff's practical guide<sup>6, 7</sup>. All the students viewed positively including learning, teaching, academic self-perception, atmosphere and social life. However, females' perception concerning educational climate was more positive with a mean score of 2.49 vs 2.37 in males, but it was statistically not significant ( $p=0.45$ ). DREEM tool

concluded that medical college is propelling in the right direction. There were negative aspects also, which need to be improved. The females scored maximum (70.97%) in academics, vs 56.66% in males which was statistically significant  $p=0.03$ . A statistically significant ( $p=0.02$ ) difference in social life score was seen, with a score of 53.5% in females vs 65.04% in males. The females scored lowest in social life which depicts an unsafe environment perception even in the medical college.

**TABLE 3: MEAN VALUES (PERCENTAGE) OF THE OVERALL EDUCATIONAL CLIMATE AND VARIOUS SUBCLASSES OF THE DREEM TOOL ALONG WITH THEIR INTERPRETATION**

Dreem tool	Mean (%)			Interpretation
	Female	Male	p-value	
Educational Climate	2.49 (62.25%)	2.37 (59.25%)	0.66 (NS)	Females are more positive than males; educational aspects could be enhanced
Learning (SPL)	31.39 (65.40%)	28.32 (59.00%)	0.35 (NS)	Females have a more positive perception

Teachers (SPT)	29.79 (67.70%)	26.67 (60.61%)	0.29 (NS)	Females percept more positively about the teachers that they are moving in the right direction
Academics (SASP)	22.71 (70.97%)	18.13 (56.66%)	0.03*	Females are very much positive about academics
Atmosphere (SPA)	27.65 (57.60%)	31.32 (65.25%)	0.26 (NS)	Females feel a less positive atmosphere
Social life (SSSP)	14.96 (53.50%)	18.21 (65.04%)	0.09*	Males are more positive versus females

\*significant, NS – not significant.

**Table 4** depicts the mean domain scores with SD for each year of female and male students for all five domains of the DREEM tool. The total score was maximum (123.83±23.04) for first-year students, and minimum (118.17±44.79) for final-year students. In females, the total item score was

maximum for the first phase (132.62± 21.14) vs males (124.82± 23.34), p=0.65, not significant. The total item score for females was lowest in the third phase part 2 with a score of 126.38± 36.43 vs 123.51± 20.33 in males, p=0.56, not significant.

**TABLE 4: THE VARIOUS DOMAINS SCORES (MEAN ± SD) FOR THE RESPECTIVE YEARS OF THE MBBS STUDY**

Domain	First-year		Second year		Third year		Final year	
	F	M	F	M	F	M	F	M
SPL	2.83±0.39	2.33±0.42	2.82±0.53	2.39±0.48	2.88±0.61	2.43±0.57	2.91±0.58	2.83±0.39
SPT	2.76±0.46	2.36±0.49	2.86±0.50	2.28±0.56	2.89±0.54	2.56±0.49	2.83±0.73	2.41±0.53
SASP	2.74±0.47	2.36±0.48	2.83±0.51	2.34±0.53	2.79±0.52	2.41±0.47	2.89±0.65	2.39±0.51
SPA	2.32±0.50	2.77±0.56	2.35±0.48	2.76±0.46	2.29±0.54	2.72±0.48	2.23±0.49	2.76±0.46
SSSP	2.34±0.54	2.86±0.49	2.27±0.43	2.87±0.56	2.33±0.51	2.83±0.59	2.21±0.53	2.81±0.51
EC	2.48 (62.00%)	2.35 (58.75%)	2.51 (62.75%)	2.37 (59.25%)	2.53 (63.25%)	2.39 (59.75%)	2.47 (61.75%)	2.38 (59.50%)
Total item score	132.62± 21.14	124.82± 23.34	129.45± 21.39	121.51± 20.31	132.45± 27.26	128.57± 23.25	126.38± 36.43	123.51± 20.33

**DISCUSSION:** This study demonstrated that by using the Dreem tool in a medical education program, the overall perception of educational climate including learning, teachers, atmosphere, self-perception, and social perception may be calculated and this is more positive than negative in the present study<sup>2</sup>. Female students were found to be more positive regarding the overall educational climate in comparison to males. The results are in alignment with an Indian study<sup>10, 11</sup>, British School of Osteopathy<sup>12, 13</sup>, United Arab Emirates<sup>14</sup>, Australia<sup>15</sup>, Turkey<sup>16</sup>, Sri Lanka<sup>17</sup> and many more countries. Miles et al depicted that the DREEM data should be analyzed concerning domains<sup>6</sup>.

The educational environment in a medical college demands periodic assessment as it is full of stress without sufficient feedback<sup>18, 19</sup>. The DREEM mean score in the present study is 121.6 (60.8%), which indicates a more positive than negative perception of the medical education environment. However, there is still scope for improvement. This score is less than the scores obtained by Miles and Leinster<sup>6</sup> Roff et al<sup>7</sup> and Varma et al<sup>19</sup>. However, this score is found to be higher than the scores

obtained by Demiroren et al<sup>16</sup>, Jiffry et al<sup>17</sup>, Bassaw et al<sup>20</sup>, Abraham et al<sup>21</sup> and Mayya et al<sup>22</sup>. Students’ social self-perception scored the lowest and so came out as the weakest domain. Males were more positive toward social life perception. Females felt a less positive atmosphere in comparison to males. This problem was more prominent in 1<sup>st</sup> and 2<sup>nd</sup> year students. Third-year students were not facing any problem with social self-perception area but the rest of other students showed poorer perception. In the first two years of medical education, students felt bored and tired with no friends in the faculty.

Usually, studies are more theoretical and laboratory based in the first two years; and studies are clinical from the third year onwards. It could explain a little bit about the results obtained. The most scored item was about the hostel accommodation which indicates good hostel facilities with a learning environment. The least scored items were about teachers being authoritarian (SPT domain) and about tiredness to enjoy the course (SSSP domain). These questions were scored the lowest value mainly by the final year students.



The schedule of clinical batch students according to the new CBME (Competency Based Medical Education) curriculum is very hectic and requires attention and a lot of time which generates anxiety, tiredness and to some extent depression too; but more reasons may be there which are yet to be explored<sup>23</sup>. First- and second-year students felt that the teachers get easily angry in the class. Although all the medical teachers are well trained by MEU (Medical Education Unit), still there is scope for improvement. The education must be made more interesting with the active participation of male and female students<sup>24</sup>. Student-centered teaching should be encouraged. Inductive learning (problem-based, case-based, inquiry-based, project-based, and discovery-based learning), gamify learning, cooperative learning, and flipped classroom are a few examples of student-centered teaching methods which must be incorporated and followed unanimously in various medical colleges<sup>25</sup>.

The female students scored maximum in SASP and male students scored maximum in SPA. It is a good indicator that female students were confident about passing the exam and were well-prepared for their careers. First and second-year male students were facing problems in understanding and memorizing the subjects when compared to female students. The reason behind this might be excessive factual knowledge. The female students precepted more positively about learning and teachers<sup>26</sup>.

This comparative study has some limitations too. The major limitation is response bias because the answers to the DREEM questionnaire are self-reported by the students<sup>27</sup>. Further, it was possible that the females might have gone for negative responses if they were in the menstrual period as mood swings are there. All the medical students did not respond to the DREEM questionnaire either because of busy schedule or because of less or no interest in it<sup>28, 29</sup>.

**CONCLUSION:** DREEM tool is the most common and very effective tool to comparatively evaluate the educational environment in female and male students of a medical college. DREEM tool has been validated and accepted by a lot of countries globally. The results of this study will definitely help the medical institute to resolve the gender disparities if any. DREEM tool will help the

institute to plan and implement various measures that will enhance the overall medical education environment among female as well as male students. The highlight of this study was that the institute was going in the right direction with some scope for improvement.

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