Original Article

Medical students' perception on their educational environment by using Dundee Ready Educational Environment Measure at a Malaysian medical school

Siti Norashikin Mohd Tambeh[1], Mohamad Nurman Yaman[2], Farah Dayana Zahedi[3], Nurul Alimah Abdul Nasir[4]

ABSTRACT

Background

Optimal educational environment in medical school has been shown to have desirable effects on medical students. In providing this environment, the input from medical students is proven to be a necessity. *Objectives:* The objective of this study is to obtain the perception of pre-clinical and clinical students on their current educational environment.

Methods

A cross-sectional study using self-administered Dundee Ready Education Environment Measure (DREEM) questionnaire was conducted among medical students in UiTM to measure their perception on educational environment. DREEM consisted of 50 items grouped into five subscales which addressed different aspects of educational environment: students' perception of learning (SPoL), teachers (SPoT), atmosphere (SPoA), academic self-perception (SASP) and social self-perception (SSSP).

Results

A total of 894 out of 1165 students completed the questionnaire. The overall mean score of DREEM was described as more positive than negative (mean score: 131.81/200), with significant difference between pre-clinical and clinical students in SPoL and SSSP subscales. SPoL was interpreted as having a more positive perception (mean score: 33.06/48), SPoT as moving in the right direction (mean score: 30.11/44), SASP as feeling more on the positive side (mean score: 20.75/32), SPoA as having a more positive attitude (mean score: 30.72/58, and SSSP as not too bad (mean score: 17.17/28). Educators were perceived as being knowledgeable, encouraging students to participate, and well-prepared for class. Students also perceived that they have good friends, learnt a lot on empathy and the knowledge taught was relevant for future career. All students perceived that educators were authoritarian, overemphasized on factual learning, and they were unable to memorise all. Clinical students viewed educators to be angry in class, too tired to enjoy the course, stressful and lonely.

Conclusion

In conclusion, the educational environment was viewed positively by the students with clinical students having more areas of concern when compared to pre-clinical students.

Keywords

educational environment; DREEM; perception; undergraduate medical students

INTRODUCTION

Medical faculties around the world strive to produce safe, competent, and empathetic doctors to better serve the communities. Similarly, medical students aim to be successful in their studies and this requires a myriad of factors coming from the students themselves such as maturity and intrinsic motivation[1] and externally from the educational environment[2]. Educational environment has a broad definition; it encompasses all the teaching and learning activities, including the interaction between students and educators[3], staffs, faculty, and university[4]. It also includes the physical context such as the facilities and equipment[5], social and psychological context[6]. All these factors interplay to motivate and engage students to

1. Siti Norashikin Mohd Tambeh, Department of Physiology, Faculty of Medicine, Universiti Teknologi MARA Sungai Buloh Campus, Selangor, Malaysia
1. Department of Medical Education, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.
2. Mohamad Nurman Yaman, Department of Medical Education, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia Email: mdnurman@ppukm.ukm.edu.my.
3. Farah Dayana Zahedi, Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.
4. Nurul Alimah Abdul Nasir, Department of Medical Education, Faculty of Medicine, Universiti Teknologi MARA Sungai Buloh Campus, Selangor, Malaysia.

Correspondence

Mohamad Nurman **Yaman,** Department of Medical Education, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.Email: mdnurman@ppukm.ukm.edu.my

DOI: https://doi.org/10.3329/bjms.v23i4.76532

learn[2] with the curriculum as the background.

A balanced and healthy educational environment in medical school has been shown to correlate positively with good academic outcome and students' satisfaction with the curriculum[4,7]. An optimal learning environment also has a desirable impact on students' professional development, personal well-being[8], quality of life[9] and better academic performance[10]. Less satisfactory educational environment perceived by students has been associated with poor academic performance[10], burnout[11] and significant decline in empathy[12]. These findings highlighted the importance of having a good educational environment. Thus, creating such favourable educational environment should be the goal of all stakeholders in the medical school, namely the faculty, educators, and students. Measuring the educational environment proves to be an invaluable input in changing the environment towards the better.

Dundee Ready Education Environment Measure (DREEM) has showed high construct and content validity and high internal consistency. It also has consistent reliability as DREEM has been administered in various medical schools, transcending countries, and cultures. The usage of DREEM to measure the educational environment was seen in various health professions, such as undergraduate medicine[13,14], postgraduate medicine or residents[15], nursing[16] and dental[17]. The usage of DREEM was universal, as it was used in various countries[18] and translated into different languages[19]. DREEM was also the most suitable tool to measure undergraduate medical educational environment with high validity and reliability[20]. DREEM was developed as a universal inventory to assess whole or parts of educational environment in medical schools[21]. It was intended as a refinement of existing instruments which were dated and not specific to health education.

DREEM were mainly used for the following purposes: diagnostic, comparing between different groups, comparison in the same group and looking at its relationship with other measures[19]. The current study aims to obtain the overview of the current educational environment from pre-clinical to clinical students, areas of strength, and areas of concern in a medical school in Malaysia using DREEM questionnaire.

METHODOLOGY

A cross-sectional study was conducted using self-administered DREEM questionnaire to all medical students from Year 1 to Year 5 in Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia. The link to DREEM questionnaire in the form of online Google form was distributed to the students in February 2023. The students were briefed on the objectives, benefits and flow of the study, and clarification on certain terminologies such as 'authoritarian', 'student-centred' and 'constructive criticism' among others. They were also assured that their participation was voluntary and confidential and their decision whether to participate or not to participate would not affect their study or assessment. Submission of the questionnaire was considered as consent, and they were given a week to complete the questionnaires. Data was analysed using Microsoft Excel version 16 and SPSS version 29 in which descriptive statistics, mean score and comparison between groups were calculated..

There are 50 items in the DREEM questionnaire which are grouped into five different subscales to address different aspects of the educational environment, namely Students' Perception of Learning (SPoL) with 12 items, Students' Perception of Teachers (SPoT) with 11 items, Students' Academic Self-Perception (SASP) with 8 items, Students' Perception of Atmosphere (SPoA) with 12 items and Students' Social Self-Perception (SSSP) with 7 items. Each item is rated between 0 and 4 in a 5-point Likert scale with overall mean score of 200 with item score of 3.50 or more indicates a true positive point and score of 2.00 or less indicates problematic area[6].

Ethical Clearance: This study was reviewed and approved by UiTM Research Ethics Committee

RESULTS

A total of 894 out of 1165 students responded to the given questionnaire, giving a response rate of 76.74%. Female students constituted 71.7% of the respondents with the remaining 28.3% was male students. Students in Year 2 had the highest response rate at 97.12% and lowest response rate was students in Year 5 with 54.4%. Table 1 shows the gender and year of study of the respondents.

Table 1: Respondents' gender and year of study in medical school, n=894

Demography Data	Frequency (%)
Gender Male Female	 253/1165 (28.3) 641/1165 (71.7)
Year of study in medical school Year 1 Year 2 Year 3 Year 4 Year 5	 219/275 (24.5) 202/208 (22.6) 189/242 (21.1) 121/190 (13.5) 163/250 (18.3)

Mean Score - Subscales and Overall, and Areas of Strength and Concern

SPoL subscale scored 33.06/48 which was described as a more positive perception with students in the clinical years scored this subscale significantly higher than students in the pre-clinical years. Students in both pre-clinical and clinical years rated item 1 highly in which they were encouraged by the educators to participate in class. However, they rated item 25 poorly as they perceived the teaching overemphasized factual learning. SPoT subscale scored 30.11/44 and described as moving in the right direction and showed no significant difference between pre-clinical and clinical students' mean score. Knowledgeable educators and their well-preparedness for class were rated highly by both pre-clinical and clinical students, however educators were also perceived as being authoritarian. The clinical students also scored item 39 poorly in which educators were perceived to be angry in class.

The score for SASP subscale was 20.75/32 which was described as feeling more on the positive side with the mean score showing no significance difference between pre-clinical and clinical students. Pre-clinical and clinical students agreed that they have learnt much about empathy and the knowledge learnt was relevant for their future career. However, they were unable to memorise all that they need as this became an area of concern for all students in this subscale. SPoA subscale scored 30.72/48 and deemed as more positive attitude with no significant difference in the mean score between the students in pre-clinical and clinical years. There was no area of strength in this subscale, however clinical students scored poorly in item 42 in which the stress outweigh the enjoyment of studying.

For SSSP subscale, the mean score was 20.75/28 which was seen as not too bad with the mean score in students in pre-clinical years was significantly higher than clinical students. In terms of area of strength, both pre-clinical and clinical students perceived that they have good friends. Clinical students perceived that they were too tired to enjoy the medical course and felt lonely and these two were the areas of concern in this subscale. The overall mean score of the DREEM questionnaire was 131.81/200, which put the educational environment in Faculty of Medicine, UiTM as more positive than negative. The mean score of the subscales and overall, for pre-clinical and clinical students is shown in Table 2. The score of items in each subscale for students in pre-clinical and clinical years is shown in Table 3.

DISCUSSION

For the current study, the use of DREEM was more for diagnostic as it gave an idea on the educational environment and identifies the areas of strengths and weaknesses. For SPoL subscale, there was a significant difference in the score between the students in pre-clinical and clinical years with clinical students had a higher score. Clinical students perceived that the teaching in clinical years was more stimulating, well-focused, student-centred, able to develop their competence, emphasize on long-term learning and encourage them to be an active learner. This may be attributed to the way teaching was conducted in pre-clinical and clinical years. During pre-clinical years, most of the teaching was carried out in lectures, with some small group sessions, practical and PBL which might hinder the process of active learning. Whereas in clinical years, the teaching and learning sessions were more active as students were divided into clinical postings, and they learnt as they attended ward rounds, bedside teaching, and other clinical encounters. To address this disparity, a change or a shift to a more student-centred learning needs to be the focus of the faculty for the provision of active learning during the preclinical years. Active learning was the right direction for medical school to undertake as it was shown to have better application and retention of knowledge compared to traditional lectures. It would also foster student-centred learning, critical thinking, and problem-solving ability[22] as application and integration of knowledge needed more than knowledge recall. Less integration of knowledge may hinder students' interest and had a negative impact on learning[23]. To implement active learning, educators

Table 2: Mean score for the subscales and overall, for pre-clinical and clinical students

DREEM Subscale	Overall Mean (SD)	Pre-clinical Mean (SD)	Clinical Mean (SD)	t-score (df)	p-value
SPoL (max=48)	33.06 (4.66) 68.88%	32.48 (4.71) 67.68%	33.58 (4.56) 69.95%	-3.545(892)	*<0.01**
SPoT (max=44)	30.11 (4.47) 68.42%	30.31 (4.44) 68.89%	29.92 (4.49) 68.0%	1.3032(892)	0.19
SASP (max=32)	20.75 (3.81) 64.84%	20.91 (3.70) 65.34%	20.61 (3.91) 64.40%	1.1744(892)	0.24
SPoA (max=48)	30.72 (5.93) 63.99%	30.95 (5.54) 64.48%	30.51 (6.25) 63.56%	1.108(892)	0.27
SSSP (max=28)	17.17 (3.71) 61.34%	17.53 (3.30) 62.63%	16.85 (4.93) 60.19%	2.393(892)	*<0.01**
Overall mean score (max=200)	131.81 (18.61) 65.90%	132.19 (17.88) 66.1%	131.47 (19.24) 65.73%	0.5774(892)	0.56

Table 3: Score of items in each subscale for pre-clinical and clinical students

Question number and item	Overall Mean (SD)	Pre-clinical students Mean (SD)	Clinical students Mean (SD)
SPoL			
Q1. I am encouraged to participate in class	3.10 (0.693)	3.03 (0.763)	3.16 (0.618)
Q7. The teaching is often stimulating	2.91 (0.735)	2.78 (0.765)	3.02 (0.689)
Q13. The teaching is student-centred	2.81 (0.740)	2.76 (0.746)	2.86 (0.731)
Q16. The teaching is sufficiently concerned to develop my competence	2.85 (0.773)	2.81 (0.749)	2.89 (0.793)
Q20. The teaching is well-focused	2.99 (0.643)	2.93 (0.664)	3.04 (0.620)
Q22. The teaching is sufficiently concerned to develop my confidence	2.70 (0.779)	2.72 (0.717)	2.67 (0.831)
Q24. The teaching time is put to good use	2.91 (0.685)	2.87 (0.724)	2.94 (0.646)
Q25. The teaching over-emphasises factual learning	***1.68 (0.828)***	***1.68 (0.757)***	***1.68 (0.887)***
Q38. I am clear about the learning objectives of the course	2.94 (0.719)	2.99 (0.673)	2.89 (0.756)
Q44. The teaching encourages me to be an active learner	2.93 (0.704)	2.86 (0.761)	3.00 (0.644)
Q47. Long-term learning is emphasised over short-term	2.86 (0.781)	2.73 (0.788)	2.98 (0.756)
Q48. The teaching is too teacher-centred	2.39 (0.825)	2.31 (0.819)	2.46 (0.825)

Question number and item	Overall Mean (SD)	Pre-clinical students Mean (SD)	Clinical students Mean (SD)
SPoT			
Q2. The teachers are knowledgeable	3.64 (0.573)	3.57 (0.599)	3.70 (0.543)
Q6. The teachers are patient with patients	3.02 (0.734)	2.89 (0.744)	3.14 (0.706)
Q8. The teachers ridicule the students	2.33 (0.974)	2.49 (0.963)	2.20 (0.964)
Q9. The teachers are authoritarian	***1.82 (0.958)***	***1.90 (0.968)***	***1.75 (0.944)***
Q18. The teachers have good communication skills with patients	3.12 (0.716)	2.84 (0.746)	3.37 (0.586)
Q29. The teachers are good at providing feedback to students	2.75 (0.822)	2.72 (0.746)	2.77 (0.884)
Q32. The teachers provide constructive criticism here	2.75 (0.766)	2.57 (0.738)	2.91 (0.757)
Q37. The teachers give clear examples	3.01 (0.621)	2.97 (0.626)	3.05 (0.614)
Q39. The teachers get angry in class	***2.16 (1.051)***	***2.67 (0.887)***	***1.70 (0.970)***
Q40. The teachers are well-prepared for their classes	3.20 (0.660)	3.20 (0.671)	3.19 (0.651)
Q50. The students irritate the teachers	2.30 (0.950)	2.48 (0.877)	2.14 (0.984)
SASP			
Q5. Learning strategies which worked for me before continue to work for me now	2.29 (0.977)	2.42 (0.952)	2.18 (0.986)
Q10. I am confident about passing this year	2.66 (0.829)	2.70 (0.824)	2.62 (0.832)
Q21. I fell I am being well prepared for my profession	2.24 (0.858)	2.37 (0.805)	2.13 (0.888)
Q26. Last year's work has been a good preparation for this year's work	2.58 (0.807)	2.53 (0.764)	2.62 (0.842)
Q27. I am able to memorise all I need	***1.68 (0.950)***	***1.82 (0.940)***	***1.55 (0.940)***
Q31. I have learned a lot about empathy in my profession	3.25 (0.655)	3.10 (0.699)	3.39 (0.580)
Q41. My problem-solving skills are being well developed here	2.88 (0.691)	2.87 (0.706)	2.88 (0.679)
Q45. Much of what I have to learn seems relevant to a career in medicine	3.17 (0.668)	3.10 (0.709)	3.24 (0.623)
SPoA			
Q11. The atmosphere is relaxed during ward teaching	2.24 (0.795)	2.25 (0.576)	2.22 (0.948)
Q12. This school is well time-tabled	2.10 (1.114)	2.12 (1.171)	2.09 (1.062)

Question number and item	Overall Mean (SD)	Pre-clinical students Mean (SD)	Clinical students Mean (SD)
Q17. Cheating is a problem in this school	2.63 (1.144)	2.62 (1.192)	2.64 (1.102)
Q23. The atmosphere is relaxed during lectures	2.80 (0.786)	2.84 (0.749)	2.76 (0.816)
Q30. There are opportunities for me to develop my interpersonal skills	2.97 (0.715)	2.91 (0.715)	3.01 (0.711)
Q33. I feel comfortable in class socially	2.67 (0.857)	2.70 (0.848)	2.65 (0.866)
Q34. The atmosphere is relaxed during seminars/tutorials	2.64 (0.851)	2.72 (0.800)	2.57 (0.890)
Q35. I find the experience disappointing	2.61 (0.985)	2.53 (0.982)	2.68 (0.984)
Q36. I am able to concentrate well	2.38 (0.898)	2.43 (0.869)	2.33 (0.922)
Q42. The enjoyment outweighs the stress of studying medicine	***2.12 (1.047)***	***2.31 (0.973)***	***1.95 (1.082)***
Q43. The atmosphere motivates me as a learner	2.81 (0.779)	2.82 (0.782)	2.81 (0.778)
Q49. I feel able to ask the questions I want	2.74 (0.858)	2.70 (0.858)	2.79 (0.857)
SSSP			
Q3. There is a good support system for students who get stressed	2.43 (0.940)	2.44 (0.946)	2.42 (0.935)
Q4. I am too tired to enjoy this course	***1.89 (1.011)***	***2.02 (0.945)***	***1.77 (1.053)***
Q14. I am rarely bored in this course	2.27 (1.015)	2.24 (0.988)	2.29 (1.040)
Q15. I have good friends in this school	3.28 (0.796)	3.26 (0.784)	3.30 (0.807)
Q19. My social life is good	2.59 (0.963)	2.65 (0.926)	2.53 (0.993)
Q28. I seldom feel lonely	***2.01 (1.093)***	***2.09 (1.059)***	***1.94 (1.119)***
Q46. My accommodation is pleasant	2.71 (0.946)	2.84 (0.819)	2.60 (1.035)

must be well-versed with teaching learning modalities that incorporate active learning and fully supported by the faculty. Faculty development programme on the preparation, planning and incorporation of active learning were some of the suggestions given by members of continuing medical education (CME) unit in North America to increase active learning content[22]. Both students in pre-clinical and clinical years perceived that teaching in the faculty over-emphasises on factual learning. DREEM studies conducted in Malaysia also showed that students scored poorly on the same item[4,6,8,13,24,25]. This might be attributed to the vast amount of learning objectives in each topic and for each discipline that the students were required to learn. Factual learning was undoubtedly important in medicine, as competent practising medical personnel need to have a concrete knowledge base[26], however, the way this knowledge was delivered need to be re-examined. Instead of the traditional way of teaching, faculty could implement methods to increase factual knowledge acquisition and retention such as spacing effect, testing effect[26] and using patient stories[27]. With

the advancement in technology, factual knowledge and its application could be delivered in a myriad of ways, such as incorporating factual knowledge into games[28] as games were shown to increase positive reinforcement. The use of smartphone application in aiding students to learn had also gaining traction and had shown promising result[29,30].

The SPoT subscale was described as moving in the right direction with no significant difference in the mean score between students in pre-clinical and clinical years. Educators were perceived as being knowledgeable, patient, have good communication skills when interacting with patients, well prepared for their classes and gave clear examples while teaching. Students in the pre-clinical and clinical years perceived highly on the educators' knowledge, and this was shown as the best area of strength in this current DREEM study. The finding on this item was compared with other medical schools in Malaysia, with other studies had similar score range of more than 3.50[4,6], between 3.00 and 3.49[8,25] and between 2.00 to 3.00[13,24]. Being knowledgeable was one of the qualities that made a teacher exceptional and distinguished them from others[31]. The educators in the faculty were on the right track and they needed to regularly update their knowledge to be able to deliver up-to-date information to the students. Even with these positive attributes, educators also had negative features that needed improvement, such as ridiculing the students, and having a need to improve on providing feedback and constructive criticism to students. To be an excellent role model, teachers need to have good rapport with students and able to give constructive feedback[32]. Constructive feedback was shown to be a positive reinforcement[33] for classroom learning and it should be given consistently, fairly, and immediately after completion of task to all students[34]. It is of paramount importance that teachers know the correct way to give constructive feedback and increasing the teachers' awareness on the importance of feedback is the first step. The educators were viewed as authoritarian by both pre-clinical and clinical students, and this was one of the areas of concern in this subscale. This item was also rated poorly in several studies conducted in Malaysia, with a mean score ranging from 1.68 to 1.95[4,6,8,13,25] with one study with a mean score of 2.30[24]. Authoritarian was one of the teaching styles identified by Barni et al.[35], apart from authoritative and permissive. Authoritarian teachers placed major emphasis on discipline and had a belief that the only way for students to gain knowledge was by paying attention during classes. It was shown that authoritarian teachers perceived conservative values as an important life principle[35]. It is interesting to see whether conservative or traditional curriculum shaped teachers to be more authoritarian. Even though authoritarianism was identified as undesirable quality and has been addressed by the medical education fraternity, there were still students in medical schools who were subjected to professional authority[36]. Another area of concern in this subscale was only perceived by the clinical students which was the educators get angry in class. This anger might stem from the multiple roles played by the clinical educators; from managing patients, conducting research, teaching and even administrative portfolios[37] which might prove to be a stressor and educators may respond with negative emotions[38]. Anger could be translated into verbal and non-verbal behaviour such as using words that were harsh and demotivating to the students. Anger or negative emotion coming from the educators negatively affect students learning experience and might contribute to poor academic performance[39]. To overcome the issues of authoritarian and anger, the faculty could initiate programmes or courses in professionalism and effective teaching skills among others.

SASP subscale was described as feeling more on the positive side and showed no significant difference in the mean score between the pre-clinical and clinical students. Students perceived that they have learned much on empathy and the knowledge they learnt was relevant to their future work. This showed that the faculty was on the right track in teaching empathy and content taught was also relevant. However, they felt that they were unable to memorise the vast amount of knowledge in the curriculum and this was the area of concern in this subscale. Apart from that, students also perceived that their problem-solving skill was not fully developed, they were not being prepared for future, and they were worried that they would not pass their exam. Students might think that they were not learning enough and were looking for the right approach in learning. There were multiple effective learning techniques that could be used by teachers and students alike. Practice

testing and distributed practice were two learning techniques that were rated highly as they were shown to increase students' performance in various tasks[40]. The use of conceptual mapping had also been shown to benefit students[41] and this method could be adopted to increase understanding. Although there was a plethora of effective learning techniques in the literature, there was no one method that suited every student, thus they need to find their own personalized learning method.

In SPoA subscale, the mean score showed no significant difference between pre-clinical and clinical students' perception and there was also no area of strength. All items in this subscale need to be improved with none scored highly or poorly overall. Clinical students perceived that the medical course was very stressful, and they were unable to feel any joy in studying. This should raise an alarm and the faculty and educators need to address this issue by finding out the root cause of this stress. To aid students in their learning, the faculty needed to have a more balanced timetable, with teachers to play a big part in making sure that their classes ambience was more relaxed, and to give more space for students to speak up more. Packed timetable implied that the curriculum did not give students the time to understand deeply the subjects and not developing skills such as problem-solving and critical thinking[42]. To make sure that the curriculum could be completed in due time, teachers would just tell the students the facts and rote memorisation would then take place[42] and may lead students to regurgitate their answers during exam without even understanding the topic. Faculty must be bold in advocating changes in the curriculum; they need to identify the core factual knowledge to reduce the content load, decreased passive lectures and incorporate more active learning to support the development of independent learners[42]. To lighten the atmosphere and promoting positive environment during teaching, teachers could incorporate appropriate humour. It was shown that humour fostered positive environment and made clinical cases more interesting and effective[43].

There was significant difference in the mean score between pre-clinical and clinical students in SSSP subscale. Clinical students felt that they were too tired and couldn't enjoy the medical course and felt lonelier, which was relatable to them feeling stressful as shown in previous subscale. When compared to other local studies, some reported poor score for the same items[4,24,25] and some reported higher score[4,6,8,13,24,25]. This finding was worrying as these students would soon graduate and enter the work force. More could be done by the faculty in terms of support for stressed students. A systematic review on stress among medical students in Malaysia reported that turning to religion was the most used coping strategies, with active coping, and positive reinterpretation as other identified strategies[44]. Students had different ways in coping with stress and the faculty should be more supportive to the students in whichever way possible. The faculty should be more proactive in conducting more stress management courses for students and placing counsellors or psychologists in campus. Further study, ideally qualitative study identifying the root cause for these poor items should be undertaken by the faculty to rectify these weaknesses. Stress level in Malaysian medical students was reported at 56% which should raise an alarm[44]. Examination and academic stressors such as enormous amount of content in each subject to learn and not enough time to study were among the stressors reportedly faced by the students[44]. High level of stress might lead to stress-related illness such as depression and anxiety[44]. The detrimental effects of stress on memory, learning and cognition were widely documented[45], with changes in declarative memory, reduced cognition, behavioural changes, and mood disorders were some of functional changes identified. Faculty need to facilitate students in managing their stress level and as academic-related stressors might be one of the culprits, review of curriculum to revise the delivery of factual knowledge might be of benefit.

The overall mean score of DREEM for FoM, UiTM was 131.81 which was described as more positive than negative with similar score between students in pre-clinical and clinical years. This showed that the current curriculum was having a positive impact on the educational environment. However, it also showed that there was room for improvement and the findings from the subscales and items could lead the faculty in the right direction for possible curriculum review. The same description of score was also shared by other studies done in Malaysia[4,6,8,13,24,25]. This showed that the educational environment in FoM, UiTM was similar as other medical schools in Malaysia. Even though the

overall mean score was acceptable and comparable to other Malaysian medical school, the current study managed to identify the strength and weaknesses and appropriate strategies need to be undertaken. The change in educational environment is the responsible of all parties, namely the faculty, teachers, and students.

CONCLUSION

The educational environment in FoM, UiTM was viewed positively by the students with knowledgeable teachers viewed as the greatest strength. Clinical students perceived more items as problematic compared to pre-clinical students regarding authoritarian and angry teachers, emphasis on factual learning and inability to memorise the content of curriculum and feeling stressed and tired. The faculty need to implement strategies to overcome these weaknesses to make the learning environment positive.

ACKNOWLEDGEMENT

This study was part of a project supported by Faculty of Medicine Fundamental Grant, Universiti Kebangsaan Malaysia. Project code: FF-2022-079

CONFLICT OF INTEREST

The authors have no conflict of interest to declare

Authors' contributions:

Data gathering and idea owner of the study: SNMT, MNY

Study design: SNMT, MNY

Data gathering: SNMT

Writing and submitting manuscript: SNMT, MNY, FDZ, NAAN

Editing and approval of final draft: SNMT, MNY, FDZ, NAAN

REFERENCES

1 .Frischenschlager, O., Haidinger, G., &Mitterauer, L. Factors associated with academic success at Vienna Medical School: prospective survey. *Croat Med J* 2005; **46**(1): 58-65

2. 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

3. Harden, R. M. The learning environment and the curriculum. *Med Teach*2001; **23**(4): 335-336

4. Salam, A., Akram, A., Mohamad, N., & Siraj, H. H. Measures of educational environment in a higher educational institution using Dundee Ready Educational Environment Measure: DREEM. *Int Med J* 2015; **22**(2): 98-102

5. Hutchinson, L. (2003). Educational environment. *BMJ* 2003; **326**(7393): 810-812

6. Rahman, N. H. A., Kamaruddin, M. A., Besar, M. N. A., & Yaman, M. N. Perception of Undergraduate Medical Students on Educational Environment. *Education in Medicine Journal* 2021; **13**(1): 57-71

7. Mayya, S. S., &Roff, S. Students′ perceptions of educational environment: a comparison of academic achievers and under-achievers at Kasturba Medical College, India. *Educ Health* 2004; **17**(3): 280-291.

8. Yusoff, M. S. B., Ja'afar, R., Arzuman, H., Arifin, W. N., & Mat Pa, M. N. Perceptions of medical students regarding educational climate at different phases of medical training in a Malaysian medical school. *Education in Medicine Journal* 2013; **5**(3): e30-e41.

9. Enns, S. C., Perotta, B., Paro, H. B., Gannam, S., Peleias, M., Mayer, F. B., et al. Medical students' perception of their educational environment and quality of life: is there a positive association?. *Acad Med* 2016; **91**(3), 409-417

10. Wayne, S. J., Fortner, S. A., Kitzes, J. A., Timm, C., & Kalishman, S. Cause or effect? The relationship between student perception of the medical school learning environment and academic performance on USMLE Step 1. *Med Teach* 2013; **35**(5): 376-380.

11. Dyrbye, L., & Shanafelt, T. A narrative review on burnout experienced by medical students and residents. *Med Educ* 2016; **50**(1): 132-149

12. Hojat, M., Vergare, M. J., Maxwell, K., Brainard, G., Herrine, S. K., Isenberg, G. A., et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. *Acad Med* 2009; **84**(9): 1182-1191

13. Arzuman, H., Yusoff, M. S. B., & Chit, S. P. Big sib students' perceptions of the educational environment at the school of medical sciences, Universiti Sains Malaysia, using Dundee Ready Educational Environment Measure (DREEM) Inventory. *Malays J Med Sci* 2010; **17**(3): 40-47

14. Kaur, M., Sidhu, T. K., Mahajan, R., & Kaur, P. Evaluation of the institutional educational environment by using the Dundee Ready Educational Environment Measure. *Int J Appl Basic Med Res* 2021; **11**(2): 85-89

15. Parpio, Y. N., Farooq, S., Zahid, N., Abdul-Ghafar, J., & Rehman, R. Perception of postgraduate medical residents regarding educational environment at French Medical Institute for Mothers and Children, Kabul Afghanistan. *J Pak Med Assoc* 2022; **72**(4): 669-673

16. Imen, R., Amal, S., Mouna, B. A., Aziza, T., & Hichem, D. Tunisian DREEM: Nursing students' perception of the learning environment. *Open J Nurs* 2022; **12**(11): 745-757
17. Arora, G., Nawabi, S., Uppal, M., Javed, M. Q., Yakub, S. S., & Shah, M. U. Dundee Ready Education Environment Measure of dentistry: analysis of dental students' perception about educational environment in College of Dentistry, Mustaqbal University. *J Pharm Bioallied Sci* 2021; **13**(Suppl 2): S1544-S1550
18. Chan, C. Y. W., Sum, M. Y., Tan, G. M. Y., Tor, P. C., & Sim, K. Adoption and correlates of the Dundee Ready Educational Environment Measure (DREEM) in the evaluation of undergraduate learning environments–a systematic review. *Med Teach* 2018; **40**(12): 1240-1247
19. Miles, S., Swift, L., & Leinster, S. J. The Dundee Ready Education Environment Measure (DREEM): a review of its adoption and use. *Med Teach* 2012; **34**(9): e620-e634
20. Soemantri, D., Herrera, C., &Riquelme, A. Measuring the educational environment in health professions studies: a systematic review. *Med Teach* 2010; **32**(12): 947-952
21. Roff, S., McAleer, S., Harden, R. M., Al-Qahtani, M., Ahmed, A. U., Deza, H., et al. Development and validation of the Dundee Ready Education Environment Measure (DREEM). *Med Teach* 1997; **19**(4): 295-299
22. Bucklin, B. A., Asdigian, N. L., Hawkins, J. L., & Klein, U. Making it stick: use of active learning strategies in continuing medical education. *BMC Med Educ* 2021; **21**: 1-9
23. Umar, B. U. & Haque, M. Changing perspectives: should we integrate Pharmacology in the clinical phase?. *Bangladesh J Med Sci* 2022, **21**(2), 249-261
24. Al-Naggar, R. A., Abdulghani, M., Osman, M. T., Al-Kubaisy, W., Daher, A. M., Nor Aripin, K. N. B., et al. The Malaysia DREEM: perceptions of medical students about the learning environment in a medical school in Malaysia. *Adv Med Educ Pract* 2014; 177-184
25. Arzuman, H., Maziz, M. N. H., Elsersi, M. M., Islam, M. N., Kumar, S. S., Jainuri, M. D. et al. Preclinical medical students perception about their educational environment based on DREEM at a Private University, Malaysia. *Bangladesh J Med Sci* 2017; **16**(4): 496-504
26. Yeh, D. D., & Park, Y. S. Improving learning efficiency of factual knowledge in medical education. *J Surg Edu* 2015; **72**(5): 882-889
27. Gamsızkan, Z., Sungur, M.A. & Günel, M.G. Evaluating the gains of using stories in medical education – A pilot study example. *Bangladesh J Med Sci* 2022; **21**(3): 694-701
28. Awan, O., Dey, C., Salts, H., Brian, J., Fotos, J., Royston, E., et al. Making learning fun: gaming in radiology education. *Acad Radiol* 2019; **26**(8): 1127-1136
29. Fralick, M., Haj, R., Hirpara, D., Wong, K., Muller, M., Matukas, L., et al. Can a smartphone app improve medical trainees' knowledge of antibiotics?. *Int J Med Educ* 2017; **8**: 416
30. Martínez, F., Tobar, C., & Taramasco, C. Implementation of a smartphone application in medical education: a randomised trial (iSTART). *BMC Med Educ* 2017; **17**(1): 1-9
31. Benekos, P. J. How to be a good teacher: Passion, person, and pedagogy. *J Crim Just Educ* 2016; **27**(2): 225-237
32. Burgess, A., Oates, K., & Goulston, K. Role modelling in medical education: the importance of teaching skills. *Clin Teach* 2016; **13**(2): 134-137
33. Whitney, T., & Ackerman, K. B. Acknowledging student behavior: A review of methods promoting positive and constructive feedback. *Beyond Behavior* 2020; **29**(2): 86-94
34. Al-Hattami, A. A. The perception of students and faculty staff on the role of constructive feedback. *Int J Instr* 2019; **12**(1): 885-894
35. Barni, D., Russo, C., & Danioni, F. Teachers' values as predictors of classroom management styles: A relative weight analysis. *Front Psychol* 2018; **9**: 1970
36. Hays, R. The rise and fall of authoritarianism in the teaching of medicine. *Einstein J Biol Med* 2016; **29**(1): 49-51
37. Hoffert, M.M., Passalacqua, K.D., Haftka-George, A., Abreu Lanfranco, O. & Martin, R.A. A curriculum for enhancing physician teaching skills: The value of physician-educator partnerships. *J Med Educ Curric Dev* 2021; **8**: 1-11
38. Du, J., Huang, J., An, Y., & Xu, W. The Relationship between stress and negative emotion: The Mediating role of rumination. *Clin Res Trials* 2018; **4**(1): 1-5
39. Makhwathana, R. M., Mudzielwana, N. P., Mulovhedzi, S. A., & Mudau, T. J. Effects of teachers' emotions in teaching and learning in the foundation phase. *J Psychol* 2017; **8**(1): 28-35
40. Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychol Sci Public Interest* 2013; **14**(1): 4-58
41. Rezapour-Nasrabad, R. Mind map learning technique: An educational interactive approach. *Int J Pharmaceut Res* 2019; **11**(1): 1593-1597
42. Lujan, H. L., & DiCarlo, S. E. Too much teaching, not enough learning: what is the solution?. *Adv Physiol Educ* 2006; **30**(1): 17-22
43. Liu, Y. P., Sun, L., Wu, X. F., Yang, Y., Zhang, C. T., Zhou, H. L. et al. Use of humour in medical education: a survey of students and teachers at a medical school in China. *BMJ Open* 2017; **7**(11): e018853
44. Salam, A., Yousuf, R., Bakar, S. M. A., & Haque, M. Stress among medical students in Malaysia: A systematic review of literatures. *Int Med J* 2013; **20**(6): 649-655.
45. Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T. P., & Sahebkar, A. The impact of stress on body function: A review. *EXCLI J* 2017; **16**: 1057