**Original Article :**

# Perception of The Learning Environment Among Medical Students At Umm Al-Qura University, Makkah, Saudi Arabia.

Maram Alshareef[1], Ghaidaa Khouj[2], Shumukh Alqahtani[2], Eman Bamoosa[2], Sarah Fageeh[2], Munira Alalyani[2], Jameel Miro[3].

1. Assistant Professor, Department of Community Medicine and Pilgrims Health, Collage of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia.

2. Department of Medicine and Surgery, Collage of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia.

3. Assistant Professor of Surgical Oncology, Department of General Surgery, Collage of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia.

Received on 03.02.2022, accepted for publication on 30.5.2022 dx.doi.org/10.5455/mjhs.2022.03.009

Corresponding Author:

Name: Ghaidaa Khouj

College of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia

Phone number: +966505532266 , E-mail: Ghaidaa.Khouj@gmail.com.

OPEN ACCESS Distributed under Creative Commons CC BY-NC-ND 4.0

## Abstract

**Background and Aim:**

Students' perception of the educational environment is an important factor that affects the learning process in educational programs. Theories have offered support that the learning place affects a student's academic achievement, performance, and future career markedly. Assessment of students' satisfaction with and perception of their learning environment is an important indicator in most universities and institutions.

This study aimed to evaluate the perception of the learning environment of medical undergraduates and interns at Umm Al-Qura University (UQU) and compare between the old and reformed curriculum participants.

**Methods:**

This cross-sectional study was conducted at the College of Medicine at UQU, Makkah, Saudi Arabia. A total of 390 medical undergraduates and interns from the College of Medicine were invited to complete the Dundee Ready Educational Environment Measure questionnaire in the form of an online survey.

**Results:**

A total of 390 medical undergraduates and interns completed the survey (response rate: 30.95%). Interns had higher mean DREEM scores than undergraduates; this difference was not significant (172±25 vs. 171±18; P=.974). The mean score percentage for the perception of teachers was 73.2% for interns compared with 72.1% for undergraduates. Perception of ambiance subscale received the lowest mean score percentage among all participants.

**Conclusion:**

Medical undergraduates and interns perceived the learning environment at the College of

Medicine of UQU positively. Areas of weakness should be addressed to improve and develop the educational environment at our university.

**Keywords:**
Medical Education; Learning Environment; Perception; Medical Undergraduates; Interns.

## Introduction

The educational environment is one of the most crucial elements that improves students' learning and develops educational programs; as the more suitable the learning environment is, the better the student's wellbeing is, as well as the future identity of that student. Educational environment can be defined as the interaction of the students with the surroundings in the learning place, including students' self-perception, general ambiance, academic self-perception, and social self-perception represented by their relationships with other people (peers, teachers) [1]. Theories have offered support that the learning place affects a student's academic achievement, performance, and future career markedly [2]. However, most undergraduate and postgraduate teaching institutes have moved towards student-based learning. As adult learning theory supports the switch of many undergraduate and postgraduate programs to students being at the core of learning, student-centered learning needs a well-supported learning environment to ensure the safety and continuity of the educational process [1,3]. Moreover, with the high prevalence of burnout, stress, anxiety, and depression among medical students and the inverse relationship between educational quality and stress and anxiety [2,4], the assessment of students' satisfaction with and perception of their learning environment is an important indicator in most universities and institutions. Such assessments should be conducted periodically to improve students' performance, enhance the quality of education, and evaluate the need for curricular change [5,6,7]. Therefore, several medical schools, especially with the inclination toward reforming curricula and introducing new strategies in teaching, have decided to evaluate the learning environment [8,9].

Many tools are available to measure students' learning environment. The Dundee Ready Educational Environment Measure (DREEM) is a global validated instrument which allows medical educators to evaluate the learning environment for students and interpret their responses [10]. The DREEM tool has been widely used in various studies internationally, such as in the United Kingdom [7] and Thailand [9], as well

as locally, such as in King Saud University Medical College [11], Oman [12], King Abdelaziz University Medical College [13], and Kuwait [14].

The Bachelor of Medicine and Bachelor of Surgery at Umm Al-Qura University (UQU) is a five-year educational program from the second to sixth academic years followed by a one-year internship. The classical curriculum provided a discipline-based education that was teacher-centered rather than student-centered. This curriculum consisted of educational blocks with the occasional addition of problem-based learning and challenge-based learning. In 2016, UQU reformed its curriculum to be a competency-based student-centered curriculum with interactive teaching methods and small-group discussions based on problem-based learning. This new curriculum integrates ethics and clinical skills education and links basic science material to clinical problems [15] to graduate a distinguished class of physicians that fulfil the criteria of the Saudi Medical Education Directives Framework [16].

As long as the curriculum is a part of the educational environment, any curricular change affects students' perception of their learning environment [17]. A 2002 study among medical students at UQU evaluated the environment of undergraduates using the DREEM score [18]. However, the educational environment after the implementation of the new curriculum at UQU has not yet been evaluated. Therefore, this study aimed to assess students' perception of the educational environment at the Medical College of UQU using the DREEM tool and compare the effect of curriculum change and the learning environment among medical undergraduates and interns.

## Methods

This descriptive cross-sectional study was conducted between August 2020 and April 2021 at College of Medicine of UQU in Makkah, Kingdom of Saudi Arabia. The DREEM questionnaire was used to evaluate the educational environment of medical undergraduates and interns after taking consent. This study was approved by the biomedical ethics committee of College of Medicine, UQU, approval number (HAPO-02-K-012-2020-09-438).

The DREEM tool is a validated questionnaire of 50 items that consists of five subscales, as follows:

1. Students' perception of learning, consisting of 12 items with a highest score of 48
2. Students' perception of teachers, consisting of 11 items with a highest score of 44
3. Students' academic self-perception,

consisting of 8 items with a highest score of 32

4. Students' perception of ambiance, consisting of 12 items with a highest score of 48
5. Students' social self-perception, consisting of 7 items with a highest score of 28

The 50 items of the DREEM tool were shown to the participants, and they were asked to rate the statements offered using a 5-point Likert scale. The distribution of scores for each response was based on 4=strongly agree, 3=agree, 2=unsure, 1=disagree, and 0=strongly disagree, resulting in a maximum score of 200. For items 4, 8, 9, 17, 25, 35, 39, 48, and 50, reverse scoring was required. As a result, higher ratings reflect a more positive evaluation.

The DREEM survey was incorporated into an online survey distributed via the official email addresses of the medical undergraduates from the second to sixth years enrolled in the reformed curriculum and interns who had graduated during the 2019/2020 academic year enrolled in the old curriculum. It was composed of two sections. The first section included demographic data (gender, marital status, family income, living status, academic year, and GPA). The second section was the DREEM questionnaire.

The total number of eligible students and interns at UQU was 650, and all of them were contacted through their emails to participate in this study. Of them, 390 (30.95%) agreed to complete the questionnaire.

*Statistical analysis*

Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS), Version 22 (IBM Corp., SPSS Inc., Chicago, IL). All the statistical analyses were carried out using two-tailed tests. A P value less than 0.05 was statistically significant. The scores for the different items of the DREEM subscales were calculated by summing their discrete items to find each subscale total score and the overall score. Due to differences in the number of the items in each subscale, the mean score percentage was calculated for standardization and comparability. Calculation of the score percentage was done by dividing the total score -1 by the maximum score for each domain. Descriptive analysis based on frequency and percent distribution was conducted for all the variables including students' demographic data and GPA. Independent sample t-tests and one-way ANOVA with post-hoc multiple comparison tests were used to compare the mean scores among medical undergraduates and interns or among their personal

characteristics.

The Biomedical Ethics Committee of the College of Medicine of UQU has approved this study. All participants provided informed consent and their confidentiality was ensured.

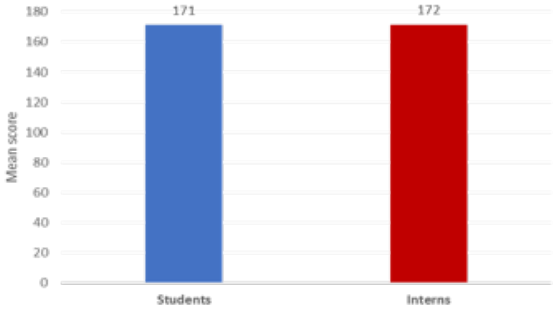
## Results

A total of 390 of medical undergraduates and interns completed the questionnaire, representing a response rate of 30.95%. Of these, there were 347 medical undergraduates (response rate: 89%) and 43 interns (response rate: 11%). Most respondents were women, 229 (response rate: 58.7%), and 161 (response rate: 41.3%) were men.

Table 1. Demographic data of sampled students at UQU

| Demographic data | No | % |
|---|---|---|
| Gender | | |
| Male | 161 | 41.3% |
| Female | 229 | 58.7% |
| Marital status | | |
| Single | 376 | 96.4% |
| Married | 13 | 3.3% |
| Divorced/ widow | 1 | .3% |
| Living status | | |
| Live with parents | 368 | 94.6% |
| Away from parents | 21 | 5.4% |
| Monthly income | | |
| < 5000 SR | 41 | 10.6% |
| 5000-10000 SR | 98 | 25.3% |
| > 10000 SR | 249 | 64.2% |
| Academic year | | |
| 3rd Year | 72 | 18.5% |
| 4th Year | 84 | 21.5% |
| 5th Year | 89 | 22.8% |
| 6th Year | 102 | 26.2% |
| Internship Year | 43 | 11.0% |
| GPA | | |
| < 3 | 37 | 9.5% |
| > 3 | 353 | 90.5% |

The overall mean DREEM score for interns was 172±25, while that for medical undergraduates was 171±18; this difference was not significant (P=.974) .



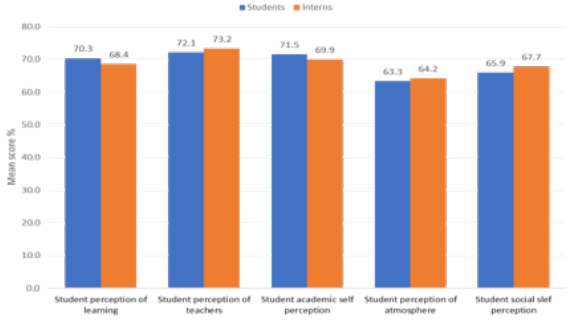

Overall mean DREEM scores per subscale among medical students and interns at UQU

Table 2. Distribution of overall education environment score according to students' personal data

| Factors | Overall score | | | P-value |
|---|---|---|---|---|
| | Range | Mean | SD | |
| Group | | | | |
| Students | 117-230 | 171 | 18 | .974# |
| Interns | 71-233 | 172 | 25 | |
| Gender | | | | |
| Male | 71-230 | 172 | 20 | .778# |
| Female | 117-233 | 171 | 17 | |
| Marital status | | | | |
| Single | 71-233 | 172 | 19 | .791$ |
| Married | 141-199 | 169 | 17 | |
| Divorced/ widow | 179-179 | 179 | 0 | |
| Living status | | | | |
| Live with parents | 71-233 | 171 | 19 | .750# |
| Away from parents | 139-202 | 173 | 17 | |
| Monthly income | | | | |
| < 5000 SR | 117-217 | 169 | 21 | .251$ |
| 5000-10000 SR | 71-223 | 169 | 20 | |
| > 10000 SR | 124-233 | 173 | 18 | |

| Factors | Overall score | | | P-value |
|---|---|---|---|---|
| | Range | Mean | SD | |
| GPA | | | | |
| < 3 | 133-211 | 168 | 21 | .303# |
| > 3 | 71-233 | 172 | 18 | |

The mean score percentages per subscale among medical undergraduates and interns are shown in Figure 1. The highest mean score percentage of agreement was reported for "Students' perception of teachers" (72.2%; interns 73.2% vs 72.1% medical undergraduates), followed by "Students' academic self-perception" (71.3%; 69.9% vs. 71.5%), "Students' perception of learning" (70.1%; 68.4% vs. 70.3%), "Students' social self-perception" (66.1%; 67.7% vs. 65.9%), and "Students' perception of ambiance" (63.4%; 64.2% vs. 63.3%), with no statistical significance in any of the five domains (P>.05)




Mean DREEM scores per subscale among medical students and interns at UQU

Table 3 illustrates mean DREEM scores for the individual items among medical undergraduates and interns at UQU. Considering "Students' perception of teachers," undergraduates had a significantly lower mean score for "Some teachers ridicule their students" than interns (3.2 vs. 3.69, respectively; P=.047). In addition, undergraduates had a significantly lower score than interns for "Some teachers get angry during teaching process" (3.2 vs. 3.7, respectively; P=.048). About "Students' perception of ambiance", undergraduates had a significantly lower mean score for "Cheating is a problem" than interns (2.4 vs. 3.3, respectively; P=.006). Further, they had a significantly higher mean score for "Opportunities to develop interpersonal skills is good" (3.7 vs. 3.3, respectively=.048). Considering "I find the overall experience disappointing," undergraduates had a significantly lower score than interns (2.6 vs. 3, respectively; P=.049). As for "Students' social self-perception," undergraduates had a significantly lower mean score for "There is good support system for students who underwent stressful events" than interns (2.4 vs. 2.9, respectively; P=.050).

Table 3. Mean Dundee Ready Education Environment Measure scores for individual items among medical undergraduate students and interns at UQU.

| Domain | Item | Group | | | | P-value |
|---|---|---|---|---|---|---|
| | | Students | | Interns | | |
| | | Mean | SD | Mean | SD | |
| Perception of learning | Teachers in classrooms are understandable. | 3.8 | 0.8 | 4.1 | 0.8 | 0.058 |
| | Teaching is often interactive. | 3.6 | 0.9 | 3.3 | 0.9 | 0.052 |
| | Teaching is learner-centered. | 3.6 | 0.9 | 3.4 | 0.9 | 0.059 |
| | Teaching helps to develop my competence. | 3.8 | 0.9 | 3.9 | 1.1 | 0.635 |
| | Teaching is well focused. | 3.5 | 0.9 | 3.6 | 0.8 | 0.669 |
| | I feel I am being well prepared for my profession. | 3.4 | 1.0 | 3.3 | 1.0 | 0.664 |
| | Teaching time is put to good use. | 3.4 | 0.9 | 3.3 | 0.8 | 0.647 |
| | Teaching overemphasizes student learning. | 3.5 | 0.8 | 3.2 | 0.8 | 0.108 |
| | Learning objectives of the year is clear to me. | 3.5 | 1.0 | 3.2 | 1.1 | 0.119 |
| | Teaching motivate me to be an active learner. | 3.6 | 0.9 | 3.3 | 1.0 | 0.059 |
| | Long-term learning is emphasized over short-term learning. | 3.6 | 0.7 | 3.4 | 0.9 | 0.119 |
| | Teaching is too teacher-centered. | 2.8 | 0.9 | 3.0 | 0.8 | 0.110 |
| Perception of teachers | Teachers have good knowledge | 4.1 | 0.7 | 4.1 | 0.9 | 0.996 |
| | Teachers are patient with students. | 3.7 | 0.9 | 3.6 | 0.9 | 0.547 |
| | Some teachers ridicule their students. | 3.2 | 1.2 | 3.9 | 0.9 | .047* |
| | Some teachers are stern and controlling. | 4.0 | 0.8 | 4.3 | 0.7 | 0.052 |
| | Teachers have good communication skills with students. | 3.7 | 0.8 | 3.6 | 0.9 | 0.425 |
| | Teachers provide good feedback to students. | 3.5 | 1.0 | 3.2 | 1.1 | 0.107 |
| | Teachers provide constructive criticism. | 3.4 | 0.8 | 3.3 | 1.0 | 0.685 |
| | Teachers provide clear examples. | 3.8 | 0.8 | 3.7 | 0.9 | 0.708 |
| | Some teachers get angry during teaching process. | 3.2 | 1.1 | 3.7 | 0.9 | .048* |
| | Teachers are well prepared for the classes. | 3.6 | 0.9 | 3.7 | 1.0 | 0.639 |
| | I feel free to ask the questions I want. | 3.4 | 1.1 | 3.3 | 1.2 | 0.667 |
| Academic self-perception | Learning techniques which worked for me before, keep to work for me now. | 3.3 | 1.0 | 3.6 | 1.0 | 0.132 |
| | I am confident about passing this year. | 4.0 | 0.9 | 4.3 | 0.8 | 0.174 |
| | Teaching helps to evolve my confidence. | 3.6 | 0.9 | 3.4 | 1.0 | 0.627 |
| | Last year's work was good preparation for this year's work. | 3.5 | 0.9 | 3.2 | 1.0 | 0.295 |
| | I have the ability to memorize all I need. | 2.8 | 1.0 | 3.0 | 1.0 | 0.632 |
| | I have learned a lot about empathy in my profession. | 3.8 | 0.9 | 3.5 | 1.1 | 0.207 |
| | My problem-solving skills are well developed. | 3.6 | 0.8 | 3.5 | 0.8 | 0.706 |
| | Much of what I have to learn seems relevant to a career in healthcare. | 3.9 | 0.8 | 3.5 | 0.9 | 0.051 |
| Perception of ambiance | Ambiance is restful during ward teaching. | 3.3 | 0.9 | 3.4 | 0.9 | 0.684 |
| | This college has well timetable. | 3.0 | 1.1 | 3.0 | 1.1 | 1.000 |
| | Cheating is a problem. | 2.4 | 1.2 | 3.3 | 1.3 | .006* |
| | Ambiance is restful during teaching. | 3.5 | 0.8 | 3.4 | 1.0 | 0.684 |

| Domain | Item | Group | | | | P-value |
|---|---|---|---|---|---|---|
| | | Students | | Interns | | |
| | | Mean | SD | Mean | SD | |
| Perception of ambiance | Opportunities to develop interpersonal skills is good. | 3.7 | 0.8 | 3.3 | 1.0 | .048* |
| | I feel comfortable socialize in teaching sessions. | 3.4 | 0.9 | 3.3 | 1.0 | 0.637 |
| | Ambiance is restful during tutorials. | 3.7 | 0.9 | 3.3 | 1.1 | 0.051 |
| | I find the overall experience disappointing. | 2.6 | 1.0 | 3.0 | 1.0 | .049* |
| | My ability to concentrate is good. | 3.5 | 1.0 | 3.5 | 0.9 | 0.999 |
| | The pleasure outweighs the stress of the year. | 3.1 | 1.1 | 3.0 | 1.1 | 0.714 |
| | The ambiance motivates me as a learner. | 3.3 | 1.1 | 3.3 | 1.1 | 1.000 |
| | The students irritate and annoy the teachers. | 2.4 | 1.0 | 2.8 | 0.9 | .049* |
| Social self-perception | I find good support system for students who get stressed. | 2.4 | 1.1 | 2.9 | 1.2 | .050* |
| | I feel exhausting enjoy this academic year. | 3.1 | 1.1 | 3.2 | 1.0 | 0.715 |
| | I am rarely bored in this year. | 2.9 | 1.0 | 2.7 | 1.0 | 0.628 |
| | I have good friends in this college. | 4.3 | 0.8 | 4.4 | 0.8 | 0.768 |
| | My social life is good. | 3.6 | 1.1 | 3.7 | 1.1 | 0.821 |
| | I am rarely feel lonely. | 3.1 | 1.1 | 3.2 | 1.0 | 0.706 |
| | My accommodation is delightful. | 3.6 | 0.8 | 3.6 | 0.8 | 1.000 |

Table 4 shows the satisfaction level among medical undergraduates and interns. Regarding "Students' perception of learning," 90.2% of undergraduates were satisfied compared with 88.4% of interns, followed by "Students' perception of teachers" (97.7% vs. 94.8%). Satisfaction with "Students' academic self-perception" was 86% and 88.8% for undergraduates and interns, respectively. Considering "Students' perception of ambiance," the proportions were 72.1% and 70.6%. Satisfaction with "Students' social self-perception" was 90.7% and 82.4%. There was no statistical significance in any of the domains (P>.05).

Table 4. Satisfaction level regarding Education Environment per sub-scale among medical students and interns at UQU

| Domain | Total | | Group | | | | P-value |
|---|---|---|---|---|---|---|---|
| | | Students | | Interns | | | |
| | No | % | No | % | No | % | |
| Perception of learning | | | | | | | |
| Unsatisfactory | 39 | 10.0% | 34 | 9.8% | 5 | 11.6% | .706 |
| Satisfactory | 351 | 90.0% | 313 | 90.2% | 38 | 88.4% | |
| Perception of teachers | | | | | | | |
| Unsatisfactory | 19 | 4.9% | 18 | 5.2% | 1 | 2.3% | .411 |
| Satisfactory | 371 | 95.1% | 329 | 94.8% | 42 | 97.7% | |
| Academic self-perception | | | | | | | |
| Unsatisfactory | 45 | 11.5% | 39 | 11.2% | 6 | 14.0% | .599 |
| Satisfactory | 345 | 88.5% | 308 | 88.8% | 37 | 86.0% | |

| Domain | Total | | Group | | | | P-value |
|---|---|---|---|---|---|---|---|
| | | Students | | Interns | | | |
| | No | % | No | % | No | % | |
| Perception of ambiance | | | | | | | |
| Unsatisfactory | 114 | 29.2% | 102 | 29.4% | 12 | 27.9% | .840 |
| Satisfactory | 276 | 70.8% | 245 | 70.6% | 31 | 72.1% | |
| Social self-perception | | | | | | | |
| Unsatisfactory | 65 | 16.7% | 61 | 17.6% | 4 | 9.3% | .170 |
| Satisfactory | 325 | 83.3% | 286 | 82.4% | 39 | 90.7% | |

## Discussion

The educational environment is a valuable factor to assess academic success and assess curricular change using the DREEM scale that evaluates students' perception of their learning environment [5,11]. As far as we know, our study is the first to assess the educational environment between the old curriculum and new reformed curriculum using the DREEM tool among medical undergraduates and interns at UQU, Makkah, KSA. A similar study was carried out in Oman [12].

In our study, the learning environment was shown to be more positive than negative, with no statistical difference, as the mean overall DREEM score for interns was 172±25, while that of undergraduates was 171±18 (P=.974). This indicates a satisfactory environment. The overall DREEM score demonstrated in our study was similar to that reported by a study of King Saud University, Riyadh, KSA (171.57) [11], but higher than that reported by most medical schools in the Middle East, including King Abdulaziz University, Jeddah, KSA (102)[13], the University of Dammam, Dammam, KSA (106) [19], Kuwait University, Kuwait (108.7) [14], and Sana'a University, Yemen (100). A previous study in 2002 at UQU among medical undergraduates following the traditional curriculum had a lower DREEM score (107) than the present study [18]. Similar results were reported by the College of Medicine at Gulf Medical University, Ajman, United Arab Emirates[17]. This tremendous change in the DREEM score indicates an improvement in the educational environment and emphasizes the importance of curriculum reformation to enhance the learning environment of medical schools and support students through the faculty [12].

This study found no difference in the mean overall DREEM score among men and women, similar to the findings of other studies [7,11]. However, some studies have found a higher total DREEM score for men than women [18,20]. This is likely because of

the equality among both genders the educational environment at UQU provides, as all students share the same educational environment and follow the same study guides.

All five DREEM subscales showed a positive perception of medical undergraduates and interns. Further, the mean score for the "perception of teachers" subscale was the highest followed by "academic self-perception," whereas the lowest mean score was for "perception of ambiance" and "social self-perception," similar to that observed in a previous study [21]. Therefore, we suggest that a committee could be formed to evaluate the quality of academic classrooms, and a student support unit be provided to improve the learning ambiance at the university.

Three items scored a mean higher than 4: "Teachers have good knowledge," "I feel confident about passing this year," and "I have good friends at this college." A similar result was reported at King Saud University, Riyadh, KSA [11]. By contrast, the item "There is a good support system for students who get stressed" was found to have a low mean score for both medical undergraduates and interns. This finding for item 3 was similar to those of several studies [13,22], but contrary to others [5,18,21] that reported a high score for the support system. Consequently, we need to establish a well-mentored support system to help students cope stressful situations and support them with their physical, social, and academic difficulties. The item "Cheating is a problem" scored a mean of 2.4 for undergraduates and 3.3 for interns (P<.05), which illustrated that cheating is a problem at our school. Our result for cheating coincided with those from the studies at King Saud University, Riyadh, KSA [11] and the Gulf Medical College, Ajman, United Arab Emirates [21], but is the opposite to those observed in Nigeria and Nepal [20]. Moreover, the item "Opportunities to develop interpersonal skills is good" scored a mean of 3.7 for undergraduates and 3.3 for interns (P<.05). This finding reflects the role of the reformed curriculum that enhances interpersonal communication skills through the implementation of a professional development module that starts from the second academic year and continues until the sixth year [23].

## Conclusion

The overall perception of medical undergraduates and interns of their educational environment at UQU was perceived to be more positive, which indicates the progression in the learning environment from 2002 to 2020. In addition, the study reported a positive score in all five domains by undergraduates and interns, with three

items that scored a mean score of more than 4.0. The areas of weakness should be addressed to improve and develop the educational environment at our university to raise student performance, and hence graduate qualified physicians.

**Limitation**

The findings of our study are limited by the low response rate of the participants, which could be attributed to the length of the DREEM tool. Thus, to adequately assess all aspects of the educational environment, it could be an option to use other instruments such as Medical Instructional Quality, Measuring the School Learning Environment Survey, and Learning Environment Questionnaire [24].

Declarations

**Ethical approval and consent to participate**

This study was ethically approved by the Scientific Research Ethics Committee of College of Medicine of UQU, Makkah, KSA. Informed consent was obtained from all participants and their confidentiality was assured. All methods were carried out in accordance with relevant guidelines and regulation.

**Consent for publication**

Not applicable.

**Availability of data and materials**

The datasets analyzed during the current study are available on this manuscript.

**Competing interest**

The authors declare that they have no competing interest.

**Funding statement**

The authors received no specific funding for this research.

**References**

1. Dunham L, Dekhtyar M, Gruener G, CichoskiKelly E, Deitz J, Elliott D, et al. Medical Student Perceptions of the Learning Environment in Medical School Change as Students Transition to Clinical Training in Undergraduate Medical School. Teach Learn Med [Internet]. 2017;29(4):383–91. Available from: http://dx.doi.org/10.1080/10401334.2017.1297712.

2. Guney A, Al S. Effective Learning Environments in Relation to Different Learning Theories. Procedia - Soc Behav Sci [Internet]. 2012;46:2334–8. Available from: http://dx.doi.org/10.1016/j.sbspro.2012.05.480

3. Sutherland KA. Holistic academic development: Is it time to think more broadly about the academic development project? Int J Acad Dev [Internet]. 2018;23(4):261–73. Available from: https://doi.org/10.1080/1360144X.2018.1524571.

4. Pokhrel NB, Khadayat R, Tulachan P. Depression, anxiety, and burnout among

medical students and residents of a medical school in Nepal: A cross-sectional study. BMC Psychiatry. 2020;20(1):1–18.

5. Patil AA, Chaudhari VL. Students' perception of the educational environment in medical college: a study based on DREEM questionnaire. Korean J Med Educ. 2016;28(3):281–8.

6. Miles S, Swift L, Leinster SJ. The Dundee Ready Education Environment Measure (DREEM): A review of its adoption and use. Med Teach. 2012;34(9):e620–34.

7. Dunne F, McAleer S, Roff S. Assessment of the undergraduate medical education environment in a large UK medical school. Health Educ J. 2006;65(2):149–58.

8. Al-Natour S. Medical students' perceptions of their educational environment at a Saudi university. Saudi J Med Med Sci. 2019;7(3):163.

9. Hongkan W, Arora R, Muenpa R, Chamnan P. Perception of educational environment among medical students in Thailand. Int J Med Educ. 2018;9:18–23.

10. Roff S, Mcaleeri S, Harden' Rm, Al-Qahtani' M, Uddin Aa, Deza H, et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). Med Teach. 1997;19:295–9.

11. Soliman MM, Sattar K, Alnassar S, Alsaif F, Alswat K, Alghonaim M, et al. Medical students' perception of the learning environment at king saud university medical college, saudi arabia, using dreem inventory. Adv Med Educ Pract. 2017;8:221–7.

12. Prashanth GP, Ismail SK. The dundee ready education environment measure: A prospective comparative study of undergraduate medical students' and interns' perceptions in Oman. Sultan Qaboos Univ Med J. 2018;18(2):e173–81.

13. Al-Hazimi A, Al-Hyiani A, Roff S. Perceptions of the educational environment of the medical school in King Abdul Aziz University, Saudi Arabia. Med Teach. 2004;26(6):570–3.

14. Karim J, Al-Halabi B, Marwan Y, Sadeq H, Dawas A, Al-Abdulrazzaq D. The educational environment of the undergraduate medical curriculum at Kuwait university. Adv Med Educ Pract. 2015;6:297–303.

15. UNIVERSITY UA-Q. Curriculum of Bachelor's of Medicine and Surgery-Methods of Instruction. 2020.

16. Tekian AS, Ahwal MSA. Aligning the SaudiMED framework with the National Commission for Academic Accreditation and Assessment domains. Saudi Med J. 2015;36(12):1496–7.

17. Shehnaz S. A Five Year Longitudinal Study of the Educational Environment in a Newly Integrated Medical Curriculum.

SQU Med Journal,. 2019;19(4):335–44.

18. Al-Hazimi A, Zaini R, Al-Hyiani A, Hassan N, Gunaid A, Ponnamperuma G, et al. Educational environment in traditional and innovative medical schools: A study in four undergraduate medical schools. Educ Heal. 2004;17(2):192–203.

19. Al Sheikh MH. Educational environment measurement, how is it affected by educational strategy in a Saudi medical school? A multivariate analysis. J Taibah Univ Med Sci [Internet]. 2014;9(2):115–22. Available from: http://dx.doi.org/10.1016/j.jtumed.2013.11.005.

20. Roff S, McAleer S, Ifere OS, Bhattacharya S. A global diagnostic tool for measuring educational environment: Comparing Nigeria and Nepal. Med Teach. 2001;23(4):378–82.

21. Shehnaz SI, Sreedharan J. Students' perceptions of educational environment in a medical school experiencing curricular transition in United Arab Emirates. Med Teach. 2011;33(1).

22. Aghamolaei T, Fazel I. Medical students' perceptions of the educational environment at an Iranian Medical Sciences University. BMC Med Educ. 2010;10(1).

23. UNIVERSITY UA-Q. Curriculum of Bachelor's of Medicine and Surgery- The General Structure of the Program [Internet]. 2020. Available from: https://uqu.edu.sa/en/colmedsc/80772.

24. Schiekirka S, Feufel MA, Herrmann-Lingen C, Raupach T. Evaluation in medical education: A topical review of target parameters, data collection tools and confounding factors. GMS Ger Med Sci. 2015;13:1–19.