ORIGINAL ARTICLE
Volume 13 Issue 1 2021
DOI: 10.21315/eimj2021.13.1.6
ARTICLE INFO
Submitted: 07-08-2020
Accepted: 14-02-2021
Online: 31-03-2021

Perception of Undergraduate Medical Students on Educational Environment

Nurul Husna Ahmad Rahman, Mohammad Arif Kamaruddin, Mohd Nasri Awang Besar, Mohamad Nurman Yaman

Department of Medical Education, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, MALAYSIA

To cite this article: Ahmad Rahman NH, Kamaruddin MA, Awang Besar MN, Yaman MN. Perception of undergraduate medical students on educational environment. Education in Medicine Journal. 2021;13(1):57–71. https://doi.org/10.21315/eimj2021.13.1.6

To link to this article: https://doi.org/10.21315/eimj2021.13.1.6

ABSTRACT

Educational environment in medical school has a significant influence on the students' progress in becoming a holistic doctor. Different background of students may have different perception towards their educational environment. The objectives of this study were to explore and ascertain the overall educational environment status of two medical programmes in the Faculty of Medicine of Universiti Kebangsaan Malaysia (UKM) and to study the common areas of concern in the educational environment. A cross-sectional study was conducted in November 2018 among all the fourth-year undergraduate medical students of session 2018/2019 in the Faculty of Medicine of UKM using the Dundee Ready Education Environment Measure (DREEM) questionnaire. A total of 114 (72.61%) respondents had completed the questionnaire. The mean global score of UKM (136.14) was higher than the mean global score of UKM-Universitas Padjadjaran (UKM-UNPAD) (128.74). UKM also noted to have a higher total mean score for all the five subscales than UKM-UNPAD. The highest percentage score was observed in the subscale of Students' Perception of Learning (SPoL) for UKM (71.89%) and UKM-UNPAD (68.56%). On the other hand, the lowest percentage score was observed among the UKM (62.57%) and UKM-UNPAD (60.04%) respondents in the subscale of Students' Social Self-Perception (SSSP). Overall, all students across these two main academic programmes perceived the educational environment in UKM positively. However, there are still aspects of the educational environment that could be improved. The existing programmes and academic modules are subjected to rigorous evaluation to be able to meet the medical students' requirements.

Keywords: *Medical students, Educational environment, DREEM, Twinning programme*

CORRESPONDING AUTHOR

Dr. Mohammad Arif Kamaruddin, Department of Medical Education, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia | Email: researchmededu@gmail.com

INTRODUCTION

The educational environment can be defined as a set of factors in physical, social, psychological and pedagogical contexts where students learn and feel connected with one another, staff, faculty, curriculum and school facilities (1–2). Ramani and Leinster (3) have described it as a platform for effective teaching and learning and stated it encourages students to learn and discover their limitations. Different students may have diverse backgrounds, prior academic performance and preferences towards learning styles; thus, students evaluate the educational environment differently (4). Al-Naggar et al. (5) has shown that students' perceptions of their learning environments are essential for the continuous improvement of the educational environments and curricula. Furthermore, educational environment assessment is a critical instrument for the delivery of high-quality education (6). A favourable educational environment has a beneficial impact on students' quality of life (7–8), professional development, academic completion, personal well-being (9), approach to learning (10), academic performance in medical school (11) and behaviour (2). The adverse effects of poor educational environments have been highly associated with students' quality of life, burnout (12), adverse effects on empathy (13) and professionalism (14). Poor educational environments contribute to poor academic performance (15). Although the concept of educational environment is considered somewhat abstract, the effects of the educational environment are significant, real and dominant (2, 16).

Since 2008, Universiti Kebangsaan Malaysia (UKM) has offered two main academic medical degree programmes, namely, the mainstream or internal UKM and the UKM-Universitas Padjadjaran (UKM-UNPAD) twinning programme. Medical students from these programmes have different experiences in their pre-clinical years but share similar experiences in their clinical years. Students in the mainstream UKM medical degree programme spend five years in pre-clinical and clinical programmes in UKM, whereas those in the UKM-UNPAD programme complete a six-year undergraduate medical degree programme, which consists two parts: three years of the pre-clinical programme conducted in the Faculty of Medicine, Universitas Padjadjaran, Bandung, Indonesia and three years of clinical practice in the Faculty of Medicine of UKM. This twinning programme has been implemented since 2006/2007, successfully producing eight batches of graduates (17).

The UKM-UNPAD twinning programme is entering its 10th year. However, no study has been conducted on UKM-UNPAD students' perceptions of the educational environment in the university. Given that students are diverse, especially in the pre-clinical years, a study that evaluates their perceptions of the educational environments during the first year of clinical experience in Malaysia is warranted. This study is important to strive for meeting students' crucial needs for effective learning and curriculum delivery (18), especially in subsequent clinical years. The findings of this study can assist medical lecturers and the administrators of the Faculty of Medicine of UKM in understanding the different backgrounds of medical students and can be used as a guide to determining how students can improve their learning and performance as they enter clinical programmes in the Faculty of Medicine of UKM.

MATERIALS AND METHODS

This cross-sectional descriptive study was conducted at the Faculty of Medicine of UKM in November 2018. All the fourth-year undergraduate medical students of session 2018/2019 in the Faculty of Medicine of UKM, 157 in total, were invited to participate. These batch were

selected because all of the students had one year of educational exposure to the clinical setting of UKM. Data were collected using the Dundee Ready Education Environment Measure (DREEM) questionnaire. The questionnaire was distributed to each student with the online Google Form at the end of the fourth year's first posting. Students were assured of their anonymity and confidentiality of their responses. The students also had been informed that their responses were voluntary and have no bearing towards their assessments or marks in their studies. They were given a week to complete the DREEM questionnaires. Responding to the questionnaires would be considered implied consent. The students were asked to answer the questionnaires according to their experience in their previous year of study (third-year of clinical studies in the UKM). The research protocol was reviewed and approved by the Universiti Kebangsaan Malaysia Research Ethics and Committee (UKM PPI/111/8/JEP-2019-043).

DREEM Inventory

A study by Roff et al. (19) described the development of the DREEM and validated it. The DREEM was developed by the international Delphi Panel, involving more than 80 health and medical profession educators from across the world. Over the past 20 years, medical and allied health educators from different educational backgrounds around the world have widely used the DREEM inventory to evaluate their institutions' educational environment (20–22). It is more compatible and suitable for different courses and countries cultures (16).

DREEM questionnaire has 50 items, which has a total score of 200 points. Each item is rated according to a 5-point Likert scales ranging between 0 and 4 (0 = strongly disagree, 1 = disagree, 2 = unsure, 3 = agree and 4 = strongly agree). The items are grouped into five subscales to indicate the different areas of the educational environment:

a. Students' Perception of Learning (SPoL; 12 items)

b. Students' Perception of Teachers (SPoT; 11 items)

c. Students' Academic Self-Perception (SASP; 8 items)

d. Students' Perception of Atmosphere (SPoA; 12 items)

e. Students' Social Self-Perception (SSSP; 7 items)

Nine negative items must be scored in a reverse manner before analysis and interpretation, which are items 4, 8, 9, 17, 25, 35, 39, 48 and 50. High scores on these negative items indicate students' disagreement about the items. An item with a mean score of 3.50 or more is considered a true positive point. An item with a mean score of between 2.00 and 3.00 is considered an educational environment aspect that can be enhanced and improved. An item with a mean score of 2.00 or less indicates a problematic area. Table 1 summarises the guidelines for interpreting the total DREEM scores and subscales (23–24).

Table 1: Guideline for interpretation of DREEM scores

Total score	SPoT	SPoA
0–50: Very poor 51–100: Plenty of problems 101–150: More positive than negative 151–200: Excellent	0–11: Abysmal 12–22: In need of some retraining 23–33: Moving in the right direction 34–44: Model course organisers	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
SPoL	**SASP**	**SSSP**
0–12: Very poor 13–24: Teaching is viewed negatively 25–36: A more positive perception 37–48: Teaching highly thought of	0–8: Feelings of total failure 9–16: Many negative aspects 17–24: Feeling more on the positive side 25–32: Confident	0–7: Miserable 8–14: Not a nice place 15–21: Not too bad 22–28: Very good socially

RESULTS

A total of 114 (72.61%) respondents had completed the DREEM questionnaire. Out of these respondents, 71.9% were from the mainstream medical programme, and 73.7% were female respondents. Approximately 77.2% were in *bumiputera* status (Table 2). Table 3 shows the mean, standard deviation (SD) and percentage of total DREEM scores and subscales among the UKM and UKM-UNPAD respondents. The mean global score of the mainstream medical programme in UKM was 136.14 ± 24.60, which was higher than the twinning medical programme UKM-UNPAD (128.74 ± 20.25). However, medical students from both main medical programme perceived their educational environments in UKM as more positive than negative. The mainstream UKM students had higher total mean scores in all the five subscales than the UKM-UNPAD students.

Table 2: Demographic profile of respondents, *n* = 114

Variables	Categories	Frequency (%)
Academic programme	UKM (mainstream)	82 (71.9)
	UKM-UNPAD	32 (28.1)
Gender	Male	30 (26.3)
	Female	84 (73.7)
Race	Bumiputera	88 (77.2)
	Chinese	17 (14.9)
	Indian	9 (7.9)
Foundation	Matriculation	72 (63.2)
	STPM	3 (2.6)
	Asasi	33 (28.9)
	Others	6 (5.3)

Note: STPM - Sijil Tinggi Persekolahan Malaysia

Table 3: Mean and standard deviation (SD) of total DREEM scores and subscales

DREEM subscale	Overall Mean (SD)	UKM Mean (SD)	UKM-UNPAD Mean (SD)	Description
SPoL (max = 48)	34.06 (5.32) 70.96%	34.51 (5.78) 71.89%	32.9 1(3.75) 68.56%	A more positive perception
SPoT (max = 44)	30.00 (5.09) 68.18%	30.35 (5.27) 68.98%	29.09 (4.55) 66.11%	Moving in the right direction
SASP (max = 32)	21.19 (3.84) 66.22%	21.72 (3.99) 67.88%	19.84 (3.08) 62.00%	Feeling more on the positive side
SPoA (max = 48)	31.49 (5.46) 65.60%	32.04 (5.47) 66.75%	30.09 (5.26) 62.69%	A more positive attitude
SSSP (max = 28)	17.32 (3.96) 61.86%	17.52 (4.09) 62.57%	16.81 (3.61) 60.04%	Not too bad
Overall mean score (max =200)	134.06 (23.67)	136.14 (24.60)	128.74 (20.25)	More positive than negative

The highest percentage scores were observed in the SPoL subscale (71.89% and 68.56% for UKM and UKM-UNPAD, respectively). The lowest percentage score was observed among students in both programmes in the SSSP subscale (62.57% for UKM and 60.04% for UKM-UNPAD). Of the 50 items in the DREEM inventory (Table 4), UKM had six items with scores of less than 2.00, which indicated problematic areas, 27 items had scores between 2.00 and 3.00, which indicate areas that can be improved. Seventeen items had scores of more than 3.00 with only one item from it had a score of 3.72, which indicates a truly positive aspect of the educational environment.

On the UKM-UNPAD twinning students, five items had scores of less than 2.00, indicating problematic areas, 37 items had scores between 2.00 to 3.00, showing areas that can be improved. Eight items had scores of more than 3.00 with only one item from it had a score of 3.56, which indicated a truly positive aspect of the educational environment (Table 4).

Table 4: Mean and standard deviation (SD) of each 50 items in DREEM

Question number and item	Overall Mean (SD)	UKM Mean (SD)	UKM-UNPAD Mean (SD)
SPoL			
Q1. I am encouraged to participate in class	3.07 (0.71)	3.16 (0.66)	2.84 (0.81)
Q7. The teaching is often stimulating	2.99 (0.67)	3.01 (0.71)	2.94 (0.56)
Q13. The teaching is student-centred	2.43 (0.87)	2.43 (0.93)	2.44 (0.72)
Q16. The teaching is sufficiently concerned to develop my competence	3.25 (0.65)	3.34 (0.63)	3.03 (0.65)
Q20. The teaching is well-focused	2.97 (0.67)	3.02 (0.68)	2.84 (0.63)
Q22. The teaching is sufficiently concerned to develop my confidence	2.89 (0.81)	3.00 (0.72)	2.59 (0.95)
Q24. The teaching time is put to good use	3.00 (0.61)	3.04 (0.62)	2.91 (0.59)
Q25. The teaching over-emphasises factual learning	1.88 (0.87)	1.80 (0.85)	2.06 (0.91)

(*continued on next page*)

Table 4: (*continued*)

Question number and item	Overall Mean (SD)	UKM Mean (SD)	UKM-UNPAD Mean (SD)
Q38. I am clear about the learning objectives of the course	2.87 (0.69)	2.91 (0.69)	2.75 (0.72)
Q44. The teaching encourages me to be an active learner	3.10 (0.69)	3.13 (0.72)	3.00 (0.62)
Q47. Long-term learning is emphasised over short-term	3.10 (0.69)	3.17 (0.68)	2.91 (0.69)
Q48. The teaching is too teacher-centred	2.52 (0.77)	2.49 (0.85)	2.59 (0.49)
Total mean score (maximum = 48)	34.06 (5.32)	34.51 (5.78)	32.91 (3.75)
SPoT			
Q2. The teachers are knowledgeable	3.68 (0.54)	3.72 (0.55)	3.56 (0.50)
Q6. The teachers are patient with patients	3.21 (0.73)	3.26 (0.79)	3.09 (0.53)
Q8. The teachers ridicule the students	2.13 (0.97)	2.17 (0.98)	2.03 (0.97)
Q9. The teachers are authoritarian	1.95 (0.88)	1.91 (0.88)	2.03 (0.89)
Q18. The teachers have good communication skills with patients	3.38 (0.63)	3.48 (0.57)	3.12 (0.71)
Q29. The teachers are good at providing feedback to students	2.78 (0.78)	2.89 (0.80)	2.50 (0.67)
Q32. The teachers provide constructive criticism here	2.83 (0.76)	2.89 (0.74)	2.69 (0.82)
Q37. The teachers give clear examples	3.03 (0.60)	3.04 (0.55)	3.00 (0.72)
Q39. The teachers get angry in class	1.80 (0.95)	1.84 (0.98)	1.69 (0.89)
Q40. The teachers are well-prepared for their classes	3.25 (0.69)	3.24 (0.73)	3.28 (0.58)
Q50. The students irritate the teachers	1.96 (0.87)	1.91 (0.88)	2.09 (0.86)
Total mean score (maximum = 44)	30.00 (5.09)	30.35 (5.27)	29.09 (4.55)
SASP			
Q5. Learning strategies which worked for me before continue to work for me now	2.16 (1.02)	2.22 (1.03)	2.00 (0.98)
Q10. I am confident about passing this year	2.54 (0.74)	2.62 (0.76)	2.31 (0.64)
Q21. I fell I am being well prepared for my profession	2.48 (0.85)	2.54 (0.91)	2.34 (0.70)
Q26. Last year's work has been a good preparation for this year's work	2.79 (0.78)	2.85 (0.80)	2.63 (0.71)
Q27. I am able to memorise all I need	1.67 (0.86)	1.73 (0.90)	1.50 (0.72)
Q31. I have learned a lot about empathy in my profession	3.29 (0.63)	3.30 (0.64)	3.25 (0.62)
Q41. My problem-solving skills are being well developed here	2.94 (0.67)	3.09 (0.61)	2.56 (0.67)

(*continued on next page*)

Table 4: (*continued*)

Question number and item	Overall Mean (SD)	UKM Mean (SD)	UKM-UNPAD Mean (SD)
Q45. Much of what I have to learn seems relevant to a career in medicine	3.33 (0.59)	3.37 (0.62)	3.25 (0.51)
Total mean score (maximum = 32)	21.19 (3.84)	21.72 (3.98)	19.84 (3.08)
SPoA			
Q11. The atmosphere is relaxed during ward teaching	1.90 (0.96)	1.99 (0.98)	1.69 (0.896)
Q12. This school is well time-tabled	2.27 (0.91)	2.28 (0.89)	2.25 (0.95)
Q17. Cheating is a problem in this school	2.53 (0.99)	2.51 (1.07)	2.56 (0.80)
Q23. The atmosphere is relaxed during lectures	2.87 (0.69)	2.88 (0.73)	2.84 (0.57)
Q30. There are opportunities for me to develop my interpersonal skills	3.10 (0.67)	3.21 (0.60)	2.81 (0.74)
Q33. I feel comfortable in class socially	2.81 (0.69)	2.82 (0.71)	2.78 (0.66)
Q34. The atmosphere is relaxed during seminars/tutorials	2.75 (0.81)	2.76 (0.83)	2.72 (0.77)
Q35. I find the experience disappointing	2.79 (0.81)	2.85 (0.86)	2.63 (0.66)
Q36. I am able to concentrate well	2.63 (0.72)	2.68 (0.70)	2.50 (0.76)
Q42. The enjoyment outweighs the stress of studying medicine	2.25 (0.92)	2.32 (0.92)	2.06 (0.91)
Q43. The atmosphere motivates me as a learner	2.84 (0.78)	2.90 (0.76)	2.69 (0.82)
Q49. I feel able to ask the questions I want	2.76 (0.88)	2.84 (0.88)	2.56 (0.84)
Total mean score (maximum = 48)	31.49 (5.46)	32.04 (5.47)	30.09 (5.26)
SSSP			
Q3. There is a good support system for students who get stressed	2.08 (0.85)	2.12 (0.87)	1.97 (0.82)
Q4. I am too tired to enjoy this course	2.33 (0.98)	2.43 (1.02)	2.09 (0.86)
Q14. I am rarely bored in this course	2.39 (0.97)	2.46 (1.01)	2.22 (0.87)
Q15. I have good friends in this school	3.23 (0.74)	3.26 (0.79)	3.16 (0.57)
Q19. My social life is good	2.79 (0.87)	2.84 (0.87)	2.66 (0.87)
Q28. I seldom feel lonely	2.14 (1.05)	2.10 (1.07)	2.25 (0.98)
Q46. My accommodation is pleasant	2.36 (1.04)	2.32 (1.05)	2.47 (1.02)
Total mean score (maximum = 28)	17.32 (3.96)	17.52 (4.09)	16.81 (3.61)
Overall mean score (maximum = 200)	134.06 (23.67)	136.14 (24.60)	128.74 (20.25)

DISCUSSION

Based on the results analysed above, the overall mean score and the total mean score for each subscale of the mainstream UKM students were slightly higher than those of the UKM-UNPAD twinning students. The possible reason is that the mainstream students had the benefit of being in the same place since their first year of study. This situation has enabled the students to be familiar and adaptable to the environment in UKM. However, the result of overall mean score and all the subscale scores of UKM and UKM-UNPAD were within the same description for interpretation of DREEM scores. One of the reasons is the similarity between UNPAD and UKM in terms of curriculum. Both offer integrated, student-centred, system-based and problem-based learning curricula in their pre-clinical programmes. These curricula prepare students for their clinical years in UKM.

SPoL

Overall, the medical students from both groups had positive perceptions of their learning (total mean scores of 34.51 and 32.91). They viewed that the lecturers had encouraged them to participate in class, sufficiently concerned to develop their competency levels and encouraged them to be active learners. They added that life-long learning is emphasised over short term. However, some students, especially those from the mainstream UKM programme, thought that factual learning is over emphasised (mean score of 1.80). This finding was consistent with the findings of Salam et al. (25) and Yusoff et al. (26), who conducted a study enrolling final-year medical students in the Universiti Sains Malaysia in Kelantan, and those of Amaranathan et al. (27) and Bavdekar (28). However, this study's findings showed some contradictions with the teaching and learning methods practised during the third year of clinical posting in UKM. In the clinical years, the application of theories and clinical components is prioritised. Students experience practical and hands-on approaches that require bedside teaching, workshops, ward rounds, student-led seminar and clinical ward work.

However, this issue can be one of the common problems in clinical years, when teachers are focused on factual recall rather than on problem-solving during clinical teachings (3). Teachers should emphasise approaches for probing medical students' understanding by asking "why" and "how" questions and facilitate the acquisition and retention of knowledge. According to Kaufman and Mann (29), when learning is relevant to problem-solving, it becomes effective and motivates adult learners. Furthermore, generally, specialists who just graduated from a postgraduate training programme are simply presumed to be able to teach medical students. They must acquire specialised knowledge and skills in teaching and learning. Several models of teaching in the clinical setting can be used as guides, including the Stanford Faculty Development model for clinical teaching (30), micro-skills of teaching model (one-minute preceptor) (31) and Dundee 3-circle outcomes model by Harden et al. (32). These models might help teachers determine their clinical teaching objectives and match these objectives to individual learners (3). The Department of Medical Education, UKM provides continuous training and conducts workshops for teaching and learning, assessment or other aspects. Further studies are needed to identify the clinical teaching area perceived by medical students as overly focused on facts.

SPoT

The medical students from both groups viewed that their teachers in UKM are moving towards the right direction (total mean scores of 30.35 and 29.09). They perceived that the teachers are knowledgeable, have good communication skills with patients and are prepared for classes. However, most of the students

agreed that teachers get angry in class (mean scores of 1.84 and 1.69). The medical students from the UKM group perceived that teachers are authoritarian (mean score of 1.91) and students irritate teachers (mean score of 1.91). These findings were similar to the studies of Yusoff et al. (26) and Salam et al. (25).

Su and Wood (33) showed that students perceive good teachers as being knowledgeable, accommodating, equipped with inspirational teaching methods, humorous and capable of providing immediate feedback to students. These characteristics may help create inspiration, excitement and enthusiasm in students during teaching and learning. Teachers' role modelling is one of the factors supporting the development of professional behaviour, characters and careers of medical students (34). Unfortunately, some teachers enforce learning through harsh and hard ways. Unfortunately, some teachers were thought to be harsh in their approach towards student learning. This could be happened because the teachers believed that totalitarian and authoritarian approaches are still the best approaches to enforce learning in medical and other courses (35). This is a worrying trend as students could imitate these behaviours later in their life when they work as doctors or teachers. An example of such behaviour is showing disrespect towards colleagues and teachers.

Yilmaz et al. (36) stated that the most important factor for building a positive learning environment is the interaction between students and teachers. This interaction involves being respectful and creating a safe environment in the school. The effects of disrespectful behaviour towards medical students include long-term stress (37), burnout (38), depression and loss of self-esteem and confidence, and can even make some students to quit the medical course (39).

One of the suggestions to improve the relationship between students and teachers is the development of a module or programme designed to train teachers about humanity and professionalism. The personal and professional development module needs to be enhanced with the aim of increasing the teacher's level of professionalism and encouraging supportive learning environments. Moreover, the faculty must increase its focus on everyone's welfare, including that of teachers, students and staff, and on their physical and psychological safety. A supportive environment may influence and motivate teachers and medical students to become good doctors with respectful behaviours.

SASP

Overall, the medical students from both groups felt more on the positive side of their academic self-perceptions (total mean scores of 21.72 and 19.84). Much of what they have learned in medical school seems relevant to their future profession, and they learned about empathy in the doctor's profession. However, many students noted to have problems in memorisation (mean 1.73 and 1.50). UKM-UNPAD students perceived that learning strategies which worked for them before have become ineffective (mean score of 2.00).

Healthcare professional programmes, especially medicine, have loads of information and skills to be mastered during undergraduate studies. These programmes not only require remembering facts or surface approach to learning but also require the use of deep approaches for learning. This finding was in line with that of Bliuc et al. (40), who showed an association between students' deep approaches to learning and improved academic performance.

A medical student undergoes a transition from a pre-clinical classroom environment to a clinical-experiential and patient-focused environment (41–42). Students should use their clinical years to practice and apply their knowledge that they have acquired in their pre-clinical years. Given that the third year of study is considered the first year of

clinical practice, students experience some challenges and difficulties in learning and practice.

Learning strategies vary between pre-clinical and clinical setting. However, according to Kaufman and Mann (29), students' past experiences and knowledge play essential roles in obtaining new knowledge. Medical students must gain strong basic medical science knowledge during pre-clinical studies for them to be able to perceive the connection during learning in a clinical setting. Yusoff et al. (26) also showed that third-year medical students have a lower score than the first- and final-year medical students in Q5 (Learning strategies which worked for me before continue to work for me now).

Atherley et al. (41) summarised that transition from the pre-clinical setting to the clinical setting comprises three conceptual perspectives, namely, educational, social and developmental perspective. From an educational perspective, many researchers have observed that limitations on knowledge and skills among students have caused challenges during transition (41, 43). Moreover, the challenges may be attributed to the feeling of burden because of demands and unpreparedness (44), and different expectations (45) during teaching, learning and assessment. Some of the suggested strategies for meeting these challenges include evaluating the impact of pre-clinical curriculum evaluation during students' transition through problem-based learning, ensuring early patient contact and developing specific transition to clerkship orientation (46–47). Although these strategies improve students' confidence, anxiety and motivation, some students still have problems with socialisation (48).

From the social perspective, among the struggles of medical students during the transition such as trying to be socially compatible with people in the environment (49), feeling frightened and uncertain of their roles (45) and unfamiliarity with many new things. This perspective was especially relevant to the twinning UKM-UNPAD students as they move to a totally new environment and meet new people. It can cause students to focus more on fitting themselves in the environment than on learning. This situation is one of the factors leading to poor academic performance (50). Few strategies to overcome this situation were to familiarise new students with other faculty members during orientation and social support (49). Students effective learn when they collaborate with others, share experiences, knowledge and perspectives (29).

SPoA

Medical students from both groups perceived a positive attitude towards the atmosphere (total mean scores of 32.04 and 30.09). However, they viewed that the atmosphere is not so relaxed during ward teaching (mean 1.99 and 1.69).

Ward or bedside teaching is one of the important teaching and learning methods that require the presence of patients, students and teachers. It is an effective method because it uses real patients and problems to facilitate learning. It can enhance medical students' clinical and communication skills, as well as the humanistic and professional aspects of medicine, thereby providing effective medical training (51–53). Students can receive feedback, which can reinforce good performance and improve poor performance, and teachers can link discussions with cases, patients, basic sciences and theories.

The atmosphere of bedside teaching must be comfortable to patients, students and teachers for an effective educational process. Some students would experience fear and anxiety during ward teaching, especially when consultants are present. Gray et al. (54) found that medical students perceive that junior doctors are more in touch with curricula and assessments, and more approachable and understanding. Compared to senior consultants, they are perceived

as more knowledgeable, stricter and have higher expectations. However, the presence of consultants or senior clinicians has been found to be beneficial because they are more experienced and knowledgeable (55).

To create a good environment for bedside teaching, Abdool and Bradley (56) proposed some methods for improving bedside teaching atmosphere, including the introduction of team members to patients and vice versa, allowing interruptions among participants, encouraging patients' contributions, asking students with open-ended questions and preventing barriers between students with good and unsatisfactory performance.

SSSP

The medical students from both groups were not too bad socially (total mean scores of 17.52 and 16.81). They are not extremely tired to enjoy the course, have good friends in school and a good social life. However, some of the students, especially those from the UKM-UNPAD programme, felt that the support systems for students who are under stress need to be improved (mean score of 1.97).

UKM-UNPAD medical students, who just joined into the UKM for a year may need a longer time to adapt to the programme. Thus, the faculty can create a structured orientation programme focusing on UKM-UNPAD students who finished their studies in UNPAD before entering the third-year clinical posting in UKM. The programmes' activities may include an introduction to UKM, teaching and learning system in clinical posting, mentor-mentee programme and buddy system.

CONCLUSION

There are some limitations of this study such as the differences between UKM and UKM-UNPAD respondents in terms of the number of students, the ratio of gender and race, and entry requirements for the programme. These limitations restricted the conducted of inferential statistics and comparison of the results from both programmes. The differences and co-founding factors need to be eliminated before statistical analysis.

Moreover, some terms in the DREEM inventory are not justified and clarified, such as "teacher-centred", "student-centred", "atmosphere is relaxed" and "teachers are authoritarian". Although no queries or questions regarding the DREEM inventory were reported during this study, the standardisation of respondents' understanding of the questionnaire should be considered.

Further studies should include correlation of the perceptions of students towards the educational environment with students' academic performance or other outcome variables. Qualitative studies are needed to scrutinise medical students' insights and deeply explore reasons and perception towards the educational environment. Finally, future studies on the educational environment's perception should consider the 21st-century teaching and learning methods.

ACKNOWLEDGEMENTS

We would like to thank UKM for funding this study via fundamental research grant FF2020178. We also would like to thank Mr. Boekhtiar Borhanuddin for providing statistical opinion and Dr. Chin Kok Yong for helping in final manuscript editing. The authors are grateful to all medical students who participated in this study.

REFERENCES

1. Alfaris EA, Naeem N, Irfan F, Qureshi R, Van Der Vleuten C. Student centered curricular elements are associated with a healthier educational environment and lower depressive symptoms in medical students. BMC Med Educ. 2014;14(1):192. https://doi.org/10.1186/1472-6920-14-192

2. 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):337–44. https://doi.org/10.1080/01421590120063330

3. Ramani S, Leinster S. AMEE guide no. 34: teaching in the clinical environment. Med Teach. 2008;30(4):347–64. https://doi.org/10.1080/01421590802061613

4. Lorenzo AR, Lorenzo BU. Learning styles of teacher education students: basis in improving the teaching – learning process. Procedia – Soc Behav Sci. 2013;103:595–605. https://doi.org/10.1016/j.sbspro.2013.10.377

5. Al-Naggar RA, Abdulghani M, Osman MT, Al-Kubaisy W, Daher AM, Nor Aripin KN, et al. The Malaysia DREEM: perceptions of medical students about the learning environment in a medical school in Malaysia. Adv Med Educ Pract. 2014;5:177–84. https://doi.org/10.2147/AMEP.S61805

6. Dent J, Harden R, editors. A practical guide for medical teachers. London: Elsevier; 2013. p. 69–74.

7. Enns SC, Perotta B, Paro HB, Gannam S, Peleias M, Mayer FB, et al. Medical students' perception of their educational environment and quality of life: is there a positive association? Acad Med. 2016;91(3):409–17. https://doi.org/10.1097/ACM.0000000000000952

8. Tempski P, Santos IS, Mayer FB, Enns SC, Perotta B, Paro HBMS, et al. Relationship among medical student resilience, educational environment and quality of life. PLoS One. 2015;10(6):e0131535. https://doi.org/10.1371/journal.pone.0131535

9. Arzuman H, Yusoff MSB, Som PC. 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):40–7.

10. Goh PS-C. Teaching practices that hinder the deep approaches to learning of twinning programme students in Malaysia: a qualitative perspective. Asia-Pacific Educ Res. 2008;17(1):63–73. https://doi.org/10.3860/taper.v17i1.350

11. Wayne SJ, Fortner SA, Kitzes JA, 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):376–80. https://doi.org/10.3109/0142159X.2013.769678

12. Dyrbye L, Shanafelt T. A narrative review on burnout experienced by medical students and residents. Med Educ. 2016;50(1):132–49. https://doi.org/10.1111/medu.12927

13. Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, et al. The devil is in the third year : a longitudinal. 2009;84(9):1182–91. https://doi.org/10.1097/ACM.0b013e3181b17e55

14. Brazeau CMLR, Schroeder R, Rovi S, Boyd L. Relationships between medical student burnout, empathy and professionalism climate. Acad Med. 2010;85(10):33–6. https://doi.org/10.1097/ACM.0b013e3181ed4c47

15. Rusticus S, Worthington A, Wilson D, Joughin K. The medical school learning environment survey: an examination of its factor structure and relationship to student performance and satisfaction. Learn Environ Res. 2014;17(3):423–35. https://doi.org/10.1007/s10984-014-9167-9

16. Soemantri D, Herrera C, Riquelme A. Measuring the educational environment in health professions studies: a systematic review. Med Teach. 2010;32(12):947–52. https://doi.org/10.3109/01421591003686229

17. Pusat Perubatan Universiti Kebangsaan Malaysia [Internet]. Selangor: Universiti Kebangsaan Malaysia. Doctor of medicine. 2019 [cited 2019 Jan 1]. Available from: https://www.ukm.my/sppfper/international-students-doctor-of-medicine/

18. Salam A, Akram A, Bujang SM, Yaman MN, Kamarudin MA, Siraj HH, et al. Educational environment in a multicultural society to meet the challenges of diversity. J Appl Pharm Sci. 2014;4(9):110–3.

19. Roff S, McAleer S, Harden RM, Al-Qahtani M, Ahmed AU, Deza H, et al. Development and validation of the Dundee Ready Education Environment Measurement (DREEM). Med Teach. 1997;19(4):295–9. https://doi.org/10.3109/01421599709034208

20. Chan CYW, Sum MY, Tan GMY, Tor PC, 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):1240–47. https://doi.org/10.1080/0142159X.2018.1426842

21. Stormon N, Ford PJ, Eley DS. DREEM-ing of dentistry: students' perception of the academic learning environment in Australia. Eur J Dent Educ. 2018;(June):1–7. https://doi.org/10.1111/eje.12384

22. Willis BW, Prost EL, Sayers SP. Assessing the educational environment of a flipped physical therapy course: utilisation of the Dundee Ready Education Environment Measure (DREEM). 2018;16(4):article 3.

23. Mc Aleer S, Roff S. A practical guide to using the Dundee Ready Education Environment Measure (DREEM). AMEE Education Guide. 23:29–33.

24. Dunne F, McAleer S, Roff S. Assessment of the undergraduate medical education environment in a large UK medical school. Health Educ J. 2006;65(2):149–58. https://doi.org/10.1177/0017869060650020 5

25. Salam A, Akram A, Mohamad N, Siraj HH. Measures of educational environment in a higher educational institution using Dundee ready educational environment measure – DREEM. Int Med J. 2015;22(2):98–102.

26. Yusoff MSB, Jaa'far R, Arzuman H, Arifin WN, Mat Pa MN. 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):30–41. https://doi.org/10.5959/eimj.v5i3.146

27. Amaranathan A, Dharanipragada K, Lakshminarayanan S. Medical students' perception of the educational environment in a tertiary care teaching hospital in India. Natl Med J India. 2018;31:231–6. https://doi.org/10.4103/0970-258X.258226

28. Bavdekar S. Dreem study: students' perceptions of learning environment in a medical college in Mumbai, India. J Assoc Physicians India. 2019;67(April):50–4.

29. Kaufman DM, Mann KV. Teaching and learning in medical education: how theory can inform practice. Underst Med Educ. 2014;16–36. https://doi.org/10.1002/9781444320282.ch2

30. Skeff KM. Enhancing teaching effectiveness and vitality in the ambulatory setting. J Gen Intern Med. 1988;3(Suppl 2):S26-33. https://doi.org/10.1007/BF02600249

31. Neher JO, Gordon KC, Meyer B, Stevens N. A five-step "microskills" model of clinical teaching. J Am Board Fam Pract. 1992;5(4):419–24.

32. Harden RM, Crosby JR, Davis MH, Friedman M. AMEE guide no. 14: outcome-based education: part 5–from competency to meta-competency: a model for the specification of learning outcomes. Med Teach. 1999;21(6):546–52. https://doi.org/10.1080/01421599978951

33. Su F, Wood M. What makes a good university lecturer? Students' perceptions of teaching excellence. J Appl Res High Educ. 2012;4(2):142–55. https://doi.org/10.1108/17581181211273110

34. Passi V, Johnson N. The impact of positive doctor role modeling. Med Teach. 2016;38(11):1139–45. https://doi.org/10.3109/0142159X.2016.1170780

35. Esmail Sabra H, Mohammed Hassan A, Mostafa Mohammed H. Relation between students' perception of teaching styles and students' academic engagement in South Valley and Assiut Universities. Egypt J Heal Care. 2018;9(1):187–204. https://doi.org/10.21608/ejhc.2018.13953

36. Yilmaz ND, Velipasaoglu S, Ozan S, Basusta BU, Midik O, Mamakli S, et al. A multicenter study: how do medical students perceive clinical learning climate? Med Educ Online. 2016;21. https://doi.org/10.3402/meo.v21.30846

37. Haviland MG, Yamagata H, Werner LS, Zhang K, Dial TH, Sonne JL. Student mistreatment in medical school and planning a career in academic medicine. Teach Learn Med. 2011;23(3):231–7. https://doi.org/10.1080/10401334.2011.586914. Erratum in: Teach Learn Med. 2012;24(1):100.

38. Cook AF, Arora VM, Rasinski KA, Curlin FA, Yoon JD. The prevalence of medical student mistreatment and its association with burnout. Acad Med. 2014;89(5):749–54. https://doi.org/10.1097/ACM.0000000000000204

39. Oser TK, Haidet P, Lewis PR, Mauger DT, Gingrich DL, Leong SL. Frequency and negative impact of medical student mistreatment based on specialty choice: a longitudinal study. Acad Med. 2014;89(5):755–61. https://doi.org/10.1097/ACM.0000000000000207

40. Bliuc A-M, Ellis RA, Goodyear P, Hendres DM. Understanding student learning in context: relationships between university students' social identity, approaches to learning, and academic performance. Eur J Psychol Educ. 2011;26(3):417–33. https://doi.org/10.1007/s10212-011-0065-6

41. Atherley A, Dolmans D, Hu W, Hegazi I, Alexander S, Teunissen PW. Beyond the struggles: a scoping review on the transition to undergraduate clinical training. Med Educ. 2019;53(6):559–70. https://doi.org/10.1111/medu.13883

42. Dube T V, Schinke RJ, Strasser R, Couper I, Lightfoot NE. Transition processes through a longitudinal integrated clerkship: a qualitative study of medical students' experiences. Med Educ. 2015;49(10):1028–37. https://doi.org/10.1111/medu.12797

43. Hell VE, Kuks JBM, Schönrock-Adema J, van Lohuizen M, Cohen-Schotanus J. Transition to clinical training: influence of pre-clinical knowledge and skills, and consequences for clinical performance. Med Educ. 2008;42:830–7. https://doi.org/10.1111/j.1365-2923.2008.03106.x

44. Bosch J, Maaz A, Hitzblech T, Holzhausen Y, Peters H. Medical students' preparedness for professional activities in early clerkships. BMC Med Educ. 2017;17:140. https://doi.org/10.1186/s12909-017-0971-7

45. Surmon L, Bialocerkowski A, Hu W. Perceptions of preparedness for the first medical clerkship: a systematic review and synthesis. BMC Med Educ [Internet]. 2016;16(1):1–11. Available from: http://dx.doi.org/10.1186/s12909-016-0615-3

46. Konkin DJ, Suddards C. Students' experiences of role, relationships and learning in two clerkship models. Med Educ. 2017;51(5):490–7. https://doi.org/10.1111/medu.13268

47. Balmer DF, Richards BF, Varpio L. How students experience and navigate transitions in undergraduate medical education: an application of Bourdieu's theoretical model. Adv Heal Sci Educ. 2015;20(4):1073–85. https://doi.org/10.1007/s10459-015-9588-y

48. Yardley S, Brosnan C, Richardson J. The consequences of authentic early experience for medical students: creation of mētis. Med Educ. 2013;47(1):109–19. https://doi.org/10.1111/j.1365-2923.2012.04287.x

49. Knobloch AC, Ledford CJW, Wilkes S, Saperstein AK. The impact of near-peer teaching on medical students' transition to clerkships. Fam Med. 2018;50(1):58–62. https://doi.org/10.22454/FamMed.2018.745428

50. Kumar M, Sharma S, Gupta S, Vaish S, Misra R. Effect of stress on academic performance in medical students – a cross sectional study. Indian J Physiol Pharmacol. 2014;58(1):81–6.

51. Stone RT, Tollefson T, Epstein R, Jozefowicz RF, Mink JW. Education research: positive effect of scheduled faculty modeling on clerkship student bedside skills exposure and learning. Neurology. 2017;88(24):e236–9. https://doi.org/10.1212/WNL.0000000000004031

52. Lockyer JM, Hodgson CS, Lee T, Faremo S, Fisher B, Dafoe W, et al. Clinical teaching as part of continuing professional development: does teaching enhance clinical performance? Med Teach. 2016;38(8):815–22. https://doi.org/10.3109/0142159X.2015.1112895

53. Sultan AS. Bedside teaching: an indispensible tool for enhancing the clinical skills of undergraduate medical students. J Pak Med Assoc. 2019;69(2):235–40.

54. Gray D, Cozar O, Lefroy J. Medical students' perceptions of bedside teaching. Clin Teach. 2017;14(3):205–10. https://doi.org/10.1111/tct.12532

55. Cassidy-Smith TN, Hope Kilgannon J, Nyce AL, Chansky ME, Baumann BM. Impact of a teaching attending physician on medical student, resident, and faculty perceptions and satisfaction. Can J Emerg Med. 2011;13(4):259–66. https://doi.org/10.2310/8000.2011.110289

56. Abdool MA, Bradley D. Twelve tips to improve medical teaching rounds. Med Teach. 2013;35(11):895–9. https://doi.org/10.3109/0142159X.2013.826788