KJMHS
KORDOFAN JOURNAL OF MEDICAL AND HEALTH SCIENCES

KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

Perceptions of the Medical Students towards the Learning Environment at the University of Kordofan, Western Sudan

El Bushra Ahmed Doumi[1], Rasha Doumi[2*], Abdelhameid Ahmed el Mugabil[3]

[1]Department of Surgery, Sheikan College & University of Kordofan, El Obeid, Western Sudan. http://orcid.org/0009-0004-1143-4709
[2]Department of Family and Community Medicine, College of Medicine, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia.
[3]Lecturer, Sheikan College, El Obeid, Western Sudan.

Article Type	Received	Accepted	DOI
Original Article	1st May, 2026	9th June, 2026	10.70946/KJMHS3-2-26-P-10

ABSTRACT

Background: The objective of this study was to explore the students' perceptions of the learning (educational) environment at the Faculty of Medicine, University of Kordofan; in order to identify the strengths and weaknesses as basement for the ongoing improvements. **Method:** A cross-sectional descriptive study was conducted among the 5th year medical students at the University of Kordofan, Western Sudan. A questionnaire was used to collect information on students' gender, dormitory status, the study climate and their satisfaction of mentoring status. The study employed the Dundee Ready Education Environment Measure (DREEM). The collected data were then analysed using the Statistical Package for Social Sciences, (SPSS) version 26. **Results:** Out of the 150 registered 5th year medical students, a total of 108 participated in this study, with a response rate of 72%. Sixty-nine of the participants (64.5%) were females. The study questionnaire showed good reliability coefficient (Cronbach's alpha) value of 0.873. The total DREEM mean score was 107.45 ± 17.56, indicating a more positive than negative response. The subscales of the students' responses distribution had mostly indicated a more positive perception of the domains of the learning environment; students' perception of learning (SPL) 61.4%, students' perception of teaching (SPT) 72.2%, students' academic self-perception (SAP)60.6%, and students' social self-perception (SSP) 53.4%, with the exception of the students' perception of atmosphere (SPA) where most of the students (62.7%) viewed it negatively. The study identified 18 items with weaknesses in the learning environment in need of prompt interventions. **Conclusions:** Perceptions of the medical students towards the learning environment at the University of Kordofan, Western Sudan are more positive than negative, and similar to the findings in developing countries. There are some weaknesses identified that need improvements

Keywords: Learning environment, medical students' perceptions, DREEM, University of Kordofan, Sudan.

Corresponding Author e-mail: rbdoumi@pnu.edu.sa

INTRODUCTION

In developing countries like Sudan, the community invests a great deal in medical education, and it demands much from students in return during and more precisely after graduation. The term "learning environment" refers to the combined social, physical, and psychological context in which the students learn including interactions with faculty, staff and peers [1]. At the Macy Foundation conference of 2018 learning environment was defined as the social interactions, organizational structures and cultures, virtual and physical spaces which surround and shape students' learning, perceptions and experiences [2]. It is worth noting that, in similar studies, the learning environment and the educational environment are terms

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

which are often used interchangeably for the same meanings. However, the study of the environment where learning takes place is essential for students' engagement and motivation. Even though the learning environment is a multifaceted and complex construct, a friendly supportive environment promotes student wellness and optimizes the learning [3].

Satisfaction with the learning environment is also closely correlated with scholastic achievement, and while a dismissive environment can lead to stress and burnout, a supportive environment enhances professionalism and academic success. A previous study revealed that the learning environment was a significant predictor of academic achievement; with a significant difference reported between high and low academic achievers [4]. Other studies have confirmed that there is a strong connection between the learning environment and outcomes of current and future students' achievement and satisfaction [5]. A recent study concludes that a positive educational environment in postgraduate medical education can also immensely affect the academic outcomes and addressing identified areas for improvement can significantly improve trainee satisfaction and well-being [6].

Hence the current learning environment of the medical schools in the 21st century must consider the growing diversity of the student population. But if we can identify the elements operating in the learning environment or climate of a given institution and evaluate how they are perceived by students and teachers, we have the basis for modifying them to enhance that learning experience in relation to our teaching goals **[7].** Studies targeting students' perceptions are vital and highly important, especially in developing countries as authentic feedback, and as a quality indicator in the quality assurance process to the administration and regulatory bodies alike. Few years' before, a study in Sudan concluded that the services delivered by a university to students falls below their expectations, indicating a lot of student's dissatisfaction [8].

The Faculty of Medicine at the University of Kordofan (FMUK) was established in 1991 including medical, nursing, environmental and public health and laboratory sciences schools. After three decades each of the four initial programs matured into a separate college and a dental school was added. The objective of this study was to evaluate the medical students' perceptions of their experienced learning environment in the college of medicine. The specific objectives were to assess their perceptions of learning, teachers, academic climate, the study atmosphere, and their social self-reflections; and to correlate the relationships between these variables.

MATERIAL AND METHODS

This is a descriptive cross-sectional study that was conducted in the University of Kordofan, Sudan in 2022. All 150 registered fifth-year medical students enrolled during the 2021–2022 academic year were invited to participate in the study. A total of 108 students responded, resulting in a response rate of 72.0%. There was no separate consent form, and individual consent was assumed when the respondent accepted, filled in and returned the questionnaire. To ensure confidentiality, anonymity, and avoid victimization, the respondents did not fill in their names or any other identifiers.

Data was collected using a self-administered questionnaire that was designed based on the pre-validated and reliable Dundee Ready Education Environment Measure (DREEM) tool for analysis of the educational environment [7, 9]. The original English version of DREEM questionnaire was used. It includes 50 items, evaluated with a five-point Likert scale with scores ranging from 0-4 as 0=strongly disagree, 1= disagree, 2= Neutral, 3= Agree, 4= strongly agree. Nine negative questions were scored inversely which are questions number 4, 8, 9, 17, 25, 35, 39, 48 and 50. The items are distributed along the five subscales for each of the study variables; the perception of learning (12 items), the perception of teachers (11 items), the academic self-perception (8 items), the perception of atmosphere (12 items), and the perception of social self-perception (7 items). The questionnaires' internal consistency was tested with Cronbach's alpha value of 0.873 that indicated excellent internal consistency.

The questionnaires were collected from all participants at the same time. The researchers communicated with the

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS
KORDOFAN JOURNAL OF MEDICAL AND HEALTH SCIENCES
KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

participants explaining that their participation was optional and that their responses would be kept confidential. The questionnaire also contained a section clearly stating that participation was voluntary and that anonymity would be maintained. It also clearly explained the purpose of the study and requested unbiased responses to reflect the true perceptions of the participants. The participants were requested not to discuss the questions and to direct all queries only to the researchers. Ethical approval for this study was obtained from the Institutional Review Board of the College of Medicine in the University of Kordofan.

The data was entered, cleaned and analysed using Statistical Package for Social Sciences "SPSS" version 26. The descriptive statistics were reported as mean and standard deviation of the total DREEM score and the five main subscales. Significance testing was done using the t-test and association between variables by chi-square test. P-value less than 0.05 will be considered as statistically significant.

The overall mean score of the participants' perception of their learning environment was calculated out of 200 with its relative percentage. Their mean perceptions of the subscales were assessed as follows; learning (out of 48), teachers (out of 44), academic self-perception (out of 32), atmosphere (out of 48), and social self-perception (out of 28).DREEM overall scores were interpreted using the guide developed by McAleer and Roff (9), which defines a score of 0–50 as 'very poor', 51–100 as indicating 'plenty of problems', 101–150 as being 'more positive than negative' and 151–200 as 'excellent'. The maximum score is 200, which indicates an ideal educational environment. The guide to the interpretation of the DREEM's item-based means: Mean score≥ 3 is Real/true positive points, 2-3 Aspects of climate that could be enhanced, ≤ 2 is Problem areas, that should be examined closely [9].

RESULTS

Out of the 150 registered 5th year medical students, a total of 108 participated in this study; with a response rate of 72%. Around 64.5% of the participants were females.

The total DREEM mean score was 107.45 ± 17.56, which represent around 53.7% of the maximum DREEM score and indicates more positive than negative educational environment. DREEM domains scores were as follows; Perception of Learning was 26.13 ± 5.54, Perception of Teaching was 26.19 ± 4.64, Academic self-perception was 19.03 ± 4.86, Perception of Atmosphere was 21.31 ± 6.11, and social self-perception was 14.42 ± 3.56. The scores for the SPL and SPT are the highest followed by SAP, with the highly positive scoring items in SPT (the teachers are knowledgeable) and in SAP (I have good friends in this school). SPA score is the lowest, reflecting a direct shadow on the possible weaknesses in present learning environment. **(Table 1)**

Table 1 Mean total and subtotal DREEM scores among the study participants

Variables	Number of items (max.)	Mean score ± SD	Interpretation
Perception of Learning (SPL), N=88	12 (max. 48)	26.13 ± 5.54	A more positive approach
Perception of Teaching (SPT), N=97	11(max. 44)	26.19 ± 4.64	Moving in the right direction
Academic self-perception (SAP), N=99	08 (max. 32)	19.03 ± 4.86	Feeling more on the positive side
Perception of Atmosphere (SPA), N=102	12 (max. 48)	21.31 ± 6.11	There are many issues that need changing
Social self-perception (SSP), N =103	07 (max. 28)	14.42 ± 3.56	Not a nice place (bordering with not too bad)
Overall/ total educational environment, (N=75)	50 (max. 200)	107.45 ± 17.56	More positive than negative

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS KORDOFAN JOURNAL OF MEDICAL AND HEALTH SCIENCES
KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

The percentages of the students' responses distribution had mostly indicated a more positive perception of the overall DREEM score (66.7%), and the main domains of the educational environment; SPL (61.4%), SPT (72.2%), PAS (60.6%), and PSS (53.4%) with the exception of the SPA where most of the students negatively viewed it (62.7%). (Table 2)

Table 2 DREEM subscale scores' interpretation

DREEM Domains	Very poor N (%)	Negatively viewed N (%)	More positive perception N (%)	Highly perceived N (%)
Perception of Learning, n=88)	1 (1.1%)	31 (35.2%)	54 (61.4%)	2 (2.3%)
Perception of Teaching, (n=97)	0 (0%)	23 (23.7%)	70 (72.2%)	4 (4.1%)
Academic self-perception, (n=99)	1 (1.0%)	27 (27.3%)	60 (60.6%)	11 (11.1%)
Perception of Atmosphere, (n=102)	6 (5.9%)	64 (62.7%)	31 (30.4%)	1 (1.0%)
Social self-perception, (n=103)	2 (1.9%)	44 (42.7%)	55 (53.4%)	2 (1.9%)
Overall/ total educational environment, (n=75)	0 (0%)	25 (33.3%)	50 (66.7%)	0 (0%)

Table 3 shows that compared with studies from Saudi Arabia, Nigeria, and Ghana, the present study reported the lowest overall DREEM score (107.45/200), indicating a less favourable perception of the educational environment. The greatest disparity was observed in the Students' Perceptions of Atmosphere domain, which scored substantially lower than in the comparison studies, suggesting challenges related to the institutional and learning climate. Nevertheless, Students' Academic Self-Perception scores were relatively comparable across studies, indicating that students maintained moderate confidence in their academic abilities despite concerns regarding the broader educational environment.

Table 3 Comparison of DREEM subscales findings in our study with other 5 regional studies

Subscale	Our study Sudan	Al-Natour SH et al [13] KSA	Al Mairi M, et al [15] KSA	Awawdeh M, et al [24] KSA	Ezomike UOet al [26] Nigeria	Ade-Oshifogun [27] Ghana
Students' perception of learning (max. 48)	26.13	29.30	27.91	29.35	30.75	31.05
Students' perception of teachers (max. 44)	26.19	28.50	28.14	28.07	26.74	27.60
Students' academic self-perception (max. 32)	19.03	19.20	19.61	19.29	21.94	21.11
Students' perception of atmosphere (max. 48)	21.31	31.90	29.94	31.17	25.26	27.22
Students' social self-perception (max. 28)	14.42	17.40	14.97	18.06	15.04	14.00
Total DREEM Score 50 Items (200)	107.45	126.40	120.45	127.20	119.66	117.32

KSA= Kingdom of Saudi Arabia

The item-level analysis showed that 18 of the 50 assessed aspects of the educational environment were identified as problematic areas requiring improvement, with mean scores ≤2. The most notable concerns within the Students' Perceptions of Atmosphere domain were related to the school timetable, which received the lowest score (0.41 ± 0.73). Similarly, within the Students' Social Self-Perceptions domain, the item "There is a good support system for students who get stressed" was rated poorly (0.66 ± 0.87), indicating perceived inadequacies in the support available for students experiencing stress. (Table 4)

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS KORDOFAN JOURNAL OF MEDICAL AND HEALTH SCIENCES
KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

Table 4 Items that need improvement among the study participants (mean score ≤2)

Item No.	Individual item	Mean ± SD
Students' perception of learning		
24	The teaching time is put to good use (n=104)	1.87 ±1.150
25	The teaching over emphasizes factual learning (n=100)	1.67± 0.817
48	The teaching is too teacher centered (n=106)	1.70± 1.189
Students' perception of teachers		
8	The teachers ridicule the students (n=106)	1.44 ± 0.916
9	The teachers are authoritarian (n=104)	1.32±0.767
39	The teachers get angry in class (n=107)	1.94 ± 1.148
Students' academic self-perceptions		
5	Learning strategies which worked for me before continue to work for me now (n=105)	1.66 ± 1.142
Students' perception of Atmosphere		
11	The atmosphere is relaxed during the ward teaching (n=105)	1.04 ± 0.950
12	This school is well timetabled (n=106)	0.41 ± 0.727
23	The atmosphere is relaxed during lectures (n=106)	1.22 ± 1.113
30	There are opportunities for me to develop interpersonal skills (n=106)	1.99 ± 1.134
34	The atmosphere is relaxed during seminars/tutorials (n=106)	1.99 ± 1.246
35	I find the experience disappointing (n=106)	1.37 ± 1.229
43	The atmosphere motivates me as a learner (n=106)	1.08 ± 1.156
Students' social self-perception		
3	There is a good support system for students who get stressed (n=107)	0.66 ± 0.868
4	I am too tired to enjoy this course (n=107)	1.58±+1.267
14	I am rarely bored on this course (n=107)	1.82 ± 1.071
46	My accommodation is pleasant (n=105)	1.82 ± 1.473

DISCUSSION

The World Federation for Medical Education (WFME) assumes that educational (learning) environment affects students' knowledge, the motivation to learn, personal safety, and their well-being. It is considered a vital part of program assessments and an important indicator for the evaluation and change of medical education programs (10). The Dundee Ready Education Environment Measure (DREEM) is the most validated tool that provides diagnostic help and is widely used currently with almost certainly. It has been found to be a reliable and valid tool for assessing students' perception of their learning environment [11]. Although we decided to use the DREEM procedure, thematic analysis approach

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

adopted in qualitative study, using focus group discussions to gather data on students' experiences, with purposive sampling of participants was also found valid to explore students' perceptions of their learning environment [12].

In this study the 5th year medical students' perceptions of the learning environment at the University of Kordofan, Western Sudan were assessed. Students on the higher courses are more mature and considered to have developed better insights for expressing their feelings about their learning. The response rate of 72% in our study was reasonable, but a similar study of 121 students at the same academic level in a Saudi University (5th year medical students), all of whom completed the questionnaire with a 100% response rate [13]. Higher response rates of 95-100% were reported in the other studies [14], but a low response rate (29.7%) was also reported [15]. The DREEM scale in this study showed good reliability coefficient value (Cronbach's alpha) of 0.873, demonstrating high internal consistency and similar to the value (0.838) reported from Khartoum [14].

The total Dundee Ready Learning Environment Measure (DREEM) mean score in our study was 107.45 ± 17.56, which represents around 53.7% of the maximum DREEM score indicating a more positive than negative response. Previous studies have shown that the mean DREEM scores from developing countries like India (101.13), Nigeria (101.82) and Pakistan (98.32) were less positive as compared to some developed countries like Germany (140) and Australia (137.3) [16]. That reflects the students in these developed countries were more satisfied with their learning environment. However, at the medical school at Gezira University (Sudan) the mean score was found positive at 122/200 [17], indicating a better score can also be achieved even in developing countries. In Hungary, interestingly, the total score of the international student population was slightly lower (118.1) when compared with their Hungarian peers (122.6) [18]. Although the learning environment in our study is positive, but not excellent and that finding forms a valid documented baseline which hopefully shall pave the way for significant on target interventions, improvements and for further future re-assessments.

The present study demonstrated that most students perceived the educational environment positively across four DREEM domains, including students' perceptions of learning (61.4%), teachers (72.2%), academic self-perceptions (60.6%), and social self-perceptions (53.4%). Consistent with these findings, recent studies in medical education have reported generally positive student perceptions of learning, teaching, and academic support in addition to the overall educational environment, suggesting that supportive educational practices and well-designed learning environments contribute positively to students' educational experiences and learning autonomy [19, 20]. Positive perceptions of learning and teachers have been associated with greater academic motivation, satisfaction, and educational achievement, while favourable academic and social self-perceptions may enhance students' confidence, resilience, and overall well-being. The negative perception of atmosphere observed in this study (62.7%) may indicate that positive evaluations of learning and teaching do not necessarily translate into a favourable overall educational climate. Previous DREEM-based study has similarly identified stress [21], insufficient student support, and institutional factors as key contributors to such perceptions, highlighting the need for interventions that address organisational and psychosocial aspects of student life alongside curricular improvements.

Comparison between our findings and the findings in other 5 regional studies is shown in table 3. Although the overall DREEM score is positive in all studies, the score in our study is the lowest (107.45); while the highest score is 127.20 from Saudi Arabia. However, all scores are in line with scores reported from other developing countries, and lower than the scores found in the developed countries [16]. Globally, Student's perception in the learning environment is a stronger motivation or determinant of learning outcome compared to other factors like age, gender and prior achievements [22]. Research has shown that the quality of the learning environment is a predictor of the quality of care provided by graduates to their future patients for years after graduation and also influences the patient management

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

and use of the health care resources [4, 5, 6, 17, 18, 22, 23].

Item-level analysis demonstrated that students highly valued their teachers' knowledge and benefited from strong peer relationships, reflecting important strengths in faculty quality and social support. In contrast, the atmosphere domain received the lowest score, suggesting concerns regarding the broader educational climate despite positive perceptions of teaching and social experiences. Similar findings have been reported in previous studies, where positive perceptions of faculty expertise and peer support coexisted with lower atmosphere scores. Previous research suggests that educational climate concerns may be influenced by factors such as academic stress, workload, and organisational challenges within medical training programmes [24, 25].

The items with problematic areas (mean score ≤2) that need improvement among the study participants were 18 in our study, 4 in Al-Natouret al study [13], 5 in Sidahmed et al study [14], 8 in Al Mairi et al study [15], 11 in Ezomike et al study [26], 027 in the study of Ade-Oshifogun et al [27]. There are so many similarities between these problematic areas in the mentioned studies which are all from developing countries. However, we could not perform valid comparisons as the study sample and criteria were different in the different studies. The details of the 18 items that need improvements (mean score ≤2) among the participants in this study are shown in table 4, all are in need of the attention of the University administration. The scores for the individual DREEM items give a clear indication where the priorities for reform should take place, as remedial measures are likely to provide more favourable conditions for students. Investments in the infrastructure using technology and virtual reality are profitable with positive outcomes. Interventions such as school timetabling, training of faculty, adopting formative assessment, effective feedback delivery and the establishment of a sound support system for stressed students are not too difficult to implement. They are likely to result in great student satisfaction, which is a standard indicator of the quality of the program climate. Behkam et al [23] recommended peer mentoring to improve the educational environment. Mentors who are widely accessible, and who frequently remind the students about what they are expected to do and encourage the student engagement in curriculum development help in addressing these identified weaknesses.

The weaknesses in the current medical education in Sudan may be attributed in part to the rapid expansion in higher education which made the concentration focused on the teaching process without paying attention to the above-mentioned important issues from the students' standpoint of view [14]. Previous local studies during the last two decades highlighted these weaknesses [28-31]. Failing to respond to these sincere calls from highly expert medical educationalists and reluctance of active engagement in reformations may hinder the ongoing efforts for local and international accreditation with expected unwanted consequences. As mentioned earlier, the World Federation for Medical Education (WFME) considers the learning environment an important issue in accreditation of medical schools. Consequently, the Sudan Medical Council considers ensuring learning environment, which is comfortable, clean and safe for students a very important step in the local accreditation process [32].

Effective clinical training environment is also an important issue with intimate relationship with the locally existing health care system in which medical students are deemed to study. The learning sites in hospitals like the emergency rooms, the inpatient wards, the referred outpatient clinics, the labour room and the operative suit are common locations for training almost all the time. The students during training are in need of comfortable, user-friendly environment; especially that the majority of the learners are females [33]. The learning environment plays a vital role in producing competent medical graduates since it influences how, why, and what medical students learn. Studies have shown that the quality of the learning environment is a predictor of the quality of care provided by graduates for years after graduation and also influences patient management and use of healthcare resources [34]. Eager well-trained students can enter the medical workforce, shouldering increasing levels of future responsibility alongside and under the intimate

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

KJMHS 2026; Vol. 3 (Issue 2)
Online ISSN: 3027-5601
Manuscript ID: KUJMS-V.3.I.2.01

supervision of qualified well-trained doctors. That is why medical students' learning environments matter [35].

CONCLUSION

One of the strengths of the present study was using a validated and reliable DREEM tool. The study had acceptable response rate, demonstrated good reliability coefficient value and high internal consistency. Perceptions of the medical students towards the learning environment at the University of Kordofan were more positive than negative. Some problematic areas in the learning environment have been identified that need improvement.

This study has paved the way for further research to re-evaluate the current study questions in more broadly representative samples. We recommend repeating the study in the same institution with more comprehensive dimensions after implementing quality assurance remedies to address the deficiencies identified.

Limitations: The current study has some limitations. The data was from 5th year students only, which limits the generalisability of our results, and the differences between genders were not investigated. Also, the study did not examine in-depth the relationship between the students' perceptions and their achievements in academic performance.

Acknowledgement: We sincerely acknowledge all the 5th year medical students of Kordofan University who objectively and dispassionately filled in and returned the DREEM questionnaire.

Author's contributions:

1. El Bushra Ahmed Doumi designed the research protocol, executed data collection and drafted the manuscript writing.
2. Rasha Bushra Ahmed made the data analysis and participated in and has critically reviewed the manuscript writing.
3. Abdelhameid Ahmed el Mugabil participated in execution of data collection and in data analysis.

All authors had approved the final version.

Financial support and sponsorship:

The authors report no external funding source.

Conflict of interest: There is no conflict of interest.

REFERENCES

1. Suba A, Suma S, Shobana R, et al. Exploring the Perception of Learning Environment Among Undergraduate Medical Students in South India e A Cross-sectional Study. *Health Professions Education* **2025**; 11:183-190. https://doi.org/10.55890/2452-3011.1330
2. Mwalati BA, Mengich GJ, Kaniaru DK. Perception of clinical learning environment among undergraduate health-based students at Masinde Muliro University of Science and Technology, Kenya. *African Journal of Empirical Research* **2025**; 6 (3): 188-200.https://ajernet.net ISSN 2709-2607
3. Farooqi FA, Khan SQ, Abdul Khabeer3,et al. DREEM Tool for Evaluating the Educational Environment: A Systematic Review and Meta-analysis. *Macedonian Journal of Medical Sciences* **2020**; 8(F):108-116. https://doi.org/10.3889/oamjms.2020.4280
4. Kasemy ZA, Kabbash I, Desouky D, et al. Perception of educational environment with an assessment of motivational learning strategies and emotional intelligence as factors affecting medical students' academic achievement. *J Edu Health Promot* **2022**; 11:303. www.jehp.net//**DOI:**10.4103/jehp.jehp_1772_21
5. Atwa H, Alkhadragy R, Abdelaziz A.Medical Students' Perception of the Educational Environment in a Gender-Segregated Undergraduate Program. *J Med Edu* **2020**; 19(3): e104934 doi: 10.5812/jme.104934.
6. Alhenaidi A, Alqallaf B, Sultan Alsalahi S, *et al.* Association between learning environment and well-being of postgraduate residents in Kuwait. *BMC Medical Education* **2025**; 25:457.https://doi.org/10.1186/s12909-025-07030-z

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

7. Roff S, McAleer S. What is educational climate? (Editorial) *Med Teach* **2001**; 23 (4): 333-334. DOI: 10.1080/01421590120063312
8. Salah E S, Elmadhoun WM, Abdalla A, et al. Perceptions and Expectations of Medical Students towards the Quality of Educational Services offered at A Sudanese University: How Far is the Gap? *Sudan JMS* **2015**; 10 (4): 137-146.
9. 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.https://doi.org/10.3109/01421599709034208
10. The Executive Council, the World Federation for Medical Education. International standards in medical education: assessment and accreditation of medical schools' – educational programmes (A WFME position paper). *Med Educ*. **1998**; 32(5):549–558.
11. Dunne F, McAleer S, Roff S. Assessment of the undergraduate medical education environment in a large UK medical school. *Health Education Journal* **2006**; 65(2) 149-158.https://doi.org/10.1177/0017896906065002O5
12. Obadeji A, Louw A, Couper I. Medical students' perceptions of the learning environment and its implications on teaching and learning: A qualitative study in Nigeria. *J Med Edu Dev*. **2024**; 17(56): 29-38. http://dx.doi.org/10.61186/edcj.17.56.29
13. Al-Natour SH. Medical students' perceptions of their educational environment at a Saudi University. *Saudi J Med Med Sci* **2019**; 7:163-8. www.sjmms.net//**DOI:**10.4103/sjmms.sjmms_141_17
14. Sidahmed AA, Musa MT, Khalid E. Assessment of Undergraduate Medical Learners' Perception of the Learning Environment using Modified DREEM Questionnaire: A Cross Sectional Study. *International Multispecialty Journal of Health* **2021**; 7 (2): 1-10. ISSN: [2395-6291]
15. Al Mairi M, Youssef Y, Alhamshari A, et al. Assessing the Learning Environment Perception Among Medical Students at a Tertiary Referral Hospital in Saudi Arabia. *Advances in Medical Education and Practice* **2024**:15 461–471. https://doi.org/10.2147/AMEP.S454478
16. Kaneez M, Zaidi SMJ, Bhatti HW, et al. Perception of the Educational Environment and Its Correlation with Academic Performance of Medical Students in a Public Sector Medical Institute of Pakistan. *Advances in Social Science, Education and Humanities Research,* **2021**; 567: 43-49.http://creativecommons.org/licenses/by-nc/4.0/.
17. Ahmed Y, Taha MH, Alneel S, et al. Students' perception of the learning environment and its relation to their study year and performance in Sudan. *Int J Med Educ***2018**; 9:145-150. DOI: 10.5116/ijme.5af0.1fee
18. Dávidovics A, Lilla Makszin L, Németh T. A national DREEM: exploring medical and dental students' perceptions on their learning environment across Hungary. *BMC Medical Education* **2024**; 24:1211. https://doi.org/10.1186/s12909-024-06197-1
19. Liu F, Niu P, Yu S, Wei L, He X, Ye J, Yao B. Investigating students' perceptions of the medical education environment and learning autonomy in blended learning in pediatrics: a cross-sectional study. BMC medical education. 2024 Dec 18;24(1):1464.
20. Stanikzai MH, Stanikzai KA, Shanawa S, Sayam H. Medical students' perceptions of the learning environment in South Asia: a systematic review of quantitative studies. Advances in Medical Education and Practice. 2025 Dec 31:2013-23.
21. Alshahrani B, Almisfer L, Alradaddi R, Alotaibi R, Alshehabeya Z, Almahroos N, Alharbi H, Al-Hazimi AM, Khatoon F. Medical Students Perception of the Educational Environment at Dar Al Uloom University Using the Dundee Ready Educational Environment Measure [DREEM] Tool. Journal of Pioneering Medical Sciences. 2025 Dec 5;14:190-4.
22. Mirghani, H., & Elnour, M. The academic environment and approach to learning effects on academic performance among Sudanese medical students. *MedEdPublish* **2017**; 6:37 https://doi.org/10.15694/mep.2017.000037
23. Behkam S, Tavallaei A, Maghbouli N, et al. Students' perception of educational environment based on Dundee Ready Education Environment Measure and the role

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org

of peer mentoring: a cross-sectional study. *BMC Medical Education* **2022**; 22:176 https://doi.org/10.1186/s12909-022-03219-8

24. Awawdeh M, Alosail LA, Alqahtani M, Almotairi A, Almikhem RN, Alahmadi RA, Aldughaither AA, Abalkhail KA. Students' perception of the educational environment at King Saud bin Abdulaziz University for health sciences using DREEM tool. BMC Medical Education. 2024 Jan 8;24(1):42.
25. Al Fryan LH, Shomo MI, Bani IA. Correction: Assessment of the 'students' perceptions of education using Dundee Ready Environment Educational measure (DREEM) inventory at Princess Nourah Bint Abdulrahman University, Saudi Arabia. BMC Medical Education. 2024 Oct 22;24:1184.
26. Ezomike UO, Madubogwu CI, Azuike EC. Evaluation of the educational environment of a new medical school in southeast Nigeria. *Niger J Clin Pract***2020**; 23:1462-9. www.njcponline.com D**OI:** 10.4103/njcp.njcp_221_20
27. Ade-Oshifogun TO, Cadet JA, Ade-Oshifogun JB. A Cross Sectional Study of Medical Students' Perception of Their Educational Environment in Ghana. *Journal of Education and Development***2019**; 3(2):15.https://doi.org/10.20849/jed.v3i2.585
28. Fahal A.H. Medical Education in the Sudan: Its strengths and weaknesses. *Med Teach***2007**; 29: 910-4. DOI: 10.1080/01421590701812991
29. Mahgoub E. The dilemma of medical education in the Sudan. *Sud Med J***2010**; 46(1): 1-3.
30. Ahmed. A.M. Medical Education in Sudan: emerging issues and acute needs. *Sudanese Journal of Public Health***2012**; 7(2):56-64.
31. Abdalla M.E. Improvement of the Medical Education Situation in Sudan: Collegectomy is Not the Only Management Option. *SJMS***2019**; 15 (1): 85–90. DOI 10.18502/sjms.v15i1.6708
32. Sudan Medical Council: Accreditation of medical schools. Available from: www.sudmc.org/en/accreditation.html
33. Doumi EA, Ahmed RB, el Mugabil AA. Analysis of the Curriculum of the Faculty of Medicine, University of Kordofan, Sudan: Using Harden's 10 Questions Framework 2022. *SJMS***2024**; 19 (4): 492–508. DOI 10.18502/sjms.v19i4.14947
34. Hamdy, H. Medical college of the future: From informative to transformative. *Med Teach* **2018**;40(10): 986–989. https://doi.org/10.1080/0142159X.2018.1498628
35. Eory A, Dornan T. Why a medical students' learning environment matters: the enabling effect of supportive social climates. *Journal of the Royal Society of Medicine* **2024;** 117(10): 329–332.DOI: 10.1177/01410768241274048

©2024 Kordofan Journal Medical & Health sciences. https://www.kujms.org Email: info@kujms.org