

The Dundee Ready Education Environment Measure (DREEM): Perception of Educational Environment and its Impact on Academic Performance of Medical and Pharmacy Students

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ABSTRACT

Objective: To assess the perceptions of health professions students towards educational environment and to ascertain differences among gender and faculties. The study also assesses the internal consistency of DREEM questionnaire of health profession students.

Methodology: A cross sectional, institution based study was done during March to June 2017 among students of health professions of faculty of medicine and faculty of pharmacy at Hamdard University, Karachi. Using proportionate quota sampling technique, DREEM questionnaire was administered to undergraduate students. Data was analysed by SPSS version 22. Descriptive statistics were used to calculate mean with standard deviation of overall DREEM and its five subscales. Independent sample t-test was used to identify gender and faculty related differences between perception of educational environment. Cronbach's alpha was also calculated to test the reliability of DREEM questionnaire.

Results: Out of 600 students, fifty percent were selected from each faculty in which 327 (54.5%) were male students. Total mean score of DREEM was 130.1/200 (65%). Student's academic self-perception domain got the highest score (97.1%) and the lowest score in students' perceptions of atmosphere (47.7%). Statistically significant differences ($P < 0.05$) were found between student's social self-perception and gender. A high level of reliability was found for the total DREEM inventory with an alpha coefficient of 0.82.

Conclusion: More positive than negative educational environment of the university was found with no differences among medical and pharmacy students.

Key words: Education, Students, Environment, University

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شعبہ طب اور شعبہ ادویات کے طلباء کا تعلیمی ماحول اور اس کے تعلیمی کارکردگی پر اثرات کے بارے میں تاثر

مقصد: اس تحقیق کا مقصد صحت کے شعبے سے تعلق رکھنے والے طلباء کی تعلیمی ماحول کے بارے میں رائے اور اس میں جنس اور قابلیت کے لحاظ سے فرق کا تعین ہے اور ساتھ ساتھ (DREEM) ڈرم سوالنامے کے موثر ہونے کی تشخیص بھی اس تحقیق کا مقصد ہے۔

طریقہ کار: مارچ 2017 سے جون 2017 کے دوران تعلیمی ادارے پر مشتمل اس تحقیق میں صحت کے شعبے سے تعلق رکھنے والے طلباء کی رائے لی گئی جن کا موثر تعلق شعبہ طب اور شعبہ ادویات ہمدرد یونیورسٹی کراچی سے تھا۔ جس میں انڈرگریجویٹ طلباء سے سوالنامہ پر کروایا گیا۔ DREEM اور اس کے مزید پانچ چھوٹے پیمانوں کا اوسط اور معیاری انحراف معلوم کرنے کے لیے وضاحتی شماریات کا استعمال کیا گیا اور تعلیمی ماحول کے بارے میں رائے میں جنس اور قابلیت کے حوالے سے فرق کو جاننے کے لیے t-test کا استعمال کیا گیا۔ جبکہ سوالنامہ ڈرم کے قابل اعتماد ہونے کے لیے شماریاتی طریقہ Cronbach's Alpha کا استعمال کیا گیا۔ نتائج: پچھترہ طلباء میں سے پچاس فیصد طلباء ہر شعبے سے منتخب کیے گئے جن میں 327 یعنی 54.5 فیصد مرد طلباء تھے، ڈرم کی مجموعی اوسط 130.1/200 یعنی 65 فیصد معلوم ہوئی جبکہ طلباء کی تعلیمی خیالات کی ذاتی رائے کا تناسب سب سے زیادہ یعنی 97.1 فیصد اور طلباء کے ماحول کے لحاظ سے خیالات کا تناسب سب سے کم یعنی 47.7 فیصد رہا۔ جبکہ جنسی لحاظ اور معاشرتی خیالات کے درمیان اہم اعداد کا فرق واضح طور سے پایا گیا اور مجموعی طور پر ڈرم سوالنامے کے قابل اعتماد ہونے کے نتائج اعلیٰ سطح کے پائے گئے ($\alpha = 0.82$)۔

حاصل مطالعہ: اس تحقیق سے ثابت ہوا کہ یونیورسٹی میں تعلیمی ماحول مثبت پایا گیا اور شعبہ طب اور شعبہ ادویات کے درمیان کوئی فرق نہیں پایا گیا۔

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INTRODUCTION

The learning environment alludes to how the learners see the atmosphere of an institution. It includes their perception regarding infrastructure of the campus, learning opportunities, teacher's skills and attitudes,

their interaction with peers, and many other factors¹. Educational surrounding is significant in establishing the success or failure of any institute² and an excellent environment is reflective of a quality curriculum. Despite the influence of the educational atmosphere on academic achievements of an institution, it is a factor which is difficult to measure, and its true status in the educational cycle remains undetermined³. Nevertheless, a positive environment leads to achievements, fun, and engagement in learning while a negative one would hinder their accomplishments.

Students' perceptions of the academic atmosphere is influenced by various cultural backgrounds of students, educational facilities available to them, quality of the faculty, curriculum, and student's expectations apart from other circumstances of the university⁴. An effective management of teaching and learning is supported by understanding the educational environment and incorporating appropriate changes and remedies wherever required. There is documented association between educational environment and the students' performance and their satisfaction⁴.

Different tools available for learning environment assessment include Postgraduate Hospital Education Environment Measure (PHEEM)⁵, Learner's Perception Survey (LPS)⁶ and many others. In order to make learning environment measurable, the Dundee Ready Education Environment Measure (DREEM) was developed⁷. This is a 50-item questionnaire developed in Dundee, United Kingdom which focuses on different aspects of the learning environment to measure the undergraduate educational setting of the Health Professional Schools⁷.

A study by Soliman MM et al. correlated DREEM score of students with their academic performance and has noted that high achievers have better perception of the educational climate⁸. In Pakistan, a survey at the Dow University of Health Sciences identified highest DREEM scores in student's academic self-perception, and lowest in learning perception⁹. Therefore, it is a vastly reliable and valid tool used for conducting comparison of students' perceptions of academic climate within an institution, between institutions or at totally different purpose of time within an institution¹⁰. Moreover, it is used to facilitate in altering the curriculum, comparing past and present curricula, and evaluating the effectiveness of an institutional programme¹¹.

Keeping with the trends of changing academic teaching methodology, the institution is moving from a traditional to an integrated curriculum with focus on improving the students' learning and understanding. The present

study was conducted to assess the perceptions of health professional students to educational environment and to ascertain differences among gender and faculties. The study also assesses the internal consistency of DREEM questionnaire of health profession students.

METHODOLOGY

This descriptive cross-sectional study was conducted from March to June 2017 at Hamdard University, Karachi among students of health professions of faculty of medicine and faculty of pharmacy. By using proportionate quota sampling technique, a total of 600 students from first to final year who agreed to participate and gave verbal informed consent were included. Students who were not physically or mentally fit on the day of data collection were excluded. Ethical approval was taken from Hamdard College of Medicine & Dentistry, Hamdard University.

A standardized DREEM questionnaire was administered to undergraduate students of medicine and pharmacy on day and time of their choice. A 10 minutes briefing regarding the objectives of the study was given and the students were asked to provide their own views and perceptions in unbiased manner. The responses from each class were taken separately and 30 minutes free time was given to respond to the provided questionnaire in their dedicated session. It was emphasized that anonymity and confidentiality of the participants will be maintained throughout the research and it would not follow or affect their academic performances.

DREEM contains 50 statements about topics relevant to the educational climate. A Likert-type scale was used that provided each item score between 0 to 4 (4 strongly agree; 3 agree; 2 uncertain; 1 disagree; and 0 strongly disagree). However, statements 4,8,9,17,25,35, 39,48 and 50 contain negative statements and are reversely coded as 0 strongly agree; 1 agree; 2 uncertain; 3 disagree; and 4 strongly disagree. The DREEM inventory representing the ideal educational environment has a maximum score of 200. The questionnaire consists of five subdomains as

1. Students' perceptions of learning (SPOL)
2. Students' perceptions of teachers (SPOT)
3. Students' academic self-perceptions (SASP)
4. Students' perceptions of atmosphere (SPOA) and
5. Students' social self-perceptions (SSSP).

Environmental perception of students as determined by DREEM was classified as "very poor" if score was between 0 and 50, "plenty of problems" with a score of 51 to 100, "more positive than negative" if 101 and 150 and "excellent" with a score between 151 to 200.

Table 1: DREEM scores and subscales

| DREEM and its subscale | Maximum score of the scale | Mean (SD) | Percentage of maximum score | Interpretation* |
|-------------------------------------|----------------------------|----------------------|-----------------------------|-----------------------------|
| All items | 200 | 130.1 (± 17.0) | 65 | More positive than negative |
| Students' perceptions of learning | 48 | 31.6 (± 4.3) | 65.8 | More positive perception |
| Students' perceptions of teachers | 44 | 27.1 (± 4.1) | 61.5 | Moving in right direction |
| Students' academic self-perceptions | 32 | 31.1 (± 6.1) | 97.1 | Confident |
| Students' perceptions of atmosphere | 48 | 22.9 (± 3.9) | 47.7 | Many issues needs change |
| Students' social self-perceptions | 28 | 17.1 (± 3.0) | 61.0 | Not too bad |

SD=Standard deviation

*McAleer S, Roff S. A practical guide to using the Dundee Ready Education Environment Measure (DREEM). Available from URL: www.gpro.co.uk/swacpro/document/dreems2.doc cited: 2016 December 10

Table 2: Faculty and Gender differences for perception of educational environment

| DREEM and its subscale | Medical Mean (SD) | Pharmacy Mean (SD) | P-value | Male mean (SD) | Female mean (SD) | P-value |
|-------------------------------------|----------------------|----------------------|---------|----------------------|----------------------|---------|
| All items | 129.9 (± 17.1) | 130.2 (± 17.0) | 0.85 | 128.9 (± 17.1) | 131.5 (± 17.3) | 0.05 |
| Students' perceptions of learning | 31.3 (± 4.37) | 31.9 (± 4.32) | 0.06 | 31.4 (± 4.27) | 31.8 (± 4.45) | 0.23 |
| Students' perceptions of teachers | 27.0 (± 4.01) | 27.3 (± 4.32) | 0.32 | 26.9 (± 4.23) | 27.4 (± 4.08) | 0.10 |
| Students' academic self-perceptions | 23.0 (± 3.89) | 22.8 (± 3.94) | 0.73 | 22.8 (± 3.78) | 23.0 (± 4.07) | 0.42 |
| Students' perceptions of atmosphere | 31.2 (± 6.09) | 31.0 (± 6.11) | 0.69 | 30.8 (± 6.19) | 31.5 (± 5.97) | 0.14 |
| Students' social self-perceptions | 17.3 (± 3.18) | 16.9 (± 2.91) | 0.09 | 16.8 (± 2.98) | 17.5 (± 3.11) | 0.007 |

The data was entered and analysed using software SPSS version 22. Descriptive statistics was used to calculate mean and standard deviation of over all DREEM and its five subscales. Independent sample t test was used to identify faculty and gender related differences between perception of educational environment. Cronbach's alpha was calculated to test the reliability of DREEM questionnaire. P-value less than 0.05 was considered as statistically significant.

RESULTS

A total of 600 students completed the DREEM with an equal distribution of students; 300 (50%) from each faculty of medicine and faculty of pharmacy. The faculty of medicine included medical and dental students. Among all, 327 (54.5%) were male and 273 (45.5%) were female students.

Table 1 shows the maximum score of total DREEM inventory and its five subscales, mean, standard deviation, and percentage of all domains with its interpretation. Total score of DREEM was 130.1/200 (65%), SPOL 31.6/48 (65.8%), SPOT 27.1/44 (61.5%), SASP 31.1/32 (97.1%), SPOA 22.9/48 (47.7%) and SSSP 17.1/28 (61%).

Table 2 shows the faculty and gender differences in perception of educational environment. Statistically significant differences were not observed between faculty of medicine and pharmacy whereas statistically significant differences were observed between male and female students' social self-perception (P-value <0.05).

Internal consistency findings are shown in Table 3. The total DREEM inventory was found to have a high level of reliability, with an alpha coefficient of 0.82. The Cronbach's alpha for the 5 subscales also shows high level of internal consistency. The value of coefficient of SPOL was 0.75, SPOT 0.76, SASP 0.76, SPOA 0.73 and SSSP 0.79.

Table 3: Reliability of DREEM questionnaire

| DREEM and its subscale | n (items) | Cronbach's alpha (α) |
|-------------------------------------|-----------|-------------------------------|
| All items | 50 | 0.82 |
| Students' perceptions of learning | 12 | 0.75 |
| Students' perceptions of teachers | 11 | 0.76 |
| Students' academic self-perceptions | 8 | 0.76 |
| Students' perceptions of atmosphere | 12 | 0.73 |
| Students' social self-perceptions | 7 | 0.79 |

DISCUSSION

The educational setting has a considerable impact on the performance of students in medical institutions. The recent advancement in research has shown that the analysis of the educational environment should form part of the appropriate educational practices developed by any institution and can be made possible by using DREEM scale^{12,13}. This study provided an overview of undergraduate students of health professions (medical and pharmacy) regarding educational environment in a private sector university.

The over all mean score of DREEM inventory was 130/200 (65%) that shows that the academic environment of the university is more positive than negative. The subscale analysis showed high confidence with student's academic self-perception with 97.1% whereas lowest in domain of student's perception of atmosphere with 47.7%. The findings of the present study are similar with other studies done in Pakistan. A recently published study¹⁴ showed the over all mean score of 113.6/200. Another study done by Jawaid et al⁹ reported the overall mean score of 114.4/200, while a study done in public and private medical colleges and another in a private medical college reported a slightly lower mean score of 125.7/200 and 125/200 respectively compared to this study^{15,16}. Other studies from Asian countries reported over all mean DREEM score ranging between 104 and 118¹⁷⁻²⁰.

On comparison of medical with pharmacy students, scores from both the faculties were similar hence both the faculties perceived their environment positively. The over all DREEM score and subscale scores of female students were slightly higher than male students. Our results are consistent with findings from other studies conducted in different medical colleges of Pakistan^{9,16}. A study conducted at six medical institutions in Pakistan also reported similar results²¹. Studies done in Athens²², India²³, Australia²⁴, Malaysia²⁵ showed better-quality self-perception of academic environment among undergraduate female medical students. Although DREEM is used to assess the educational environment of the institute but it does not provide us the underlying reasons for the same.

The Cronbach alpha (internal consistency reliability) was 0.82 in the present study which is higher than the 0.7 or 0.8 thresholds generally considered acceptable for scales²⁶. The Cronbach's alpha values for the five subscales also showed adequate level of internal consistency in measuring the five aspects of student's perception of educational climate. Similar studies also showed Cronbach's alpha values as 0.89⁹, 0.91²⁷ and 0.93²⁸ that suggested that an instrument with high internal consistency was used.

CONCLUSION

DREEM is found to be an effective and reliable instrument for measuring the academic environment of the present institute. The over all DREEM score was 65% with the highest score (97%) found in the domain of students' academic self-perception while the lowest (47.7%) in students' perception of atmosphere. These results can be used for further enhancement of the educational environment of the institute. This study reflects a positive perception of educational environment at the university among medical and pharmacy students.

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