RESEARCH ARTICLE

Medical students' perceptions of their educational environment in an integrated curriculum in Saudi Arabia

Tahani Altamimi,[1] Johnson Alex,[2] Sara Mattout,[3] Noha Mitwally,[4] Sami Alnassar[5]

Abstract

Objective: To measure medical students' perceptions of their educational environment and to determine the potential differences in those perceptions with regard to gender and the year of study.

Method: The cross-sectional study was conducted at the College of Medicine, Dar Al Uloom University, Riyadh, Saudi Arabia, in 2018-19, and comprised medical students enrolled at the college. Data was collected using the Dundee Ready Educational Environment Measure scale. Data was analysed using SPSS 22.

Results: Of the 262 students approached, 191(73%) responded. The total mean score was 122.49±21.50. Perception of educational environment was higher for male students and advanced-level students ($p<0.05$).

Conclusion: The findings illustrated a healthy educational environment.

Keywords: Educational environment, Medical student, Integrated curriculum, Dundee Ready Educational Environment Measure, DREEM. (JPMA 71: 672; 2021)

DOI: https://doi.org/10.47391/JPMA.1354

Introduction

The educational environment (EE) includes everything that occurs in classroom, department, faculty and university and affects the progress of students' medical education.[1-3] As per the World Federation for Medical Education WFME), EE should be considered a prime area in the evaluation of medical education programmes.[1-3] Student-centred learning approaches are well-represented in modern strategies of learning methodology and curricula, which might explain the recent and growing interest in measuring students' perceptions of EE in medical schools.[2,3]

The Dundee Ready Educational Environment Measure (DREEM) is the best available tool for investigating medical students' EE perceptions. DREEM was developed at the University of Dundee in 1997. It was specifically designed for medical and healthcare-related courses, and it was validated universally to ensure that results would accurately reflect the EE.[4]

The College of Medicine at Dar Al Uloom University (DAU) is a new private medical college in Riyadh, Saudi Arabia. Established in 2013, its programme is based on an integrated curriculum and it integrates pre-clinical and clinical years. The language of instruction at medical schools in Saudi Arabia is English. Both male and female students follow the same curriculum in gender-separated class sections that are taught by the same faculty members.

The current study was planned to gauge students' perceptions of EE, and to determine potential differences in such perceptions based on gender and the year of study.

Subjects and Methods

The cross-sectional study was conducted at the College of Medicine, Dar Al Uloom University, Riyadh, Saudi Arabia, in 2018-19. After approval from the institutional ethics review board, the sample was raised from among the medical students enrolled at the time of the study. All students of both genders enrolled in the undergraduate medical programme from the first to the fifth year were approached. Those excluded were students having attendance <75% and those who were not willing to participate. All students received a personal invitation with detailed information about the study. Students were encouraged to read the participant information sheets and consent forms electronically before responding, and, if they agree, they proceeded to the English version of DREEM survey.

The DREEM inventory consists of 50 closed-end statements related to five domains. Each item is scored using a 5-point Likert scale; 4 = 'strongly agree', 3 = 'agree', 2 = 'uncertain', 1 = 'disagree', and 0 = 'strongly disagree'. However, nine items (4, 8, 9, 17, 25, 35, 39, 48,

[1]Department of Family and Community Medicine, College of Medicine, University of Hail, Hail, [2]Department of Medical Education, [3]Department of Clinical Sciences, [4]Department of Basic Medical Sciences, College of Medicine, Dar Al Uloom University, Riyadh, [5]Department of Surgery, College of Medicine, King Saud University, Riyadh, Saudi Arabia.

Correspondence: Tahani Altamimi. Email: tahanin.altamimi@gmail.com

and 50) are negatively phrased, and have reversed scores, ranging from 0 = 'strongly agree' to 4 = 'strongly disagree'4. The DREEM domains are students' perceptions of learning (SPoL; 12 items; maximum score 48), students' perceptions of teachers (SPoT; 11 items; maximum score 44), students' academic self-perceptions (SASP; eight items; maximum score 32), students' perceptions of the atmosphere (SPoA; 12 items; maximum score 48), and students' social self-perceptions (SSSP; seven items, maximum score 28). Considering these maximum scores, the data was converted into percentages for each domain[4]. The total possible DREEM score is 200. The guideline for the overall DREEM score interpretation is as follows: 0-50 = 'very poor'; 51-100 = 'numerous problems'; 101-150 = 'more positive than negative'; and 151-200 = 'excellent'.[4] For individual items, a mean score of 3 or more indicates a 'strong positive item', 2 or less indicates the item 'needs attention', and between 2 and 3 indicates the item 'needs improvement'.

Data was analysed using SPSS 22. The scores were expressed using means and standard deviations. The mean differences between gender and class levels were analysed using independent student t-tests. One-way analysis of variance (ANOVA) was used to identify the difference in mean scores between participants' years in the programme in all five DREEM domains. Where ANOVA showed significance, post-hoc followed by Tukey's test was run for multiple comparisons. P<0.05 was considered statistically significant.

Results

Of the 262 students approached, 191(73%) responded; 67 (35%) men and 124(65%) women. The total mean score was 122.49±21.50, representing 61% of the maximum possible 200 score (Table-1).

The mean overall DREEM score was significantly higher for males 128.64±21.43 compared to females 119.17±20.88 (p=0.003). Domain scores were significantly higher for males compared to females in three domains: SPoL, SASP and SSSP (Table-2).

Table-1: Overall DREEM domain scores of medical students, College of Medicine, Dar Al Uloom.

DREEM Domain	Mean Score (SD)	Percentage
Overall mean score	122.49±21.50	61%
Students' perceptions of learning (SPoL)	29.36±6.19	61%
Students' perceptions of teachers (SPoT)	27.00±5.10	61%
Students' academic self-perceptions (SASP)	19.55±4.46	61%
Students' perceptions of the atmosphere (SPoA)	29.61±5.70	62%
Students' social self-perceptions (SSSP)	16.95±3.67	61%

DREEM: Dundee Ready Educational Environment Measure.

Table-2: Comparative analysis in the domains of DREEM scores between male and female students (n=191).

DREEM domain	F (124) M (67)	Mean	SD	P-value
Students' perceptions of learning	Female	28.32	6.12	P=.001*
	Male	31.30	5.90	
Students' perceptions of teachers	Female	26.47	5.18	P=.050
	Male	27.99	4.86	
Students' academic self-perceptions	Female	18.82	4.53	P=.002*
	Male	20.91	4.03	
Students' perceptions of the atmosphere	Female	29.18	5.47	P=.147
	Male	30.43	6.09	
Students' social self-perceptions	Female	16.38	3.52	P=.003*
	Male	18.01	3.77	
Overall mean score	Female	119.17	20.88	P=.003*
	Male	128.64	21.43	

* Statistically significant at P<0.05.
DREEM: Dundee Ready Educational Environment Measure.

In the SPoL domain, items ranged from 2.11 to 2.84. significant differences were observed between male and female students on the following items: teaching is often stimulating (p=0.009), teaching is student-centred (p=0.013), teaching helps to develop my competence (p=0.001), teaching is well focussed (p=0.003), teaching over-emphasises factual learning (p=0.026), and I am clear about the learning objectives of the course (p=0.000).

SPoT item scores ranged from 2.10 to 2.97. Significant gender differences were observed on four items: teachers are knowledgeable (p=0.000), teachers help me develop my practical skills (p=0.008), teachers provide constructive criticism here (p=0.000), and teachers are well-prepared for their classes (p=0.000).

SASP scores ranged from 2.00 to 2.84. There were significant gender differences on four items: I am confident about my passing this year (p=0.004); I have learned a lot about the way scientific research is carried out (p=0.033); my problem-solving skills are being well-developed here (p=0.031); and much of what I have to learn seems relevant to a career in medicine (p=0.013).

SPoA scores ranged from 2.01 to 2.79. Significant gender differences were found on four items: cheating is a problem in this college (p=0.001), the atmosphere is relaxed during lectures (p=0.013), I feel comfortable in class socially (p=0.025), and I am able to concentrate well (p=0.043). SSSP scores ranged from 1.77 to 2.78, and only three items had significant gender-related differences (p<0.05).

The overall DREEM scores for pre-clinical years 1-3 was 119.21±19.93 compared to 125.48±22.52 for clinical years 4 and 5 students (p=0.043) (Table-3).

Table-3: A comparison of DREEM domain scores between pre-clinical and clinical phases.

DREEM domain	Pre-clinical phase	Clinical phase	P-value
Total Score	119.21±19.93	125.48±22.52	0.043*
Students' perceptions of learning	28.27±5.83	30.36±6.36	0.019*
Students' perceptions of teachers	26.45±4.98	27.5±5.19	0.156
Students' academic self-perceptions	19.13±4.58	19.94±4.33	0.214
Students' perceptions of the atmosphere	28.63±5.13	30.51±6.07	0.022*
Students' social self-perceptions	13.71±3.58	17.17±3.76	0.393

* Statistically significant at P<0.05.
DREEM: Dundee Ready Educational Environment Measure.

Discussion

The assessment of EE is considered a key component of good educational practice. As a part of quality improvement, the current study was conducted to understand stakeholders' perceptions of their EE. Results showed that students' perceptions of their EE with respect to various components were more positive than negative. The total mean score for DREEM was 122.49/200 for 61% students. According to McAleer and Roff,[2-4] this indicates that students' perception of the EE at DAU's College of Medicine was more positive than negative.

Similar studies have been conducted in different medical institutions in various provinces of Saudi Arabia and elsewhere. The current study's mean DREEM score was relatively high compared to studies conducted at nine other university medical schools in Saudi Arabia.[5-15] Moreover, the current study's mean DREEM score was higher than that of other studies conducted in medical schools with integrated curricula in Sharjah,[16] the United Arab Emirates (UAE),[17] Kuwait,[18] Pakistan,[19] India,[20] and the West Indies.[21] However, the scores were relatively low compared to those reported from medical schools in the developed countries, such as Australia (143/200),[22] and the United Kingdom (139/200).[23] This variation in scores could be related to differences in teaching curricula in different countries. However, many studies from various parts of the world have shown DREEM scores similar to those of the current study probably because of similar teaching methods.[24] It is also evident that no learning environment is without its weaknesses, as DREEM score >143 has not been reported in literature. Students' perceptions of learning, atmosphere, and teachers' overall performance have generally received higher ratings than other DREEM domains in most studies conducted in Saudi Arabia.[6,7,8,24]

Out of the 50 items, 49 were scored 2-3, with the highest mean score of 2.97 for item 32 (the teachers provide constructive criticism) by male students. The scores indicate that these areas could be improved. Alternatively, one item had a score <2, indicating a problem area that needs to be monitored closely. This item corresponded to the lowest score in the current study (1.77) for item 15 (I have good friends in this college) by female students. An explanation for this could be that few friendships between women form in medical school. In sharp contrast to this finding, a study at Qassim University[11] in Saudi Arabia reported this particular item receiving the highest score. Cross-study discrepancies could be explained by differences in the culture of different provinces in Saudi Arabia, resulting in variance in abilities and/or preferences for developing strong friendships.

In studies conducted in different parts of the world, DREEM has been used to analyse EE with respect to gender differences.[5,6] The overall DREEM scores in the current study confirmed significant gender differences at DAU. In general, male students perceived the EE more positively than did female students. Interestingly, similar studies found that female students rated their EE more negatively than did their male counterparts.[25] In the current study, the SPoL, SASP and SSSP mean scores were significantly lower for females. The overall mean difference in DREEM scores between males and females was also significant. This variation in scores between male and female students could be attributed to the implementation of the curriculum in separate groups.

In the SPoL domain, the overall score was 29/48 (60.41%), indicating that students perceived their learning more positively. The mean score 2.42 was relatively high when compared with studies conducted in other countries, such as India.[21] SPoT score 61.36% indicated that students at DAU perceived the teaching process at the college as moving more in the right direction. The average individual item score was 2.45, which was better than that reported in other studies in Saudi Arabia.[13]

The total score of the SASP domain 19.5/32 (60.93%) indicated that students felt confident and positive about their academic activities. Most of the individual items in

this domain were the same for male and female students, with the exception of their problem-solving skills, scientific research, and confidence in passing the particular year. Similarly, SPoA score 29.6/48 (61.6%) suggested that the study participants perceived the academic atmosphere as being more congenial than did their counterparts in Saudi Arabia[12] and Sharjah.[16]

SSSP score 16.95(60.53%) indicated that students were able to experience college social situations without any problems, which is similar to an earlier study.[26] The highest mean score was on item 3 (2.66), which reflected the good academic support system at the college. In many studies,[7,11,12] item 3 had scores ≤2, indicating that the counselling system of those institutions was problematic.

Significant differences were observed among students with respect to their academic year and perceived approach to the current EE. An interesting aspect of the present study was the comparative analysis of pre-clinical and clinical groups on the DREEM domains. Students' perceptions of their academic environment improved as they advanced to senior classes in the programme. The clinical group perceived EE more positively compared to the pre-clinical group. This positive perception trend was reflected in all domains and was statistically significant in the SPoL and SPoA. These findings are in contrast with other studies that found that pre-clinical students perceived the academic environment more positively than clinical students.[6,10,20] Advanced students' favourable perceptions in the current study could be related to their motivation, as they were newly exposed to clinical opportunities and thus could put into practice what they had learned during pre-clinical training. In contrast, the pre-clinical group may have been stressed in their new medical environment as they had just recently enrolled and were still exploring the EE. In a comparable report involving Nepalese and Nigerian students,[3] a trend towards improved perceptions during senior years was also observed. An explanation for these observations was that basic-year students may not have sufficient experience to provide valid and critical evaluations of their educational process.

A comparison of DREEM domain scores of medical students at DAU and King Saud University (KSU)[5] showed different scores. The KSU students' perceptions were more positive compared to that of DAU students based on overall DREEM scores; 137.25/200[5] against 122.49 and 125.48 for DAU students in pre-clinical and clinical phases, respectively. However, the domain differences were minor and not statistically significant (p<0.668). Although students' perceptions were positive for both colleges, KSU DREEM scores were higher than those of DAU. These findings give clues about areas that need improvement in order to bring the two colleges into alignment. Despite the identical curricula, the two colleges differ in the number of students, human resources and faculty members, logistical support and facilities, and student demographics. Hence, these are possible reasons for varied EE scores. In addition, the KSU data included only graduating students, while in the current study, students from first to fifth years were included, which may have had a significant effect on the findings. A similar study conducted at the Faculty of Medicine at Rabigh and Jeddah campuses of King Abdulaziz University[27] found that the educational environment was positive in both campuses. It was more positive in Jeddah compared to Rabigh, but the differences was not significant in most DREEM domains.

The present study has limitations, like a small sample size, and having more female participants than males. Also, the study only explored students' perceptions of EE and did not determine other possible influencing factors.

Conclusion

The overall perception of EE was more positive than negative, and EE can be called healthy. However, many identified areas require remedial steps as well. Clinical students and males were more satisfied with EE compared to pre-clinical and female students.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Genn JM. AMEE Medical Education Guide No. 23 (Part 2): curriculum, environment, climate, quality and change in medical education–a unifying perspective. Med Teach. 2001; 23:445-54.
2. Roff S, McAleer S. What is educational climate? Med Teach. 2001; 23:333-4.
3. Roff S, McAleer S, Ifere OS, Bhattacharya S. A global diagnostic tool for measuring educational environment: comparing Nigeria and Nepal. Med Teach. 2001; 23:378-82.
4. Roff S, McAleer S, Harden RM, Al-Qahtani M, Ahmed AU, Dea H, et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). Med Teach. 1997; 19:295-9.
5. Soliman M, Sattar K, Alnassar S, Alsaif F, Alswat K, Alghonaim M, et al. Medical students' perception of the learning environment at King Saud University Medical College, Saudi Arabia, using DREEM inventory. Advan Med Educ Prac. 2017; 8:221-7.
6. Al-Ayed IH, Sheik SA. Assessment of the educational environment at the College of Medicine of King Saud University, Riyadh. East Mediter Health J. 2008; 14:953-9.
7. Al-Hazimi AR, Zaini R, Al-Hyiani A, Hassan N, Gunaid A, Ponnamperuma G, et al. Educational environment in traditional and innovative medical schools: a study in four undergraduate medical schools. Educ Health. 2004; 17:192-203.

8. Al Rukban MO, Khalil MS, Al-Zalabani A. Learning environment in medical schools adopting different educational strategies. Educ Res Rev. 2010; 5:126-9.
9. Al-Kabbaa AF, Ahmad HH, Saeed AA, Abdalla AM, Mustafa AA. Perception of the learning environment by students in a new medical school in Saudi Arabia: areas of concern. J Taibah Univ Medl Sci. 2012; 7:69-75.
10. Khan SQ, Al-Shahrani M, Khabeer A, Farooqi FA, Alshamrani A, Alabduljabbar AM, et al. Medical students' perception of their educational environment at Imam Abdulrahman Bin Faisal University, Kingdom of Saudi Arabia. J Fam Community Med. 2019; 26:45-50.
11. Al-Mohaimeed A. Perceptions of the educational environment of a new medical school, Saudi Arabia. Int J Health Sci. 2013; 7:150-9.
12. Altemani AH, Merghani TH. The quality of the educational environment in a medical college in Saudi Arabia. Int J Med Educ. 2017; 8:128-32.
13. Hasan T, Gupta P. Assessing the learning environment at Jazan medical school of Saudi Arabia. Med Teach. 2013; 35:S90-6.
14. Makhdoom NM. Assessment of the quality of educational climate during undergraduate clinical teaching years in the College of Medicine, Taibah University. JTaibah Univ Med Sci. 2009; 4:42-52.
15. Mojaddidi MA, Khoshhal KI, Habib F, Shalaby S, El-Bab ME, Al-Zalabani AH. Reassessment of the undergraduate educational environment in College of Medicine, Taibah University, Almadinah Almunawwarah, Saudi Arabia. Med Teach. 2013; 35:S39-46.
16. Nosair E, Mirghani Z, Mostafa RM. Measuring students' perceptions of educational environment in the PBL program of Sharjah Medical College. JMed Educ Curric Dev. 2015; 2:S29926.
17. Shehnaz SI, Sreedharan J. Students' perceptions of educational environment in a medical school experiencing curricular transition in United Arab Emirates. Med Teach. 2011; 33:e37-e42.
18. Karim J, Becher Al-Halabi YM, Sadeq H, Dawas A, Al-Abdulrazzaq D. The educational environment of the undergraduate medical curriculum at Kuwait University. AdvMed Educ Pract. 2015; 6:297-303.
19. Khursheed I, Baig L. Students' perceptions of educational environment of a private medical school in Pakistan. J Pak Med Assoc. 2014; 64:1244-9.
20. Abraham RK, Ramnarayan K, Vinod P, Torke S. Students' perceptions of learning environment in an Indian medical school. BMC Med Educ. 2008; 8:20.
21. Bassaw B, Roff S, McAleer S, Roopnarinesingh S, De Lisle J, Teelucksingh S, et al. Students' perspectives on the educational environment, Faculty of Medical Sciences, Trinidad. Med Teach. 2003; 25:522-6.
22. Denz-Penhey H, Murdoch JC. A comparison between findings from the DREEM questionnaire and that from qualitative interviews. Med Teach. 2009; 31:e449-53.
23. Varma R, Tiyagi E, Gupta JK. Determining the quality of educational climate across multiple undergraduate teaching sites using the DREEM inventory. BMC Med Educ. 2005; 5:8.
24. Zawawi AH, Elzubeir M. Using DREEM to compare graduating students' perceptions of learning environments at medical schools adopting contrasting educational strategies. Med Teach. 2012; 34:S25-31.
25. Till, H. Identifying the perceived weaknesses of a new curriculum by means of the Dundee Ready Education Environment Measure (DREEM) Inventory. Med Teach. 2004; 26:39-45.
26. Al-Natour SH. Medical Students' Perceptions of their Educational Environment at a Saudi University. Saudi J Med Med Sci.2019; 7:163-8.
27. Imran M, Shamim MS, Baig M, Farouq M, Gazzaz ZJ, Al-Mutairi OM. Tale of two cities: comparison of educational environment of two colleges (Jeddah and Rabigh) affiliated with one university. J Pak Med Assoc. 2016; 66:316-9.