Original Research Paper

Students' perception of the educational environment in a Medical Faculty with an innovative curriculum in Sri Lanka

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Abstract

Introduction: The educational environment is crucial in determining the success of undergraduate medical education. The Dundee Ready Education Environment Measure (DREEM) is a validated tool to assess the educational environment created in medical schools. The University of Colombo, Faculty of Medicine (UCFM) is an established medical school with an innovative curriculum. Though the curriculum is periodically monitored the 'educational environment' crucial to its success is not regularly assessed. We studied the educational environment created at the UCFM, using the DREEM questionnaire.

Materials and methods: The DREEM questionnaire was administered to a batch of 192 senior medical undergraduates at UCFM maintaining anonymity. The results were analysed using SPSS 16 and relevant statistical tests. Results were compared with relevant similar studies.

Results: Of the 151 students (78.6%) who responded, majority (65.6%) responded 'more positively than negatively' to the DREEM inventory. The global mean score was 53.7% in comparison to medical schools of Dundee (69.5%), Nepal (65%) and Sri Jayawardenapura in Sri Lanka (53.6%). The study subscale scores were placed a step below the ideal score, similar to scores of above medical schools. Of the sub scales, the student's perception of teachers and their perception of the atmosphere scored comparatively lower, with significant gender differences in perception.

Discussion: Majority had a positive perception of the UCFM educational environment with males requiring more support in certain areas. The two Sri Lankan medical schools had similar results. Problem areas and areas requiring enhancement in the UCFM educational environment needs effective management for the success of its curriculum.

*Key words***:** medical curricula, University of Colombo Faculty of Medicine, medical undergraduates, DREEM questionnaire

Introduction

The 'educational environment' defined as everything that happens within the classroom, department, faculty or university is crucial in determining the success of undergraduate medical education (Genn, 2001; Roff & McAleer 2001). Motivated learners in supportive environments have high levels of self-efficacy. Thus effective management of learning is aided by understanding the educational environment and introducing appropriate changes. The Dundee Ready Education Environment Measure (DREEM) (Roff *et al.,* 1997) is specific to the unique environment experienced by students in medical and healthcare related courses (Whittle *et al.,* 2007). DREEM questionnaire developed by an international Delphi panel has been applied to several undergraduate courses for health professionals worldwide (Whittle *et al.,* 2007). It produces global readings and diagnostic analyses allowing quality assurance comparisons to be made between courses as well as within components of a course (Roff & McAleer, 2001; Roff, 2005).

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The Faculty of Medicine of the University of Colombo (UCFM) is an established medical school with a history of 140 years. Its traditional discipline based curriculum was replaced by an innovative, integrated curriculum in 1995. The current curriculum includes five streams comprising Introductory Basic Sciences, Applied Sciences, Behavioral Sciences, Clinical Sciences and Community Streams with varying emphasis at different stages of the curriculum. The curriculum and its delivery are periodically monitored, however the 'educational environment' crucial to the success of undergraduate medical education is not regularly assessed. Thus we aimed to assess the students' perception of the educational environment at the UCFM using the DREEM questionnaire and to compare results with relevant similar studies.

Methods

All students (n=192) in a batch of senior UCFM medical undergraduates adequately exposed to the five curricular streams and to different modalities of teaching and learning comprised the study population. The gender distribution of the population was almost equal.

Ethical clearance was obtained from the UCFM ethics committee. After explaining the study and the DREEM questionnaire and obtaining their consent, it was administered to the study population on 25.01.2008. Anonymity was maintained.

SPSS 16, Mann Whitney's U test and chi square tests were used to analyze data based on DREEM guidelines. DREEM consists of 50 items relevant to the educational climate. Each positive statement scores 0-4 on a 5-point scale and the negative statements score in reverse. Items with a mean score of 3 and above are considered positive and items with a mean score of 2 and below are considered as problem areas and were identified in the study population. Items with a mean score between 2 and 3 are considered as aspects of the educational environment that require enhancement. DREEM has five subscales and a maximum total score of 200, indicating an ideal educational environment. The subscales comprise: 1.Students' perception of learning (SPL), 2.Students' perception of teachers (SPT), 3.Students' academic self-perception (SAS), 4.Students' perception of atmosphere (SPA), and 5.Students' social self-perception (SSS). The scores for each subscale were interpreted on a four-tiered scale, the top tier representing the highest score indicating an ideal situation. The bottom tier represents the lowest score and a less ideal situation (Roff *et al.,* 1997).

The results were compared with DREEM studies from South Asia at BP Koirala Institute of Health Sciences in Dharan Nepal (BPKI HSN) (Roff *et al.,* 2001), the preliminary DREEM study setting at University of Dundee, UK (DU) (Al-Hazimi *et al.,* 2004) and the single documented study from Sri Lanka, from Faculty of Medical Sciences, University of Sri Jayawardenapura (Jiffry *et al.,* 2005).

Results

There were 151 respondents (78.6%) to the DREEM questionnaire with females accounting for 64.24% (n=97). Majority (65.6%) responded 'more positively than negatively' to DREEM at UCFM. 'A more positive perception' was observed among 68.2% for students' perceptions of learning (SPL, sample mean score 26.8). Furthermore, 55% perceived that teachers are 'moving in the right direction' for students' perception of teachers (SPT, sample mean score 22.7). The majority (69.5%) also had an academic self perception that was 'more on the positive side' (SAS, sample mean score 18.2). Faculty atmosphere was perceived as 'a more positive atmosphere' (SPA, sample mean score 24.7) by 50.3% while 46.4% thought that there are issues that need changing. More than half (52.3%) thought that the society they live in is 'not too bad**'** (SSS, sample mean score 14.8) while 42.4% believed their society is 'not a nice place to be'. The five subscales scores were a step below the ideal on the four tiered scale. Students' perception of teachers and students' perception of atmosphere obtained the lowest mean scores among the subscales. (Table 1).

A gender based significant difference was observed with regard to teaching being sufficiently concerned to develop competence ($p<0.05$) in the students' perception of learning subscale. A significant difference was observed among males and females regarding the perception that teachers provided constructive criticism ($p<0.05$) in the students' perception of teachers subscale. In the students' academic self perception, they agreed that they learned a lot about empathy in this profession with a gender based significant difference in the perception ($p<0.01$).

Table 1: Scores obtained for subscales by the study population

DREEM and its subscales	Maximum Score	Sample Mean Score (S.D.)	Categorization of Subscales (%)	
All items	200	107.43 (16.27)	Very poor	0.70
			Plenty of problems	33.10
			More positive than negative	**65.60**
			Excellent	0.70
Students' perceptions of learning	48	26.87 (5.16)	Very poor	0.70
			Teaching is viewed negatively	29.80
			A more positive perception	**68.20**
			Teaching highly thought of	1.30
Students' perceptions of teachers	44	22.74 (3.96)	Abysmal	0.70
			In need of some retraining	44.30
			Moving in the right direction	**55.00**
			Model teachers	0.00
Students' academic self-perception	32	18.22 (3.52)	Feelings of total failure	2.00
			Many negative aspects	26.50
			Feeling more on the positive side	**69.50**
			Confident	2.00
Students' perceptions of atmosphere	48	24.72 (5.42)	A terrible environment	2.60
			There are many issues which need changing	46.40
			A more positive atmosphere	**50.30**
			A good feeling overall	0.70
Students' social self-perception	28	14.87 (3.78)	Miserable	3.30
			Not a nice place	42.40
			Not too bad	**52.30**
			Very good socially	2.00

DREEM = Dundee Ready Education Environment Measure, S.D. = Standard deviation

The difference was significant among the two genders for the questions 'there are opportunities for me to develop interpersonal skills' (p<0.01), 'I feel comfortable in the class socially' (p<0.05) and 'the atmosphere is relaxed during seminars/tutorials' (p<0.05) in the students' perception of atmosphere sub scale. Accommodation was perceived to be pleasant with a gender based difference (p<0.02) in the students' social self perception subscale. Female students expressed more agreement with a significant difference among the genders for having a good social life (p<0.05), having good friends in school (p<0.05) and seldom feeling lonely (p<0.05). (Table 2). The study population perceived that teaching over emphasizes factual learning as the single problem area in the students' perception of learning subscale. Other areas in the subscale were perceived as requiring enhancement. In the students' perception of teachers subscale, they positively perceived their teachers as knowledgeable, whilst teachers' feedback to students was identified as a problem. The study population indicated that they prefer teachers to be more patient

and less authoritarian and perceived these as problem areas. Not being able to memorize all they need was a problem for the study population in the students' academic self perception subscale. Other areas in the subscale were perceived as areas requiring enhancement. Several problem areas were identified in the subscale students' perception of atmosphere indicating an atmosphere that is less motivational and stressful. In the students' social self perception subscale, the study group agreed they had problems with the support systems available for those who get stressed.

Table 2: Item gender scores, p values of item gender scores and item mean scores obtained in the UCFM study population.

Statement	M	F	p value (M/F)	UCFM (M+F)
Students' perception of learning:				
1. I am encouraged to participate in class	2.70	2.51	>0.05	2.58*
7. The teaching is often stimulating	2.00	2.14	>0.05	2.09*
13.The teaching is student-centered	2.31	2.67	>0.05	2.54*
16.The teaching is sufficiently concerned to develop my competence	1.98	2.34	<0.05#	2.01*
20.The teaching is well focused	2.41	2.43	>0.05	2.42*
22.The teaching is sufficiently concerned to develop my confidence	2.00	2.01	>0.05	2.21*
24.The teaching time is put to good use	2.20	2.39	>0.05	2.32*
25.The teaching over- emphasized factual learning	1.56	1.74	>0.05	1.68˜
38. I am clear about the learning objectives of the course	2.17	2.34	>0.05	2.28*
44.The teaching encourages me to be an active learner	2.11	2.20	>0.05	2.17*
47.Long term learning is emphasized over the short term	2.46	2.52	>0.05	2.50*
48.The teaching is too teacher-centered	1.89	2.19	>0.05	2.08*
Students' perception of teachers:				
2. The teachers are knowledgeable	3.19	3.15	>0.05	3.17°
6. The teachers are patient with patients	2.33	2.34	>0.05	2.34*
8. The teachers ridicule the students	1.50	1.57	>0.05	1.54˜
9. The teachers are authoritarian	1.24	1.57	>0.05	1.45˜
18.The teachers have good communication skills with patients	2.20	2.37	>0.05	2.31*
29.The teachers are good at providing feedback to students	1.69	1.74	>0.05	1.72˜
32.The teachers provide constructive criticism here	2.00	2.32	<0.05#	2.21*
37.The teachers give clear examples	2.39	2.42	>0.05	2.41*
39.The teachers get angry in class	1.44	1.32	>0.05	1.36˜
40.The teachers are well prepared for their classes	2.48	2.60	>0.05	2.56*
50.The students irritate the teachers	1.52	1.76	>0.05	1.68˜
Students' academic self perception:				
5. Learning strategies which worked for me before continue to work for me now	2.11	2.15	>0.05	2.14*
10. I am confident about passing this year	2.78	2.64	>0.05	2.69*
21. I feel I am being well prepared for my profession	2.15	2.13	>0.05	2.14*
26. Last year's work has been a good preparation for this year's work	2.04	2.19	>0.05	2.13*
27. I am able to memorize all I need	1.61	1.41	>0.05	1.48˜
31. I have learned a lot about empathy in my profession	2.33	2.88	<0.01#	2.68*
41. My problem-solving skills are being well developed here	2.17	2.23	>0.05	2.21*
45. Much of what I have to learn seems relevant to a career in medicine	2.57	2.85	>0.05	2.75*

Statement	M	F	p value (M/F)	UCFM (M+F)
Students' perception of atmosphere:				
11.The atmosphere is relaxed during the ward teaching	1.57	1.53	>0.05	1.54˜
12.This school is well timetabled	2.15	2.29	>0.05	2.24*
17.Cheating is a problem in this school	2.02	1.88	>0.05	1.93˜
23.The atmosphere is relaxed during lectures	2.41	2.54	>0.05	2.49*
30.There are opportunities for me to develop interpersonal skills	2.54	2.56	<0.01#	2.55*
33. I feel comfortable in the class socially	2.19	2.59	<0.05#	2.44*
34.The atmosphere is relaxed during seminars /tutorials	2.09	1.99	<0.05#	2.03*
35. I find the experience disappointing	1.83	1.75	>0.05	1.78˜
36. I am able to concentrate well	2.30	2.24	>0.05	2.26*
42.The enjoyment outweighs the stress of studying medicine	1.63	2.72	>0.05	1.69˜
43.The atmosphere motivates me as a learner	1.85	1.92	>0.05	1.89˜
49. I feel able to ask the questions I want	2.04	1.79	>0.05	1.88˜
Students' social self perception:				
3. There is a good support system for students who get stressed	1.43	1.43	>0.05	1.43˜
4. I am too tired to enjoy this course	1.50	1.36	>0.05	1.41˜
14. I am rarely bored on this course	1.85	1.81	>0.05	1.83˜
15. I have good friends in the school	2.37	2.90	<0.05#	2.71*
19. My social life is good	2.13	2.68	<0.05#	2.48*
28. I seldom feel lonely	2.09	2.14	<0.05#	2.13*
46. My accommodation is pleasant	2.70	2.99	<0.02#	2.89*

M= Male, F = Female, UCFM = University of Colombo, Faculty of Medicine, # Significant *p* values, ˜ Problem areas
* Aspects of the learning environment that could be enhanced, ° Positive aspects

Other problem areas identified in the same subscale were 'being too tired to enjoy the course' and 'being bored'. The study population also perceived they needed enhancement in the areas of accommodation, friends, social life and support to overcome loneliness (Table 2).

In comparison with other DREEM studies, the percentage sample mean score in the study population was 53.7%, whilst it was 69.50% at Dundee University, 65% at BP Koirala Institute of Health Sciences in Dharan in Nepal and 53.6% at Faculty of Medical Sciences, University of Sri Jayawardenapura (FMS/USJ) in Sri Lanka. A percentage mean score of 55.98% for students' perception of learning, 51.68% for students' perception of teachers, 56.94% for students' academic self-perception, 51.50% for students' perception of atmosphere, and 53.11% for students' social self-perception were obtained for subscales of the study population. A comparison of the percentage mean scores of subscales of study population with the other three studies is depicted in table 3.

The global mean score of the study sample (107) was lower than what was observed in studies from University of Dundee (139) and BP Koirala Institute of Health Sciences in Dharan Nepal (130) and was similar to the study results from Faculty of Medical Sciences, University of Sri Jayawardenapura in Sri Lanka (107). The global mean score of Faculty of Medical Sciences, University of Sri Jayawardenapura had been obtained utilizing pooled data from three student groups including pre, para and clinical groups, stating that there was no significant difference in the score obtained by each group. BP Koirala Institute of Health Sciences in Dharan, Nepal study also had combined the mean scores of six groups ranging from 1st to 6th year to obtain the global mean score. The subscale scores of the study population were placed in the second tier, a step below the ideal, similar to subscale scores of these three studies.

Table 3: Comparison of sample mean scores of the study population with studies from University of Dundee, BP Koirala Institute of Health Sciences, Nepal and Faculty of Medical Sciences, University of Sri Jayawardenapura, Sri Lanka

DREEM and its subscales	UCFM Sample Mean Score (percentages)	DU Sample Mean Score (percentages)	BPKI HSN Sample Mean Score (percentages)	FMS/USJ Sample Mean Score (percentages)
All items (/200)	107.4 (53.72%)	139 (69.50%)	130 (65.00%)	107.2 (53.6%)
Students' perceptions of learning (/48)	26.8 (55.98%)	34 (70.83%)	33 (68.75%)	25.6 (53.33%)
Students' perceptions of teachers (/44)	22.7 (51.68%)	29 (65.91%)	26 (59.09%)	23.3 (52.96%)
Students' academic self-perception (/32)	18.2 (56.94%)	23 (71.88%)	22 (68.75%)	17.5 (23.44%)
Students' perceptions of atmosphere (/48)	24.7 (51.50%)	35 (72.92%)	32 (66.67%)	24.9 (51.87%)
Students' social self-perception (/28)	14.8 (53.11%)	20 (71.43%)	18 (64.24%)	15.2 (54.29%)

BPKI HSN = BP Koirala Institute of Health Sciences, Nepal, DREEM = Dundee Ready Education Environment Measure
DU = University of Dundee, FMS/USJ = Faculty of Medical Sciences, University of Sri Jayawardenapura
UCFM = University of Colombo, Faculty of Medicine

The study scores were lower than those obtained at University of Dundee and BP Koirala Institute of Health Sciences in Dharan, Nepal, while being similar to those obtained at Faculty of Medical Sciences, University of Sri Jayawardenapura in Sri Lanka which utilized pooled data. The subscale scores were similarly low especially in students' perception of teachers and students' perception of atmosphere subscales in both studies from Sri Lanka (Table 3).

Discussion

The response rate among males for DREEM at UCFM was lower than that of the female response rate irrespective of the almost equal gender distribution of the study population. The males also scored more negatively on several aspects of the educational environment than females and perceived more loneliness. Females scored more negatively than males only with regard to a relaxed atmosphere during seminars/tutorials. Similarly at Melaka Manipal Medical College in India (Reem *et al*., 2007), the females had a more positive perception than males on many aspects, among both academic underachievers and achievers. However this gender-based difference of perception was not evident in a subsequent DREEM analysis done at the same campus among first year and clinical phase students (Reem *et al.,* 2008). Some of the statistically significant gender differences observed at UCFM could be due to more supportive interpersonal relationships/empathetic behaviours among females in the study population. The study results indicate that the males require more support to develop competence, empathy, interpersonal skills and a good social life in comparison to females among this group at the UCFM.

The batch of senior medical undergraduates comprising the study population at UCFM, perceived their educational environment to be more positive. The study also identifies certain problem areas as well as areas in their educational environment that require enhancement. It is necessary to strengthen these identified areas especially in the students' perception of teachers and students' perception of atmosphere sub domains, for effective management of learning for the success of the curriculum.

Some of the problem areas identified in the study population have also been identified as problems encountered in medical schools with traditional curricula by Al Hazimi and coauthors (2004). They documented that students in traditional medical curricula perceived teaching as being too teacher centered, over emphasizing factual learning with more authoritarian teachers. It was also observed that the students in these environments were more likely to feel tired, less able to memorize all they needed and were less likely to enjoy the course. However the UCFM curriculum is not considered a traditional curriculum. Thus studying the perceptions of a wider group of students comprising students in the early phase of their course as well those who have completed the course would enable a wider perception of the educational environment created at the institution and its actual impact on the curriculum.

Although the overall perception of the educational environment at the UCFM was more positive, the global mean score of the study sample was lower than what was observed in studies from University of Dundee and BP Koirala Institute of Health Sciences in Dharan Nepal and was similar to the study results from Faculty of Medical Sciences, University of Sri Jayawardenapura in Sri Lanka. The entry criterion for state universities in Sri Lanka is based on the merit score obtained at the highly competitive National Advanced Level Examination. The students who gain entry to study medicine are those who achieve high merit scores at this highly competitive examination. Thus it is possible that the students are already academically challenged at entry and are more prone to stress during their undergraduate studies. This may have contributed to similar global mean scores and sub domain scores obtained for DREEM from the two Sri Lankan medical schools (UCFM and FMS/USJ) and to the differences observed with the regional study from BP Koirala Institute of Health Sciences in Dharan, Nepal.

The students' perception of emphasized factual learning leading to memorization and stress in the medical school may also be broadly rooted in their acquired study habits related to over emphasized factual learning for the entry level examination. It may be possible to overcome these problems by redesigning the induction course at entry level to address these issues.

Conclusion

The senior batch of medical undergraduates comprising the study population at the UCFM, perceived their educational environment to be more positive. Certain problem areas and areas that require enhancement in the UCFM educational environment were identified for effective management of learning especially in the students' perception of teachers and students' perception of atmosphere sub domains.

Acknowledgements

We gratefully acknowledge the contribution made by

1. The senior batch of medical undergraduates of Faculty of Medicine, University of Colombo for participating in the study.
2. Staff of the Medical Education and Research Centre (MEDARC), Faculty of Medicine, University of Colombo by providing guidance and advice.
3. Staff of the Department of Community Medicine, Faculty of Medicine, University of Colombo by providing expert advice and guidance on statistical analysis.

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