

A DREEM Based Appraisal of Educational Environment at Dental Colleges: Comparing Pakistan and Turkey



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OBJECTIVE: This study was conducted to establish a baseline DREEM score for a Pakistani private dental college and a private dental college of Turkey, to compare the educational environment as perceived by the dental students' of the two institutes and provide insight into the aspects of dental education that are in need of improvement.

METHODOLOGY: It's a cross-sectional, questionnaire based study conducted at Bahria University Medical and Dental College, Karachi (BUMDC) and a private dental college of Istanbul, Turkey between December 2018 and March 2019. The Dundee Ready Education Environment Measure was filled out by first, second and third year undergraduate dental students at both the institutes. Ethical approval was obtained from ethical review committee of BUMDC after consent was taken from the head of the Turkish institute.

RESULTS: Global DREEM mean score of the two institutes was 116.6 ± 20.7 . The overall DREEM score of Bahria University was 119.3 ± 24.3 while of Turkish dental institute was 113.8 ± 16.1 , with p -value = 0.000. Institutional DREEM depicts a student perception that is predominantly positive. In both the institutes, the perception regarding the social atmosphere (Students' Social Self Perception) scored lowest as compared to all other domains.

CONCLUSION: Over all the educational environment at both the institutes is satisfactory however this study has highlighted a need for reforms to improve the social and teaching atmosphere. Despite the overall positive trend, the institutes have yet to achieve excellent status for educational environment. One can learn from the Turkish university in terms of how the social atmosphere can be improved, while the Turkish dental college can benefit by implementing a more student centered teaching methodology.

KEYWORDS: DREEM, Educational environment, dental students, perception, Pakistan.

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INTRODUCTION

Defined as everything that is part of the academic institute and affects the learning process, educational environment includes infrastructure, teaching methodology, attitude and behaviour of both teachers and peers.^{1,2,3} Numerous studies have proven that educational environment is a major determinant of successful learning instruction.^{4,5,6} The atmosphere of an institute is considered a stronger predictor of academic growth as compared to prior achievement at school.³ It bears considerable consequence on the effectiveness of curriculum and hence

skill, motivation and eventual success of the student.⁷ The acute noteworthiness of this arbitrary component of medical and dental education brought about the need to qualitatively measure it with a reproducible, universally accepted technique.⁸

Advances in this front led to the development of Dundee Ready Educational Environment Measure (DREEM) questionnaire by a multinational committee of medical educators in 1997.^{1,9,10} Further research has established it as a globally recognized and validated tool for "measuring" the perception of learning environment of students at medical and dental institutes.^{11,12} Culturally nonspecific, it is an inventory of fifty components that focus on five domains of education namely learning, teaching, academic and social self-perception & atmosphere.¹³ It draws a holistic and comprehensive snapshot of all the domains at work within the educational institute.¹⁴ A considerable impact of this inventory is that it makes homogenized comparisons between

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medical and dental schools of different countries, a possibility, allowing institutes to establish a point of reference for future comparisons.^{15,16,17} Moreover, it may bring to light areas of concerns that might have been unintentionally left out by the educators.^{18,19}

Bahria University Medical and Dental College (BUMDC), is located in the metropolis of Karachi. Established in 2011, the dental college follows a hybrid-modular curriculum and incorporates both traditional and latest student based teaching methodology. With a teaching history of less than a decade the college is still in its infancy and hence in constant need of rigorous introspection in order to optimize the learning environment.²⁰

Despite its validity as a successful investigative tool for evaluation of quality of teaching, only a handful of DREEM based researches have been conducted in dental colleges of Pakistan and not one international comparison has been made thus far.¹⁰

This study was conducted to establish a baseline DREEM score, to juxtapose the educational environment perception of student of the two institutes and provide insight into the aspects of dental education that are in need of improvement.

METHODOLOGY

Permission for the research was granted by the Ethical review committee of BUMDC (ERC 05/2019). It was a cross-sectional questionnaire based survey. Students who had completed one, two or three years of undergraduate dental education at Bahria University Medical and Dental College, Karachi and a private dental college located in Istanbul, Turkey were invited to take part in it between the period of December 2018 and March 2019. Final year students and house officers were excluded from the study. Sample size of 132 students from each institute was calculated, keeping the confidence interval at 95%, margin of error at 0.5%, population size of 200 and prevalence of 50%. Formula used was,

$$\text{Sample size } n = \frac{[DEFF * Np(1-p)]}{[(d^2 / Z^2 1 - \alpha/2 * (N-1) + p*(1-p))]}$$

Convenience sampling technique was used. In all, 264 participants were requested to take part in the study. Participation in the study was voluntary. Data from the Turkish private dental college was collected by a faculty member who was selected under Erasmus teaching mobility program from Bahria University to deliver a lecture to dental students of the Turkish dental college. After the lecture, faculty member explicated the purpose and idea of the study, assured confidentiality and took assent before asking the students to fill the proforma. The original English DREEM inventory was translated into Turkish. Validity of the

translation was evaluated with a pilot study and the participants of the pilot study were then excluded from the final study. Similarly at our institute, after explaining the purpose of the study and taking consent, 132 original English language DREEM forms were circulated. Anonymity of the process was reassured. A total of 121 students responded from Bahria University and 124 responded from the Turkish dental college.

The DREEM questionnaire was employed to measure educational environment's perception of the participants. Based on five main domains and a total score of 200, it comprises of a 50-item inventory focused on statements related to the Educational Environment namely Students' perceptions of learning (SPL) with 12 statements and a total sum of 48, Students' perceptions of teachers (SPT) having 11 articles and topmost sum of 44, Students' academic self-perceptions (SASP) with total of 8 statements and a total sum of 32, Students' perceptions of atmosphere (SPA) comprising of 12 articles and an absolute sum of 48 and lastly Students' social self-perceptions (SSSP) with 7 statements and topmost sum of 28.

5- point Likert type scale was employed to collect responses ranging from strongly agree (4) to strongly disagree (0). The nine negative statements were tallied in reverse manner where strongly agree was scored 0 and strongly disagree scored 4. Incomplete questionnaires were excluded from the study. As suggested by McAleer and Roff in their DREEM inventory guide, the total DREEM score was interpreted as follows: total score of 0-50 was considered very poor, 51-100 as an environment with plenty of problems, score between 101-150 was considered more positive than negative, 151-200 as excellent. Individual statement scores ≤ 3.5 was considered real positive, a score of 2.0-3.0 suggested that the item has room for improvement and an average score of ≤ 2.0 was considered troublesome.

The data was compiled manually into MS Office Excel Version 2010 spread sheets from both the countries and then into SPSS Version 23. For categorical variables such as nationality, frequency and percentages were presented. Continuous variables such as age and DREEM scores were presented as mean \pm standard deviation (SD). To know the significance between Bahria University's and Turkish dental college students with DREEM score independent sample t-test was applied. For comparison of different level of students with their achieved scores of DREEM inventory Fisher exact test was applied. p-value of ≤ 0.05 was considered to be statistically significant.

RESULTS

Response rate of our institute was 91.6% while that of

Turkish University was 93.9%. Average age of the Pakistani students was 20.74 ± 1.24 years (18-26) and that of Turkish students was 20.61 ± 1.92 years (17-33)

Table 1 mentions the Global DREEM mean score of the two institutes and the combined subscale score. The total DREEM score of our institute was 119.34 ± 24.26 while of

Table 1: Overall DREEM score (mean and standard deviation) and total score of DREEM subscales. (Combined score of Pakistan and Turkey)

	Mean	Std. Deviation
Overall sum	116.56	20.69
SPL sum	28.69	6.19
SPT sum	26.07	4.92
SASP	19.35	4.83
SPA	27.62	6.98
SSSP	14.83	3.77

SPL: Students' perception of learning

SPT: Students' perception of teachers

SASP: Student's academic self-perception

SPA: Students' perception of atmosphere

SSSP: Students' social self-perception

Turkish dental college was 113.85 ± 16.13 . Overall as well as individual institutional DREEM depicts a student perception of more positive than negative (101-150). And the difference between the two institutes is statistically significant, p-value = 0.038

Subscale mean and standard deviation along with their interpretation for both the institutes is displayed in Table 2.

The table also indicates the significant differences between the two institutes.

Table 2: Mean Scores and standard deviation of different subscales and their interpretation

Subscales and total score	Pakistani Students scores and status	Turkish Students score and status	P- value
SPL(48)	30.40±7.46 25-36=A more positive perception	27.02±4.01 25-36=A more positive perception	0.000
SPT(44)	27.05±5.45 23-33= Moving in the right direction	25.12±4.17 23-33= Moving in the right direction	0.002
SASP(32)	19.78±5.24 17-24= Feelings more on the positive side	18.93±4.38 17-24= Feelings more on the positive side	0.170
SPA(48)	26.15±7.05 25-36= A more positive attitude	29.05±6.63 25-36= A more positive attitude	0.001
SSSP(28)	15.96±4.19 15-21=Not too bad	13.73±2.92 8-14 = Not too nice	0.000

Individual item analysis and comparison of the DREEM inventory is presented in Table 3.

Table 3: Individual item mean scores of DREEM inventory for Pakistan and Turkey, along with their p-value

		Pakistani students Mean±SD	Turkish students Mean±SD	P-value
SPL1	I am encouraged to participate in class	2.52±0.93	2.76±0.93	0.05
SPL2	The teaching is often stimulating*	2.47±0.86	2.83±0.86	0.001
SPL3	The teaching is student-centered*	2.51±0.80	2.73±0.88	0.042
SPL4	The teaching is sufficiently concerned to develop my competence*	2.26±0.92	1.40±0.98	0.000
SPL5	The teaching is well focused	2.72±0.70	2.80±0.90	0.448
SPL6	I feel I am being well prepared for my profession	2.71±0.93	2.66±0.98	0.688
SPL7	The teaching time is put to good use	2.63±0.90	2.51±1.06	0.342
SPL8	The teaching over-emphasizes factual Learning*	2.31±0.89	1.48±1.17	0.000
SPL9	I am clear about the learning objectives of the course*	2.36±0.97	1.48±0.93	0.000
SPL10	The teaching encourages me to be an active learner*	2.38±0.98	2.75±1.09	0.006
SPL11	Long term learning emphasizes over short term*	2.35±0.98	2.81±0.83	0.000
SPL12	The teaching is too teacher-centered	2.02±0.92	1.83±1.10	0.139
SPT13	The teachers are knowledgeable*	2.84±0.85	3.22±0.93	0.01
SPT14	The teachers are patient with patients*	2.53±0.91	2.97±0.92	0.000
SPT15	The teachers ridicule the students*	1.99±0.97	1.51±1.16	0.001
SPT16	The teachers are authoritarian	2.42±0.78	2.51±0.98	0.448
SPT17	The teachers have good communications skills with patients*	2.52±0.93	1.26±0.97	0.000
SPT18	The teachers are good at providing feedback to students*	2.35±0.92	2.76±1.02	0.001
SPT19	The teachers provide constructive criticism here*	2.28±0.87	2.64±1.00	0.003
SPT20	The teachers give clear examples*	2.52±0.95	2.91±1.01	0.003
SPT21	The teachers get angry in class*	2.12±1.02	1.62±1.06	0.000
SPT22	The teachers are well prepared for their classes	2.67±0.86	2.82±1.00	0.229
SPT23	The registrars irritate the course Organizers	1.84±0.96	1.75±1.05	0.473
SASP24	Learning strategies which worked for me before continue to work for me now*	2.32±0.83	2.54±0.87	0.048
SASP25	I am confident about my passing this Year**	2.54±1.04	1.38±1.22	0.000
SASP26	The teaching is sufficiently concerned to develop my confidence*	2.23±0.91	2.57±1.09	0.009
SASP27	Last year's work has been a good preparation for this year's work	2.28±0.93	2.54±1.06	0.052
SASP28	I am able to memorize all I need	2.25±0.97	2.34±1.09	0.496
SASP29	I have learned a lot about empathy in my profession	2.46±0.94	2.66±1.04	0.106
SASP30	My problem solving skills are being well developed here	2.51±1.14	2.70±0.97	0.163
SASP31	Much of what I have to learn seems relevant to a career in healthcare	2.630.91	2.69±0.93	0.629
SPA32	The atmosphere is relaxed during the ward teaching*	2.35±0.96	2.77±1.01	0.001
SPA33	This school is well time-tabled*	2.54±1.06	2.07±1.14	0.001
SPS34	Cheating is a problem in this school	1.81±1.27	2.05±1.35	0.159
SPA35	The atmosphere is relaxed during Lectures*	2.42±0.88	2.70±1.00	0.021
SPS36	There are opportunities for me to develop interpersonal skills	2.46±0.93	2.68±1.05	0.081
SPA37	I feel comfortable in class socially*	2.35±1.03	2.77±1.08	0.002
SPA38	The atmosphere is relaxed during seminars /tutorials	2.45±1.02	2.60±0.92	0.23
SPA39	I find the experience disappointing*	1.67±1.12	2.52±1.17	0.000
SPA40	I am able to concentrate well	2.33±0.91	2.51±0.89	0.111
SPA41	The enjoyment outweighs the stress of the course*	1.99±1.07	2.38±0.97	0.003
SPA42	The atmosphere motivates me as a Learner	2.19±1.01	2.37±0.96	0.154
SPA43	The students irritate the teachers	1.68±1.21	1.43±1.10	0.092
SSSP44	There is a good support system for students who get stressed	1.81±1.29	1.88±1.17	0.662
+SSSP45	I am too tired to enjoy the course*	2.40±1.15	2.08±1.14	0.033
SSSP46	I am rarely bored on this course	1.94±1.18	1.98±1.00	0.766
SSSP47	I have good friends in this school	2.86±1.14	3.04±0.97	0.205
SSSP48	My social life is good*	2.47±1.19	1.36±0.94	0.000
SSSP49	I seldom feel lonely*	1.98±1.27	2.33±1.30	0.032
SSSP50	My accommodation is pleasant*	2.29±1.15	1.19±1.20	0.000

Statements showing statistically significant difference are marked with * Negative statements are in bold and italics. Students' with the higher score are in stronger agreement with the statement.

DISCUSSION

The study aimed to evaluate what differences, if any, existed between private dental college of Turkey and Pakistan in terms of educational environment as perceived by the students. For this purpose the institutes were evaluated by employing the DREEM questionnaires. It is the first time that such a study is being conducted in either of the institutes. With overall DREEM score of 119.3 ± 24.3 for BUMDC and 113.8 ± 16.1 for the Turkish Institute there appears very little difference in the overall opinion but nonetheless, the difference is statistically significant, $p\text{-value} = 0.038$.

Scores in the range of 100 to 150 are considered more positive than negative but with definite room for improvement, as only values above 150 are considered excellent. These values are in concurrence with findings of Khan K et al¹⁹, who reported a score of 120 for 4 dental institutes of Rawalpindi, Pakistan and also similar to results reported by Tontus O et al²¹ of Turkey who stated DREEM score of 107.15/200 for 11 medical faculties in Turkey. Similar scores have been reported for Saudi Arabia¹, Iran³, India²³ and other countries of this region. In contrast to these, higher scores were reported by Vanghan B et al. (135.37 ± 19.33) in their study⁹ conducted in University of Melbourne, Australia and by Hongkan W et al²⁴ from Thailand (131.1 ± 17.0).

Analysis of the subscales revealed that students of Bahria dental college rated the learning environment as the most positive aspect of their environment, suggesting that the students are generally satisfied with the hybrid curriculum, focused on incorporating student centered practices. The most highly rated statements were 'I feel I am being well prepared for my profession' and 'teaching time is put to good use' which depicts that the institute is ensuring students' satisfaction when it comes to their future performance. For the Turkish students, the atmosphere of their institute was most highly rated, showing they found the teaching environment relaxed, stress free and overall joyous. Among the highest rated statements were "the atmosphere is relaxed during lectures" and 'I feel comfortable in class socially'. Both the institutes unanimously declared the social self-perception to be the most neglected category, indicating a need for improvement of effective support system for stressed out individuals.

Analysis of the individual items demonstrated that for the private dental college of Turkey, a shift from teacher centred to student centred approach is needed as the statements pertaining to this category all unanimously scored less than 2. In this domain BUMDC appears to be on the right track as the students have rated this component to be the highest among all others subscales.

According to our findings Bahria dental college needs to work on improving its control over cheating during examination as its one of the poorly rated items. Concerted efforts also need to be put into making the overall university experience enjoyable for the students as they most strongly agreed to the statement "I find the experience disappointing". This study has provided valuable insight into students' perception of their learning environment and how it compares with another international institute. Secondly, individual items analysis highlighted specific problems and strengths within each of the dental colleges.

One of the inherent limitations of DREEM questionnaire is that it does not give any details about the underlying reasons for the highlighted issue nor does it suggest solutions to the problems. Furthermore the DREEM inventory being a predetermined questionnaire might have left out certain factors that impacted our educational setups. Moreover the sampling techniques employed for this study is voluntary participation and this may have resulted in sampling bias. The self-reporting questionnaire is likely associated with response bias. Since this study only compared two dental colleges and its results cannot be generalized, further studies should be done in future with more number of institutes participating in order to establish a generalized score. Moreover this study can be conducted again, in the same dental college, at a later point in time to determine the effect of any changes that the institutes may have made in their educational environment.

CONCLUSION

This study has highlighted a number of problems that are in need of attention. Both institutes need to reform their educational environment. Even though the overall scores may be predominantly positive both the institutes have yet to achieve excellent status for all the criteria that constitute an educational environment. Bahria University can learn from the Turkish university in terms of how the social atmosphere can be improved, while the Turkish dental college can benefit by implementing a more student centered teaching methodology. DREEM-based surveys are highly recommended for periodic monitoring of the educational environment.

CONFLICT OF INTEREST

None

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