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Educational environment as perceived by dental students at King Saud University ☆

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Abstract   *Objectives:* Main objectives of the present study were to develop a baseline information about dental students' perception of their educational environment at the College of Dentistry, King Saud University (KSU) in Riyadh; and to investigate the role of four different variables on the students' perception.

Methods: Dundee Ready Education Environment Measure (DREEM) questionnaire was distributed among 497 undergraduate dental students, in the second week of the first semester of the academic year, from second year students to interns studying in the College of Dentistry of King Saud University (KSU).

Results: Response rate was 60.73%. Mean for the total DREEM scores was 108.42/200. DREEM subscales mean were above 50% of the total score. DREEM overall score showed no significant statistical difference among the four variables investigated, except the academic year, where the second year students scored significantly higher (118.36 ± 15.8) compared to the interns (105 ± 21.3).

Conclusion: Students' perception of educational environment in the KSU College of Dentistry was satisfactory. However, several weak areas were identified which need some attention and consideration.

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1. Introduction

The importance of including student input in education is accepted as a key component of processes used to monitor the quality of academic program (Henzi et al., 2007). Health profession students' perspectives on the content, structure, and quality of their educational experience are an essential component of a broad-based assessment of the curriculum and an important source of information through which alterations can be made, mistakes corrected, and momentum maintained (Henzi et al., 2005; Till, 2005).

Higher education environment embraces everything happening in the school (Genn, 2001), which includes the school's overall atmosphere or characteristics, the kind of behaviors that are rewarded, encouraged, and emphasized, and the predominant lifestyle (Genn, 2001).

Educational environment is one of the most important determinants of an effective curriculum (Ostapczuk et al., 2012). How students experience this environment may be called as climate (Genn, 2001). It has been shown that climate strongly affects student achievement, satisfaction, and success (O'Brien et al., 2008; Genn, 2001; Till, 2005).

In 2005, Karagiannopoulou & Christodoulides showed that students' approaches to learning and their learning outcomes are influenced by the teaching–learning environment, involving a number of interrelated components, such as the teaching method and assessment, course structure, curriculum, workload, and teacher effectiveness (Karagiannopoulou and Christodoulides, 2005).

Individual students may respond differently to different elements in their learning experience. Thus, evaluating how students perceive their educational environment and assessing the institution's climate on a regular basis are tools highly essential to nurture areas of excellence, improve areas that need attention, and enhance the students' learning experience (Till, 2005).

Educational climates are measurable (Ostapczuk et al., 2012). A range of studies using quantitative (close-ended questionnaire based) (Henzi et al., 2005), or qualitative (open-ended interview based) (Victoroff and Hogan, 2006), or (open-ended questionnaire based) (Henzi et al., 2007) methodology have been developed to explore learners' responses and views of their educational experiences.

A variety of instruments have been developed to measure the environment of higher education institutions, including College and University Environment Scales (CUES), Classroom Environment Scales (CES), and the College and University Environment Inventory (CUCEI) (Ostapczuk et al., 2012; Henzi et al., 2005).

The DREEM was developed and validated by Roff using a standard methodology utilizing grounded theory and a Delphi panel of nearly 100 medical and health profession educators from several countries. This methodology was designed to develop a non-culturally specific instrument (Roff, 2005a, 2005b; Ostapczuk et al., 2012). DREEM has a proven high reliability (Ostapczuk et al., 2012; O'Brien et al., 2008; Roff et al., 2001; Tomas et al., 2014). DREEM was applicable in different medical and dental schools in Europe (Ostapczuk et al., 2012; Tomas et al., 2014; Varma et al., 2005; Foster Page et al., 2012), Africa (Roff et al., 2001), Asia (Al-Hazimi et al., 2004a; Mayya and Roff, 2004; Jiffry et al., 2005; Al-Hazimi et al., 2004b; Abraham et al., 2008; Mahrous et al., 2013) and America (Al-Ayed et al., 2008; Till, 2005; Roff, 2005a, 2005b).

Aims of the present study was to gather baseline information using the DREEM inventory about the KSU dental students' perceptions of their educational environment; also to ascertain how students belonging to different genders and levels of the dental school responded to the DREEM questions.

2. Materials and methods

The Institutional Review Board of the College of Dentistry, King Saud University has approved the study prior to its conduction. A verbal consent was obtained from participants and approved by the Ethics Committee Review Board. The research has been conducted in full accordance with the World Medical Association Declaration of Helsinki.

2.1. Participants

All undergraduate students who had completed at least one successful year in dental school and interns studying at King Saud University in Riyadh were invited to participate in the study. A total of 497 questionnaires were distributed to both male and female students in the second week of the first semester of the academic year. The questionnaires were distributed to the second year through the fifth year students and then collected. Further, the questionnaires to all current interns who graduated from the school were sent via e-mail.

2.2. Instruments

DREEM questionnaire, which has been validated as a universal diagnostic inventory for assessing the educational environment (Ostapczuk et al., 2012), was used in this study. The inventory consists of 50 items with each item scored on a five-point Likert scale with 4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree, and 0 = strongly disagree. Nine of the items were negative (items 4, 8, 9, 17, 25, 35, 39, 48, and 50) and were thus scored in reverse order such that a higher score indicates a more positive reading.

DREEM inventory measures five domains of the students' perceptions of their institute:

(a) Students' perception of learning (SPL): 12 items, maximum score of 48.
(b) Students' perception of teachers (SPT): 11 items, maximum score of 44.
(c) Students' academic self-perception (ASP): 8 items, maximum score of 32.
(d) Students' perception of atmosphere (SPA): 12 items, maximum score of 48.
(e) Students' social self-perception (SSSP): 7 items, maximum score of 28.

The original English version of the DREEM questionnaire was used. Certain key words were translated into Arabic, by professional translators, to assure students' understanding. To check the validity of the translation, it was conducted as backward and forward translation. Students were asked to

anonymously respond to each item on the basis of their own experience in their previous years by evaluating on a five-point scale ranging from strongly agree to strongly disagree. Students were asked to indicate their age, gender, current academic year, marital status, and grade point average (GPA) on the questionnaires.

Mean total scores for all subscales were interpreted according to the practical guide to using the DREEM written by McAleer and Roff, (Table 1) (McAleer et al., 2001).

Statistical package for social sciences (SPSS version 16) was used for data analysis. The mean scores for each item, each subscale, and the total subscales were calculated. An independent t-test was used to compare mean scores by gender and marital status. Analysis of variance (ANOVA) followed by a

post-hoc Tukey's test was used to compare mean scores between different academic levels and GPA classes. A p-value of less than 0.05 was considered statistically significant.

3. Results

The questionnaire was completed by 302 dental students with a response rate of 60.76%. More than half of the respondents (55.96%) were female. The response rate for each academic year is presented in Table 2.

The overall DREEM scores for the sample ranged from 60.00 to 160.00, with a mean of (108.42/200) and a standard deviation of 18.92. The mean DREEM scores obtained by the sample in each subscale are shown in Table 3, where all subscale mean scores were above 50% of the total score, the score for ASP was the highest (61.88%), and the lowest score was for SSSP (51.68%). DREEM mean score for each individual item is shown in Table 4.

DREEM overall score showed no statistical significant difference among the four variables investigated, except academic year, where the second year students obtained a significantly higher score (118.36 ± 15.8) compared to that of the interns (105 ± 21.3). In contrast, certain DREEM subscales' scores of the different academic levels had statistically significant differences, as did those of the different genders. GPA and marital status showed no significant statistical differences in any of the five DREEM subscales.

The effect of the four investigated variables on the individual DREEM items, showed some significant differences. There were significant differences between male and female responses to the items of the DREEM inventory. Among the five items (10, 11, 25, 36, and 42) for which males scored higher values than females, three belonged to the SPA subscale (Table 4).

Regarding marital status, four statements showed significant differences between unmarried and married respondents (Table 4). Unmarried respondents scored higher than the married in the majority of the items.

The majority of the significant differences between the different academic levels were between the second year students and other academic levels as well as between the interns and other academic levels.

The highest number of items showing statistically significant differences was found between the second year students and interns, as shown in Table 4.

In addition, statistical significant differences were found between the second year students and the third, fourth, and fifth year students. The second year students scored significantly higher (p-value < 0.05). Statistically significant

Table 1 Guide for interpretation of the DREEM scores.

	Score	Interpretation
Total DREEM scores	0–50	Very poor
	51–100	Plenty of problems
	101–150	More positive than negative
	151–200	Excellent
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
SAP	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 to be changed
	25–36	A more positive atmosphere
	37–48	A good feeling overall
SSP	0–7	Miserable
	8–14	Not a nice place
	15–21	Not very bad
	22–28	Very good socially

Table 2 Number of questionnaires distributed for male and female respondents and the response rates for each academic year.

Year of study	Distributed		Received		Total received	Response rate
	Male	Female	Male	Female		
2nd year	70	36	17	30	47	44.34%
3rd year	75	46	41	35	76	62.81%
4th year	66	40	16	36	52	49.06%
5th year	62	35	33	33	66	68.04%
Interns	30	37	26	35	61	91.04%
Total	303	194	133	169	302	60.76%

Table 3 Mean scores for the total DREEM and its subscales.

DREEM subscale		Maximum score	Mean (SD)	Percentage of the maximum score
SPL	Students' perception of learning	48	25.30 (5.37)	52.71%
SPT	Students' perception of teaching	44	24.42 (5.13)	55.57%
ASP	Academic self-perception	32	19.80 (3.94)	61.88%
SPA	Students' perception of atmosphere	48	25.16 (6.03)	52.42%
SSSP	Students' social self-perception	28	14.47 (3.44)	51.68%
Total DREEM		200	108.42 (18.92)	54.21%

differences were also found between the second year students and the third, fourth, and fifth year students in their scoring of several DREEM subscales.

No statistically significant differences were found between the third and the fourth or fifth year students.

4. Discussion

Educational environment perception by the students is key factor in determining the nature of their learning experience.

The DREEM inventory can be used to generate a profile of a particular institution's strengths and weaknesses in order to make comparative analyses of students' perceptions of educational environments both within an institution and between institutions. Several similar studies have been conducted in medical (Ostapczuk et al., 2012; Varma et al., 2005; Roff et al., 2001; Al-Hazimi et al., 2004a; Mayya and Roff, 2004; Jiffry et al., 2005; Al-Hazimi et al., 2004b; Abraham et al., 2008; Till, 2005; Till, 2004; Roff, 2005a, 2005b); nursing (O'Brien et al., 2008); and dental nursing and dental technology schools (Zamzuri et al., 2004; Roff, 2005a, 2005b). In the Kingdom of Saudi Arabia, only few studies using the DREEM inventory have been conducted at different universities, College of Medicine: King Abdul Aziz, Umm Al-Qura (Al-Hazimi et al., 2004a, 2004b) and King Saud University (Al-Ayed et al., 2008), at Jeddah, Makkah and Riyadh, respectively; in addition to a recent research conducted to assess the educational environment in a newly established dental college at Taibah University, Al Madinah (Mahrous et al., 2013).

In the College of Dentistry at King Saud University in Riyadh, similar to most medical and dental schools in the Middle East region, the under graduate curriculum can be described as traditional, as defined by the General Medical Council (1993) (Tomas et al., 2014).

Traditional curriculum is a teacher-centered and discipline-based curriculum with no optional modules or electives. The teaching depends primarily on gathering information, with the teacher as the main source of information. Teaching methods comprise lectures, practical classes, and clinical sessions, with no or limited problem-based sessions. In general, students view learning as something "done to them" by the teacher and the curriculum as an aggregate of separate subjects (Al-Hazimi et al., 2004a, 2004b).

The overall mean DREEM score for our dental school (108.42/200) indicates that there is more positive than negative perception of the students regarding their educational environment, as interpreted using the DREEM practical guide (Roff et al., 2001). The overall sample rated the environment in this institution as average or satisfactory. Present findings comes into agreement with other studies that reported a DREEM score of around 50%; for example, Trinidad (109.9/200) (Ostapczuk et al., 2012); Sri Lanka (107.7/200) (Jiffry et al., 2005); Kasturba, India (107.44/200) (Mayya and Roff, 2004); and Sana'a University (100/200) (Al-Hazimi et al., 2004a). Other studies, such as those in the UK, 5 Dundee University 9 (Al-Hazimi et al., 2004a), and Nepal and Nigeria (Ostapczuk et al., 2012) reported a higher mean total DREEM scores of 60–70% (118–139/200), which indicate greater student satisfaction. Despite the overall perception being satisfactory, various deficiencies existed in these schools.

Conversely, a study conducted in Canada (Till, 2004) and another unpublished study conducted in Saudi medical college at KSU (Al-Ayed et al., 2008) reported that students perceived their environment as negative (<50%) with many problems that require urgent attention.

The scores for all five DREEM domains of educational environment in the present study revealed that students' perception of learning, teacher, and atmosphere, as well as their academic and social self-perception were satisfactory. Students' academic self-perception was perceived as the most positive aspect (61.88%) compared with the other domains. This is consistent with the results of studies conducted at Kasturba, India (Mayya and Roff, 2004), Jeddah, Makkah, Sana'a (Al-Hazimi et al., 2004a), Sri Lanka (Jiffry et al., 2005), Trinidad (Ostapczuk et al., 2012), and Nepal (Ostapczuk et al., 2012). This may suggest that our educational environment may influence the students' perception of adopting an optimistic approach in their studies, which will make them more confident about passing the courses and their readiness to become good dentists in the future.

Among the weak items (items with mean of 2 or below) identified in this study, the support system for stressed students was rated as the weakest. This finding is in agreement with several studies (Jiffry et al., 2005; Ostapczuk et al., 2012; Al-Hazimi et al., 2004a). A previous study at this school showed that most of our dental students had a relatively high level of perceived stress (Henzi et al., 2005). There is an urgent and high requirement for a student-friendly atmosphere where a high standard of academic support is readily available. A good support system, effective assistance from the teaching staff and faculty administrators, orientation lectures, conferences, counseling, and stress management programs are needed (Al-Saleh et al., 2010).

Teaching was perceived as highly teacher-centered and overemphasizing on factual learning, which is consistent with other studies' findings (Al-Hazimi et al., 2004a; Till, 2004). This result can be attributed to the traditional curriculum, which is organized and taught as independent blocks of factual knowledge. This has long been recognized as an ineffective learning strategy, forcing students to use surface learning

Table 4 Mean scores for all DREEM items for the overall sample and the significant differences between the variables.

Domain subscale	Item	Mean(SD)	Sig. gender effect			Significant marital status effect			Sign. academic level effect		
			Male M (SD)	Female M(SD)	P value	Married M (SD)	Single M (SD)	P Value	2nd year M (SD)	Intern M (SD)	P value
SPL	**Students' perception of learning**	25.30 (5.37)							27.88 (4.96)	23.91 (5.62)	0.0001
	1. I am encouraged to participate during teaching sessions	2.41 (0.868)							2.74 (0.896)	2.21 (0.777)	0.0007
	7. The teaching is often stimulating	2.04 (0.857)							2.24 (0.822)	1.83 (0.827)	0.0059
	13. The teaching is student centered	2.14 (0.876)							2.44 (0.693)	1.93 (1.039)	0.0014
	16. The teaching helps to develop my competence	2.37 (0.845)									
	20. The teaching is well focused	2.30 (0.857)							2.65 (0.795)	2.02 (0.904)	0.0001
	22. The teaching helps to develop my confidence	2.22 (1.005)									
	24. The teaching time is utilized properly	2.17 (0.931)	2.01 (0.916)	2.3 (0.924)	0.007						
	*25. The teaching over emphasizes factual learning**	1.53* (0.810)	1.73 (0.808)	1.38 (0.782)	2.E-4						
	38. I am clear about the learning objectives of the courses	2.45 (0.805)	2.29 (0.893)	2.57 (0.708)	0.003						
	44. The teaching encourages me to be an active learner	2.01 (0.978)									
	47. Long term learning is emphasized over short term learning	2.21 (0.958)									
	48. The teaching is too teacher centered	*1.50 (0.839)									
SPT	**Students' perception of teaching**	24.42 (5.13)	22.89 (5.85)	26.00 (4.89)	5.E-6				26.06 (4.81)	22.28 (4.90)	
	2. The teachers are knowledgeable	3.00 (0.650)	2.9 (0.708)	3.08 (0.591)	0.02						
	6. The teachers are patient with patients	2.43 (0.864)									
	*8. The teachers ridicule the students**	1.84*(1.033)	1.56 (1.075)	2.06 (0.946)	2.E-5				2.45 (0.904)	1.51 (1.074)	0.0000
	*9. The teachers are authoritarian**	1.53* (1.078)	1,35 (1,106)	1.67 (1.039)	0.002				2.06 (1.092)	1.11 (1.097)	0.0000
	18. The teachers have good communication skills with patients	2.58 (0.795)									
	29. The teachers are good at providing feedback to students	2.03 (0.940)	1.89 (1.002)	2.14 (0.876)	0.021				2.28 (0.886)	1.69 (1.088)	0.0016
	32. The teachers provide constructive criticism	2.19 (1.012)									
	37. The teachers give clear examples	2.42 (0.837)	2.24 (0.888)	2.56 (0.767)	0.001						
	*39. The teachers get angry during teaching sessions**	1.81*(1.030)	1.63 (1.133)	1.94 (0.926)	0.011						

Table 4 (*continued*)

Domain subscale	Item	Mean(SD)	Sig. gender effect			Significant marital status effect			Sign. academic level effect		
			Male M (SD)	Female M(SD)	P value	Married M (SD)	Single M (SD)	P Value	2nd year M (SD)	Intern M (SD)	P value
	40. The teachers are well prepared for their teaching sessions	2.56 (0.875)	2.28 (0.972)	2.77 (0.727)	1.E-6				2.78 (0.795)	2.25 (0.960)	0.0014
	50. The students irritate the teachers	2.03 (1.027)	1.75 (1.003)	2.25 (0.994)	3.E-5						
ASP	**Academic self-perception**	19.80 (3.94)									
	5. Learning strategies which worked for me before continue to work even now	2.21 (0.889)									
	10. I am confident about my passing this year	2.81 (0.797)	2.97 (0.774)	2.68 (0.794)	0.002				2.70 (0.858)	3.19 (0.945)	0.0032
	21. I feel I am being well prepared for my profession	2.56 (0.869)							2.39 (0.977)	2.93 (0.727)	0.0007
	26. Last year's work has been a good preparation for this year's work	2.69 (0.926)				2.65 (0.952)	2.94 (0.619)	0.001	2.54 (0.836)	3.05 (0.717)	0.0005
	27. I am able to memorize all I need*	1.83* (1.003)							1.80 (1.003)	2.35 (1.087)	0.0041
	31. I have learned a lot about empathy in my profession	2.61 (0.969)									
	41. My problem solving skills are being well developed	2.39 (0.907)									
	45. Much of what I have to learn seems relevant to a career in healthcare	2.65 (0.773)									
SPA	**Students' perception of atmosphere**	25.16 (6.03)							29.87 (4.52)	24.21 (6.86)	0.0001
	11. The atmosphere is relaxed during the clinical teaching*	1.58* (1.111)	1.79 (1.139)	1.41 (1.063)	0.003	1.61 (1.132)	1.22 (0.941)	0.029	2.23 (1.031)	1.28 (1.097)	0.0000
	12. This school is well timetabled	2.05 (1.075)									
	17. Cheating is a problem in the school*	1.63* (1.206)	1.31 (1.211)	1.87 (1.147)	5.E-5				2.15 (1.122)	1.41 (1.10)	0.0004
	23. The atmosphere is relaxed during lectures	2.41 (0.923)	2.22 (0.94)	2.55 (0.884)	0.002				2.78 (0.629)	2.13 (1.024)	0.0000
	30. There are opportunities for me to develop interpersonal skills	2.72 (0.877)									
	33. I feel comfortable in teaching sessions socially	2.34 (0.840)							2.74 (0.681)	2.23 (0.956)	0.0008
	34. The atmosphere is relaxed during seminars/tutorials	2.29 (0.827)	2.13 (0.813)	2.42 (0.818)	0.003						
	35. I find my experience in dental school disappointing	2.08 (1.012)									
	36. I am able to concentrate well	2.30 (0.941)	2.5 (0.885)	2.14 (0.955)	0.001						
	42. The enjoyment outweighs the stress	1.57* (1.119)	1.73 (1.120)	1.44	0.028						

Table 4 (*continued*)

Domain subscale	Item	Mean(SD)	Sig. gender effect			Significant marital status effect			Sign. academic level effect		
			Male M (SD)	Female M(SD)	P value	Married M (SD)	Single M (SD)	P Value	2nd year M (SD)	Intern M (SD)	P value
	of the courses*			(1.106)							
	43. The atmosphere motivates me as a learner*	1.91* (1.010)							2.37 (0.878)	1.75 (1.120)	0.0008
	49. I feel I am able to ask the questions I want	2.27 (1.068)	1.69 (1.111)	2.51 (0.971)	9.E-6						
SSSP	**Students' social self-perception**	14.47 (3.44)									
	3. There is a good support system for students who get stressed	1.02* (1.012)									
	4. I am too tired to enjoy the courses*	1.32*(1.048)	1.35 (1.071)	1.10 (0.831)	0.011						
	14. I am rarely bored on the courses*	1.73*(1.026)									
	15. I have good friends in this school	3.32 (0.845)									
	19. My social life is good	2.85 (1.037)									
	28. I seldom feel lonely	2.02 (1.108)									
	46. My accommodation in the school is pleasant	2.23 (0.918)									
Total DREEM		108.42 (18.92)							118.36 (15.79)	105.59 (21.79)	0.0004

Items with a value less than 2.00 is denoted in italics and marked with *. Items with a value equal to or more than 3.00 is denoted in bold.

techniques that train the memory but not the mind (Albarrak et al., 2013). To advance beyond an educational environment that rewards memorization and survival game strategies, students must have time to reflect and think about their learning. This will demand a different approach to traditional education formats and a complete reorganization of the educational competencies and content delivery. It has been suggested that a ''natural critical learning environment'' must be created that fosters reasoning from evidence, improves thinking, and develops inquiry skills (Pyle et al., 2006).

Unfortunately KSU students at all academic levels except second year agreed that teachers are authoritarian, they ridicule their students, and they get angry during teaching sessions. This perception worsened from the second year to the interns, which is consistent with the results of previous studies (Abraham et al., 2008; Al-Hazimi et al., 2004a; Ostapczuk et al., 2012; Mayya and Roff, 2004). This may reflect a problem in the approachability of staff and lack of staff training in health profession education. A humanistic approach characterized by close professional relationships between faculty and students, fostered by mentoring, advising, and small-group interaction should be implemented. Students who are respected learn to respect their patients, both present and future, as living human beings, as individuals with diverse backgrounds, life experiences, and values. A humanistic environment establishes a context for the development of interpersonal skills necessary for learning, caring for patients, and making meaningful contributions to the profession (Harden et al., 2006).

Present findings concurred with those of previous studies (Ostapczuk et al., 2012; Foster-Page et al., 2012; Al-Hazimi et al., 2004a; Mayya and Roff, 2004; Jiffry et al., 2005; Al-Ayed et al., 2008) in that the atmosphere in the clinical setting was not perceived as relaxed by the respondents. Present results may support previous findings that clinical training is the most stressful aspect of studying dentistry (Al-Saleh et al., 2010).

The strongest item as perceived by the students was the good friends they have in this school, consistent with the findings for King Abdul Aziz University, Umm Al-Qura University, and Sana'a University (Al-Hazimi et al., 2004a), as well as Nigeria and Nepal (Ostapczuk et al., 2012). The second strongest item was knowledgeable teachers, consistent with the findings for Sri Lanka (Jiffry et al., 2005), Dundee University (Al-Hazimi et al., 2004a), Trinidad (Ostapczuk et al., 2012), and Nigeria (Ostapczuk et al., 2012). Although the teachers were considered knowledgeable, the quality of feedback provided to our students was assessed as inadequate. This perception may reflect lack of staff training in health education. Staff development must extend beyond lecturing and teaching methods, and must include other areas such as leadership, organization and management skills, and professional academic qualities. Programs must be flexible to meet the individual teachers' needs (Ostapczuk et al., 2012).

Through analyzing the role of gender difference on the students' perception of their educational environment, students' gender did not cause a significant difference in their perception of the overall educational environment. This deviated from the studies, where male students perceived the educational environment as better than did female students at a Nigerian medical school (Ostapczuk et al., 2012), whereas female students perceived the educational environment as better than did male

students in the UK (Ostapczuk et al., 2012). It is important to note that Saudi schools have a system wherein female students are separated from male students, but both are taught by professors of both genders.

Within the DREEM inventory subscales, the domain of students' perception of teachers did reveal significant differences between male and female students: female students perceived their teachers as better than did male students, similar to the findings for Dundee University students (Ostapczuk et al., 2012). Female respondents perceived their teachers as more knowledgeable, not ridiculing their students, good at providing feedback to students, giving clear examples, being well prepared in their teaching sessions, being less authoritarian, and expressing anger less often in teaching sessions than the males' perception of their teachers.

In the present study, generally, females were satisfied with more number of items and components of their educational environment than were males, which is consistent with the findings of studies conducted in Dundee University (Al-Hazimi et al., 2004a; Sri Lanka (Jiffry et al., 2005), and India (Abraham et al., 2008).

Our analysis demonstrated that students at different academic levels perceived the educational environment aspects differently. Not surprisingly, second year students' perceptions of several items were significantly higher than those of all other academic levels, particularly the interns. This finding may suggest that dental students entered the school optimistic and enthusiastic, but they lose this optimism as soon as they start experiencing real clinical and practical labs, and they maintain this level of disappointment and depression throughout their studies. In fact, a longitudinal study is recommended to prove this theory.

Second year students' perception of the overall educational environment and the learning, teachers, and atmosphere domains were better than that of the higher academic levels. This can be attributed to the short-term experience of the second year students and, more importantly, to the fact that they had not been exposed to the intense and stressful clinical and preclinical courses. The progressive decline in the students' perception of the overall environment, the learning, and teaching from the second year students to the interns were also demonstrated in other studies (Abraham et al., 2008; Al-Ayed et al., 2008; Foster-Page et al., 2012) and was reported by Deza, who first found that the students who had been enrolled at the school longer period were significantly less satisfied with the teaching and the support system for stressed students than those who had been enrolled for a shorter period (Ostapczuk et al., 2012).

As the students become more involved in their clinical training, they experience increased stressful situations (Jiffry et al., 2005). The dental school clinical environment has many problems, such as lack of efficiency and a considerably large unproductive time because of the amount of administrative work that students are required to perform while working in the clinic. This work involves tracking down patients, completing paper work, scheduling appointments, and performing other clinic operational tasks. Interestingly, the shortage of faculty, inconsistent feedback between instructors and lack of calibration in assigning grades for students' clinical evaluation, condescending feedback (especially in open areas of the clinic in front of staff, patients, and other students), chasing requirements, and finding patients who had dental problems

that matched the procedural requirements dictated by the various clinical departments are perceived as extremely stressful by the students (Henzi et al., 2006; Henzi et al., 2007).

Unmarried students perceived the atmosphere in clinical teaching as significantly more relaxed than did married students. This supports findings of a previous study at our school, which reported that married students stated a significantly greater problem with being criticized in front of patients and having an inadequate number of dental assistants than did single students (Al-Saleh et al., 2010).

The dental school has its unique environment and dental students have their unique experience Dentistry requires students to master several fine technical skills and treat patients, while receiving daily evaluation on their clinical performance. Several studies have been conducted in dental schools to identify areas of strengths and weaknesses within dental education from the students' perspectives (Henzi et al., 2007, 2006, 2005).

Regarding weaknesses, our students agreed with their peers from different dental schools that the emphasis on factual learning and stressful clinical environment were the most negative aspects in their education (Henzi et al., 2006, 2007).

The DREEM inventory thus provides useful diagnostic information about the dental institute in order to assess the strengths and weaknesses of the educational environment. Although several of the most frequently reported weaknesses appear to be prevalent and inherent in diverse dental educational environments, intensive efforts are required by dental school administrators to manage these weaknesses effectively, thus promoting the educational and professional wellbeing of the dental undergraduate students.

4.1. Practice points

- Health profession students' perception of their educational environment is an essential source of information to encourage areas of excellence, improve areas that need attention, and enhance the students' learning experience.
- DREEM provides useful diagnostic non-culturally specific instrument to measure the educational environment of higher education institutions, including dental schools.
- Clinical training is the most stressful aspect of studying dentistry.
- A good support system, effective assistance from the teaching staff and faculty administrators, orientation lectures, conferences, counseling, and stress management programs are needed.

Conflict of interest

The authors declared that there is no conflict of interest.

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