

Assessing the Learning Environment Perception Among Medical Students at a Tertiary Referral Hospital in Saudi Arabia

Mohammed Al Mairi , Yasmin Youssef , Ahmad Alhamshari , Radwan Alkhatib ,
Hamzah Koujan , Anas Alkhabaz , Aniko Szabo 

Department of Anatomy and Genetics, College of Medicine, Alfaisal University, Riyadh, Kingdom of Saudi Arabia

Correspondence: Aniko Szabo, Department of Anatomy and Genetics, College of Medicine, Alfaisal University Takhassusi Street, Riyadh, 11533, Kingdom of Saudi Arabia, Email aszabo@alfaisal.edu

Objective: To assess the perception of medical students at Alfaisal University College of Medicine (AUCOM) of their learning environment at a referral-based tertiary hospital in Riyadh, Saudi Arabia.

Methods: The validated Dundee Ready Educational Environment Measure (DREEM) questionnaire was administered to all year 4 and year 5 students during the academic year 2020–2021. Scores were analyzed using the descriptors provided by the questionnaire developers and compared across different students' cohorts using SPSS.

Results: The overall DREEM score was 120.45/200, which can be described as a “more positive than negative environment”, indicating a positive perception with a potential for improvement. All domain scores were on the positive side except the “students' social self-perception” which had a score indicating a problematic area. Female students had a statistically significant more positive score in the domain “students' perception of learning” than male students. Scores for individual questions were persistently on the positive side except for eight questions that pointed to problematic areas in the curriculum. When compared between student cohorts, five questions had statistically significant difference in scores between students in both academic years, but only two of those had scores indicating concerning areas.

Conclusion: Referral-based tertiary hospitals can be perceived positively by students as a learning environment in undergraduate medical education. We identified some areas of concern in our curriculum to be targeted by future research.

Keywords: clinical training, DREEM, referral hospital, Saudi Arabia, tertiary hospital

Introduction

Attaining a satisfactory clinical competency is a principal objective of every undergraduate medical curriculum.¹ Medical schools incorporate early clinical training as part of their curricula to provide students with structured and supervised clinical exposure during their undergraduate education. This is based on the premise that clinical exposure aids in students' development in different areas required for better clinical competency and professionalism.^{2,3} However, clinical exposure is not unified across clinical settings. The influence of the training setting on clinical skills of medical students is still unclear despite several efforts to investigate it. In the early 1970s, Haggerty suggested that the first clinical experience of students should be with uncomplicated and common cases to allow for the development of simple, yet essential clinical skills.⁴ Undoubtedly, this type of encounter is best observed in community settings where most of the presentations are of common and acute illnesses, in contrast to tertiary hospitals which mainly offer exposure to patients with complex and advanced diseases.⁵ Nevertheless, it has also been argued that tertiary hospitals may provide a more supervised exposure to students compared to the “busy” community settings.⁶ However, several studies that investigated differences in students' academic and clinical performance between the two settings reported comparable outcomes.^{7–10}

The learning environment broadly refers to the physical, social, and psychosocial context in which learning happens.¹¹ The World Federation for Medical Education (WFME) includes regular assessments and updates of the learning environment as a basic standard for quality improvement.¹² However, the traditional use of students' achievement scores as an indicator for the efficacy of education is now considered insufficient.¹³ Therefore, understanding the learning environment and how students perceive it is crucial when comparing different teaching settings. Evidence in the literature suggests that students' perception of their learning environment is an important factor affecting their aspiration and learning outcomes.^{14,15} This aspect is particularly vital when we consider the differences in clinical training sites. Despite that, there are not many reports in the literature that directly evaluate medical students' perception of their learning environment across the different clinical settings, especially in the Middle East.

Alfaisal University College of Medicine (AUCOM) is a newly established private, non-profit medical college affiliated with King Faisal Specialist Hospital & Research Centre (KFSH&RC) in Riyadh, Saudi Arabia. AUCOM implements a six-year-long curriculum consisting of basic sciences instruction (years 1–3), clerkship training (years 4 and 5), and internship (year 6). Our clerkship curriculum is structured with KFSH&RC, which is a referral-based hospital that provides specialized tertiary-care services, as the primary site of clinical rotations. The hospital is rated as one of the nation's top centers with a capacity of over 1900 beds in its two main buildings in Riyadh and Jeddah. However, being a referral center, KFSH&RC represents a very unique patient encounter, particularly in undergraduate medical education. Our curriculum also incorporates some training time at other community hospitals to account for a more diverse patient encounter. However, as students, we notice mixed perceptions among our colleagues regarding the training site and the type of encounter we see during our clerkship years. This was especially evident during the Corona Virus Disease (COVID-19) pandemic where our clerkship training was almost entirely held in KFSH&RC as the other training sites have suspended their programs. Therefore, in this study we attempt to explore medical students' perception of their learning environment at this referral-based tertiary hospital in Saudi Arabia. In addition, since no prior similar studies exist from our institution, we aim to identify areas of improvement in our learning environment to be targeted by future research.

Materials and Methods

Study Design and Tool

This is a cross-sectional, survey-based study. Participants were asked to reflect on their experience at KFSH&RC using the validated Dundee Ready Educational Environment Measure (DREEM) questionnaire. This questionnaire is a non-culturally specific tool utilized for qualitative and quantitative evaluation of the educational environment of medical schools and health training settings, including teaching hospitals.¹⁶ The tool was first published in 1997 and has been validated in the literature.^{17,18} It consists of 50 items based on students' perceptions of five domains directly related to their educational environment. These domains are "students' perception of learning" (12 items), "students' perception of teachers" (11 items), "students' academic self-perception" (8 items), "students' perception of atmosphere" (12 items), and "students' social self-perception" (7 items). The items are scored on a five-point Likert scale as follows: 4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree, and 0 = strongly disagree. Nine items (questions 4, 8, 9, 17, 25, 35, 39, 48, 50) are scored negatively with 4 = strongly disagree and 0 = strongly agree. Some questions were slightly modified to fit into our clerkship curriculum. Our questionnaire also included a socio-demographic section recording age, gender, academic year, cumulative GPA, and the number of clinical rotations completed at KFSH&RC, which were used for categorical comparisons. Furthermore, the Arabic version of the questionnaire was adapted from previous studies, and students had the option of choosing the preferred language before filling out the survey.¹⁹ Both the English and Arabic versions were distributed to six students from the study sample to check for clarity of the components before starting the data collection.

Study Period and Inclusion Criteria

The sample consisted of students in year four and year five registered for the academic year 2020–2021 at AUCOM (n = 394). The data was collected during the spring semester between January and May 2021.

Data Collection

Ethical approval was obtained from Alfaisal Institutional Review Board (IRB) under reference number (IRB-20081), and all ethical requirements of the IRB were fulfilled during the study. Due to the COVID-19 restrictions, the questionnaire was made online and distributed to students from each academic year via direct messages on Zoom after their classes. Participation in the study was voluntary, and participants were informed that completion of the questionnaire was considered as their consent. No identifiable data was collected to ensure confidentiality, and only the authors had access to the survey responses.

Statistical Analysis

All Arabic responses were translated back into English for the analysis. The categorical data was coded and entered through IBM SPSS Statistics for Windows, Version 28.0. The mean score and standard deviation for each item were calculated. The mean scores for each domain were calculated out of the sum of items under the domain for each response. The overall score was calculated by adding the mean scores for all the domains. All domain scores and the overall score were compared among cohorts of the academic year, cumulative GPA, and the number of clinical rotations using the independent sample *t*-test to look for any statistically significant differences. A *p*-value <0.05 was considered as statistically significant.

Data Interpretation

We utilized the descriptors suggested by McAleer and Roff as outlined in Table 1 for qualitative interpretation of the scores.¹⁸

Results

Out of 394 students who met the inclusion criteria, only 117 completed the survey (response rate of 29.7%). The Cronbach's alpha value for our survey was 0.90. About two-thirds (59.8%) of the participants were from the (22–23 years) age group. Most of the participants (70.1%) were females and only (29.9%) were males. The distribution of participants across academic years was almost equivalent. Table 2 shows the demographic characteristics of the participants.

Table 1 Descriptors Suggested by McAleer and Roff

Domain	Score range	Descriptor
Individual Questions	≤2	A problematic area
	2–3	An area for improvement
	≥3.5	True positive
Students' Perceptions of Learning	0–12	Very poor
	13–24	Teaching is viewed negatively
	25–36	A more positive perception
	37–48	Teaching highly thought of
Students' Perceptions of Teachers	0–11	Abysmal
	12–22	In need of some retraining
	23–33	Moving in the right direction
	34–44	Model course organisers

(Continued)

Table 1 (Continued).

Domain	Score range	Descriptor
Students' Academic Self Perceptions	0–8	Feelings of total failure
	9–16	Many negative aspects
	17–24	Feeling more on the positive side
	25–32	Confident
Students' Perception of Atmosphere	0–12	A terrible environment
	13–24	There are many issues which need changing
	25–36	A more positive attitude
	37–48	A good feeling overall
Students' Social Self Perceptions	0–7	Miserable
	8–14	Not a nice place
	15–21	Not too bad
	22–28	Very good socially
Total DREEM Score	0–50	Very poor
	51–100	Significant problem
	101–150	More positive than negative
	151–200	Excellent

Table 2 Summary of the Demographic Characteristics of the Study Participants

Characteristics	N(%)
Number of participants	117 (29.7)
Age	
20–21 years	30 (25.6)
22–23 years	70 (59.8)
24 and above	17 (14.5)
Gender	
Male	35 (29.9)
Female	82 (70.1)
Academic year	
4th year	66 (56.4)
5th year	51 (43.6)
Cumulative GPA (out of 4.00)	
3.75–4.00	40 (34.2)
3.5–3.74	37 (31.6)
3.25–3.49	27 (23.1)
3.00–3.24	11 (9.4)
Less than 3.00	2 (1.7)
Number of rotations done at KFSH&RC (including your current one)	
1–2	6 (5.1)
3–4	63 (53.8)
5–6	6 (5.1)
More than 6	42 (35.9)

Of all 50 questions in the DREEM questionnaire, 40 had a mean score between 2–3. Only two questions had a mean score above 3, and eight questions had a mean score less than 2. The two questions with a mean score above 3 in both years were “the teachers are knowledgeable” and “I am confident about passing this year”. The eight questions with a score less than 2 were “There is a good support system for students who get stressed”, “I have learned a lot about the way scientific research is carried out”, “The teaching over-emphasizes factual learning”, “The rotations are well timetabled”, “The enjoyment outweighs the stress of the rotations”, “I am too tired to enjoy the rotations”, “I am rarely bored in the rotations”, and “I seldom feel lonely”.

When comparing responses between the two academic years, five questions had statistically significant differences. Those questions are “The teaching is too teacher centered”, “The teachers are authoritarian”, “I have learned a lot about the way scientific research is carried out”, “The teachers are well prepared for their sessions”, and “The atmosphere is relaxed during lectures”. Table 3 summarizes the mean scores of each item in the questionnaire.

Table 3 The Overall, Fourth, and Fifth Year Means of All DREEM Questions

Domain	Question	Both years		Fourth year		Fifth year		p-value
		Mean	SD	Mean	SD	Mean	SD	
SPL	I am encouraged to participate in sessions	2.85	0.98	2.85	0.95	2.84	1.03	0.977
	The teaching is often stimulating	2.44	1.04	2.48	1.01	2.39	1.08	0.634
	The teaching is student centered	2.25	1.07	2.35	1.02	2.12	1.14	0.251
	The teaching helps to develop my competence	2.69	0.85	2.73	0.8	2.65	0.91	0.613
	The teaching is well focused	2.28	1.11	2.29	1	2.27	1.25	0.949
	The teaching helps to develop my confidence	2.52	0.95	2.52	0.95	2.53	0.97	0.936
	The teaching time is put to good use	2.02	1.07	2.05	1.07	1.98	1.07	0.745
	The teaching over-emphasizes factual learning [↔]	1.65	0.95	1.67	0.93	1.63	0.98	0.826
	I am clear about the learning objectives of the rotations	2.44	1.09	2.5	1.09	2.35	1.11	0.473
	The teaching encourages me to be an active learner	2.55	0.91	2.52	1	2.59	0.8	0.670
	Long term learning is emphasized over short term learning	2.21	1.13	2.18	1.11	2.24	1.16	0.800
	The teaching is too teacher centered [↔]	2.03	0.91	2.2	0.86	1.8	0.92	0.019*
SPT	The teachers are knowledgeable	3.44	0.76	3.55	0.66	3.31	0.86	0.102
	The teachers deliver research-led teaching	2.53	1.04	2.53	0.96	2.53	1.14	0.996
	The teachers ridicule the students [↔]	2.47	1.03	2.59	1.02	2.31	1.03	0.150
	The teachers are authoritarian [↔]	2.27	0.96	2.48	0.83	2	1.06	0.006*
	The teachers help me to develop my practical skills	2.7	0.89	2.65	0.94	2.76	0.84	0.499
	The teachers are good at providing feedback to students	2.22	1.02	2.32	1.01	2.1	1.03	0.248
	I have learned a lot about the way scientific research is carried out	1.5	1.26	1.18	1.14	1.92	1.29	0.001*
	The teachers give clear examples	2.94	0.77	3	0.77	2.86	0.78	0.341
	The teachers get angry in sessions [↔]	2.57	0.99	2.62	0.96	2.51	1.05	0.550
	The teachers are well prepared for their sessions	2.83	0.98	3.02	0.92	2.59	1	0.018*
	The students irritate the teachers [↔]	2.65	1.05	2.62	1	2.69	1.12	0.742

(Continued)

Table 3 (Continued).

Domain	Question	Both years		Fourth year		Fifth year		p-value
		Mean	SD	Mean	SD	Mean	SD	
SAP	Learning strategies which worked for me before continue to work for me now	2.09	0.99	2.03	1.02	2.16	0.95	0.494
	I am confident about passing this year	3.21	0.78	3.12	0.81	3.33	0.71	0.143
	I feel I am being well prepared for my career	2.11	1.11	2.09	1.03	2.14	1.22	0.824
	Last year's work has been a good preparation for this year's work	2.27	1.19	2.21	1.22	2.35	1.15	0.527
	I am able to memorize all I need	2.06	1.12	2.08	1.06	2.04	1.22	0.862
	The teachers provide constructive criticism here	2.42	0.92	2.53	0.9	2.27	0.94	0.137
	My problem-solving skills are being well developed here	2.61	0.86	2.59	0.86	2.63	0.87	0.821
	Much of what I have to learn seems relevant to my career	2.84	0.8	2.89	0.79	2.76	0.82	0.388
SPA	The atmosphere is relaxed during laboratory/practical/fieldwork sessions (eg students can ask questions and make mistakes)	2.85	0.9	2.89	0.88	2.78	0.92	0.514
	The rotations are well timetabled	1.88	1.12	1.98	1.09	1.75	1.15	0.251
	Cheating is a problem in this faculty [↔]	2.32	1.12	2.29	1.09	2.37	1.17	0.687
	The atmosphere is relaxed during lectures	2.67	1	2.83	0.87	2.45	1.12	0.040*
	There are opportunities to develop my interpersonal skills	2.53	1.06	2.59	0.98	2.45	1.15	0.479
	I feel comfortable in class socially	2.76	0.91	2.8	0.88	2.71	0.94	0.568
	The atmosphere is relaxed during small group discussions/bedside teaching	2.89	0.95	2.95	1	2.8	0.9	0.399
	I find the experience disappointing [↔]	2.39	1.2	2.32	1.22	2.49	1.19	0.446
	I am able to concentrate well	2.34	0.98	2.38	0.96	2.29	1.01	0.643
	The enjoyment outweighs the stress of the rotations	1.96	1.24	2	1.18	1.9	1.33	0.674
	The atmosphere motivates me as a learner	2.56	0.98	2.58	1.01	2.55	0.96	0.884
	I feel able to ask the questions I want	2.79	0.99	2.83	1.02	2.73	0.96	0.561
SSP	There is a good support system for students who get stressed	1.49	1.06	1.44	1.04	1.55	1.1	0.583
	I am too tired to enjoy the rotations [↔]	1.91	1.15	1.97	1.12	1.84	1.19	0.557
	I am rarely bored in the rotations	1.85	1.11	1.88	1.14	1.8	1.08	0.719
	I have good friends in this faculty	2.54	1.07	2.38	1.11	2.75	1	0.066
	My social life is good	2.35	1.2	2.45	1.17	2.22	1.24	0.287
	I seldom feel lonely	1.97	1.23	2.02	1.31	1.92	1.13	0.685
	My accommodation is pleasant	2.74	0.92	2.77	0.87	2.71	0.99	0.699

Notes: [↔]Questions with reverse scoring. *Statistically significant.

Abbreviations: SPL, Students' Perception of Learning, SPT, Students' Perception of Teachers, SAP, Students' Academic Self-perceptions, SPA, Students' Perception of Atmosphere, SSP, Students' Social Self-perception, SD, Standard deviation.

Table 4 Total DREEM Scores According to Different Domains

Domain	Both years		Fourth year		Fifth year		p-value	Description
	Mean	SD	Mean	SD	Mean	SD		
Students' Perception of Learning	27.9	7.3	28.3	6.7	27.4	8.0	0.496	"A more positive perception"
Students' Perception of Teachers	28.1	5.7	28.6	5.2	27.6	6.3	0.362	"Moving in the right direction"
Students' Academic Self-perception	19.6	4.9	19.6	4.7	19.7	5.3	0.879	"Feeling more on the positive side"
Students' Perception of Atmosphere	29.9	7.3	30.5	6.7	29.3	8.1	0.390	"A more positive attitude"
Students' Social Self-perception	14.9	4.8	14.9	4.8	14.8	4.9	0.891	"Not a nice place"
Total DREEM Score	120.5	26.1	121.8	23.6	118.7	29.2	0.532	"More positive than negative environment"

Table 5 Total DREEM Scores for Males and Females

Domain	Males (n=35)		Females (n=82)		p-value
	Mean	SD	Mean	SD	
Students' Perception of Learning	25.5	8.8	29.0	6.3	0.04*
Students' Perception of Teachers	26.9	7.0	28.7	5.0	0.18
Students' Academic Self-perception	19.2	5.9	19.8	4.5	0.63
Students' Perception of Atmosphere	29.5	7.8	30.1	7.2	0.67
Students' Social Self-perception	15.0	5.7	14.8	4.5	0.88
Global DREEM Score	116.0	31.4	122.3	23.5	0.29

Note: *Statistically significant.

For the individual domains, the total scores were not significantly different between the two academic year cohorts. When analyzed according to age, cumulative GPA, and the number of rotations, no statistically significant differences were identified either. The total DREEM score for all students out of a maximum of 200 was 120.5 ± 26.1 . There was no statistically significant difference between year 4 and year 5 scores. We did not identify any statistically significant differences between scores for age groups, cumulative GPA, or number of rotations. Table 4 lists the total score for each domain along with the descriptors suggested by McAleer and Roff.¹⁸

When analyzed according to gender, only the "students' perception of learning" domain had a statistically significant difference with female students having a higher mean score than male students (Table 5).

Discussion

The main intent of this study was to evaluate the perception of undergraduate medical students of their learning environment in a referral-based tertiary hospital in Saudi Arabia. The response rate (29.7%) was slightly lower than what is reported in the literature for similar studies using the DREEM questionnaire.^{20–23} This could be attributed to the online method of distributing the questionnaire due to COVID-19 restrictions.

Overall, the results indicate a generally positive perception of the learning environment among the students, as evidenced by the overall DREEM score of 120.45/200, which falls into the category of a "more positive than negative environment". This suggests that the students perceive their learning environment at the referral-based tertiary hospital as largely favorable. These findings are encouraging and reflect the efforts made by AUCOM and the hospital in providing a conducive educational setting for medical students. However, it is important to address the identified areas of concern. The domain "students' social self-perception" stood out as an area requiring improvement, as it received a score

indicating a problematic aspect of the learning environment. This suggests that there may be challenges related to social interactions, peer relationships, or a sense of belonging among the students. To create a more positive social environment, interventions such as team-building activities, mentorship programs, and peer support initiatives could be implemented to enhance social cohesion and foster a sense of community among the students.

Students' Perception of Learning

The overall score of this domain was 27.91, which is described as “a more positive perception” of learning. Interestingly, female students demonstrated a significantly more positive perception of learning compared to male students. This finding is consistent with previous studies^{24,25} and highlights potential gender differences in how students perceive and engage with the learning environment. Exploring these differences further can provide valuable insights into tailoring educational strategies to meet the needs and preferences of both male and female students, ensuring an inclusive and equitable learning environment.

Although most of the questions in this domain had a score between 2–3, one question “The teaching overemphasizes factual learning” had a score less than 2. This finding is not unique to our institute. Veerapen et al suggested that this common concern of factual learning among medical students might be related to the curricular content rather than its delivery.²⁶ The question “The teaching is too teacher centered” had a statistically significant different mean score between year 4 and year 5 groups (2.2 vs 1.8, $p=0.019$) with the fifth-year mean score falling into the category of a problematic area. This observation is concerning given that learning in fifth year is supposed to be self-directed and needs to be addressed in the future.

Furthermore, having positive scores for questions “The teaching helps to develop my competence” and “The teaching helps to develop my confidence” is reassuring. This finding shows that students probably do not perceive fear of missing out on knowledge gain from the type of patient encounter in this unique clinical teaching setting.

Students' Perception of Teachers

The overall score of this domain was 28.14, which is described as “moving in the right direction”. This score does not seem to be affected by gender, academic year, or cumulative GPA. Questions related to teachers' knowledge, preparedness for sessions, and providing feedback scored very well. In fact, the question “The teachers are knowledgeable” had the highest score in our survey (3.44), which is almost a true positive mean score. This observation is expected in such a specialized teaching hospital and probably related to the experience of staff physicians. The question “I have learned a lot about the way scientific research is carried out” scored poorly across both academic years. Students in the fifth-year group had a statistically significant higher mean score than fourth year students (1.92 vs 1.18, $p=0.001$). Nonetheless, this is still an area that needs to be addressed.

Students' Academic Self-Perception

The overall score of this domain was 19.61, which is described as “feeling more on the positive side”. All the individual questions under this domain had positive scores between 2–3. One question, “I am confident about passing this year”, even had a score above 3 (3.21), which is a good indicator.

Students' perception of this domain has shown the strongest correlation to self-perceived clinical competence.²⁷ It is evident from the overall scores of students in this domain that the learning environment at our training site is favorable for undergraduate medical education and that the students do not perceive shortcomings in their clinical competence. Furthermore, the majority of students responded positively to the question “I feel I am being well prepared for my career” with a relatively more positive score for the fifth-year students as compared to the fourth-year students.

Students' Perception of Atmosphere

The overall score of this domain was 29.94, which is described as “a more positive attitude”. Most of the students in our study responded negatively to the question “I find the experience disappointing”. One question “The atmosphere is relaxed during lectures” had a statistically significant mean score for fourth year students compared to fifth year students (2.83 vs 2.45, $p=0.040$) but both mean scores were in the positive side.

Students' Social Self-Perception

The overall score for this domain was the lowest of all the domains (14.97), barely falling into the category of “Not a nice place”. Many questions in this domain had a poor score below 2, indicating problematic areas. Medical schools are often perceived as stressful and challenging, so having a good support system is as important as having a good formal curriculum. The question “There is a good support system for students who get stressed” had a very poor score across the two academic years (1.44 and 1.55, respectively). Although our medical school has established several on-campus student support programs (eg, academic counselling, mentorship program), most of those programs target pre-clerkship students (years 1–3) and not clerkship students (years 4 and 5) since they spend most of their training time in the hospital. Our finding suggests that more focus needs to be directed towards clerkship students in advanced years, perhaps by establishing student support programs on the hospital campus. Future research should focus on improving this aspect of the curriculum and measuring its impact on students' aspiration and performance in clinical training.

Limitations

The main limitation of this study was the relatively low response rate. This was mainly due to the COVID-19 restrictions at the time of data collection. Additionally, we only included one institution in our study, which limits the generalizability of our results. Despite that, the findings from this study give important insights into the design of clinical training in undergraduate medical education. Future studies could incorporate additional assessment methods to gain a more comprehensive understanding of the learning environment, including direct observations and qualitative approaches.

Conclusions

This study highlights the importance of understanding the learning environment and its impact on students' aspirations and learning outcomes. The results of our study show that the learning environment in referral-based tertiary hospitals, such as the one in our study, can be viewed positively by students in undergraduate medical education. However, it is crucial to address the identified areas of concern to enhance the overall educational experience. Some individual questions also pointed to specific problematic areas in our curriculum that need to be addressed in the future.

The findings in this study provide valuable insights for curriculum development and improvement. Future research should focus on addressing the specific concerns raised by students, particularly in the domain of social self-perception. Additionally, exploring the impact of the learning environment on clinical skills development and professional competence would further enrich our understanding of the learning environment.

Data Sharing Statement

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics Approval

The questionnaire and methodology for this study was approved by the Institutional Review Board of Alfaisal University on December 27, 2020 (Reference number: IRB-20081).

Acknowledgment

The authors would like to extend their appreciation to all of Tahirah Alhaider, Asmaa Attieh, and Tasnim Hajbi for their help with the data collection and to all participants for taking the time to fill out the study's survey.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Disclosure

The authors have no competing interests to declare that are relevant to the content of this article.

References

- Hassan S. How to develop a core curriculum in clinical skills for undergraduate medical teaching in the school of medical sciences at universiti sains Malaysia? *Malays J Med Sci*. 2007;14(2):4–10.
- Mochizuki A, Tajima HT, Nobuoka S, Ino M. Early exposure of medical students to types of patient care provided across life cycle stages [version 1] MedEdPublish. 2019;8(151). doi:10.15694/mep.2019.000151.1
- Alhaqwi AI, van der Molen HT, Schmidt HG, Magzoub ME. Determinants of effective clinical learning: a student and teacher perspective in Saudi Arabia. *Educ Health*. 2010;23(2):369. doi:10.4103/1357-6283.101490
- Haggerty RJ. Patient care and student learning in a pediatric clinic. *Pediatrics*. 1972;50(6):847–848. doi:10.1542/peds.50.6.847
- Satran L, Harris IB, Allen S, Anderson DC, Poland GA, Miller WL. Hospital-based versus community-based clinical education: comparing performances and course evaluations by students in their second-year pediatrics rotation. *Acad Med*. 1993;68(5):380–382. doi:10.1097/00001888-199305000-00024
- Carney PA, Ogrinc G, Harwood BG, Schiffman JS, Cochran N. The influence of teaching setting on medical students' clinical skills development: is the academic medical center the "gold standard"? *Acad Med*. 2005;80(12):1153–1158. doi:10.1097/00001888-200512000-00021.
- Chen JG, Saidi A, Rivkees S, Black NP. University- versus community-based residency programs: does the distinction matter? *J Grad Med Educ*. 2017;9(4):426–429. doi:10.4300/JGME-D-16-00579.1.
- Worley P, Esterman A, Prideaux D. Cohort study of examination performance of undergraduate medical students learning in community settings. *BMJ*. 2004;328(7433):207–209. doi:10.1136/bmj.328.7433.207
- Rotenberg C, Field S. P110: are there differences in student academic and clinical performance after rotations at tertiary or community care Emergency Medicine teaching sites? *CJEM*. 2019;21(S1):S103–S104. doi:10.1017/cem.2019.301
- Uther P, Ooi CY. Paediatric clinical exposure for medical students: are they seeing enough? *J Paediatr Child Health*. 2016;52(12):1086–1089. doi:10.1111/jpc.13304
- Shochet RB, Colbert-Getz JM, Levine RB, Wright SM. Gauging events that influence students' perceptions of the medical school learning environment: findings from one institution. *Acad Med*. 2013;88(2):246–252. doi:10.1097/ACM.0b013e31827bfa14
- Online document World Federation for Medical Education. (2015) Basic medical education WFME global standards for quality improvement. Retrieved December 16, 2022. from https://www.imeac.org/wp-content/uploads/2017/07/06_WFME_2015.pdf.
- Robinson JM, Aldridge JM. Environment–attitude relationships: girls in inquiry-based mathematics classrooms in the United Arab Emirates. *Learn Environ Res*. 2022;25(3):619–640. doi:10.1007/s10984-022-09409-x
- Plucker JA. The relationship between school climate conditions and student aspirations. *J Educ Res*. 1998;91(4):240–246. doi:10.1080/00220679809597549
- Genn JM. AMEE medical education guide no. 23 (Part 1): curriculum, environment, climate, quality and change in medical education: a unifying perspective. *Med Teach*. 2001;23(4):337–344. doi:10.1080/01421590120063330
- 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–e634. doi:10.3109/0142159X.2012.668625
- Roff S, McAleer S, Harden RM, et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). *Med Teach*. 1997;19(4):295–299. doi:10.3109/01421599709034208
- McAleer S, Roff S. A practical guide to using the Dundee Ready Education Environment Measure (DREEM). Genn JM, editor. *Curriculum, Environment, Climate, Quality and Change in Medical Education: A Unifying Perspective*. 29–33. AMEE Education Guide, 23. Scotland: AMEE. 2001.
- Alfakhry G, Rowaida S, Jamous I, et al. English and Arabic versions of the used Dundee Ready Education Environment Measure (DREEM) questionnaire for the study conducted at Damascus University pharmacy school and submitted to mededpublish. figshare. *Dataset*. 2022b. doi:10.6084/m9.figshare.21257319.v1
- 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 Univer Med J*. 2018;18(2):e173–e181. doi:10.18295/squmj.2018.18.02.009
- Khan SQ, Al-Shahrani M, Khabeer A, et al. Medical students' perception of their educational environment at imam abdulrahman bin faisal university, kingdom of Saudi Arabia. *J Family Community Med*. 2019;26(1):45–50. doi:10.4103/jfcm.JFCM_12_18
- Al-Natour SH. Medical students' perceptions of their educational environment at a Saudi university. *Saudi J Med Med Sci*. 2019;7(3):163–168. doi:10.4103/sjmms.sjmms_141_17
- Aga SS, Khan MA, Al Qurashi M, et al. Medical students' perception of the educational environment at college of medicine: a prospective study with a review of literature. *Educa Res Inter*. 2021;2021:1–14. doi:10.1155/2021/7260507
- Rahman NI, Aziz AA, Zulkifli Z, et al. Perceptions of students in different phases of medical education of the educational environment: universiti Sultan Zainal Abidin. *Adv Med Educa Prac*. 2015;6:211–222. doi:10.2147/AMEPS78838
- Rehman R, Ghias K, Fatima SS, Hussain M, Alam F. Dream of a conducive learning environment: one DREEM for all medical students! *J Pak Med Assoc*. 2017;67(1):43292.
- Veerapen K, McAleer S. Students' perception of the learning environment in a distributed medical programme. *Med Educ Online*. 2010;15(1):5168. doi:10.3402/meo.v15i0.5168
- Lai N, Nalliah S, Jutti RC, Hla Y, Lim VK. The educational environment and self-perceived clinical competence of senior medical students in a Malaysian medical school. *Educ Health*. 2009;22(2):148.

Advances in Medical Education and Practice

Dovepress

Publish your work in this journal

Advances in Medical Education and Practice is an international, peer-reviewed, open access journal that aims to present and publish research on Medical Education covering medical, dental, nursing and allied health care professional education. The journal covers undergraduate education, postgraduate training and continuing medical education including emerging trends and innovative models linking education, research, and health care services. The manuscript management system is completely online and includes a very quick and fair peer-review system. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <http://www.dovepress.com/advances-in-medical-education-and-practice-journal>