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Quality of educational environment among Egyptian medical students using DREEM questionnaire

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Keywords:

Educational Environment; DREEM questionnaire; Medical Education; Medical Curriculum; Student Satisfaction.

Abstract

Background: In order for educationalists to provide the highest quality of teaching to their students it is a prerequisite to enrich the environment in order to make it conducive of learning. This can be achieved by identifying the weaknesses of the milieu the student is immersed in so that they maybe ameliorated. .

Objectives: To assess the quality of the educational environment in Mansoura College of Medicine, Egypt using a validated tool.

Methods: A Cross-Sectional study using the Arabic and English version of the validated Dundee Ready Educational Environment (DREEM) questionnaire. The authors distributed 950 questionnaires and collected 845 completed questionnaires from students across the six years of the MBChB program during the academic year 2011/2012.

Results: The mean total score was 92.6 ± 23.37 out of a

maximum of 200 (46.3%) indicating plenty of problems. There were no individual areas of excellence identified. The following three areas achieved a score of less than one (a) presence of a support system for stressed students (b) absence of boredom during studying (c) memorization of facts (learning by rote). The scores of the subscale were as follow: students' perceptions of learning 20.03/48, perceptions of teachers 22.96/44, academic self-perceptions 14.43/32, and perceptions of atmosphere 20.45/48 and social-self perceptions 14.75/28. Clinical students showed more positive perception than preclinical students in most of the domains. The student's perception of the teacher was the only domain that showed significant difference between male and female participants.

Conclusion: The majority of the students (60.9%) responded 'plenty of problems' to educational environment and so improvement is required across all five domains of the educational environment⁶.

Introduction

The learning environment has been defined as, 'Everything that is happening in the classroom or department or faculty or university'.¹ It was also defined as the, "Environment experienced or perceived by the students as well as by the teachers". These perceptions would be based on three important facets which includes: the physical environment, emotional climate, and intellectual climate.²

As universities continue to become more student oriented, student perceptions of higher educational facilities and services are becoming increasingly important.³ Meaningful learning correlates positively with the students' perceptions of the educational environment, which impacts on students' learning experiences and outcomes. It influences how, why and

what students learn.⁴ A conducive environment has a positive and significant impact on students' learning, academic progress, and well-being.⁵

In order for educationalists to provide the highest quality of teaching to their students it is a prerequisite to enrich the environment in order to make it conducive of learning. This can be achieved by identifying the weaknesses of the milieu the student is immersed in so that they maybe ameliorated. Accordingly, it is essential to utilize appropriate methods and instruments to assess the educational environment in order to ascertain what is happening, in order to ascertain the progress.^{6,7}

Various methodologies have been utilized to investigate educational climate. Recent studies include qualitative approaches⁸ or the use of questionnaires.^{6,9,10} Of these,

only the DREEM (Dundee Ready Educational Environment Measure) questionnaire⁶ is specific to the unique environment experienced by students on medical and healthcare-related courses. This instrument has been applied to a number of undergraduate courses for health professionals' worldwide.¹¹ However, it is clear that such questionnaires cannot reveal the whole story. While they may be valuable in identifying areas of concern shared by a majority of students, they yield no insight into the underlying reasons for these responses.⁵

This tool can be used to highlight the strengths and weaknesses of an educational institution, compare the performance and effectiveness of different medical schools, and make comparisons among students in different years of study and differences between the genders.⁴ In addition, it is used to help modify the curriculum, comparing past and present curricula and evaluating the efficacy of a university program.¹² It can help medical and health schools to recognize their educational priorities and introduce more effective measures as a result. Furthermore, it enables institutions to compare their performances and productivities with their peers, which can be educationally insightful.¹³ Most researchers agree upon the usefulness of the DREEM inventory as a useful basis for strategic planning and resource utilization.¹⁴

To the best of our knowledge, no studies have been conducted in Egypt that assess the medical educational environment. So the objectives of this study were to assess the quality of the educational environment using DREEM as perceived by the preclinical and clinical years' medical students so that corrective measures could be taken to enhance students' learning experiences and to test whether there is any difference in the students' perceptions according to gender and academic phase.

Methodology

Study location

This study was carried out in the faculty of medicine, Mansoura University during the academic year 2011/2012. The faculty gives a traditional 6-year course: the first three years represents the preclinical stage and is devoted to basic medical sciences while the last three years represents the clinical stage during which students rotate to different clinical departments. The curriculum depends heavily on the use of lectures. All activities are teacher centered which consists of information gathering and 'regurgitation' with few open discussions or problem-solving sessions. The learning task is to reproduce the subject matter in the final examination.

Our target group included the students in all of the 6 grades which were subdivided into preclinical and clinical students. This study was approved by the Vice Dean of the Students' Affairs in the Faculty of Medicine, Mansoura University.

Sample size was calculated online.¹⁵ A pilot study was done on 137 students, from which the mean of the total

score was found to be 90.3 ± 19.1 and by considering the worst expected as 92.3, the sample size was 564 with 95% confidence level and 80% study power. This number is multiplied by 1.5 to compensate for the design effect of the cluster sampling technique employed. Thus the final sample size was 846.

The students were selected from all the six grades in proportion to their total numbers and they were interviewed at the practical sessions after taking permission from the respective heads of departments. Each section/round was considered as a cluster. The authors gave brief explanations of the objectives and the method of filling out the questionnaire. Students were also assured of their anonymity and the confidentiality of their responses. The researchers collected the completed questionnaires at the same session. The authors distributed 950 questionnaires and collected 845 completed questionnaire (response rate =88.9%).

Instrument

We used the combined DREEM questionnaire in English and Arabic without modification as applied in Saudi Arabia.¹⁴ The DREEM contains 50 statements relating to a range of topics directly relevant to education climate. Students were asked to read each statement carefully and to respond using a 5 point Likert-type scale ranging from strongly agree to strongly disagree. It is important that each student applies the items to their own current learning situation and responded to all the 50 items.

Scoring the DREEM

Items are scored: 4 for Strongly Agree (SA), 3 for Agree (A), 2 for Uncertain (U), 1 for Disagree (D) and 0 for Strongly Disagree (SD). However, 9 of the 50 items (numbers 4, 8, 9, 17, 25, 35, 39, 48 and 50) are negative statements and should be scored 0 for SA, 1 for A, 2 for U, 3 for D and 4 for SD. The 50-item DREEM has a maximum score of 200 indicating the ideal educational environment as perceived by the students. A score of 0 is the minimum and would be a deeply worrying result for any medical educator and warrant intervention (0-50 Very Poor, 51-100 Plenty of Problems, and 101-150 More Positive than Negative, 151-200 Excellent). Items that have a mean score of 3.5 or over are real positive points. Any item with a mean of 2 or less should be examined more closely as they indicate problem areas. Items with a mean between 2 and 3 are aspects of the climate that could be enhanced.¹⁶

As well as the total DREEM score, the data was later regrouped according to the five domains, as questions about perception were in different locations in the original questionnaire. These domains are: Students' Perceptions of Learning (12 items/ maximum score 48), Students' Perceptions of Teachers (11 items/ maximum score 44), Students' Academic Self-perceptions (8 items/ maximum score 32), Students' Perceptions of Academic Atmosphere (12 items/ maximum score 48) and Students' Social Self-perceptions (7 items/ maximum

score 28). The interpretation of the subscales was as follow. Students' Perceptions of Learning (0-12 Very Poor, 13-24 Teaching is viewed negatively, 25-36 A more positive perception, 37-48 Teaching highly thought of), Students' Perceptions of Teachers (0-11 Abysmal, 12-22 In need of some retraining, 23-33 Moving in the right direction, 34-44 Model course organizers), Students' Academic Self-perceptions (0-8 Feelings of total failure, 9-16 Many negative aspects, 17-24 Feeling more on the positive side, 25-32 Confident), Students' Perceptions of Academic Atmosphere (0-12 A terrible environment, 13-

24 There are many issues which need changing, 25-36 A more positive attitude, 37-48 A good feeling overall), Students' Social Self-perceptions (0-7 Miserable, 8-14 Not a nice place, 15-21 Not too bad, 22-28 Very good socially).¹⁶

Data analysis: We analyzed the collected data using SPSS version 16. A descriptive analysis of the collected data was done in the form of frequencies and mean \pm SD. Student's t-test was used to compare the means between different groups. $P \leq 0.05$ was chosen as the level of statistical significance.

Results

*The mean age of the participants in the study was 20.24 \pm 1.51. Male and female students accounted for 39.8% and 60.2%; respectively. Students enrolled on basic sciences in the preclinical phase accounted for 43.8% of the respondents and the remaining 56.2% were enrolled in the clinical phase, (Table 1).

		Number	%
Sex	Male	336	39.8%
	Female	509	60.2%
Stage:	Preclinical	370	43.8%
	Clinical	475	56.2%
Academic year	1	158	18.7%
	2*	33	3.9%
	3	179	21.2%
	4	171	20.2%
	5	144	17.0%
	6	160	18.9%
Age (mean \pm SD):		20.24 \pm 1.51	

Table 1: Sociodemographic characters of the medical students in Mansoura University during the academic year 2011/2012.

*The small number of grade 2 as the total number of students is about 200 students.

Item	Mean±SD
Items with score less than one	
There is a good support system for students who get stressed	0.90±1.05
I am rarely bored on this course	0.99±1.27
I am able to memorize all I need	0.96±1.09
Items with score between two and three	
The teachers are knowledgeable	2.76±0.97
I am too tired to enjoy this course	2.67±1.39
The teachers are patient with patients	2.31±1.06
I am confident about my passing this year	2.14±1.34
Cheating is a problem in this school	2.18±1.38
The teachers have good communication skills with patients	2.42±1.00
My social life is good	2.21±1.38
The teaching is well focused	2.01±1.25
The teaching over-emphasizes factual learning	2.41±1.39
I have learned a lot about empathy in my profession	2.67±1.15
I feel comfortable in class socially	2.10±1.32
The atmosphere is relaxed during seminars/tutorials	2.11±1.30
I found the experience disappointing	2.23±1.42
The teachers give clear examples	2.27±1.20
The teachers are well prepared for their classes	2.23±1.20
My accommodation is pleasant	2.73±1.28
The teaching is too teacher-centered	2.43±1.35
I feel able to ask the question I want	2.36±1.23

Table 2: The items of the learning environment with scores less than one and those between two and three as reported by the medical students in Mansoura University during the academic year 2011/2012.

By studying each item of DREEM separately, no item achieved a score of greater than 3.5. Most of the items had a score of less than two which identifies problem areas that should be examined more closely, the lowest score (less than 1) achieved for three items which were: "There is a good support system for students who get stressed" (0.9), "I am rarely bored on this course" (0.99) and "I am able to memorize all I need" (0.96). Eighteen items achieved a score between 2 and 3 which translates as aspects of the climate that could be enhanced. These items are shown in Table 2.

Domain	Max. score	Sample score (% from total score)	Categorization of subscale	Number	%
Total DREEM	200	92.6±23.37 (46.3%)	Very poor	29	3.4%
			Plenty of problems	515	60.9%
			More positive than negative	295	34.9%
			Excellent	6	0.7%
Students' perception of learning (SPL)	48	20.03±7.76 (41.7%)	Very poor	141	16.7%
			Teaching is viewed negatively	465	55.0%
			More positive perception	222	26.3%
			Teaching is highly thought of	17	2.0%
Students' perception of Teachers (SPT)	44	22.96±5.57 (52.2%)	Abysmal	18	2.1%
			In need of some retaining	364	43.1%
			Moving in the right direction	444	52.5%
			Model course organizer	19	2.2%
Students' Academic Self - perception (SAS)	32	14.43±5.46 (45.1%)	Feeling of total failure	125	14.8%
			Many negative aspects	415	49.1%
			Feeling more on the positive side	284	33.6%
			Confident	21	2.5%
Students' Perception of Atmosphere (SPA)	48	20.45±6.83 (42.6%)	Terrible environment	102	12.1%
			Many issues need change	517	61.2%
			More positive attitude	216	25.6%
			Good feeling overall	10	1.2%
Students' Social Self- perception (SSS)	28	14.75±3.86 (52.7%)	Miserable	32	3.8%
			Not a nice place	354	41.9%
			Not too bad	433	51.2%
			Very good socially	26	3.1%

Table 3: Description of the five domains of the learning environment as reported by the medical students in Mansoura University during the academic year 2011/2012.

Table 3 shows that the majority of the students (60.9%) responded 'plenty of problems' to educational perception of Teachers (52.2%). More than half of the environment in the faculty of medicine with a total score of 92.6±23.37 (46.3% of the total score 200). Agreement of Students' social self- perception achieved the highest score 20.03/48). However, 52.5% perceived that teachers

are 'moving in the right direction' for students' 'Many issues need change' (SPA, sample mean score 20.45/48). More than half of the students (51.2%) perception of teachers (SPT, sample mean score 22.96/44). The higher percentage of the students (49.1%) thought that the society they live in is 'not too bad' (SSS, sample mean score 14.75/28) while 41.9% believed their society is 'not a nice place to be'. Furthermore, faculty atmosphere was perceived as

Domain (Total score)	Academic stage			Gender		
	Preclinical	Clinical	P	Male	Female	P
Total (200)	90.22±22.28	94.47±24.04	0.009	90.92±24.24	93.71±22.73	0.09
Students' perception of learning (48)	20.23±7.62	19.87±7.87	0.50	19.54±7.92	20.35±7.64	0.13
Students' perception of Teachers (44)	21.54±4.90	24.06±5.81	≤0.001	22.06±5.74	23.55±5.38	≤0.001
Students' academic self-perception (32)	13.79±5.42	14.92±5.45	0.003	14.19±5.61	14.59±5.36	0.29
Students' perception of atmosphere (48)	19.94±6.43	20.84±7.11	0.06	20.39±7.01	20.49±6.71	0.84
Students' social self-perception (28)	14.72±4.15	14.77±3.63	0.85	14.76±3.96	14.73±3.80	0.92

Table 4: Variation of the domain mean scores according to gender and educational stage of the medical students in Mansoura University during the academic year 2011/2012.

Clinical stage students showed more positive perception than preclinical stage students regarding the total educational environment (94.47±24.04 versus 90.22±22.28), Students' perception of Teachers (24.06±5.81 versus 21.54±4.90) and Students' academic self-perception (14.92±5.45 versus 13.79±5.42) with statistical significance (Table 4).

Students' perception of Teacher is the only domain that showed significant difference between males and females with a more positive perception being observed for female than male (23.55±5.38 and 22.06±5.74); respectively.

Discussion

There has been growing interest and concern about the role of the learning environment in medical education. Educational environment is one of the most important factors in determining the success of an effective curriculum.¹⁷

The results of this research revealed a mean overall score of 92.6/200 for the DREEM items, this mean score between 50 and 100 indicating potential problems.¹⁶ In medical schools with a traditional system, scores are found to be below 120; however, in modern, student-centered systems, the mean score is generally much

higher.¹⁸ Similar results were reported by Hassan et al,¹⁹ in Khartoum (99.5/200), Aghamolaei and Fazel,²⁰ in Iran (99.6/200), Al-Hazimi et al,¹³ In King Abdul Aziz University, Saudi Arabia (102/200) and Lokuhetty et al,²¹ in Sri Lanka (107.43/200) and Nahar et al,²² in Bangladesh (110/200). The similarity of the results could be due to similarity in the educational environments.

The mean total score higher than 120 was reported by Riquelme et al,²³ in Pontificia Universidad Católica de Chile (127.5 /200) (63.8%), Avalos et al,²⁴ in Ireland (130 /200) (65%), Shehnaz et al,²⁵ in United Arab Emirates (135/200) (67.5%) indicating relative satisfaction with the environment but with room for improvement.

The highest reported score was (156.1/200) (78%) in the study of Palmgren and Chandratilake,²⁶ in chiropractic training institutions and in some studies from the United Kingdom: (70.4%) in the study of McKendree,²⁷ and (71.5%) in the study of Miles and Leinster.²⁸ These high scores mean that these universities have modern systems with the existence of an excellent educational environment.

In this study, the scores of the subscale were: students' perceptions of learning 20.03/48, perceptions of teachers

22.96/44, academic self-perceptions 14.43/32, perceptions of atmosphere 20.45/48 and social-self perceptions 14.75/28. These scores are similar to those reported by Al-Hazimi *et al*,¹³ in Saudi Arabia and Aghamolaei and Fazel,²⁰ in Iran, these comparable results might be explained by the traditional system that was established in these universities. However Abraham *et al*,¹⁷ reported higher scores in an Indian medical school with a traditional system. Lokuhetty *et al*,²¹ in Sri Lanka and Shehnaz *et al*,²⁵ in United Arab Emirates found that the majority of the subscales were towards the right position and this is due to the innovative curriculum they use in these universities. Al-Hazimi *et al*,¹² conducted a 'study on three traditional and one innovative medical schools, the mean scores for the traditional medical schools were lower than the innovative one. Students from traditional schools rated their learning and teaching environment significantly lower than their counterparts in the innovative medical school.

Furthermore, no item received a mean score ≥ 3.5 . The item "*I am able to memorize all I need*" (0.96) received the lowest score This item scored below 2.0 in many other studies.^{12,29} This finding may be due to the high volume of the curriculum that needs further review and reduction from our faculty. Also Palmgren and Chandratilake,²⁶ in chiropractic training institutions found that their students were stressed by memorization of too many facts in their chiropractic program that might be focusing on the retention of too many facts rather than the attainment of practical skills. Another item with lowest score is "*the presence of a good support system for students who get stressed*" (0.9), this view has been supported by others.^{14,19,26} Health care students are exposed to a diversity of pressures, many of which may cause stress,³⁰ and it is a very important issue to be addressed as the educational institutions should have a student-friendly environment with a proper support system that may help to alleviate the anxiety expressed by the students and consequently help to diminish the number of students who fail courses. Support systems are more available in innovative health care educational institutions than the traditional ones,¹² The item "*I am rarely bored on this course*" (0.99) needs further exploration to identify the potential causes of boredom with curriculum overload potentially being one of the causes, this was in agreement with Arzuman *et al*,²⁹ in Malaysia and Hassan *et al*,¹⁹ in Khartoum.

Clinical stage students showed more positive perception than preclinical stage students regarding the majority of the subscale scores, the preclinical students did not complete three items of DREEM questions related to clinical contact and this may explain that difference. This was also viewed by Aghamolaei and Fazel,²⁰ in Iran.

More positive perception was observed for female than male for the total educational environment and most of

the subscale scores but Students' perception of Teacher was the only significant one. This is in agreement with Fidelma *et al*,¹⁸ in UK and Nahar *et al*,²² in Bangladesh who found that females rated the educational milieu higher than their male counterparts but Abraham *et al*,¹⁷ in India and Aghamolaei and Fazel,²⁰ in Iran found no significant difference with respect to the gender of the student. On the other hand Mayya and Roff,⁴ in India reported lower scores among females than males.

Conclusion

The majority of the students (60.9%) responded 'plenty of problems' to educational environment as the mean total score was 92.6 ± 23.37 . More than half of the students reported '*teaching is viewed negatively*' for students' perceptions of learning, teachers are '*moving in the right direction*' for students' perception of teachers and the society they live in is '*not too bad*'. Forty-nine percent of the students had an academic self perception that was '*Many negative aspects*'. Furthermore, faculty atmosphere was perceived as '*Many issues need change*'. Clinical students showed more positive perception than preclinical students in most of the domains. Students' perception of Teacher is the only domain that showed significant difference between males and females.

Recommendations

From our results we found that improvement is required across all five domains of the educational environment. For example reduction of the curriculum as much as possible in order to be more memorable and decrease the students' boredom, the presence of a proper support system for those exposed to different forms of stress, the methods of teaching should be changed to help the students to develop competence, confidence and different skills and making stress on student centered teaching rather than teacher centered teaching, the teachers should have more training courses to be more knowledgeable, presentable with better communication skills with the students, finally we should provide the students with a more relaxing and interesting learning atmosphere for a proper learning outcome.

Study limitation

This is a single center study and its results cannot be generalized to all Egyptian Faculties of Medicine.

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Ethical approval: The study was approved by the Vice Dean of the Students' Affairs in the Faculty of Medicine, Mansoura University.

Disclaimer: The contents of this manuscript are solely the responsibility of the authors.

The main message

- The educational environment has a significant impact on students' learning and academic progress.
- Mansoura Medical School educational environment was assessed by the students as having '*plenty of problems*'.
- Improvement is required in all the domains of the educational environment.

Current research questions

- We need further research to answer some questions as the underlying causes of the students' boredom during their courses.
- There is a need for multi-center nation-wide study including both public and private medical education to

give a full picture of the learning environment and facilitate inter-faculties comparison.

- Corrective measures should be developed, tested, implemented and evaluated

Authors' contributions

- Helal R: Conception of the research idea, data collection, data entry and drafting of the manuscript.
- El-Masry R: Research design, data collection and analysis, review of literature and revision the manuscript.
- El-Gilany A: Coordination of the whole research process, data interpretation and revising the manuscript for intellectual contents.

All authors approved the manuscript for publication.

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