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STUDENT PERCEPTION OF EDUCATIONAL ENVIRONMENT IN REHMAN MEDICAL COLLEGE, PESHAWAR, PAKISTAN

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ABSTRACT

Introduction: Modern education emphasizes the building up of an effective educational environment as a tool to enhance learning. To optimize the educational environment, it is imperative to diagnose its strengths and identify weaknesses for remediation. The present study was conducted to evaluate the Integrated Medical Curriculum at Rehman Medical College, Peshawar, Khyber Pakhtunkhwa, based on students' perception of the curriculum, so that weak areas of the program could be identified and remediation done.

Materials & Methods: The cross sectional survey was conducted on MBBS students of professional years 1-5 at Rehman Medical College (RMC) in June 2015 (towards the end of the academic session), through convenience sampling, maintaining confidentiality of identity. All students present on the days of questionnaire distribution were enrolled and the standardized 50-item Dundee Ready Educational Environment Measure (DREEM) administered to them after informed consent and relevant instructions. Data were entered and analyzed by SPSS 15.0 for descriptive statistics; year-wise comparisons were done through one-way ANOVA, keeping $p \leq 0.05$ as significant.

Results: A total of 337 questionnaires were collected (response rate 67%). The overall mean score was 116.14±28.54 indicating "more positive than negative" perception of the RMC educational environment; the highest score was from Year 4 (126.27±40.53) and the lowest was from year 2 (107.37±30.89). In subscale analysis of mean scores, PoT scored highest (60.75%), followed by PoL (58.71%), ASP (58.2%), SSP (57.53%), and PoA (55.52%). Regarding Likert scale categories of mean scores for the 250 responses of all five MBBS years, 43(17.2%) were in the <2.00 category, 109(43.6%) were in the 2.00-2.49 category, 82(32.8%) were in the 2.50-3.00 category, while the remaining 16(6.4%) were in the >3.00 category.

Conclusion: Students' perceptions of the RMC educational environment indicated a "more positive than negative" response and compared favorably with other studies from Pakistan and other developing countries.

Keywords: Education, Medical, Undergraduate; Students, Medical; Curriculum; Learning; Perception.

The authors declared no conflict of interest. All authors contributed substantially to the planning of research (TSM, AR), data collection (AR, SB), data analysis (SB, AR) and write-up of the article (TSM, AR) and agreed to be accountable for all aspects of the work.

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INTRODUCTION

Educational Environment is the atmosphere within which the student studies. It is considered an important factor in effective student learning. The professional development of students depends to a large extent on the attributes of the environment where they study or work that has a recognized impact on their behavior, academic progress and sense of wellbeing.[1-3]

Past reviews project the educational environment emphatically because of its association with scholarly achievements and fulfillment with instructive educational programs. Better learning is based on educator perception of the importance of educational environment. It impacts on how, why, and what the students learn.[3]

Though it is understood that the educational environment is a natural and intangible perception, significant advancement has been made in the last quarter of the twentieth century to further new dimensions and development of its conceptualization. The assessment inventories of the educational environments aim for students' perceptions to be quantified and compared either longitudinally within an individual health professions institution or between different institutions.[4]

The World Federation for Medical Education (WFME, 1998) also considers the learning environment as one of the areas that should be targeted while evaluating medical education programs.[5] Various researches over the years have attempted to identify and quantify the presence of rather intangible aspects of a learning environment, such as the "climate, atmosphere, ethos, tone, ambience, the culture and personality of the institution".[6]

Social, cultural and psychological elements are also included in the educational environment (EE) over and above the physical surroundings.[3] According to Genn (2001) understanding of learning environment and sub-environments has the potential for managing curriculum development and change;[7] a curriculum's most significant manifestation and conceptualization is the environment, educational and organizational, which embraces everything that is happening in the medical school.[7] The curriculum and students' perception towards it may affect the quality of learning, and thus, their motivation. The students' feedback becomes pivotal for the success of the educational climate.[8] Before entering a new learning institution, students and their parents enquire about the teaching and learning environment in addition to social climate of the institution. The institution also has an obligation to offer a 'fit for purpose' curriculum in an educational environment that will enhance the prospects of success of its students.[9]

Various methodologies have been developed to investigate educational environment. Researchers have applied qualitative approaches or the use of questionnaires. One of the validated questionnaires developed by Roff et al (1997) is DREEM (Dundee Ready Educational Environment Measure) Questionnaire.[10] The DREEM was developed and validated by an international Delphi panel of medical educators, together with its testing for reliability on a culturally diverse student sample.[11] It is the most specific tool for investigation of the unique environment experienced by students on medical and health care related courses. DREEM can be used as an overall diagnostic tool, for comparing 2 independent samples and for comparing 2 matched samples.

Since the educational environment can be improved, it is imperative to diagnose its strengths and identify weaknesses for remediation. The present study was therefore conducted to evaluate the Innovative Integrated Medical Curriculum at Rehman Medical College, Peshawar, Khyber Pakhtunkhwa, based on students' perception of the curriculum, so that weak areas of the program could be identified and remediation done.

MATERIALS & METHODS

The cross sectional study was carried out at Rehman Medical College, Peshawar, Khyber Pakhtunkhwa, Pakistan from March to June 2015 (data collected in June towards the end of the academic session) on all the students of First to Final Professional MBBS years who consented for the survey through the standardized self-administered DREEM questionnaire. Before the survey, important terms were explained to the students of the respective year. Students were given the option to write their names or not, and all names

were kept confidential. Convenience sampling was employed among different professional year students while collecting data from individual classes. An attempt was made to measure the student's perception and compare various years. The inventory is used in the present study as a diagnostic tool, to diagnose specific problem areas based on subscale analysis, and to observe the trends in students' perception as they move up the academic ladder.

DREEM Questionnaire

The DREEM questionnaire consists of 50 items, each scored 0-4 on a 5-point Likert scale (*0 = Strongly disagree, 1 = Disagree, 2 = Unsure, 3 = Agree, and 4 = Strongly agree*). The inventory has 5 subscales measuring Students Perception of Learning (PoL, 12 items), Perception of Teachers (PoT, 11 items), Academic Self Perception (ASP, 8 items), Perception of Atmosphere (PoA, 12 items) and Social Self Perception (SSP, 7 items); the DREEM Items are administered in random order rather than in sub scales.

Nine out of 50 items are Negative statements (items 4, 8, 9, 17, 25, 35, 39, 48, and 50); these are scored in reverse, so that high scores on these items indicate disagreement with the negative statement, i.e. a positive result. The questionnaire generates an overall "score" for the course.

Higher the total and dimensional scores, the better the environment. Roff (2005),[12] described that on an average the DREEM score varied from 78 to 139 out of 200 and the questionnaire had the ability to identify the strengths and weaknesses of a particular institution.

According to MacAleer and Roff (2001)[4] the inventory can be used to identify areas of strength and weaknesses. Individual items with a mean score of $\geq$3 in the present study indicates strong areas, items with a mean score of ≤2 need particular attention, and items with mean scores between 2 and 3 are areas of the educational environment that could be improved.

Data were analyzed for descriptive data using SPSS 15, and results were expressed as means of scores. Comparisons between the different MBBS years were made using ANOVA, keeping p≤0.05 as significant.

RESULTS

The total number of students who volunteered in the present study was 337/503 (67% response rate). The breakdown for the respective classes was 1st year (n=76, 22.55%), 2nd year (n=76, 22.55%) 3rd year (n=38, 11.27%), 4th year (n=71, 21.06%) and final year (n=76, 22.55%).

Table 1 shows the mean DREEM scores based on subscales for all the respective years.

Overall mean DREEM score for all MBBS years was 116.14±28.54 (58.1%)); the individual scores of each MBBS year were 112.51±21.30 (56.25%) for First Year, 107.37±30.89 (53.7%) for Second Year, 117.10±22.64 (58.55%) for Third Year, 126.27±40.53 (63.13%) for Fourth Year, and 118.62±16.14 (59.31%) for the Final Year MBBS. These differences were statistically significant by one-way ANOVA (p=0.001).

Analysis of mean subscale scores showed that PoT scored highest (26.73/44, 60.75%), followed by PoL (28.18/48, 58.71%), ASP (18.62/32, 58.2%), SSP (16.11/28, 57.53%), and PoA (26.65/48, 55.52%).

Significant differences were found by one-way ANOVA for all the mean subscale scores of five MBBS years with overall p=0.002; p<0.001 for PoL, and PoT, p=0.001 for ASP, p=0.004 for ASP, and p=0.005 for SSP.

Table 1: MBBS year-wise comparison of subscale items (n=337).

DREEM Subscales	Year 1 Mean & SD (Range)	Year 2 Mean & SD (Range)	Year 3 Mean & SD (Range)	Year 4 Mean & SD (Range)	Year 5 Mean & SD (Range)	Overall Mean (Range)
POL (Max. 48)	26.02±7.02 (10-43)	25.00±9.82 (0-48)	28.32±6.18 (17-41)	32.70±10.19 (0-47)	29.21±5.37 (14-43)	28.18±8.53 (0-48)
POT (Max. 44)	24.45±4.71 (10-37)	26.92±6.96 (0-41)	27.55±3.89 (19-33)	29.75±10.15 (4-44)	25.60±3.70 (15-35)	26.73±6.74 (0-44)
ASP (Max. 32)	16.10±5.23 (6-31)	17.96±7.47 (0 – 31)	20.54±5.80 (6-31)	19.35±8.62 (0-32)	20.17±4.46 (10-31)	18.62±6.69 (0-32)
POA (Max. 48)	27.49±6.6 (12-46)	23.51±9.28 (4-40)	25.70±6.76 (12-44)	28.70±12.79 (0-48)	27.46±4.85 (15-37)	26.65±8.77 (0-48)
SSP (Max. 28)	17.27±3.92 (7-28)	14.92±5.16 (2-27)	16.65±4.26 (7-25)	15.76±7.87 (0-28)	16.17±3.06 (10-25)	16.11±5.20 (0-28)
Subscales Mean Scores**	22.50±4.26 (10.60-33.4)	21.77±6.16 (0.8-32.4)	23.79±3.88 (15.2-32.8)	25.25±8.10 (3.6-39.6)	23.72±3.22 (15-33.8)	23.34±5.63 (0.8-39.6)
Overall Mean Scores* (Max. 200)	112.51±21.30 (53-167)	107.37±30.89 (4-162)	117.10±22.64 (47-164)	126.27±40.53 (18-198)	118.62±16.14 (75-169)	116.14±28.54 (4-198)

*p=0.001 for the difference in mean scores by MBBS years. **p=0.002 for subscales means by MBBS years.

The subscale scores for all years are shown in Table 2a and Table 2b.

Overall, year 4 had better results for PoL, PoT and PoA as compared to rest of the years. ASP and SSP are two areas of low scores throughout the academic years, however they can be categorized in more positive than negative category, according to practical guide by MacAleer and Roff (2001).[4] These areas need to be stressed for provision of conducive learning environment for the students.

As per Table 2a, the worst score for year 1 was 1.57 for, "*I am confident about passing this year*" (positive trend); the worst scores for "*There is a good support system for students who get stressed*" was 1.23 in 2nd Prof, and 1.93 in 4th Prof (negative trends); third Prof scored lowest (1.79 each) in two items of PoL: "*Long term learning is emphasized over short term learning*" (negative trend), and "*The teaching is too teacher centered*" (positive trend); for final Prof, the lowest score was 1.14 for, "*The students irritate the teachers*" indicating a positive trend.

Table 2a: Lowest response scores of subscale items by MBBS years (n=337).

#	Subscale Items	MBBS Years				
		Year 1	Year 2	Year 3	Year 4	Year 5
1.	Perception of Learning (PoL)					
	• Long term learning is emphasized over short term learning	2.73±1.00	1.80±1.37	1.79±1.07	2.27±1.43	2.55±0.86
	• The teaching is too teacher centered	2.97±1.08	1.80±1.37	1.79±1.07	2.27±1.43	1.91±0.87
2.	Perception of Teaching (PoT)					
	• The students irritate the teachers	2.66±1.01	2.71±1.02	3.08±0.54	2.70±1.70	1.14±0.86
3.	Academic Self Perception (ASP)					
	• I am confident about passing this year	1.57±0.72	2.97±1.10	2.95±0.91	1.96±1.80	3.14±0.80
4.	Perception of Atmosphere (PoA)					
	• The program is well timetabled	2.10±1.06	2.15±1.37	1.83±1.46	2.18±1.47	1.53±1.23
5.	Social Self Perception (SSP)					
	• There is a good support system for students who get stressed	2.70±1.03	1.23±1.29	1.38±1.30	1.93±1.40	1.29±1.10

As far as higher scores were concerned (Table 2b), Year 1 scored 3.46 in "*I find the experience disappointing*" indicating a negative trend; Year 2 also obtained 3.24 for "*The teachers get angry in class*" another negative trend. Other positive trends were 3.20 for "*I am rarely bored on this course*" for year 1, 3.14 for "*I am confident about passing this year*" for year 5, and 3.01 each for "*The teaching is often stimulating*" and "*The teaching is student centered*" for year 4.

Table 2b: Highest response scores of subscale items by MBBS years (n=337).

#	Subscale Items	MBBS Years				
		Year 1	Year 2	Year 3	Year 4	Year 5
1.	Perception of Learning (PoL)					
	• The teaching is often stimulating	2.30±0.92	1.95±1.16	2.53±0.92	3.01±1.34	2.44±0.96
	• The teaching is student centered	2.28±0.96	2.17±1.10	2.55±0.83	3.01±1.14	2.37±1.00
2.	Perception of Teaching (PoT)					
	• The teachers get angry in class	2.76±1.11	3.24±1.06	2.59±1.32	2.34±1.63	1.76±1.15
3.	Academic Self Perception (ASP)					
	• I am confident about passing this year	1.57±0.72	2.97±1.10	2.95±0.91	1.96±1.80	3.14±0.78
4.	Perception of Atmosphere (PoA)					
	• I find the experience disappointing	3.46±0.88	2.47±1.20	2.14±1.04	2.32±1.54	1.67±0.87
5.	Social Self Perception (SSP)					
	• I am rarely bored on this course	3.20±1.06	1.76±1.37	1.81±1.40	2.23±1.53	1.84±1.01

Table 3 depicts the distribution of 250 responses for the 50-items of DREEM based on the Likert scale categories. The most frequent responses were categorized as 2-2.49 on the Likert scale, comprising 109(43.6%), followed by 82(32.8%) in the 2.5-3.00 scale category; there were 43(17.2%) responses in the <2.00 category, and 16(6.4%) responses in the >3.00 category. Students of forth year MBBS scored 48 items as more positive than negative as compared to other years i.e. items with mean scores 2.00 and above, while year 2 identified 14 areas with scores <2.00 that needed particular attention. Overall 43(17.2%) items needed redress i.e. score less than 2.

Table 3: Year-wise mean score frequencies by Likert scale categories (n=337).

Mean score categories	Year 1	Year 2	Year 3	Year 4	Year 5	Total
>3.0	05	02	03	03	03	16
2.5 - 3.00	17	07	16	22	20	82
2 - 2.49	21	27	21	23	17	109
< 2	07	14	10	02	10	43
Total	**50**	**50**	**50**	**50**	**50**	**250**

Comparison of the mean scores of subscales by MBBS years is shown in Figure 1. The highest mean is shown by PoL in year 4, however it suffers a steep fall in year 2, thereby relegating it to overall second place after PoT, which shows an overall greater consistency, except for a dip in the final year, nearing its first year level. PoA remains fairly steady, except for a serious dip in year 2, that undermines its overall ranking. Though ASP shows a steady improvement with MBBS years, SSP seems to dip after year 2 and thereafter does not recover to any extent. A

consistent dip is seen in 3 subscales of PoL, PoA, and SSP in year 2, while rises are seen in PoT and ASP in the same year; year 4 shows the best scores overall.

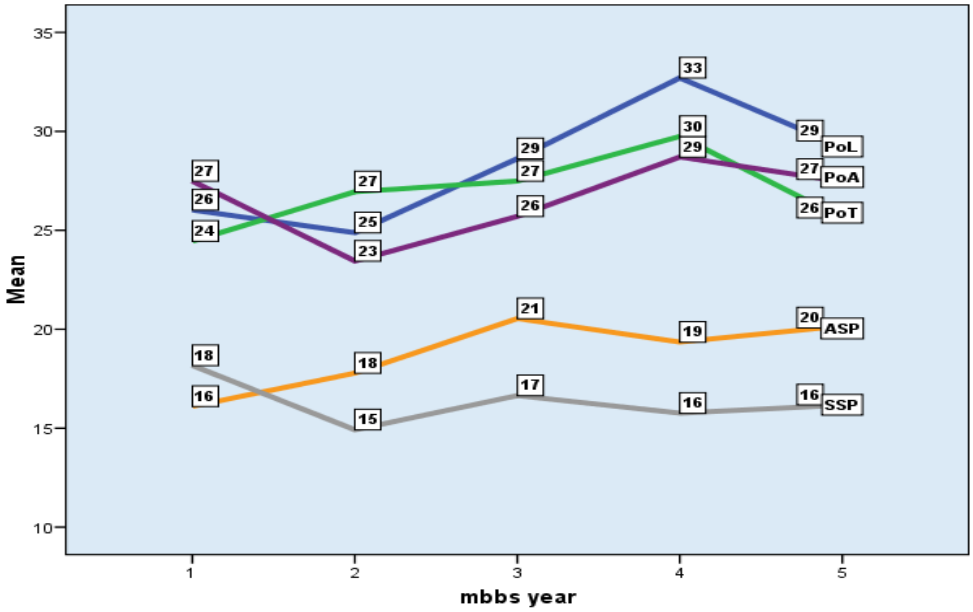

Figure 1: Comparison of the mean scores of DREEM subscales by MBBS years (n=337).

DISCUSSION

In the present study DREEM inventory was used to assess the satisfaction level of students in MBBS program from 1st year to Final year. Mean score for the inventory was 116 out of 200 (n= 337) showing more positive perception of students than negative. DREEM scores for medical colleges in Sri Lanka, Nepal, Nigeria, UK and India were reported as 108/200, 130/200, 118/200,139/200 and 117/200 respectively.[11] A similar study in Pakistan by Masood J et al showed a score of 114/200 in three medical colleges of Karachi.[8] There is no established agreement on what actually is the acceptable DREEM inventory score from published literature.[6,8]

Table 5 provides a summary of comparisons of overall DREEM scores from different relevant research studies around the world. The present study shows a comparable score with other similar institutions of developing countries, though lower scores than the UK.

Table 5: Comparison with literature

#	Authors	Place	Year	Sample	Overall DREEM score
1.	Present Study Mufti T et al.	Peshawar, Pakistan	2015	Private medical college All Five Years	116 .29
2.	Masood J et al[8]	Karachi, Pakistan	2013	3 medical colleges	114.4
3.	Tontus HO et al[15]	Turkey	2010	11 medical schools	104.05
4.	Khan JS et al[7]	Lahore, Pakistan	2011	Final year 6 Public colleges 2 Private colleges	125 115 137
5.	Abraham R et al[15]	India	2008	First Year Clinical year	119 114
6.	Varma R et al[14]	Birmingham, UK	2005	Obs & Gyn students 8 medical schools	139

In this study, the obtained overall score is an indicator of positive learning environment for medical students. Improvement in scores throughout the program depicts enhancement in student understanding and adjustment to the college's environment and better end results in the annual examination.

The overall score of 116 indicating "*More positive than negative*" evaluation of the RMC educational environment is similar to other studies in the developing world[13] and is encouraging since RMC is a new college with an innovative curricular design, compared to other older colleges mentioned in the literature.

Subscale analysis showed the highest score was obtained in PoT (60.75%), followed by PoL (58.71%), ASP (58.2%), SSP (57.53%), and PoA (55.52%). A study from Pakistan[9] found highest score of 58.5% in ASP, and lowest in PoL at 53.7%; however, an international study by Varma et al[14] identified domains similar to this study, though they were not significantly different from other domains statistically.

On comparison of other items among the various years, Fourth year students believed their teachers' teaching to be more stimulating, participatory and student centered, with the first year students closely matching their views in perception of learning. Final year students believed their teachers to be more knowledgeable than the rest of the years. The students in general had consensus that the teachers are authoritative, however they provide constructive criticism. The level of confidence improved gradually throughout the successive years with a dip in year 4 and highest score in final year MBBS. The students' perception of their preparation for Professional Examinations also improved as they moved on their academic ladder. Students' self-perception about problem solving skills and relevance of their medical education to careers in healthcare were more or less the same, with the second year being less satisfied with their problem solving skills.

Students believed that the atmosphere of the college in general is relaxed specially during the ward teaching and lectures, although third year students were not satisfied with ward teaching. Students felt comfortable and believed that there were opportunities for them to develop their interpersonal skills. They are able to concentrate well and they are motivated to learn except second year MBBS.

As the DREEM inventory is a measure of an overall motivation and attitude of an individual student rather than an independent scale to measure environment,[17] it therefore does not give deep insight about the reasons underlying perceptions. Thus, qualitative studies as an adjunct to DREEM can significantly improve areas of student dissatisfaction.

CONCLUSION

The findings are consistent with a positive response from junior and senior students which is encouraging for a new medical college in which there is no prior experience of innovative educational environment.

RECOMMENDATION

Further studies are required to obtain and analyze data from the same environment for remediation of weak areas so as to improve the DREEM scores.

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