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Original Article

Dentistry Section

Evaluating Student's Perceptions of the Learning Environment in an Indian Dental School

DOLAR DOSHI[1], B. SRIKANTH REDDY[2], P. KARUNAKAR[3], KOPPARESH DESHPANDE[4]

ABSTRACT

Objective: To evaluate student's perception of the learning environment in a private dental institute in India based on DREEM inventory.

Materials and Methods: This cross-sectional study included students in all four years of the undergraduate dental course of Panineeya Institute of Dental Sciences and Hospital, Hyderabad, India. Self-administered Dundee Ready Education environment Measure (DREEM) inventory consisting of 50-items on a five-point Likert scale was utilized to assess the students' perceptions regarding learning environment in this academic dental school. Comparison for the total and domain DREEM score means was carried out via independent t-test for dichotomous variables (gender) and ANOVA for more than two variables (year of study). Significant difference was noted for $p < 0.05$.

Results: The response rate for this study was 86.8%. Mean age of the study participants was 19.61 ± 1.50 y. The overall DREEM score for this population was 125.24 ± 21.10 reflecting a more of positive than negative education environment in this institution. When individual domain scores were accounted, except for the domain SAS, females had a higher mean scores for all domains which was however statistically significant only for the domains SPL ($p = 0.03$) and SPT ($p = 0.01$). Likewise, significant differences were also noted for SPL and SPT based on the year of study, wherein for both the domains, third year students had significantly higher mean scores and least was recorded for fourth year students. Correlation of the various domains demonstrated significant positive correlation among the domains.

Conclusion: Overall this sample of dental students rated the learning environment in this dental institute as positive.

Keywords: Dental institute, DREEM, Learning, Questionnaire, Students

INTRODUCTION

A conducive undergraduate dental curriculum plays a pivotal role in shaping dental students' behaviour, academic progress and sense of confidence [1]. Students' learning environment is key determinant for the success of the course. Moreover, the students' level of competence is a reflection of their learning environment in their educational institution. The "Learning Environment" has been defined as "everything that is happening in the classroom or department or faculty or university" [1,2].

Bassaw et al., [3] have pointed out that the learning environment as perceived by the students' is one of the most central component influencing the accomplishment of a successful curriculum. Valuing student's perception of learning in a dental institution helps the institute to ameliorate the strengths and address the weaknesses of the institution. It also enables to make comparative analysis within the institution or benchmarking between themselves and another institution and test and apply it as a predictor of student's performance [4].

Evaluating a learning environment facilitates quality improvement and innovation in a professional school. Since dental education is very expensive, academic success is crucial as academic failure is improvident both to the society and to the individual. An ever-conducive environment will reduce the hazards of academic under-achievement.

Several methodologies have been utilized to explore the learning environment like qualitative approaches [5], quantitative [6,7] or both [8,9]. Nevertheless, for most of the health-care related courses [4,10-15]. Dundee Ready Educational Environment Measure (DREEM) has been employed to introspect the learning environments. The DREEM questionnaire developed by Delphi technique reflects a students' overall perception of teaching in five aspects of learning, their learning, their perception of teaching, academic self-perception, educational atmosphere and social self-perceptions. Globally, this questionnaire has been employed by many dental schools [12,16-18], nevertheless to our knowledge only one study has been reported in India [11]. Therefore, the aim of the present study was to evaluate student's perception of the learning environment in a private dental institute in India based on DREEM inventory and determine the strengths and weakness of the institution.

MATERIALS AND METHODS

Study Participants

This cross-sectional study included students in all four years of the undergraduate dental course of Panineeya Institute of Dental Sciences and Hospital, Hyderabad, India. All the students were briefed about the purpose of the study and were assured of anonymity and confidentiality. Participation was voluntary and participants' consent to take part in the study was inferred by completed questionnaire. Ethical Clearance from Institutional Review Board was obtained.

Survey Instrument

The Dundee Ready Education Environment Measure (DREEM) inventory was utilized to assess the students' perceptions regarding learning environment in this academic dental school. This self-

Year of study	Male n (%)	Female n (%)	Total n (%)
First	10 (14.5)	59 (85.5)	69 (24.8)
Second	9 (13.0)	60 (87.0)	69 (24.8)
Third	16 (22.2)	56 (77.8)	72 (25.9)
Fourth	24 (35.3)	44 (64.7)	68 (24.5)
Total	59 (21.2)	219 (78.8)	278 (100.0)
Mean ± SD age	19.98 ± 1.61	19.51 ± 1.46	19.61 ± 1.50

[Table/Fig-1]: Distribution of study population based on gender and year of study

		Total DREEM scores (Max – 200) Mean ± SD	SPL (Max – 48) Mean ± SD	SPT (Max – 44) Mean ± SD	SAS (Max – 32) Mean ± SD	SPA (Max – 48) Mean ± SD	SSS (Max – 28) Mean ± SD
Male		121.83 ±23.05	29.31 ± 7.03	27.02 ± 5.55	21.76 ± 5.81	28.24 ± 6.88	15.51 ± 4.30
Female		126.16 ± 20.50	31.52 ± 6.96	28.64 ± 4.48	21.06 ± 5.13	28.63 ± 5.79	16.31 ± 3.78
Total		125.24 ± 21.10	31.05 + 7.02	28.30 ± 4.76	21.21 ± 5.28	28.55 ± 6.03	16.14 ± 3.90
p-value		0.16	0.03*	0.01*	0.36	0.65	0.16
Year of Study	First year	128.35 ± 16.60	32.30 ± 5.51	28.65 ± 4.19	21.59 ± 4.36	29.43 ± 5.25	16.36 ± 3.36
	Second year	124.62 ± 20.67	31.46 ± 6.15	27.77 ± 4.52	21.00 ± 5.09	28.38 ± 6.19	16.01 ± 4.25
	Third year	129.92 ± 20.02	32.33 ± 6.24	29.60 ± 4.76	22.17 ± 5.11	29.35 +± 5.99	16.47 ± 3.50
	Fourth year	117.78 ± 24.74	27.99 ± 8.96	27.10 ± 5.23	20.01 ± 6.28	26.99 ± 6.44	15.69 ± 4.45
Total		125.24 ± 21.10	31.05 ± 7.02	28.30 ± 4.76	21.21 ± 5.28	28.55 ± 6.03	16.14 ± 3.90
p-value		0.003*	0.0004*	0.01*	0.09	0.05	0.63

[Table/Fig-2]: Mean + S.D of the overall DREEM and domain scores based on gender and year of study, **Statistically significant*

Domain		Items	Gender		p-value	Year of Study				p-value
			male	female		First	Second	Third	Fourth	
SPL	7	The teaching is often stimulating	2.4	2.5	0.71	2.6	2.6	2.7	2.1	0.009*
	13	The teaching is student centred	2.4	2.4	0.89	2.4	2.6	2.7	2.1	0.004*
	16	The teaching helps to develop my competence	2.6	2.8	0.06	3.1	2.7	2.7	2.5	0.001*
	20	The teaching is well focused	2.7	2.7	0.36	2.9	2.8	2.8	2.4	0.004*
	21	The teaching helps to develop my confidence	2.7	2.8	0.27	3.0	2.8	2.8	2.5	0.05*
	24	The teaching time is put to good use	2.4	2.8	0.005*	2.9	2.6	2.8	2.4	0.04*
	25	The teaching over emphasizes factual (realistic) learning	2.2	2.5	0.013*	2.4	2.5	2.7	2.0	0.001*
	44	The teaching encourages me to be an active learner	2.3	2.7	0.03*	2.7	2.6	2.7	2.3	0.08
SPT	9	The teachers are authoritarian	2.6	2.7	0.13	2.5	2.6	2.9	2.8	0.007*
	18	The teachers have good communication skills with patients	2.8	2.8	0.88	2.9	2.9	3.0	2.4	0.01*
	29	The teachers are good at providing feedback to students	2.5	2.5	0.82	2.7	2.5	2.6	2.1	0.01*
	40	The teachers are well prepared for their classes	2.6	2.9	0.02*	3.1	2.8	2.8	2.8	0.08
	50	The students irritate the teachers	1.4	1.7	0.09	1.5	1.6	2.0	1.3	0.007*
SAS	26	Last year's work has been a good preparation for this year's work	2.9	2.6	0.01*	2.6	2.6	2.9	2.5	0.18
	45	Much of what I have to learn seems relevant to a career in healthcare	2.7	2.8	0.17	2.9	2.7	3.0	2.6	0.02*
SPA	12	This course is well timetabled	2.3	2.4	0.70	2.7	2.2	2.4	2.1	0.007*
	30	There are opportunities for me to develop interpersonal skills	2.5	2.6	0.74	2.9	2.5	2.6	2.3	0.007*
	35	I find the experience disappointing	2.0	2.1	0.38	1.9	2.3	1.9	2.4	0.003*
	42	The enjoyment outweighs the stress of the course	2.5	2.1	0.03*	2.4	2.2	2.3	1.8	0.05*
	43	The atmosphere motivates me as a learner	2.3	2.4	0.54	2.6	2.4	2.4	2.1	0.039*
SSS	3	There is a good support system for students who get stressed	1.7	1.7	0.75	2.0	1.7	1.8	1.4	0.008*
	4	I am too tired to enjoy the course	2.2	2.2	0.89	1.8	2.6	2.0	2.5	0.000*
	46	My accommodation is pleasant	2.2	2.6	0.01*	2.8	2.3	2.7	2.2	0.01*

[Table/Fig-3]: Mean DREEM domain item scores where significant differences were observed between gender and year of study., **statistically significant*

administered questionnaire consists of 50-items on a five-point Likert scale (4 – Strongly Agree; 3- Agree; 2- Uncertain; 1 – Disagree; 0 – Strongly Disagree) with a maximum score of 200 categorised into the following five domains :

1. **Students' Perception of Learning (SPL) –** 12- items; maximum score-48; satisfactory score-24
2. **Students' Perception of Teachers (SPT)** – 11- items; maximum score-44; satisfactory score-22
3. **Students' Academic Self-Perceptions (SASP)** – 8- items; maximum score-32; satisfactory score-16
4. **Students' Perception of Atmosphere (SPA)** – 12- items; maximum score-48; satisfactory score-24
5. **Students' Social Self-Perception (SSS)** – 7- items; maximum score-28; satisfactory score-14

Seven negative items were scored in reverse order (4, 8, 9, 17, 25, 35, 39, 48 & 50). According to Roff et al., [19], individuals items with a mean score of 3 or greater reflect a positive educational environment implying the strengths of the institution; items with a mean score between 2 and 3 demonstrate areas that are neither strengths or weakness but are regarded as areas that could be enhanced and items with a mean score of 2 or below point towards areas of weaknesses of the institution. Interpretation of overall DREEM score and domain scores was done using the guide proposed by Roff & Mc Aleer [2].

STATISTICAL ANALYSIS

The validity of the questionnaire was calculated using Cronbach's alpha. Demographic data and DREEM scores were entered and analysed using Statistical Package for Social Sciences (SPSS version 14). Mean and Standard Deviation were calculated for DREEM total and domain scores based on gender and year of undergraduate study. Comparison for the total and domain DREEM score means was carried out via independent t-test for dichotomous variables

Variables	SPL	SPT	SAS	SPA	SSS
SPL	1.0000				
SPT	r=0.5806*	1.0000			
SAS	r=0.5869*	r=0.4030*	1.0000		
SPA	r=0.5898*	r=0.5239*	r=0.6635*	1.0000	
SSS	r=0.3575*	r=0.3107*	r=0.3555*	r=0.4889*	1.0000

[Table/Fig-4]: Correlation among of DREEM scores by karl pearson's correlation coefficient., *$p<0.05$

(gender) and ANOVA for more than two variables (year of study). Where ANOVA revealed a significant difference, post-hoc pair-wise comparison was done by means of Tukey's test. Correlation among the domains was done using Karl Pearson's correlation coefficient. Significant difference was noted for $p < 0.05$.

RESULTS

Each of the 50-items on the DREEM was correlated with the overall score for the scale and alpha values were computed with each item removed. The overall reliability co-efficient alpha was 0.89 and validity 0.95.

Out of the 320 questionnaires distributed, 278 returned completed questionnaire and were included in the study (Response rate – 86.8%).

Study Participants' Demographics

[Table/Fig-1] demonstrates the number and percentages of the study population based on gender and year of study. Out of the 278 who completed the study, 59 (21.2%) were males and 219 (78.8%) were females. Mean age of the study participants was 19.61 ± 1.50 years.

Overall DREEM and Domain score

The overall DREEM score for this population was 125.24 + 21.10 reflecting a more of positive than negative education environment in this institution. No significant gender difference was noted for overall DREEM score. Nonetheless, there was a significant difference in the overall DREEM score ($p = 0.003$) based on the year of study with highest mean score for third year (129.92 ± 20.08) and least for fourth year (117.78 ± 24.74). Posthoc analysis revealed significant difference of fourth year with first year ($p = 0.01$) and third year ($p = 0.002$).

When individual domain scores were accounted, except for the domain SAS, females had a higher mean scores for all domains which was however statistically significant only for the domains SPL ($p = 0.03$) and SPT ($p = 0.01$). Likewise, significant differences were also noted for SPL and SPT based on the year of study, wherein for both the domains, third year students had significantly higher mean scores and least was recorded for fourth year students. Pair-wise comparison revealed significant difference between fourth year with all the years for SPL and conversely, for SPT, significant difference was observed only between third and fourth year [Table/Fig-2].

Item-wise comparison illustrated that for the domain SPL significant gender differences were noted for items 24; 25 and 44 and based on the year of study for items 7,13,16,20,21,24,25. For all other domain, only one item in each domain showed significant gender difference (SPT- 40; SAS – 26; SPA – 42; SSS – 56). Year of study revealed significant differences in 4-items in domains SPT (9,18,29,49); one item in SAS (45); 5-items in SPA (12,30,35,42,43) and three items in SSS (3,4,46) [Table/Fig-3].

Correlation of the various domains demonstrated significant positive correlation among the domains [Table/Fig-4].

DISCUSSION

Evaluation of learning environment in health professional institutes have been recognized worldwide [10, 12, 15-18, 20-23], surprisingly little work has been done with this regard in India [11,13,24,25]. Investigating student's perception provides a valuable insight into the course environment, hence, the present study aimed to evaluate student's perception of their learning environment in a private dental institute in India. The DREEM inventory employed in this study has been a valid tool in identifying the difficult areas of learning process in many dental institutes [11,12,16-18,26-27]. A good response rate of 86.8% indicates that students were interested in participating in the study. In our study, Cronbach's alpha value was 0.8 demonstrating a high level of internal consistency and the ability to produce similar results on similar cohort at different times and occasions.

The overall DREEM score for this population was 125.24 ± 21.10 signifying a more positive than negative learning perception among this group of dental students. This corresponded to the findings of the study by Ostapczuk MS et al., among German students [12]. On the other hand, this value was lower when compared to students of Peninsula dental school, United Kingdom [17] (143.58 + 20.84) and higher in comparison with that of dental institutions' in Pakistan (115.06) [26].

Though no statistically significant difference was observed based on gender ($p = 0.16$), females perceived the learning environment in a more positive manner than their male counterparts, which could be attributed to typically different learning styles among them [28].

Of all the responses, the least score for the overall and the domain scores was recorded for fourth year students. This observation could be because during the final year, the students are encouraged more towards self-directed learning so that they might develop the confidence to work independently. Also, stress related to work completion and appearing for the final qualifying examination may have attributed to the lower score. On the contrary, the overall and the subscale values were high for third year students. This perception by this year of students could be because learning is put into practice with step-by-step training and guidance from the teachers.

The average score of responses to the first subscale SPL was 31/48 and most of the items score than 2. This reflects Socratic methodology with realistic learning and encouraging students to actively participate in the learning process. Favorable perceptions regarding teachers their knowledge, preparation depicts that the learning process is moving in the right direction (SPT 28/44). Likewise, scores of SAS, SPA and SSS also signifies that the overall learning environment in this dental institute was positive.

Analysis of individual items can be useful in recognizing areas of strengths and weaknesses. On the whole, two questions that scored above three were students perceived teachers to be knowledgeable (I2) and that students are more confident of passing this year (I10). This can be regarded as the strengths of the institution. Conversely, certain areas of concern (score less than 2) were also highlighted in this study. Firstly, concern over the support system for stressed students (I3), which also has be a recognized concern for most of the teaching medical schools [7, 20,29]. Despite the fact that in our institution, Students' Cell is made available to counsel students, it has not been utilized may be due to personal reasons.

Secondly, students felt that the course bored them (I14), this could be because of the limited and repetitive clinical procedures they are allowed to perform in this stage of clinical teaching. Lastly, student's feel that they irritate teachers (I50), which may in turn affect the teaching approach.

Based on the reports of this study, a few recommendations can be suggested in the dental education system. The curriculum can be based on the SPICES(student-centred, problem-based, integrated, community-based, electives and systematic) model [30] rather than the traditional classroom-based teaching. This will enable to stimulate and facilitate students' at integrated theory components with practice thereby assist them to approach learning as a lifelong

process rather than factual learning. Moreover, it might revolutionize the curriculum to student- centred rather than teacher-dominated. Teachers can be motivated by rewarding them for their fineness in teaching and leadership. Introduction of personal tutoring system, peer tutoring and senior to junior mentoring can aid in creating a more supportive and positive learning environment.

However, generalization of this study results should be done with certain limitations. Firstly, the self-report nature of the study itself may contribute to bias. Secondly, only information from one institute was obtained due to logistic reasons.

CONCLUSION

Overall this sample of dental students rated the learning environment in this dental institute as positive. The study bestows valuable insight as to how students' view the course thereby enabling the institutes to address student's specific concern. Also, it is recommended to continuously acquire students' perceptions so as to offer them an optimized learning environment.

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PARTICULARS OF CONTRIBUTORS:

1. Reader, Department of Public Health Dentistry, Panineeya Institute of Dental Sciences and Hospital, Road no. 5, Kamalanagar, Dilsukhnagar, Hyderabad, Telangana, India.
2. Reader, Department of Public Health Dentistry, Panineeya Institute of Dental Sciences and Hospital, Road no. 5, Kamalanagar, Dilsukhnagar, Hyderabad, Telangana, India.
3. Principal and Head, Department of Conservative Dentistry & Endodontics, Panineeya Institute of Dental Sciences and Hospital, Road no. 5, Kamalanagar, Dilsukhnagar, Hyderabad, Telangana, India.
4. Reader, Department of Biochemistry, Sri Sai College of Dental Surgery, Vikarabad, Hyderabad, Telangana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Dolar Doshi,
Reader, Department of Public Health Dentistry, Panineeya Institute of Dental Sciences & Hospital,
Road no. 5, Kamalanagar, Dilsukhnagar, Hyderabad – 500 060, Andhra Pradesh, India.
Phone : +91-9985217700, Fax : +91-40-24045037, E-mail : doshidolar@yahoo.com

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