

Perceptions of students in different phases of medical education of the educational environment: Universiti Sultan Zainal Abidin

Nor Iza A Rahman
Aniza Abd Aziz
Zainal Zulkifli
Muhammad Arshad Haj
Farah Hanani Binti Mohd
Nasir
Sharvina Pergalathan
Muhammad Ismail Hamidi
Salwani Ismail
Nordin Bin Simbak
Mainul Haque

Faculty of Medicine, Universiti Sultan
Zainal Abidin, Kuala Terengganu,
Terengganu, Malaysia

Background: The Dundee Ready Education Environment Measure (DREEM) was planned and designed to quantify the educational environment precisely for medical schools and health-related professional schools. DREEM is now considered a valid and reliable tool, which is globally accepted for measuring the medical educational environment. The educational environment encountered by students has an impact on satisfaction with the course of study, perceived sense of well-being, aspirations, and academic achievement. In addition to being measurable, the educational environment can also be changed, thus enhancing the quality of medical education and the environment, and the medical education process. The objective of this study was to assess the educational environment of the Universiti Sultan Zainal Abidin (UniSZA) undergraduate medical program from the students' perspective. The study expected to explore UniSZA medical students' overall perceptions, perceptions of learning, teachers, atmosphere, academic self-perception, and social self-perception using the DREEM questionnaire.

Methods: A cross-sectional survey was conducted to study the perceptions of the students toward the educational environment of UniSZA as a new medical school, using the DREEM questionnaire. All medical students of UniSZA from Years I–V enrolled in the Bachelor of Medicine and Bachelor of Surgery programs were the target population ($n=270$). Therefore, the universal sampling technique was used. The data were analyzed using the SPSS 20 software. This study obtained ethical clearance from the Faculty of Medicine and Health Sciences, UniSZA.

Results: A total of 195 out of 270 students responded. Respondents included 31% males and 69% females. The overall DREEM scores were significantly higher ($P<0.001$) for females than males.

Conclusion: The medical students at UniSZA showed a positive perception of their educational environment. The new medical faculty, established for only a few years, has achieved an above-average, conducive educational environment for students. Most of the students showed a positive perception for the entire five domains tested in the DREEM survey. Females were consistently satisfied with UniSZA's educational environment, and self-perception was high, as compared to male undergraduates.

Keywords: perceptions, medical students, educational environment, DREEM, UniSZA

Correspondence: Mainul Haque
Faculty of Medicine and Health Sciences,
Universiti Sultan Zainal Abidin, Kampus
Kota, Jalan Sultan Mahmud, 20400 Kuala
Terengganu, Terengganu, Malaysia
Email runurono@gmail.com

Introduction

Medical education (ME) is considered as highly demanding in almost all societies and countries. ME and professional conduct as aspects of university life are considered as very complex and stressful.^{1–8} Students and medical doctors need to achieve the

development of exclusive and wide-ranging skills and aptitudes to meet demands of patients and communities that they serve.¹⁻⁸

Environment is the sum total of what is around something or someone. It includes living things and natural forces. The environment of living things provides conditions for development and growth. It can also cause danger and damage.⁹

“The ME environment ideally should foster intellectual activities and progression, while at the same time encouraging friendliness, co-operation and support.”¹⁰ A number of researchers have reported that encouraging and enlightening settings are very important determinants for medical students for their development as more holistic and rational prescribers.^{4,11-20} There has been an exigent requisite to define educational environment.²¹⁻²⁷ Some educational scientists from Malaysia feel that the

[...] educational environment is a broad concept where education encompasses both teaching and learning while environment encompasses everything that surrounds us. Educational environment can be described as anything surrounds an educational institution.²⁸

Similarly, there has been an urgent need for the development of a valid and reliable instrument for the measurement of the educational environment.^{21-27,29} Again, appraisal of the total environment of a medical school is very important to ensure the optimum standard of high-quality ME.²⁹⁻³¹

The Dundee Ready Education Environment Measure (DREEM) was planned and designed to precisely quantify the educational environment for medical schools and health-related professional schools.^{19,32} DREEM is now considered a valid and reliable tool, which is globally accepted for measuring the ME environment.^{19,32,33} Therefore, throughout the world, the DREEM questionnaire has been used, and many studies' findings have been published in highly reputed journals.^{15,17,19,32,34-40} A numbers of studies have also been conducted in Malaysian medical schools.^{28,29,41-44}

The educational environment encountered by students has an impact on satisfaction with the course of study, perceived well-being, aspirations, and academic achievement.⁴⁵⁻⁴⁷ In addition to being measurable, the educational environment can also be changed, thus enhancing the quality of the environment and the ME process.⁴⁸ Various methodologies have been utilized to investigate educational climate. Studies about educational climate date back to the 1970s. In 1970, Rothman et al from the University of Toronto developed the Learning Environment Questionnaire.²¹ The DREEM questionnaire

was originally used to evaluate the learning environments of medical students, whose course curriculum had rapidly changed during a period of major reforms in traditional teaching methods up until and during the 1990s. There are other related tools, including the precursor to DREEM, the ME Environment Measure, and several subsequent tools that have been designed to measure the educational environment in specific post-graduate medical settings: the Post-graduate Hospital Educational Environment Measure, the Surgical Theatre Educational Environment Measure, and the Anesthetic Theatre Educational Environment Measure.⁴⁹

DREEM was published in 1997 as a tool to evaluate educational environments of medical schools and other health training settings and a recent review concluded that it was the most suitable such instrument.⁴⁹

A Delphi technique, involving a panel of 30 faculty members from around the world, was used to generate criteria indicative of desirable education climates for health professions in light of the new curriculum standards.⁵⁰

DREEM was then refined into a 50-item self-report questionnaire using a 5-point Likert scale,⁵¹ with scores reflecting a student's overall perception of the environment and their perceptions of five main aspects of this environment, namely: 1) their learning, 2) the teachers, 3) academic self-perception, 4) atmosphere, and 5) social self-perception.^{50,52}

DREEM has been translated to eight languages and has been used in at least 20 countries. This questionnaire has been applied globally to a number of undergraduate medical schools.⁵³ In fact, the DREEM questionnaire is an ideal instrument for examining students' opinions. It is valuable in highlighting areas of concern voiced by medical students, including educational climate, academic achievement, and social support. A systematic review of 79 original articles concluded that DREEM is “likely to be the most suitable instrument for undergraduate medicine, postgraduate medicine, nursing and dental education”.⁵⁴

The medical faculty of the Universiti Sultan Zainal Abidin (UniSZA) has evolved with time. It initially started as a faculty of health sciences offering three diploma programs in Radiography, Medical Laboratory Technology, and Nursing Science. UniSZA was honored with the trust given by the Ministry of Higher Education of the Government of Malaysia to contribute toward the development and improvement of health care by the approval of the university's medical program in Kuala Terengganu, Terengganu, Malaysia. The approval was granted by the Ministry of Higher Education on February 3, 2009. Faculty had already started one degree program, Dietetics (Honors) in 2008; a Bachelor of Medicine and Bachelor of

Surgery (MBBS) became part of the program in 2009. In 2011, a Diploma in Physiotherapy was added to existing diploma programs. It is expected that faculty will admit new groups of students in 2015 into another three new programs: 1) Bachelor of Biomedicine, 2) Bachelor of Medical Imaging and Diagnostics, 3) Bachelor of Nutrition. The first group of 30 MBBS students, admitted in 2009, graduated in August 2014. It is expected that UniSZA graduates will start working as House Officers and serving Malaysia by as early as 2015.

The objective of this study was to assess the educational environment of the UniSZA undergraduate medical program from the students' perspective. The researchers expected to explore UniSZA medical students' overall perception, and perceptions of learning, teachers, atmosphere, academic self-perception, and social self-perception, using the DREEM questionnaire. The current work will also determine the association between UniSZA medical students' socio-demographic and educational characteristics overall and based on five subscales of the DREEM questionnaire.

Materials and methods

A cross-sectional survey was conducted to study the perception of the students toward the educational environment of UniSZA as a new medical school. Throughout the world and in different medical schools of both developed and developing countries, DREEM has been extensively utilized as an instrument to collect evidence about educational environment.^{15,17,19,28,29,32,34-44,55,56} The DREEM instrument was first developed at the University of Dundee, and it now provides and achieves validation as a global, generic "diagnostic inventory for measuring the quality of educational environment".^{32,53}

DREEM is a 50-item inventory, consisting of five subscales. 1) students' perceptions of learning (SPL) – 12 items, maximum score of 48; 2) students' perceptions of teachers (SPT) – eleven items, maximum score of 44; 3) students' academic self-perceptions (SASP) – eight items, maximum score of 32; 4) students' perceptions of atmosphere (SPA) – 12 items, maximum score of 48; and 5) students' social self-perceptions (SSSP) – seven items, maximum score of 28. The total score for all subscales is 200 (Table 1). However, negative items were scored in reverse for analysis so that the higher the score, the more negative the feedback, or the more incorrect perception.

All medical students of UniSZA from Years I–V of the MBBS program were the target population. The total number of students participating was 270. Therefore, the universal sampling technique was used. The DREEM questionnaires were distributed among the study subjects, who were given

Table 1 Guide of DREEM score categories and interpretation according to domain¹²

Domain	Score	Interpretation
SPL	0–12	Very poor
	13–24	Teaching is viewed negatively
	25–36	A more positive approach
	37–48	Teaching highly thought of
SPT	0–11	Abysmal
	12–22	In need of some retraining
	23–33	Moving in the right direction
	34–44	Model teachers
SASP	0–8	Feeling of total failure
	9–16	Many negative aspects
	17–24	Feeling more on the positive side
	25–32	Confident
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
SSSP	0–7	Miserable
	8–14	Not a nice place
	15–21	Not too bad
	22–28	Very good socially

Abbreviations: SPL, students' perceptions of learning; SPT, students' perceptions of teaching; SASP, students' academic self-perceptions; SPA, students' perceptions of atmosphere; SSSP, students' social self-perceptions; DREEM, the Dundee Ready Education Environment Measure.

1 day to complete them. The data were collected in July 2014. Explanation about the purpose of the study was given, and consent was obtained from every student. The questionnaires were then retrieved. The completed questionnaires were collated for further analysis. The data were analyzed using SPSS version 20 software using descriptive statistics; the numerical variables were described using means and standard deviations (SD), and categorical variables were presented in frequencies and percentages. The Independent *t*-test was applied for comparison between two means variables, which included sex, phase of study, and type of secondary school. Analysis of variance (ANOVA) was used for comparison of more than two means, which included race, marital status, cumulative grade point average, type of foundation study, and year of study.

There are four methods available to students to pursue a degree program in Malaysia. The Ministry of Education conducts two major programs to enter degree programs: The first method allows students to matriculate after secondary school. This program is usually a 1-year program, but it may extend up to 2 years if necessary. The majority of UniSZA students have completed the 1-year matriculation program. The second method is the Malaysia Certificate of Higher Education, which is a 1.5-year program. In addition, a 1-year foundation training is conducted by select Malaysian Universities. Finally, students can opt to complete

a diploma after secondary school designed for entry into a degree program.

This study obtained ethical clearance from the Faculty of Medicine and Health Sciences, recorded as Memo Number UniSZA.NI 1 1628-1 J Id.2 (9) and dated October 27, 2014. As the current study was based on a questionnaire, no intervention with human or animal was required. UniSZA did not provide any funding to conduct this study. Therefore, the ethical committee initially provided the authors with verbal permission to conduct the study, pending formal written authorization.

Results

Demographic data of the current study are described in Table 2. A total of 195 (72%) out of 270 students responded to the questionnaire. Specifically, the response rate according to year consisted of Year I (55 students, or 28%); Year II

(47 students, or 24%); Year III (34 students, or 17%); Year IV (38 students, or 20%); and Year V (21 students, or 11%) responses (Table 2). There were both male (60, or 31%) and female (135, or 69%) study respondents. Most of them (187, or 96%) were single, and the remaining eight students (4%) were either engaged or married. The majority of the medical students were Malays (136, or 70%), followed by Chinese (26 students, or 13%), Indians (29 students, or 15%), and other races (four student respondents, or 2%). Fifty-five respondents (28%) were recruited from the Year I population, and the least represented at 21 respondents (11%) were Year V students. Most students (65%) were from non-boarding schools, and the remaining 69 students (35%) came to the university from boarding schools (Table 2).

The five items from the DREEM questionnaire with the highest mean score were derived from the SPT, SASP, and SSSP domains. SPT item 2 scored a mean of 3.39 ± 0.568 points, and item 40 scored 3.10 ± 0.725 points. SASP item 31 scored a mean of 3.06 ± 0.652 points, and item 45 achieved 3.05 ± 0.612 points. SSSP item 15 garnered 3.14 ± 0.806 points. Items scored at less than 2.0 were items belonging to the SPL, SASP, and SSSP domains. In the SPL domain, item 25 achieved just 1.49 ± 0.833 points; SASP item 27 scored only 1.67 ± 0.895 points; SSSP item 3 received only 1.98 ± 0.922 points, and item 14 in the same domain scored only 1.97 ± 1.04 points (Table 3). A total of nine items engendered negative statements, and scores for these items varied from 1.49 ± 0.833 to 2.39 ± 0.985 points (Table 3). The distribution of negative statements was as follows: the SPL domain received two negative responses, the SPT domain had four, and the SASP domain had no negative statements. Furthermore, the SPA domain accounted for two negative statements, and the SSSP domain accounted for a single negative statement.

The mean DREEM scores were 128.2 ± 17.46 for pre-clinical and 127.5 ± 15.65 points for clinical students (Table 4). Pre-clinical students scored slightly higher than clinical students, but there were no statistically significant differences ($P=0.386$) (Table 5). A minimal difference was also found according to subscale scores.

The scores for all five subscales (Table 6) illustrate respondents' positive perceptions, and the interpretation of responses suggested by the DREEM scoring system.⁵⁷ In general, the majority of students perceived their learning experience as positive (84%) and the teaching as appropriate (79%); students felt positive in their academic self-perceptions (81%), and, for the most part, agreed that the learning atmosphere was positive (83%). They also perceived that their social surroundings were acceptable

Table 2 Demographic profiles of respondents (n=195)

Variable	n	%			
Sociodemographic characteristics					
Sex					
Male	60	30.8			
Female	135	69.2			
Marital status					
Single	187	95.9			
Engaged	7	3.6			
Married	1	0.5			
Race					
Malay	136	69.7			
Chinese	26	13.3			
Indian	29	14.9			
Others	4	2.1			
Educational characteristics					
Phases of study					
Phase I (basic sciences)	102	52.3			
Phase II (clinical)	93	47.7			
Year of study	Total number of students	Number of respondents	%		
Year I	60	55	91.7	55	28.2
Year II	60	47	78.3	47	24.1
Year III	67	34	50.7	34	17.4
Year IV	53	38	71.7	38	19.5
Year V	30	21	70.0	21	10.8
Type of foundation study					
1-year matriculation	170	87.2			
2-year matriculation	7	3.6			
Others	18	9.2			
Cumulative grade point average (CGPA) ^{a,b}					
4.00	70	35.9			
Below 4.0	98	50.3			
Type of secondary school					
Boarding school	69	35.4			
Non-boarding school	126	64.6			

Notes: ^a27 students had data missing; ^bmean (SD) CGPA = 3.92 (0.097).

Abbreviation: SD, standard deviation.

Table 3 The mean item score of DREEM by medical students of UniSZA (n=195), and description of DREEM by medical students of UniSZA according to academic phases

Domain	Item	Mean (SD)
SPL		
1	I am encouraged to participate	2.80 (0.660)
7	The teaching is often stimulating	2.81 (0.748)
13	The teaching is student-centered	2.65 (0.761)
16	The teaching is helpful to develop my skills/competency	2.99 (0.725)
20	The teaching is well focused	2.86 (0.666)
22	The teaching is sufficient to develop my confidence	2.55 (0.800)
24	The teaching time is put to good use	2.74 (0.731)
25	The teaching over-emphasizes factual learning*	1.49 (0.833)
38	I am clear about the learning objectives of the course	2.84 (0.681)
44	The teaching encourages me to be an active learner	2.83 (0.806)
47	Long-term learning is emphasized over short-term learning	2.72 (0.770)
48	The teaching is too teacher-centered*	2.30 (0.784)
SPT		
2	The teachers are knowledgeable	3.39 (0.568)
6	The teachers place emphasis on being patient-centered during their interaction with patients	2.87 (0.748)
8	The teachers ridicule the students*	2.46 (0.838)
9	The teachers are authoritarian*	2.06 (0.851)
18	The teachers have good communication skills with the patients	2.80 (0.777)
29	The teachers are good at providing feedback to students	2.65 (0.869)
32	The teachers provide constructive criticism here	2.59 (0.810)
37	The teachers give clear examples	2.87 (0.657)
39	The teachers get angry in class*	2.39 (0.985)
40	The teachers are well prepared for their classes	3.10 (0.725)
50	The students irritate the teachers*	2.11 (0.994)
SASP		
5	Learning strategies which work for me before, continue to work for me now	2.53 (0.875)
10	I am confident about passing this year	2.53 (0.833)
21	I feel I am well prepared for my profession	2.10 (0.825)
26	Last year's work has been a good preparation for this year's work	2.46 (0.768)
27	I am able to memorize all I need	1.67 (0.895)
31	I have learned a lot about empathy in my profession	3.06 (0.652)
41	My problem-solving skills are well developed here	2.78 (0.707)
45	Much of what I have to learn seems relevant to my career in health care	3.05 (0.612)
SPA		
11	The atmosphere was relaxed during ward teaching	2.02 (0.885)
12	The school is well timetabled	2.26 (1.06)
17	Cheating is a problem in this school*	2.36 (1.04)
23	The atmosphere is relaxed during lectures	2.58 (0.872)
30	There are opportunities for me to develop interpersonal skills	2.93 (0.659)
33	I feel comfortable in class socially	2.84 (0.718)
34	The atmosphere is relaxed during seminars/tutorials	2.62 (0.849)
35	I found the experience disappointing*	2.39 (0.980)
36	I am able to concentrate well	2.52 (0.789)
42	The enjoyment outweighs the stress of studying medicine	2.31 (0.929)
43	The atmosphere motivates me as a learner	2.70 (0.821)
49	I feel able to ask the questions I want	2.70 (0.821)
SSSP		
3	There is a good support system for students who get stressed	1.98 (0.922)
4	I am too tired to enjoy this course	2.21 (0.985)
14	I am rarely bored on this course*	1.97 (1.04)
15	I have good friends in this school	3.14 (0.806)
19	My social life is good	2.76 (0.928)
28	I seldom feel lonely	2.18 (1.05)
46	My accommodation is pleasant	2.35 (0.937)

Note: *Represents items as negative statements.

Abbreviations: SPL, students' perceptions of learning; SPT, students' perceptions of teaching; SASP, students' academic self-perceptions; SPA, students' perceptions of atmosphere; SSSP, students' social self-perceptions; SD, standard deviation; DREEM, the Dundee Ready Education Environment Measure; UniSZA, Universiti Sultan Zainal Abidin.

Table 4 Domain mean score of DREEM by medical students of UniSZA according to academic phase (n=195)

Domain	Mean (SD)		
	Pre-clinical	Clinical	Overall
Students' perceptions of learning (SPL) ^a	31.3 (4.97)	31.8 (4.07)	31.6 (4.56)
Students' perceptions of teaching (SPT) ^b	29.4 (4.26)	29.1 (4.69)	29.3 (4.46)
Students' academic self-perceptions (SASP) ^c	20.1 (3.31)	20.2 (3.42)	20.1 (3.35)
Students' perceptions of atmosphere (SPA) ^a	30.5 (5.42)	30.0 (4.61)	30.2 (5.04)
Students' social self-perceptions (SSSP) ^d	16.9 (3.44)	16.3 (2.83)	16.6 (3.18)
Total DREEM score ^e	128.2 (17.46)	127.5 (15.65)	127.9 (16.58)

Notes: ^aMinimum score =0, maximum score =48; ^bminimum score =0, maximum score =44; ^cminimum score =0, maximum score =32; ^dminimum score =0, maximum score =28; ^eminimum score =0, maximum score =200 points.

Abbreviations: DREEM, the Dundee Ready Education Environment Measure; UniSZA, Universiti Sultan Zainal Abidin; SD, standard deviation.

Table 5 Summary of association between social demographic and educational characteristics with mean score of DREEM by medical students of UniSZA (n=195)

Variable	n	Mean (SD)					
		Overall	SPL	SPT	SASP	SPA	SSSP
Sociodemographic characteristics							
Sex ^f							
Male	60	120.7 (17.9) ^d	29.8 (5.37) ^d	27.3 (4.320) ^d	19.1 (3.93) ^c	29.1 (5.59) ^a	15.3 (3.15) ^d
Female	135	131.1 (14.9) ^d	32.4 (3.92) ^d	30.6 (4.25) ^d	20.6 (2.96) ^c	30.7 (4.71) ^a	17.2 (3.01) ^d
Marital status ^g							
Single	187	127.8 (16.8) ^e	31.6 (4.61) ^e	29.3 (4.50) ^e	20.1 (3.40) ^e	30.2 (5.08) ^e	16.6 (3.22) ^e
Engaged	7	129.3 (11.6) ^e	31.3 (3.77) ^e	28.6 (3.64) ^e	20.9 (2.19) ^e	32.3 (4.11) ^e	16.3 (2.06) ^e
Married	1	131.0 (0) ^e	31.0 (0) ^e	31.0 (0) ^e	20.0 (0) ^e	32.0 (0) ^e	17.0 (0) ^e
Race ^g							
Malay	136	127.7 (14.3) ^e	31.8 (3.94) ^e	29.2 (4.20) ^e	20.1 (2.98) ^e	30.0 (4.47) ^b	16.5 (2.75) ^e
Chinese	26	123.3 (22.9) ^e	30.2 (6.20) ^e	28.3 (5.06) ^e	20.2 (4.56) ^e	28.5 (6.50) ^b	16.1 (4.21) ^e
Indian	29	133.6 (19.9) ^e	31.5 (5.65) ^e	30.5 (5.08) ^e	20.5 (3.88) ^e	33.0 (5.51) ^b	17.6 (3.99) ^e
Others	4	124.8 (4.35) ^e	31.6 (4.56) ^e	29.3 (3.59) ^e	20.3 (3.40) ^e	28.5 (2.08) ^b	15.3 (0.96) ^e
Educational characteristics							
Phases of study ^f							
Phase I (pre-clinical)	102	128.2 (17.5) ^e	31.3 (4.97) ^e	29.4 (4.26) ^e	20.1 (3.31) ^e	30.5 (5.42) ^e	16.9 (3.45) ^e
Phase II (clinical)	93	127.5 (15.7) ^e	31.8 (4.07) ^e	29.2 (4.69) ^e	20.2 (3.42) ^e	30.0 (4.61) ^e	16.3 (2.83) ^e
Year of Study ^g							
Year I	55	129.4 (18.2) ^e	31.4 (5.17) ^e	30.1 (4.43) ^e	19.9 (3.48) ^e	31.4 (5.79) ^e	16.5 (3.38) ^e
Year II	47	126.9 (16.6) ^e	31.2 (4.79) ^e	28.6 (3.93) ^e	20.4 (3.11) ^e	29.3 (4.76) ^e	17.3 (3.51) ^e
Year III	34	130.8 (15.8) ^e	32.1 (4.08) ^e	30.3 (4.77) ^e	21.2 (3.16) ^e	30.7 (4.51) ^e	16.4 (2.84) ^e
Year IV	38	127.1 (12.1) ^e	31.8 (3.82) ^e	28.9 (4.13) ^e	19.9 (3.13) ^e	29.8 (3.81) ^e	16.7 (2.38) ^e
Year V	21	123.3 (20.3) ^e	31.7 (4.56) ^e	27.7 (5.22) ^e	19.2 (4.04) ^e	29.3 (6.00) ^e	15.4 (3.47) ^e
Type of foundation study ^g							
1-year matriculation	170	127.6 (16.6) ^e	31.6 (4.46) ^e	29.2 (4.43) ^b	20.0 (3.41) ^e	30.2 (5.16) ^e	16.5 (3.15) ^e
2-year matriculation	7	119.9 (5.40) ^e	29.3 (2.69) ^e	25.6 (3.15) ^b	20.7 (1.11) ^e	28.4 (2.07) ^e	15.9 (2.11) ^e
Others	18	134.2 (17.7) ^e	32.3 (4.56) ^e	31.7 (4.04) ^b	21.2 (3.24) ^e	31.4 (4.57) ^e	17.6 (3.70) ^e
Cumulative grade point average (CGPA) ^h							
4.00	70	127.5 (20.3) ^e	31.7 (5.17) ^e	29.1 (5.03) ^e	20.2 (3.77) ^e	30.3 (6.09) ^e	16.7 (3.87) ^e
Below 4.0	98	128.0 (14.9) ^e	31.8 (4.48) ^e	29.5 (4.33) ^e	20.1 (3.21) ^e	30.3 (4.55) ^e	16.4 (2.68) ^e
Type of secondary school ^f							
Boarding school	69	126.7 (13.3) ^e	31.7 (3.54) ^e	29.2 (3.99) ^e	19.8 (2.99) ^e	29.9 (4.29) ^e	16.1 (2.20) ^e
Non-boarding school	126	128.6 (18.1) ^e	31.5 (5.04) ^e	29.3 (4.71) ^e	20.4 (3.53) ^e	30.5 (5.42) ^e	16.9 (3.58) ^e

Notes: ^aStatistically significant at $P < 0.05$; ^bsignificant at $P < 0.01$; ^chighly significant at $P < 0.005$; ^dvery highly significant at $P < 0.001$; ^enon-significant at $P > 0.05$; ^findependent t-test; ^gone-way ANOVA; ^h27 students had data missing. Mean total score of SPL was 31.6, maximum =48; mean total score of SPT was 29.3, maximum =44; mean total score of SASP was 20.2, maximum =32; mean total score of SPA was 30.2, maximum =48; mean total score of SSSP was 16.6, maximum =28 points.

Abbreviations: SPL, students' perceptions of learning; SPT, students' perceptions of teaching; SASP, students' academic self-perceptions; SPA, students' perceptions of atmosphere; SSSP, students' social self-perceptions; SD, standard deviation; DREEM, the Dundee Ready Education Environment Measure; UniSZA, Universiti Sultan Zainal Abidin; ANOVA, Analysis of variance.

Table 6 Domain interpretation score of DREEM by medical students of UniSZA according to academic phase (n=195)

Level of score based on domain	Number of respondents, n (%)		
	Pre-clinical	Clinical	Overall
Students' perceptions of learning			
Very poor	0 (0)	0 (0)	0 (0)
Teaching is viewed negatively	10 (9.8)	4 (4.3)	14 (7.2)
A more positive approach	82 (80.4)	82 (88.2)	164 (84.1)
Teaching highly thought of	10 (9.8)	7 (7.5)	17 (8.7)
Students' perceptions of teaching			
Abysmal	0 (0)	0 (0)	0 (0)
In need of some retraining	4 (3.9)	8 (8.6)	12 (6.2)
Moving in the right direction	83 (81.4)	71 (76.3)	154 (79.0)
Model teachers	15 (14.7)	14 (15.1)	29 (14.9)
Students' academic self-perceptions			
Feeling of total failure	0 (0)	1 (1.1)	1 (0.5)
Many negative aspects	9 (8.8)	8 (8.6)	17 (8.7)
Feeling more on the positive side	80 (78.4)	78 (83.9)	158 (81.0)
Confident	13 (12.7)	6 (6.5)	19 (9.7)
Students' perceptions of atmosphere			
A terrible environment	0 (0)	1 (1.1)	1 (0.5)
There are many issues that need changing	8 (7.8)	8 (8.6)	16 (8.2)
A more positive atmosphere	82 (80.4)	80 (86.0)	162 (83.1)
A good feeling overall	12 (11.8)	4 (4.3)	16 (8.2)
Students' social self-perceptions			
Miserable	0 (0)	1 (1.1)	1 (0.5)
Not a nice place	25 (24.5)	18 (19.4)	43 (22.1)
Not too bad	68 (66.7)	73 (78.5)	141 (72.3)
Very good socially	9 (8.8)	1 (1.1)	10 (5.1)

Abbreviations: DREEM, the Dundee Ready Education Environment Measure; UniSZA, Universiti Sultan Zainal Abidin.

(72%). A higher percentage of clinical students favored the UniSZA environment more than the pre-clinical students in all subscales, except perception of teaching (Table 4).

Overall scores

The overall mean DREEM scores (Table 5) were significantly higher ($P<0.001$) for females (131.1±14.9 points) than for males (120.7±17.9 points). Thus, female students indicated a more positive perception than their male counterparts about the UniSZA educational environment.

Students' perceptions of learning

The mean SPL score indicated that there was a significant difference ($P<0.001$) between the sexes (SPL score for

males was 29.8±5.37 points; SPL score for females was 32.4±3.92 points) in perceptions of learning at UniSZA's medical school. However, there was also no significant difference ($P=0.386$) observed between learning phases (preclinical phase, 31.3±4.97 points; clinical phase, 31.8±4.07 points). Similarly, in terms of the SPL domain, no significant differences ($P>0.05$) were observed in other sociodemographic or educational parameters (Table 5).

Students' perceptions of teaching

The mean SPT score indicates that there was a significant difference ($P<0.001$) between sexes (SPT for males was 27.3±4.32 points; SPT for females was 30.6±4.25 points) in the medical school student population. There was also significant difference ($P=0.005$) in mean SPT score when compared with the same students' mean score generated from their evaluation of background foundation studies. The DREEM scores were significantly higher among students who had completed foundation studies (31.7±4.04 points) than for students who participated in a matriculation program. Among those who participated in the matriculation program, the 1-year graduates scored higher (29.2±4.43 points) than those who participated in the 2-year program (25.6±3.15 points). However, no significant differences ($P>0.05$) were observed due to marital status, race, year of study, cumulative grade point average, or type of secondary school (Table 5).

Students' academic self-perceptions

The mean SASP score indicated that there was a significant difference ($P=0.004$) in the sexes' perceptions (mean score for males, 19.1±3.93 points; mean score for females 20.6±2.96 points). However, no significant differences ($P>0.05$) were observed in the remaining seven parameters (Table 5).

Students' perceptions of atmosphere

The mean SPA indicated that there was a significant difference ($P=0.038$) between sexes (mean score for males was 29.1±5.59 points; mean score for female students was 30.7±4.71 points). Significant difference ($P=0.005$) was observed among races. For Indians, the mean SPA score was 33±5.51 points, followed by Malays at 30±4.47 points. The SPA score for the ethnic category of others was 28.5±2.08 points, and the mean SPA score for Chinese students was 28.5±6.50 points. The remaining six social and educational considerations showed no significant differences ($P>0.05$) (Table 5).

Students' social self-perceptions

The mean SSSP score indicated that there was a significant sex-related difference ($P < 0.001$) in perceptions (the mean score for males was 15.3 ± 3.15 points, and the mean female score for females was 17.2 ± 3.01 points). However, other socio-demographic and educational parameters showed no significant difference ($P > 0.05$) in the SSSP domain at the medical school of UniSZA (Table 5).

Discussion

The aim of this study was to understand and examine the educational environment offered by the Faculty of Medicine and Health Sciences, UniSZA, through the eyes of undergraduates as per feedback provided by the students. The findings were used to identify strengths and weaknesses in the institution's educational environment. A medical school is an environment in which students anticipate experiencing real-life learning activities. Curriculum is the most important determinant of the learning environment, and it controls the behavior of all stakeholders.^{58,59} Any curriculum change should also involve changes in educational environment, management, and the organization to result in the predicted outcomes. Improvement in the educational environment and curriculum is only possible by identifying weaknesses and strengths in both. Monitoring the perception of students of their educational environment is also crucial.⁴¹ DREEM is an instrument used to assess the educational microclimate and macroclimate of medical schools as perceived by the students.^{12,32}

Overall scores

The overall mean DREEM score in the current study was 127.9 ± 16.58 points. Study findings were within the accepted range of 101–150 points that is an indicative of a “more positive than negative” perception.⁵⁷ Overall scores from the current study were analogous with results from institutions in the UK, Nepal, Nigeria, Saudi Arabia, United Arab Emirates (UAE), Yemen, Kuwait, and Iran.^{39,60–66} The University Kebangsaan Malaysia (UKM) and the Universiti Sains Malaysia (USM) scores were quite similar with scores generated at UniSZA.^{28,44}

Students' perceptions of learning

Item 16 (Table 3) in the SPL domain obtained the highest score at UniSZA, which indicates that students believe teaching is helpful in developing skills needed in their profession. On the other hand, the item 25 (Table 3) score was very low. However, none of the items received a very

high score, indicating that there is a need for improvement. There was no statistically significant difference ($P = 0.386$) in the mean score between pre-clinical and clinical students (Table 5). This result indicates that the learning methods used by students are suitable and are adapted to their curriculum. Female students' responses were statistically significantly ($P < 0.001$) in their positive perception of learning, as compared to males (Table 5). It has been reported from Michigan State University, East Lansing, MI, USA that there have been differences observed in learning styles between male and female undergraduates.⁶⁷ Furthermore, females generally spend more time studying, compared to males. The overall scores generated at UniSZA were quite similar with scores generated by a number of other studies.^{37,44,56} There were two negative statements made by students regarding SPL. Students complained about “over emphasizes factual learning and too much teacher-centered teaching” at UniSZA. UniSZA managers must put more emphasis on improving these weaknesses and on ensuring future development of the total educational environment of UniSZA.

Students' perceptions of teaching

Items 2 and 40 (Table 3) in the SPT domain scored quite highly, and remaining items scored in the above-average range. This result shows that students are satisfied and able to adapt to the teaching style provided by the lecturers. It also signifies that teaching standards at UniSZA are moderately good. No research participants scored well in the SPT domain. Therefore, students expect some improvement in teaching methodology.

There was no statistically significant difference ($P = 0.696$) in the mean SPT score between pre-clinical and clinical students (Table 5). The teaching style in clinical education is more practical, and in pre-clinical education, it is more theoretical. This finding can be interpreted as an endorsement of effective teaching, with similar satisfaction at different educational phases supporting the interpretation.

Students from the 1-year matriculation program have more positive perceptions, as compared to those who participated in the 2-year matriculation program (Table 5). The 1-year matriculation students probably cope better with the ME system than their peers. This may be one reason that causes 2-year matriculation students to face more difficulties in medical-school. In Malaysia, 2-year matriculation is considered to be a program for relatively weak students.

Female medical students demonstrated more positive perceptions toward teaching; their mean SPT score was sig-

nificantly higher than their male counterparts' mean score ($P<0.001$). Research findings show that female students develop more trust toward their lecturers when compared with males.⁶⁸

The overall scores were quite similar with a number of other studies.^{39,64} There were four items (8, 9, 39, and 50) that generated negative statements (Table 3). Those items included statements like “teachers ridicule the students”, “are authoritarian”, “get angry” and that “students irritate teachers”. These issues will damage the quality of teaching and learning programs of UniSZA. Therefore, university authorities should initiate some training plan to resolve these issues.

Students' academic self-perception

Items 31 and 45 (Table 3) scored well in SASP, but Item 27 scored below average. This can be ascribed to the possible fact that students have confidence in their academic performance, but encounter difficulties in memorizing facts and data, which are critical in the medical field. Therefore, certain policies need to be implemented by the medical faculty at UniSZA to address this issue. Both pre-clinical and clinical students reported similar SASP scores, with no statistically significant differences ($P=0.906$; Tables 4 and 6). The female students scored better, and their scores were significantly different than male students' scores ($P=0.004$; Table 5). This finding is supported by research on sex-related differences in another educational institute.⁶⁹ The overall score (20.1 ± 3.35 points) for SASP was somewhat higher in the current study than it was in studies conducted in Saudi Arabia and Kuwait.^{63,65}

Students' perceptions of atmosphere

SPA is very important, because it influences all aspects of teaching and learning. All the items from this domain scored above-average at UniSZA, which indicates that research participants have positive perceptions. However, none of the items scored very well. The policy makers of UniSZA should concentrate more on leisure activities and encouraging didactic settings. Females' perceptions regarding SPA were significantly different ($P=0.038$) than male students' perceptions. Previous study results have shown that females have better coping strategies and adapt more readily than their male colleagues.^{70,71} The present study also exhibited that Indian students have a significantly better ability to cope with the ME milieu, followed by Malays, Chinese, and others ($P=0.005$). The overall SPA scores were comparable to scores generated in an Irish study,¹⁰ but a bit higher than scores

achieved in a study in Kuwait.⁶⁵ There were two negative statements (items 17, 35, Table 3). Student reported cheating and disappointment. The authors expect that with more intensive care in the future, these two issues can be improved in the near future.

Students' social self-perceptions

Item 15 (Table 3) is the item in the SSSP domain with highest score. Item 3 and 14 scores were low. Other items achieved average scores. These findings prove that students depend mostly on their friends for their social and moral support. There was only one negative item reported, number 14, regarding SSSP. UniSZA medical students were “rarely bored”, but students claimed that the UniSZA system does not provide adequate opportunities to manage stress, and also that social opportunities are inadequate. The authors expect that UniSZA will engineer more opportunities for students to relax and improve their social life. Male students disclosed a statistically significant, less positive perception when compared to females ($P<0.001$). Females are more emotionally attached to their friends in many aspects, whereas males are only attached to enjoyable activities, but are not proactive in sharing problems with friends.⁷² The overall scores for UniSZA in the SSSP domain were comparable to an equivalent Irish study,¹⁰ but were slightly higher than scores generated in a study in Kuwait.⁶⁵ Malaysia is a multi-ethnic country with a multi-cultural society; in fact, the UniSZA social environment was perceived to be well-balanced between Malay, Chinese, and Indian students. Current findings were very similar with another study of Malaysian student perceptions.²⁸

Study limitations

This is a cross-sectional study with its own inherent limitations. The number of participants who returned the questionnaire varied among the year of study. Only 195 out of 270 students responded to the questionnaire. This lower response rate was due to the fact that when the study was conducted, some students were busy with exam preparations, and others had returned home for the semester break.

Conclusion

The medical students of UniSZA showed a positive perception of their MBBS program and educational environment. The Faculty of Medicine and Health Sciences of UniSZA, within a few years, has achieved an above-average, conducive learning environment for their students. Most of the students showed a positive perception in the entire five domains tested in the DREEM questionnaire. Female medical

students were consistently satisfied with UniSZA's educational environment, as compared to their male undergraduate counterparts.

A regular evaluation process of the students' perceptions is necessary to obtain continual information feedback from them and other stakeholders, so that the learning environment can be improved to support consistently effective learning and teaching. Also, initial mistakes can be corrected easily, and a proper learning pace can be conserved. This appraisal will provide baseline data and guidelines in areas that students feel good about, which should be reinforced, and in the weaker areas, which need improvement. Well-planned, prospective follow-up research is advocated in this regard. Consequently, the medical faculty of UniSZA can improve immensely, and can be the best among medical universities of Malaysia. Improved and consistent performance will enable UniSZA to produce more holistic doctors who are better prepared to serve the people of Malaysia and the rest of the world.

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Disclosure

The authors report no conflicts of interest in this work.

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