Medical Students’ Perceptions of their Educational Environment at a Saudi University

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Abstract
Background: Students’ perception of their educational environment has a significant impact on their behavior and academic progress.

Aim: The aim of the study is to assess the perceptions of undergraduate medical students regarding their educational environment at Imam Abdulrahman Bin Faisal University, Saudi Arabia.

Subjects and Methods: This cross-sectional study utilized the Dundee Ready Education Environment Measure (DREEM) inventory to collect data from 5th-year medical students at Imam Abdulrahman Bin Faisal University during the academic year 2010–2011 (score range: 0–200). The mean scores for each individual item and for the following five contributing DREEM domains were calculated: Perception of learning, perception of teaching, academic self-perception, perception of atmosphere and social self-perception.

Results: The questionnaire was distributed to 121 students, all of whom completed the questionnaire. Of these, 65.3% were male and 34.7% were female. The mean total score was 126.4 (63%), indicating that the educational environment is satisfactory. The two lowest scoring contributory domains were academic self-perception (17.4/28; 60%) and perception of learning (29.3/48; 61%). No areas of excellence were identified (i.e., mean scores of >3.5); however, four main problematic areas were identified (mean scores of ≤2.0): Overemphasis of factual learning (1.66), difficulty with authoritarianism of teachers (1.55), students unable to memorize everything (1.82) and boredom in course (1.81).

Conclusion: This study found that the overall educational environment at Imam Abdulrahman Bin Faisal University is satisfactory, with further scope of improvement. The author recommends implementation of remedial measures such as modifications in curriculum and using innovative teaching strategies to overcome problematic areas and further improve the overall educational environment.

Keywords: Dundee Ready Education Environment Measure, education, environment, medical, Saudi Arabia, student perceptions
INTRODUCTION

Students’ perceptions of their educational environment have a significant impact on their behavior, academic progress and achievements.[1] Understanding students’ perceptions of their educational environment is also useful for improving the quality of learning, and accordingly, there is an increasing interest in examining this perception in medical schools. One tool for measuring such student perception is the 50-item Dundee Ready Education Environment Measure (DREEM) questionnaire, which was developed using the input of 80 international medical educators.[2] Besides being a tool for measuring and “diagnosing” the problems within the educational environment of health professions, it can also be used to identify areas of strengths and weaknesses in a current educational climate[3,4] and for comparing outcomes of a current teaching program within a certain institute and between medical schools.[5,6]

DREEM inventory has been widely used globally,[6-13] including in the Arab region.[10] In Saudi Arabia, several medical schools have used this tool to assess the education environment, and total scores have ranged from 109/200 (54.5%) to 137/200 (65.5%).[16-23] Assessing the quality of educational environment based on the perception of medical students helps identify areas of strengths and weaknesses in a system, which in turn can allow for curriculum remedial measures, such as adoption of effective curriculum and teaching methods, to improve the educational environment.[23] One such example is in Taibah University, where initially the DREEM score was low (109/200); nonetheless, after the subsequent remedial measures, this score improved to 120/200.[18] When students’ learning problems and difficulties are not addressed, their learning environment is affected, resulting in repeated failures and, consequently, in incompetent health-care professionals.[13] This highlights the importance of DREEM inventory in understanding areas requiring remedial actions.

The College of Medicine at Imam Abdulrahman Bin Faisal University (IAU) (formerly University of Dammam) was established more than 40 years ago. IAU had initially been following a “traditional” learning curriculum for teaching undergraduates; however, in 2003, problem-based learning (PBL) curriculum was introduced after which both these strategies are used in parallel to teach medicine. A previous study has reported the DREEM score of IAU’s medical college along with comparisons between gender, year of study and curriculum.[21] However, to the best of the author’s knowledge, no study has specifically assessed how students following a traditional curriculum (at the time of conducting the study) perceive their educational environment at the medical college of IAU.

The results of this study are important and can be used as a reference or baseline for comparison after the curriculum modification to PBL at IAU and implementation of remedial measures and with results of other national medical schools.

SUBJECTS AND METHODS

This cross-sectional study used the original English version of the DREEM inventory,[2] a 50-statement closed-ended questionnaire, to collect the data from 5th-year medical students at IAU, Dammam, Saudi Arabia, during the end-of-year evaluations for the academic year 2010–2011. The study elicited information for measuring students’ perceptions of the educational environment during their 4th and 5th year, without documenting their expectations. Every other 5th-year medical student in each of the six groups rotating in the Department of Dermatology at IAU (n = 121) were chosen to participate in this study just before the end of their rotation examination.

The researcher administered and collected the questionnaire from all participants at the same time. The questionnaire contained a section clearly stating that participation was voluntary and that anonymity would be maintained. It also clearly explained the purpose of the study and requested unbiased responses to reflect the true perceptions of the participants. The participants were requested not to discuss the questions and to direct all queries only to the researcher. The participants rated the 50 questions on a 5-point Likert scale, where 4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree, and 0 = strongly disagree. Each statement was scored 0–4 (total score range: 0–200), and thus higher scores indicate a more positive evaluation. The negative statements (questions 4, 8, 9, 17, 25, 35, 39, 48, and 50) were reverse scored. Ethical approval for this study was retrospectively obtained from the Institutional Review Board (IRB) of IAU (IRB-2018-01-158).

Data analysis

The collected data were entered into Microsoft Excel and analyzed using SPSS version 16.0 (IBM Corp., Chicago, IL, USA). The mean scores were calculated for each individual DREEM item as well as the following five categories: perception of learning (PoL; 12 statements), perception of teaching (PoT; 11 statements), academic self-perception (ASP; 8 statements), perception of atmosphere (PoA; 12 statements) and social self-perception (SSP; 7 statements). All data are presented as simple frequencies and percentages.
RESULTS

All 121 students completed the questionnaire, giving a response rate of 100%. Of these, 79 (65.3%) were male, and the mean age was 22.7 years. The overall DREEM mean score was 126.4 (63%), indicating a relative overall satisfaction with the environment but with room for improvement.\[24\] The mean scores for the five DREEM domains were as follows: PoL, 29.3/48 (61%); PoT, 28.5/44 (64.8%); ASP, 19.2/32 (60%); PoA, 31.97/48 (66.6%) and students’ SSP, 17.4/28 (62%). Therefore, the lowest scoring domains were ASP and PoL. Guide to interpreting the subscores of each learning perceptions is shown in Table 1.\[24\]

The mean scores for each individual DREEM item are shown in Table 2 (of a maximum of four for each item). These scores are helpful in identifying specific strengths and weaknesses within the educational climate. The following were identified as the main problematic areas (i.e., with scores of ≤2): overemphasis on factual learning (1.66), difficulty with the authoritarianism of teachers (1.55), students unable to memorize everything (1.82) and boredom in the course (1.81). The study did not identify any areas of excellence (i.e., a score of >3.5); nonetheless, three items of strength were identified (scores of ≥3.0): teachers are knowledgeable (3.21), good friends in school (3.29) and students are able to ask questions in class (3.15). In addition, 43 items received scores of 2–3 (i.e., can be enhanced) \[Table 2\].

DISCUSSION

This study found that at the medical college of IAU, the mean DREEM score among students following the traditional course was 126.4/200 (63.2%). Currently, there are no widely accepted cutoffs to determine the acceptable DREEM inventory scores. Nevertheless, the mean overall score of this study was considerably higher than that of studies from India,\[9,10,25,26\] Iran,\[11\] Pakistan\[12\] and Korea\[13,14\] as well as from most similar studies in the region,\[5,16-21\] indicating positivity/acceptability of the learning environment. However, there is significant room for improvement, as the study scores were lower than that found in studies from Ireland\[6\] and the United Kingdom.\[9,10\] It should be noted that as these countries are diverse in development, differences in the scores can be expected. In fact, there are several other factors that can affect these scores, including type of curriculum, faculty and level of education as well as the number of students participating in the surveys.

Al-Hazimi et al.\[8\] found that the DREEM score of medical schools teaching traditional curricula was 102/200 (51%) in King Abdulaziz University and 107/200 (53.5%) in Umm Al Qura University, Saudi Arabia, and 100/200 (50%) in Sana’a University Medical School, Republic of Yemen. These scores were considerably lower than that of the current study, despite all following the traditional curricula. However, it should be noted that the sample size, sampling bias, students at different levels of education and disciplines participating in the surveys as well as dissimilarities in the faculty may all account for the differences in score results.

Interestingly, the score of all the above-mentioned medical schools was considerably lower than that of the medical school at Dundee University (DU) (139/200; 69.5%). In general, higher scores indicate a more student-centered, integrated, problem-based curricula compared with those offering traditional teacher-centered curricula, where the scores are generally <120.\[9,10,25,26\] As DU is at the forefront of implementing such student-centered, innovative curriculum, the current study findings can be benchmarked against that of DU to determine specific modifications required at IAU for improving its curriculum. The creation of a more conducive environment that is outcome based and prioritizes engagement of learners and responsibility of students over their learning process would increase the likelihood of creating active learners. Overall curriculum reform and adoption of educational strategies that include problem- and community-based approaches to teaching and learning may also improve the educational environment.\[8\]

Several medical schools from Saudi Arabia have reported scores lower than that found in the current study.\[16-21\] The overall DREEM score at King Khalid University was 112.9/200 (56.45%), which indicates a satisfactory environment but is lower than that of the current study.\[9\] The mean overall scores of <120 in Saudi Arabia is likely

Table 1: Interpretations of scores using McAleer and Roff\[24\] score descriptors

| Subscale                   | Scores | Interpretation according to the scale                  |
|----------------------------|--------|--------------------------------------------------------|
| Perception of learning     | 29.3   | A more positive approach (range: 25-36)               |
| Perception of teachers     | 28.5   | Moving in the right direction (range: 23-33)          |
| Academic self-perception   | 19.2   | Feeling more on the positive side (range: 17-24)      |
| Perception of atmosphere   | 31.9   | A more positive atmosphere (range: 25-36)             |
| Social self-perception     | 17.4   | Not too bad (range: 15-21)                            |
due to use of traditional teaching methods as well as being more focused on infrastructure and facilities and less focused on human resources and policy models. Some authors have attributed these differences in Saudi Arabia to the number of students, human resources, faculty, methods of implementing the curriculum, logistic support and students' demography. A recent study found that after curriculum reform at the medical college of King Saud University (KSU), Saudi Arabia, the mean overall DREEM score was 137 (68%), which was considerably higher than that of the current study. The likely reasons for these differences are implementation of the system-oriented hybrid curriculum along with the small number of...
participants in the KSU study. Specifically, for the medical college at IAU, although the overall total score of the current study was considerably higher than that reported by Al Sheikh, both studies found similar difficulties in the individual-item analysis. It should be noted that because Al Sheikh included students of two parallel curricula (PBL and traditional) and the current only had students learning under the traditional curriculum, the total mean scores cannot be compared directly. Nonetheless, the current study provides baseline information for comparison between the two curricula, and thus provides guidance for adopting the necessary remedial measures at IAU.

This study found that the mean scores for all five DREEM domains were within the proposed scoring band, indicating positivity/acceptability of the learning environment [Table 1]. Further, the study identified four main problematic areas from all domains, namely, overemphasis of factual learning, authoritarianism of teachers, inability of students to memorize everything and boredom of students in courses. The same problems and difficulties have been reported by several authors and are universal findings in most educational systems. Overemphasis of factual learning is driven by formative and summative assessments and can be reduced through the implementation of problem-based evaluations, which can drive active learning and provide students with more stimulatory methods of learning. Students’ difficulty with authoritarianism of teachers suggests that teachers are inclined toward more traditional styles of teaching. Adopting innovative teaching methods and evaluating teachers’ behavior and attitudes can help overcome students’ perception of authoritarianism. Students being unable to memorize everything is suggestive of curriculum overload and should accordingly be addressed. Finally, for boredom of students in courses, providing mentoring and establishing a student support system would likely result in students being integrated and more involved in the course, thereby helping to overcome this problematic area. Remedial measures are likely to provide more favorable conditions for students, which may raise their competence.

**Limitations**

The main limitations of the study are the convenience sampling method used, which may result in important points being overlooked, and the relatively small sample size that was limited to a chosen group of students of the same medical year. Selecting a larger sample that includes students from different levels of undergraduate medical education is likely to produce more comprehensive results. Further, in voluntary participation methods and self-reporting questionnaires, sampling and response bias can be expected. Finally, although generalization of the findings could not be achieved, this study provides baseline data for comparing against the PBL curriculum recently adopted at the College of Medicine at IAU.

**CONCLUSION**

This study found that the 5th-year medical students following a traditional curriculum at the College of Medicine, IAU, perceived their overall educational environment to be relatively positive. Further, the study identified overemphasis of factual learning (in PoL), authoritarianism of teachers (PoT), inability of students to memorize everything (ASP) and boredom of students in courses (SSP) as the four main problematic areas. Therefore, this study provides valuable baseline data for educators and curriculum/policy-makers at IAU for enhancing the educational environment.

**Ethical considerations**

The study was retrospectively approved by the IRB of Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia (Ref no.: IRB-2018-01-158), and was conducted in accordance with the ethical standards given in 1964 Declaration of Helsinki, as revised in 2008. Respondents were informed that response to the questionnaire would be considered as consent for participating in this study.

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**Conflicts of interest**

There are no conflicts of interest.

**REFERENCES**

1. Genn JM. AMEE medical education guide no 23 (Part 1): Curriculum, environment, climate, quality and change in medical education-a unifying perspective. Med Teach 2001;23:337-44.
2. Roff S, McAleer S, Harden RM, Al-Qahtani M, Ahmed AU, Deza H. Development and validation of the Dundee Ready education environment measure. Med Teach 1997;19:295-99.
3. Roff S, McAleer S. What is educational climate? Med Teach 2001;23:333-4.
4. Bassaw B, Roff S, McAleer S, Roopnarinesingh S, De Lisle J, Techuksingh S, et al. Students’ perspectives on the educational environment, faculty of...
medical sciences, Trinidad. Med Teach 2003;25:522-6.
5. Al-Hazimi A, Zaini R, Al-Hyani 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 (Abingdon) 2004;17:192-203.
6. Avalos G, Freeman C, Dunne F. Determining the quality of the medical educational environment at an Irish medical school using the DREEM inventory. Ir Med J 2007;100:522-5.
7. Varma R, Tiyagi E, Gupta JK. Determining the quality of educational climate across multiple undergraduate teaching sites using the DREEM inventory. BMC Med Educ 2007;11:265-72.
8. Abraham R, Ramnarayan K, Vinod P, Torke S. Students’ perceptions of learning environment in an Indian medical school. BMC Med Educ 2008;8:20.
9. Kohli V, Dahiwal U. Medical students’ perception of the educational environment in a medical college in India: A cross-sectional study using the Dundee Ready education environment questionnaire. J Educ Eval Health Prof 2013;10:5.
10. Moshki M, Delmoalian A. Students’ perceptions of learning environments in Gonabad university of medical sciences. Med J Islam Repub Iran 2014;28:153.
11. Khursheed I, Baig L. Students’ perceptions of educational environment of a private medical school in Pakistan. J Pak Med Assoc 2014;64:1244-9.
12. Kim H, Jeong H, Jeon P, Kim S, Park YB, Kang Y. Perception study of traditional Korean medical students on the medical education using the Dundee Ready educational environment measure. Evid Based Complement Alternat Med 2016;2016:604297.
13. Park KH, Park JH, Kim S, Rhee JA, Kim JH, Ahn YJ, et al. Students’ perception of the educational environment of medical schools in Korea: Findings from a nationwide survey. Korean J Med Educ 2015;27:117-30.
14. Patil AA, Chaudhari VL. Students’ perception of the educational environment in medical college: A study based on DREEM questionnaire. Korean J Med Educ 2016;28:281-8.
15. 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.
16. Hasen T, Gupta P. Assessing the learning environment at Jazan medical school of Saudi Arabia. Med Teach 2013;35 Suppl 1:S90-6.
17. Mojadidi 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 Suppl 1:S39-46.
18. Alshehri SA, Alshehri AF, Erwin TD. Measuring the medical school educational environment: Validating an approach from Saudi Arabia. Health Edu J 2012;71:553-64.
19. Imran M, Shami MS, Baig M, Farooq 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.
20. Al Sheik MH. Educational environment measurement, how is it affected by educational strategy in a Saudi medical school? A multivariate analysis. J Taibah Univ Med Sci 2014;9:115-22.
21. Soliman MM, Sattar K, Almassar S, Alsawat K, Alghonaim M, et al. Medical students’ perception of the learning environment at King Saud university medical college, Saudi Arabia, using DREEM inventory. Adv Med Educ Pract 2017;8:221-7.
22. Tooth D, Tonge K, McManus IC. Anxiety and study methods in preclinical students: Causal relation to examination performance. Med Educ 1989;23:416-21.
23. McAleer S, Roff S. A practical guide in using the Dundee Ready education environment measure. In: Genn JM, editor. Curriculum, Environment, Climate, Quality and Change in Medical Education: A Unifying Perspective. AMEE Education Guide No. 23. Dundee: Association for Medical Education in Europe; 2001. p. 29-33.
24. Al-Ayed IH, Sheik SA. Assessment of the educational environment at the college of medicine of King Saud university, Riyadh. East Mediterr Health J 2008;14:953-9.
25. Roff S. The Dundee Ready educational environment measure (DREEM) – A generic instrument for measuring students’ perceptions of undergraduate health professions curricula. Med Teach 2005;27:322-5.