

Evaluating Medical Students' Perceptions of the Educational Environment at the National Defense University of Malaysia

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Abstract

The National Defence University of Malaysia offers a unique medical curriculum, which combines medical syllabus and military training. Medical student's perception on educational environment offers further insights into students learning needs and improvement of the medical curriculum. This study is to determine the perceptions of the NDUM medical students towards their educational environment. This is a cross sectional study. The Dundee Ready Educational Environment Measure (Dreem) inventory was distributed to 189 students during the 2015-2016 academic years. The inventory consists of 50 items; scored on a 0-4 likert scale. It has five subdomains including students' perceptions of: learning, teaching, atmosphere, academic self-perceptions, and social self-perceptions with maximum scores of 200. The response rate was 79.1% (cadets (73.08%) vs civilian (26.92%). The total DREEM score was 138.16/200 (69.3%). Students' perceptions of: learning, teachers, academic self-perceptions, atmosphere and social self-perceptions scores were 33.34/48(69.4%), 32.6/44(74%), 22.17/32(69.2%), 32.68/48(68%) and 18.02/28(64.3%) respectively. The highest score was "The teachers are knowledgeable" (3.75). The lowest score was "The teaching overemphasizes factual learning" (1.31). Students most preferred learning method was study group (84.1%) while the least preferred learning method was e-learning (12.1%). Medical students in this university have positive perceptions with their educational environment. Some low scoring areas indicate that the learning environment need to be improved. This information may assist the faculty in strategic planning of medical curriculum and sustaining a high quality educational environment for the students. Further research on educational environment is vital in ensuring continuous quality in the academic curriculum.

Keywords: Educational Environment, Medical Students, Military, Teaching Philosophy

Introduction

The field of medicine has acquired immense attention with an increased focus on a global scale educational environment in the medical sector (Roff, 2005a; 2005b). For efficient

learning, educational environment has become an important factor for students to empower themselves (Dent and Harden, 2009; Newble and Cannon, 2001). Hence, crucial assessment of the educational environment, especially in the medical education sector, is required to deliver good quality education.

A number of previous studies have elaborated the different factors affecting the success of an effective curriculum (Bassaw et al., 2003). Lizzio et al, (2002) and Mayya et al (2004) conducted studies to examine the relationship between educational environment and the success of students in their academics with curriculum satisfaction and revealed the existence of positive correlation between them. Learning excellence is correlated with the perceptions of educators and teachers of the educational environments as well. It is also claimed that educational environment tends to have an influence on what and how students learn (2001).

The perceptions of students towards an educational environment could be used as a foundation to implement changes and modifications in the existing educational structure. The meaningful learning is positively correlated with the perceptions of students of an educational setup that has impacts on the learning behavior of students and their academic outcomes.

Student contentment relies mainly on the environment of learning in which they are exposed. Research on learning environment aids medical teachers in establishing best teaching strategies, which in turn improve students' learning environment. The research findings on assessment of educational process and its environment could be used to enhance the satisfaction and academic achievement of students (Demirören et al., 2008). Student satisfaction has hence become an important factor to assess the learning experience quality, which is often determined by several outcome variables. For assessing the outcome variables related to learning environment and their impact on student learning, researchers have perceived different theories based on the analysis of the value and need of learning environment, which engages students and enhances their role in the educational setting (Hong et al., 2003).

Though many previous studies have come up with different measurement instruments to assess the education environment one of the most commonly used methods for such assessment is the Dundee Ready Education Environment Measure (DREEM) which was developed by the international Delphi panel in Dundee, Scotland, UK.[11] The DREEM is a non-contextualised specific survey tool designed to measure educational environment in a range of health professional programs across different cultures (Al-Naggar et al., 2014). The previous studies reported appropriate levels of internal consistency and constancy of the DREEM to be used to measure students' perceptions of the educational environments in Malaysia (Belayachi et al., 2015; Rana et al., 2013).

The DREEM instrument is a widely used instrument that aids medical teachers with diagnostic assistance to measure the overall learning environment in their respective college. Furthermore, the DREEM instrument has been translated into languages such as Spanish, Greek, Arabic, Persian, Swedish, etc. (Thomas et al., 2009). It has a widespread usage in studies conducted in different regions and continents such as the Middle East, Asia, Africa and North and South America (Zawawi and Elzubeir, 2012). In addition, the DREEM instrument known for its reliability in different settings and assist the educational decision makers in recognizing the limitations of the curriculum (Rahman et al., 2015).

The present research aims at examining the perceptions of military medical students towards educational environment in Malaysia and the following objectives are framed:

1. To assess the perceptions of the educational environment among medical students of the National Defense University of Malaysia (NDUM) using DREEM instrument

2. To assess the relationship between socio-demographic variables and students' perceptions of educational environment.

Methodology

Study Design and Setting: This was a quantitative cross-sectional questionnaire survey assessing perceptions on educational climate amongst medical students of the NDUM. NDUM was founded in Kuala Lumpur; Malaysia in 1995 as the Malaysian Armed Forces Academy and then upgraded to university status in 2006. The Faculty of Medicine and Defence Health (FMDH) offering a full-time five-year Medical Doctor (MD) program established in 2011, and its first class graduated in October 2016. FMDH follows a combination of medical education based on an integrated medical curriculum and military training. Students have access to unique medical program, which incorporates military medicine component, and problem-based learning approach is emphasized. Most undergraduate students reside in the hostels on a university campus.

Research Subject: Fifth year undergraduate students from FMDH aged 18 and above years were invited for this study. Non-Malaysian citizens (two students) were excluded because their appraisal of educational environment could have been influenced by factors that were not present in the study area. Sample recruitment and data collection conducted during the second semester of the 2015-2016 academic year. Self-administered questionnaires and informed consent forms distributed to the students by research investigators in the classrooms after the teaching sessions. Participation was voluntary and anonymous. Only those who had given informed consent upon receiving sufficient information about the study took part in the survey. Participants were allowed to fill in the forms at their convenience, so that they had enough time to understand the details of the study and their participation in it. The informed consent forms did not have any link with the completed questionnaire and were stored separately from the questionnaires. The Research Ethics Committee at the FMDH approved the study.

Procedures: The study included the English version of the DREEM questionnaire the questionnaire holds a summative score of 200 and includes 50 items grouped into five sub-scales of perceptions: (1) students' perception of learning (SPL), (2) students' perception of teachers (SPT), (3) students' academic self-perception (SASP), (4) students' perception of atmosphere (SPA), and (5) students' social self-perception (SSSP). The items were measured by using a five point Likert-type scale ranging from 0 (strongly disagree) to 4 (strongly agree), such that the total score can range from 0 to 200. The scores for nine negatively worded items were reverse coded to

Produce the same direction of scoring. Table 1 shows a guide used for interpretation of DREEM scores. We included 2 additional items on learning environment assessment. We asked students whether they thought that medical curriculum was (1) 'good', (2) 'moderate', (3) 'satisfactory'; (4) 'not satisfactory' or (4) 'absolutely not satisfactory', and whether they agree ('yes' or 'no') that the following learning methods were effective: study group, self-study, study via YouTube and e-learning.

Table 1

Guide for interpretation of DREEM scores (adopted from Roff et al., 1997)

Total score	
0-50	Very poor
51-100	Plenty of problems
101-150	More positive than negative
151-200	Excellent
Students' perception of learning (SPL)	
0-12	Very poor
13-24	Teaching is viewed negatively
25-36	A more positive approach
37-48	Teaching highly thought of
Students' perception of teachers (SPT)	
0-11	Abysmal
12-22	In need of some retaining
23-33	Moving in the right direction
34-44	Model teachers
Students' academic self-perception (SASP)	
0-8	Feeling of total failure
9-16	Many negative aspects
17-24	Feeling more on the positive side
25-32	Confident
Students' perception of atmosphere (SPA)	
0-12	A terrible environment
13-24	There are many issues that need changing
25-36	A more positive atmosphere
37-48	A good feeling overall
Students' social self-perception (SSSP)	
0-7	Miserable
8-14	Not a nice place
15-21	Not too bad
22-28	Very good socially
Individual survey items	
0-2	Problem area
2-3	Need to be improved
3.5-4	Real positive points

Data analysis

Frequencies and percentages were used to describe socio-demographic variables. Overall DREEM score, sub-scale scores and individual item scores were computed by summing up the responses and described by mean and standard deviation. Statistical significance for association between DREEM scores and sociodemographic variables were calculated using Student's *t*-test and one-way analysis of variance (ANOVA), as appropriate. The level of significance established as $p \leq 0.05$. The data were analysed using PASW 21 (SPSS, Chicago, IL).

Results

182 students participated in this study. The overall response rate was 79.1%. Table 2 provides socio-demographic characteristics of the participants. The majority of the respondents were male (58.24%). More than two-third of the study population were military cadet students (73.08%).

Table 2

The profile of respondents (n = 182)

Socio-demographic characteristics	Frequency	Percentage
Gender		
Male	106	58.24
Female	76	41.76
Age (year)		
Mean (\pm SD) = 21.99 (\pm 1.41)		
Ethnicity		
Malay	121	66.48
Chinese	18	9.89
Indian	42	23.08
Other	1	0.55
Academic year		
Year 1	36	20.00
Year 2	30	16.67
Year 3	39	21.67
Year 4	45	25.00
Year 5	30	16.67
Student status		
Military cadet	133	73.08
Civilian student	49	26.92
Cumulative grade point average (CGPA)		
Excellent	21	14.79
Good	53	37.32
Credit	50	35.21
Fail	18	12.68
Extracurricular activities		
Very active	12	6.63
Active	107	59.12
Less active	61	33.70
No activity	1	0.55

Table 3 shows the mean DREEM scores of students' perception of educational environment. The mean total score was 138.16/200 (\pm 14.47). The mean SPL score was 33.34/48 (\pm 3.8). The participants reported that overemphasis on factual learning with the lowest mean score of 1.31/4 (\pm 0.76) among all individual items in this study. In addition, the students reported that teaching is too teacher-centred (2.22/4 \pm 0.84).

The mean SPT score was 33.66/44 (\pm 3.4). The respondents stated that the teachers are adequately equipped with knowledge; the response has the highest mean score of 3.75/4

(± 0.44) in this study. Nevertheless, the mean scores of the following items related to the perception of teachers indicate the need for improvement: they are authoritarian (2.12/4 \pm 1.00), get irritated by the students (2.27/4 \pm 1.06), ridicule the students (2.45/4 \pm 0.99) and get angry in class (2.54/4 \pm 0.89).

The academic self-perception of the students was presented by the mean SASP score of 22.17/32 (± 3.11). The participants faced the problem with memorizing all required information (1.84/4 \pm 0.83). Also, the respondents had problems with feeling of being well prepared for their profession (2.30 \pm 0.82) and use of learning strategies that worked well for them before (2.58/4 \pm 0.88). The mean SPA score was 32.68/48 (± 5.1). The results of analysis of students' perceptions by individual items show that there are problems with cheating (2.22/4 \pm 1.15), the course being too stressful (2.52/4 \pm 0.90), and atmosphere during ward teaching (2.56/4 \pm 0.81). Also, the score of the reported disappointing experience (2.57/4 \pm 0.92) implies that educational environment could be improved. Social self-perception (SSSP) had a mean score of 15.8/28 (± 2.6). There are areas of concerns related to students feeling bored (2.23/4 \pm 1.11), lonely on this course (2.29/4 \pm 1.00), support system for students under stress (2.34/4 \pm 0.92), and students being too tired to enjoy this course (2.39/4 \pm 0.90).

Table 3

The mean scores of students' educational environment at the National Defence University of Malaysia

Subscale	Items	Mean (max. score)	\pm SD
Students' perception of learning (SPL)			
1	I am encouraged to participate in teaching sessions (n = 181)	3.15 (4)	0.60
7	The teaching is often stimulating (n = 180)	3.10 (4)	0.60
13	The teaching is student-centered (n = 181)	2.81 (4)	0.74
16	The teaching helps to develop my competence (n = 181)	3.22 (4)	0.57
20	The teaching is well focused (n = 181)	3.17 (4)	0.57
22	The teaching helps to develop my confidence (n = 182)	3.08 (4)	0.62
24	The teaching time is put to good use (n = 182)	3.13 (4)	0.62
25	The teaching overemphasizes factual learning* (n = 176)	1.31 (4)	0.76
38	I am clear about the learning objectives of the course (n = 182)	3.11 (4)	0.58
44	The teaching encourages me to be an active learner (n = 179)	3.04 (4)	0.63
47	Long-term learning is emphasized over short-term learning (n = 180)	2.91 (4)	0.72
48	The teaching is too teacher-centered* (n = 180)	2.22 (4)	0.84
Total SPL score (n = 167)		33.34 (48)	3.80
Students' perception of teachers (SPT)			

2	The teachers are knowledgeable (n = 182)	3.75 (4)	0.44
6	The teachers are patient with students (n = 181)	3.12 (4)	0.62
8	The teachers ridicule their students* (n = 176)	2.45 (4)	0.99
9	The teachers are authoritarian* (n = 178)	2.12 (4)	1.00
18	The teachers have good communication skills with students =180	3.18 (4)	0.66
29	The teachers are good at providing feedback to students (n = 181)	3.01 (4)	0.68
32	The teachers provide constructive criticism (n = 178)	2.91 (4)	0.70
37	The teachers give clear examples (n = 182)	3.19 (4)	0.51
39	The teachers get angry in class* (n = 181)	2.54 (4)	0.89
40	The teachers are well prepared for their classes (n = 182)	3.38 (4)	0.60
50	The students irritate the teachers* (n = 181)	2.27 (4)	1.06
Total SPT score (n = 169)		32.66 (44)	3.41
Students' academic self-perception (SASP)			
5	Learning strategies that worked for me before continue to work for me now (n = 173)	2.58 (4)	0.88
10	I am confident about passing this year (n = 181)	2.79 (4)	0.77
21	I feel I am being well prepared for my profession (n = 181)	2.30 (4)	0.82
26	<i>Last year work has been a good preparation for this year's work (n = 179)</i>	2.69 (4)	0.77
27	<i>I am able to memorize all I need (n = 182)</i>	1.84 (4)	0.83
31	<i>I have learned a lot about empathy in my profession (n = 182)</i>	3.16 (4)	0.61
41	My problem-solving skills are being well developed here (n = 181)	2.93 (4)	0.69
45	Much of what I have to learn seems relevant to a career in healthcare (n = 179)	3.16 (4)	0.60
Total SASP score (n = 167)		22.17 (32)	3.11
Students' perception of atmosphere (SPA)			
11	The atmosphere is relaxed during ward teaching (n = 175)	2.56 (4)	0.81
12	This school is well timetabled (n = 180)	2.81 (4)	0.84
17	<i>Cheating is a problem in this school* (n = 181)</i>	2.22 (4)	1.15
23	The atmosphere is relaxed during lectures (n = 182)	2.96 (4)	0.71
30	There are opportunities for me to develop interpersonal skills (n = 181)	3.12 (4)	0.60
33	<i>I feel comfortable in class socially (n = 179)</i>	3.09 (4)	0.61

34	The atmosphere is relaxed during seminars/tutorials (n = 182)	3.01 (4)	0.58
35	<i>I find the experience disappointing*</i> (n = 179)	2.57 (4)	0.92
36	I am able to concentrate well (n = 181)	2.63 (4)	0.84
42	The enjoyment outweighs the stress of the course (n = 181)	2.52 (4)	0.90
43	The atmosphere motivates me as a learner (n = 180)	2.88 (4)	0.81
49	I feel able to ask the questions I want (n = 182)	3.12 (4)	0.69
Total SPA score (n = 166)		32.68 (48)	4.97
Students' social self-perception (SSSP)			
3	There is a good support system for students who get stressed (n = 181)	2.34 (4)	0.92
4	I am too tired to enjoy this course* (n = 181)	2.39 (4)	0.90
14	I am rarely bored on this course (n = 182)	2.23 (4)	1.11
15	I have good friends in this course (n = 181)	3.23 (4)	0.76
19	My social life is good (n = 182)	2.85 (4)	0.85
28	I seldom feel lonely (n = 181)	2.29 (4)	1.00
46	My accommodation is pleasant (n = 181)	2.71 (4)	1.08
Total SSSP score (n = 177)		18.02 (28)	3.53
Overall DREEM score (n = 141)		138.16 (200)	14.47

* - negative items

The majority of the students perceived that self-study is the most efficient learning method followed by the group study. The e learning is the least preferred choice among the students (Table 4)

Table 4

Students' perception of the efficiency of learning methods (n = 182)

Learning method	Efficient	
	n	%
Self-study	153	84.1%
Group study	138	75.8%
Study via YouTube	88	48.4%
E-learning	22	12.1%

With regard to the overall students' perception of the curriculum, more than a half perceived it as good (51.96%), and only 1.6% of them were not satisfied with the curriculum (Figure 1).

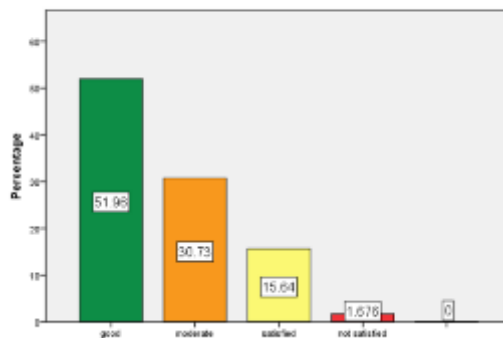


Figure 1: Overall students' perception with regard to medical curriculum

Discussion

The study was conducted in a military setting that represents a unique environment. Apart from a comprehensive academic education; its daily routine includes sports, various extracurricular activities as well as a solid military training, and this may have resulted in different perceptions of the educational environment among military medical students compared to the students from civilian medical schools. Hence, this study was aimed to evaluate the perceptions of the exclusive educational environment among the medical students of a military university in Malaysia.

The mean total DREEM score of 138.16/200 (± 14.47) indicates that the students perceived their educational environment as more positive than negative (Table 1). This result is higher compared with two other Malaysian studies: a study by the private medical school reported the mean DREEM total score of 125.3/200 ± 19.5 (Al-Naggar et al., 2014) and by the public medical school – the mean score of 127.9/200 ± 16.58 (Rahman et al., 2015). This could be attributed to the positive role of the military components in the educational environment at the NDUM. In addition, the students are introduced to the practice of military medicine through hands-on exercises in the basics of battlefield medicine, aviation medicine, naval and underwater medicine.

As for the students' perception of learning (SPL), the results from our university demonstrated "a more positive approach" (Table 1) with a mean score of 33.34/48 (± 3.80). The result in this study is slightly higher than that of from two other Malaysian universities: private (30.6/48; ± 5.4) (Belayachi et al., 2015); Al-Naggar., et al. 2014) and public (Rahman et al., 2015) (31.6/48; ± 4.56) [18]. Another recent study from Morocco showed much lower mean SPL score than in our study (21.2/48; ± 6.2)[14]. This could be due to the maintenance of high levels of discipline in the military university environment whereby the students need to be punctual in all activities. The consistency in training of punctuality attributable to military environment could be associated with the development of competence in systematic educational activities. The lowest individual item mean score in this domain relates to overemphasizing of factual learning in teaching; the value of 1.31/4 (± 0.76) could be interpreted as problem area that should be examined more closely (Table 1). The finding is consistent with the results from the local public medical school (1.49/4 ± 0.83) (Rahman et al., 2015). However, this value was higher in the studies from the private medical school in Malaysia (2.4/4 ± 0.83) (Belayachi et al., 2015) and Morocco (2.0/4 ± 1.11)[14].

The students had “a more positive approach” with regard their perception of teachers (Table 1) with a mean SPT score of 32.66/44 (± 3.41). It is higher than in local public (29.3/44 ± 4.46), local private (27.4/44 ± 4.4) and overseas universities (21.8/44 ± 5.3) (Belayachi et al., 2015; Rana et al., 2013; Rahman et al., 2015). We hypothesize that since the NDUM has a unique symbiosis of both military and civilian lecturers their different, and sometimes even opposing, instructional approaches paradoxically complement each other and could have contributed to positive students’ perception of teaching staff.

The students felt that they were “more on the positive side” with regard to their academic self-perception (Table 1) with the mean SASP score of 22.17/32 (± 3.11). This is higher than the findings from the Malaysian public medical school (20.1/32 ± 3.35) (Rahman et al., 2015); local Malaysian private medical school (20.6/32 ± 3.80) [13] and Moroccan medical university (13.1/32 ± 5.00) (Rana et al., 2013). The problem area lies in the necessity to memorize a lot of factual material, especially during the exam session, which is a common issue in medical education. The students scored the lowest (1.84/4 ± 0.83) in the response to the item “I am able to memorize all I need”. We found slightly lower result (1.67/4 ± 0.89) in a study from the local public medical school (Rahman et al., 2015). The study from the local private medical school showed slightly higher mean score for this item (2.3/4 ± 0.89) than in this study (Belayachi et al., 2015).

Students perceived “a more positive” atmosphere at our medical faculty (32.68/48 ± 4.97). This is slightly higher than in studies from both local and overseas universities whereas the mean SPA score was 30.2/48 ± 5.04 in a study from the local public medical school (Rahman et al., 2015), 29.7/48 ± 5.20 from the local private medical school (Belayachi et al., 2015) and 19.0/48 ± 5.30 in a Moroccan study (Rana et al., 2013). The atmosphere at the NDUM provides opportunities to excel in physical education with specific time allocated every afternoon for sports and self-defense classes (taekwondo) on Friday evenings. These activities could be one of the contributing factors for our relatively high SPA scores.

The students’ social self-perception scores (18.0 ± 3.53) are “not too bad” (Table 1) and slightly higher than that of in previous local studies: from the public medical school (16.6/28 ± 3.18) (Rahman et al., 2015) and private medical school (16.7/28 ± 3.3) (Belayachi et al., 2015). We assume that consistent physical and military training has improved their social self-perception and teamwork skills especially after being introduced to the military “esprit de corps”.

The areas that need to be improved include a lack of student-centred teaching, which must be adopted by the lecturers. Cheating imposes serious implications for NDUM students, especially during the exam. The student who found cheating would be barred from the exam and could be punished by the military disciplinary board. Nevertheless, students perceive cheating as a serious problem at the NDUM and adequate actions are required to address this issue. Besides, the FMDH needs to organise a few discussion sessions with the students to clarify the reason of their perception of being “bored in this course” as their timetable is full with academic activities.

Although the curriculum has been designed in an integrated way and involves series of small group discussion and other educational activities, the majority of students preferred self-study to other methods of learning. Self-study implies flexibility about time and different study styles. The model that provides the learners with an outline of their learning or studying styles called a VARK model Visual (V), Auditory (A), Read/Write (R) and Kinaesthetic (K) (Roff

et al., 1997). According to this model, the studying style based on the preferred sensory modalities that are involved in taking in information.

This study reported that more than two third of the students (75.8%) study in groups for their revision. It is higher than in a recent study, more than half (54.5%) did not have an experience of participating in a study group (Rybczynski and Schussler, 2011). In addition, Rybczynski et al. [20] reported that about one-tenth (14%) of students were joining study groups throughout the semester.

Conclusion

Medical students at the NDUM undergo an undergraduate medical program, which includes a combination of medical studies and military training; the duration of the program is five years. In this study, they showed positive perception of their educational environment overall and all its five domains. The academic and extracurricular activities designed for the students as well as military training are well accepted by the students. We found that the students still largely rely on memorizing skills rather than comprehension and other higher processes of cognition. This study is the first to provide the data about the students' perception of a medical curriculum in a military university in Malaysia. Our findings help to identify a few areas of educational environment that need to be improved.

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