

ANALYSIS AND RESULTS: CONFIRMATORY FACTOR ANALYSIS THE MALAY VERSION OF DREEM INVENTORY WITH MEDICAL STUDENTS OF UNISZA, KUALA TERENGGANU, MALAYSIA

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ABSTRACT

Objectives: The DREEM inventory has been universally established as a generic instrument to assess health-related educational programs. There were some apprehensions regarding the psychometric properties of the DREEM raised in last few years. This study evaluated first ever the psychometric properties of the Bahasa Melayu version of the DREEM in a sample of Malaysian medical students.

Methods: A cross-sectional study was carried and universal sampling method was applied. Researchers selected 1-5th-year medical students of Universiti Sultan Zainal Abidin, Malaysia, as study subjects. Researchers collected data through a guided self-administered questionnaire during a face-to-face session.

Results: Confirmatory factor analysis (CFA) showed that the one factor model of DREEM-M (Model A), consisting 50 items were not fit, indicating it was a multidimensional instrument. On further CFA, it appeared that the proposed five-factor structure was not fit (Model B) as all the goodness-of-fit indices did not signify a model fit.

Conclusions: The study findings revealed that the DREEM inventory 50-item inventory failed to achieve a model fit, but it demonstrated a high of internal consistency. The proposed 19-item DREEM-M revealed good model fit.

Keywords: Confirmatory factor analysis, Malay version of DREEM, Malaysia.

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INTRODUCTION

The World Federation for Medical Education emphasized the teaching-learning environment as one of the principal objectives for the assessment of medical education programs, in 1998 [1]. It is widely established among medical educators and teachers that the effects of the educational environment, both academic and clinical, are important elements of medical students' attitudes, knowledge, skills, progression, and behaviors [2-5]. Dr. Sue Roff, a faculty member of the Centre for Medical Education of University of Dundee, Scotland, UK, was the principal scientist of a team and who developed the 50-item DREEM instrument utilizing a "Delphi panel of nearly 100 health professions educators from around the world and validation by over 1000 students in countries as diverse as Scotland, Argentina, Bangladesh and Ethiopia to measure and "diagnose" undergraduate educational climates in the health professions [6]." The DREEM is a 50-item inventory measure of students' perceptions of their learning environment resulting in scores on five scales. These are labeled, the perception of learning, the perception of course organizers, academic self-perception, the perception of atmosphere (SPoA), and social self-perception [6]. Medical educators and researchers of different parts of the world have tried to quantify the medical education environment and the most extensively utilizing the DREEM inventory [6,7-15]. Thereafter, the DREEM inventory has demonstrated itself globally valuable in a diverse health-care setting such as medical, dental, nursing, and chiropractic the teaching-learning environments [16-20]. The far majority these studies revealed that "variety of descriptive statistics for the scale items, subscales, and the total DREEM score; internal consistency (Cronbach's

alpha); and correlational statistics, investigating relationships between the DREEM total and subscale scores with characteristics such as age, gender, and program year level" [21].

Structural equation modeling (SEM) is statistical procedures that one can use to decrease "the number of observed variables into a smaller number of latent variables by examining the covariation among the observed variables" [22]. SEM includes two components, i.e., confirmatory factor analysis (CFA) and structural model [23]. CFA is a confirmatory procedure—it is theory focused. Therefore, the preparation of the analysis is driven by the theoretical associations among the observed and unobserved variables. The researcher planned to measure a hypothesized model a population covariance matrix that is compared with the observed covariance matrix -CFA is conducted. Precisely, when any research intended to reduce the difference between the estimated and observed matrices [22]. Thereafter, CFA depicts the pattern of observed variables for those latent constructs hypothesized model [23]. CFA plays the role of validating and finding the reliability of any measurement in most social science studies [24]. Afterward, several study inventories have been CFA to measure the validity and reliability [25-30].

The Faculty of Medicine, UniSZA, is scheduled to conduct a major revision in the next few years of the undergraduate medical curriculum [31,32]. The Ministry of Higher Education of the Government of Malaysia to approved the University's medical program in Kuala Terengganu, Terengganu, Malaysia. The first group of 30 MBBS students, admitted in 2009, graduated in August 2014. Malaysian medical education is

usually of a 5-year program and 2-year housemanship in hospitals owned by the Ministry of Health, Government of Malaysia [14,33-35].

This study aimed to evaluate the psychometric properties of Malay translated DREEM (DREEM-M) in a sample of Malaysian medical students. This study was designed to answer four questions: (i) Is DREEM-M a valid tool to measure the educational climate in a sample of Malaysia medical students? (ii) Is DREEM-M a reliable tool to measure the educational climate in a sample of Malaysia medical students? (iii) What is the best fit model of DREEM-M to measure the educational climate in the studied population? (iv) Does the internal consistency of DREEM-M vary across years of study? The authors hypothesized DREEM-M would demonstrate a high level of internal consistency; however, its construct validity will differ from the original construct proposed by the DREEM developers.

METHODS

A cross-sectional study was carried, and universal sampling method was applied. Based on the best practice of sample size calculation for a validation study, 5-10 samples per item were considered adequate to obtain a significant result [36], therefore a minimum number of study subject was 250. Researchers selected 1-5th-year medical students in a public medical school (UniSZA) as study subjects. All medical students of UniSZA from 1-5th year of the MBBS program of session 2015-2016 were the target population. The total number of medical students at UniSZA was 300 (60×5=300). The universal sampling technique was used as the total sample size was small and obtains a significant result [36]. A pilot study was conducted among 10 undergraduate medical students (2×5=10, 2 students from each year) for Malay version of DREEM inventory and it was found that the survey instructions and items were easily comprehensible and suitable for the study. The students who participated in the pilot study were excluded from the final study. Researchers collected data through a guided self-administered questionnaire during a face-to-face session. This study obtained ethical approval from UniSZA Research Ethics Committee, recorded as Memo Number UniSZA. C/1/UHREC/628-1 (44), Dated: 3 November 2015. Informed consent was obtained from the respondents before the questionnaire administration. Completion of DREEM-M was voluntary, and participants were informed that not returning it would not affect their progress in the medical study. DREEM-M was immediately returned after completion. Data were analyzed by Statistical Package for the Social Sciences version 22 (SPSS 22) and Analysis of Moment Structure software version 22 (AMOS 22).

The DREEM inventory was developed as a tool to measure educational climate at educational institutions [6,37] and was claimed as a "cultural-free" instrument [38]. There are 50 items measuring five aspects of the educational environment based on students' perception, which include students' perception of learning (SPoL), students' perception of teaching (SPoT), students' academic self-perception (SASP), students' perception of atmosphere (SPoA) and students' social self-perception (SSSP). Each item is rated based on five-Likert scales range between 0 and 4 (0 = strongly disagree, 1 = disagree, 2 = unsure, 3 = agree, and 4 = strongly agree). There are 9 negative items that must be scored in a reverse manner before analysis and interpretation; item 4, 8, 9, 17, 25, 35, 39, 48, and 50 [6]. It has been translated into various languages, and the reported overall Cronbach's alpha coefficient ranges from 0.89 to 0.93 [5,39-44]. The Malay translated DREEM was used in this study [45].

A descriptive analysis of the demographic data was performed by SPSS 22. CFA was performed to test measurement model of each latent construct. CFA was performed by AMOS 22. The latent constructs and the proposed model were considered fit if all the goodness-of-fit indices achieve minimal requirement (Table 1) [46]. Standardized factor loading (SFL), modification indices (MI), and standardized residual covariance's (SRC) were used as indicators for selecting items fit to be remain in the model [47]. The SFL signify contribution of items to their respective construct [47], MI suggest correlations between variables,

therefore, reduction of Chi-square values signify its contribution to the model [47], and SRC estimate a standard normal distribution if the model is correct, thus if the model is correct, most of the items should have an SRC value of less than ±2 [47,48]. Although the reduction in Chi-square values would improve model fit, following the suggestions in MI, SRC, and SFL should be based on a literature review or theoretical basis [49,50]. A correlation between constructs of <0.85 was considered as good discriminant validity thus supporting construct validity [47].

Table 1: Goodness-of-fit indices that were used to signify model fit

Name of category	Name of index	Level of acceptance
Absolute fit ¹	RMSEA	<0.08 [51]
	GFI	More than 0.9 [52]
Incremental fit ²	CFI	More than 0.9 [53]
	TLI	More than 0.9 [54]
	NFI	More than 0.9 [55]
Parsimonious fit ³	Chisq/df	<5 [56]

¹Absolute fit: Measures overall goodness-of-fit for both the structural and measurement models collectively. This type of measure does not make any comparison to a specified null model (incremental fit measure) or adjust for the number of parameters in the estimated model (parsimonious fit measure).

²Incremental fit: Measures goodness-of-fit that compares the current model to a specified "null" (independence) model to determine the degree of improvement over the null model. ³Parsimonious fit: Measures goodness-of-fit representing the degree of model fit per estimated coefficient. This measure attempts to correct for any "overfitting" of the model and evaluates the parsimony of the model compared to the goodness-of-fit. RMSEA: Root mean square of error approximation, GFI: Goodness-of-fit index, CFI: Comparative fit index, TLI: Tucker-lewis index, NFI: Normed fit index, Chisq/df: Chi-square/degree of freedom

Reliability analysis was applied to determine the internal consistency of DREEM-M inventory. Internal consistency of items was evaluated by the Cronbach's alpha, corrected item-total correlation (CITC), and Cronbach's alpha if item deleted (CAID) values. The items were considered to represent an acceptable level of internal consistency if the Cronbach's alpha value within 0.5-0.7 and a good level if the Cronbach's alpha value more than 0.7 [57,58]. An item is considered to highly contribute to the measured construct if CITC value more than 0.3 and CAID value decreased [59].

RESULTS

A total of 277 medical students completely responded to the 50 statements of DREEM-M. Demographic profiles of participants were summarized in Table 2.

CFA showed that the one factor model of DREEM-M (Model A), consisting 50 items were not fit, indicating it was a multidimensional instrument (Table 3). On further CFA, it appeared that the proposed five-factor structure was not fit (Model B) as all the goodness-of-fit indices did not signify a model fit. Item reduction was performed based on MI, SRC, and SFL values to select which DREEM-M items should remain in the model [47]. As shown in Table 3, the five-factor model of DREEM-M with 19 items (Model G) was found to be model fit as all the goodness-of-fit indices signifies model fit.

SFL for the proposed five-factor structure of the 50-item DREEM-M (Model A) ranged between 0.05 and 0.79, suggesting that certain items did not represent the construct being measured. Whereas, for the best fit model (i.e., Model G), the SFL ranged between 0.49 and 0.81 (Fig. 1), indicating that all items contributed highly to the constructs being measured. The majority of standardized correlation coefficients (r) between the five domains were more than 0.85, except the correlation between SSSP-SASP (r=0.75) and SSSP-SPoT (r=0.83) (Fig. 1), suggesting that they might be assessing similar constructs [47].

Reliability analysis shows that the overall Cronbach's alpha values for the 50 item and 19-item DREEM-M were more than 0.9, respectively

(Table 4). Both versions showed a high level of internal consistency in measuring students' perception of educational climate. The Cronbach's alpha values for the five subscales of the 50-item DREEM-M ranged between 0.78 and 0.85 while for the 19-item DREEM-M ranged between 0.69 and 0.79 (Table 4). The subscales for both versions showed acceptable to a high level of internal consistency [57,58] in measuring the five aspects of students' perception of educational climate. Reliability analysis showed that the internal consistency of DREEM-M for both versions varied across phases of study. The Cronbach's alpha values across phases of study for subscales of the 50-item DREEM-M ranged between 0.78 and 0.88 while for the 19-item DREEM ranged between 0.64 and 0.83 (Table 4). Reliability analysis shows that the original 50-items DREEM had CITC values ranged between 0.117 and 0.730. This result reflected that certain items contribute poorly to the constructs being measured as the CITC values <0.30 [59]; item 17, 25, 48, and 50 (Table 5). In contrast, the CITC values for the 19-item DREEM ranged between 0.410 and 0.723. It indicates that all the items in the

19-item DREEM highly contributed to the constructs being measured as the CITC values more than 0.3 (Table 6) [59].

DISCUSSION

The educational environment is exceedingly multifaceted and defining also a very difficult assignment. Educational environment has considered as "a set of factors that gives each situation a personality,

Table 2: Demographic profiles of participants

Variables	Frequency (%) (n=277)
Year of study	
1 st year	54 (19.5)
2 nd year	56 (20.2)
3 rd year	54 (19.5)
4 th year	53 (19.1)
5 th year	60 (21.7)
Phase of study	
Preclinical	110 (39.7)
Clinical	167 (60.3)
Sex	
Male	76 (27.4)
Female	201 (72.6)
Race	
Malay	174 (62.8)
Chinese	47 (17.0)
Indian	53 (19.1)
Other	3 (1.1)

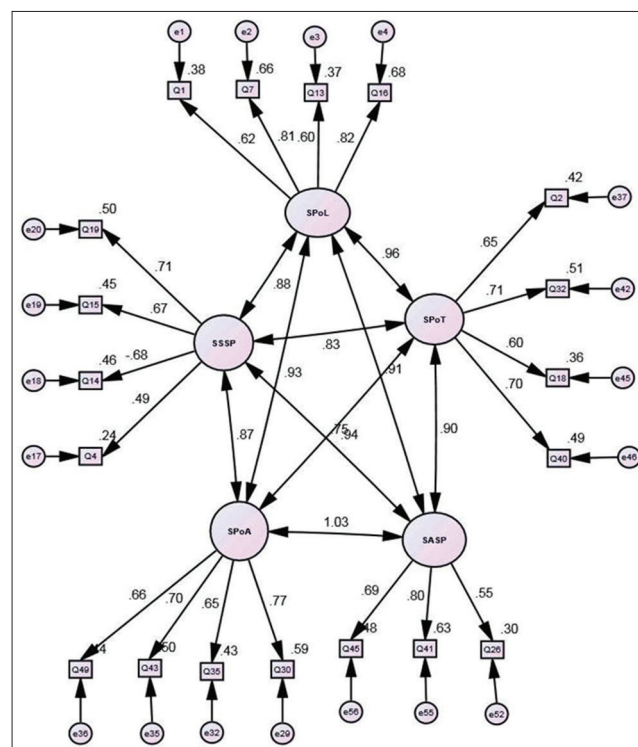


Fig. 1: Standardized factor loading for the best fit model of DREEM

Table 3: The results of CFA

DREEM model	X ² - statistic (df)	p-value	Goodness-of-fit indices					
			RMSEA	GFI	CFI	TLI	NFI	ChiSq/df
Model A: One factor model (50 items)	3140.93 (1175)	<0.001	0.078	0.644	0.736	0.725	0.638	2.673
Model B: Original five factors model (50 items)	2998.14 (1165)	<0.001	0.076	0.661	0.754	0.741	0.655	2.574
Model C: Yusoff (2012) model (17 items)	305.11 (109)	<0.001	0.081	0.882	0.914	0.893	0.874	2.799
Model D: Five factors model (40 items)	1552.17 (730)	<0.001	0.064	0.763	0.841	0.830	0.740	2.126
Model E: Five factors model (30 items)	777.43 (395)	<0.001	0.059	0.842	0.894	0.883	0.807	1.968
Model F: Five factors model (24 items)	501.95 (242)	<0.001	0.062	0.875	0.923	0.912	0.862	2.074
Model G: Five factors model (19 items)	242.76 (142)	<0.001	0.051	0.918	0.959	0.950	0.907	1.710

Best fitting model in bold. Model D (item 9, 12, 22, 23, 27, 31, 38, 39, 42, and 44 were removed from Model B); Model E (item 6, 8, 10, 11, 20, 21, 24, 28, 36, and 47 were removed from Model D); Model F (item 5, 17, 25, 46, 48, and 50 were removed from Model E); Model G (item 3, 29, 33, 34, and 37 were removed from Model F)

Table 4: Cronbach's alpha values of the 50-item and 19-item DREEM-M

Domain	Cronbach's alpha					
	The 50-item DREEM-M			The 19-item DREEM-M		
	Preclinical	Clinical	Overall	Preclinical	Clinical	Overall
DREEM-M	0.951	0.937	0.943	0.894	0.859	0.874
SPL	0.845	0.832	0.836	0.833	0.764	0.796
SPT	0.826	0.831	0.826	0.791	0.725	0.754
SASP	0.842	0.797	0.818	0.757	0.640	0.694
SPA	0.882	0.845	0.859	0.771	0.803	0.784
SSSP	0.784	0.781	0.787	0.729	0.719	0.730

Table 5: Reliability analysis of the 50 items of DREEM according to the five domains

Number and statement	CITC	CAID
SPoL		
1 I am encouraged to participate/ <i>Saya terdorong untuk mengambil bahagian</i>	0.553	0.819
7 The teaching is often stimulating/ <i>Setiap pengajaran selalu meransangkan</i>	0.730	0.805
13 The teaching is student-centered/ <i>Pengajaran menekankan pendekatan berpusat pada pelajar</i>	0.551	0.820
16 The teaching is helpful to develop my skills / <i>competency/Kaedah pengajaran membantu untuk meningkatkan kemahiran/kecekapan saya</i>	0.728	0.807
20 The teaching is well focused/ <i>Kaedah pengajaran memberikan focus yang menyeluruh</i>	0.649	0.812
22 The teaching is sufficiently to develop my confidence/ <i>Kaedah pengajaran cukup untuk meningkatkan keyakinan saya</i>	0.675	0.810
24 The teaching time is put to good use/ <i>Masa pengajaran digunakan dengan baik sekali</i>	0.682	0.810
25 The teaching over emphasizes factual learning*/ <i>Pengajaran terlalu menitikberatkan pembelajaran berasaskan fakta</i>	-0.117	0.869
38 I am clear about the learning objectives of the course/ <i>Saya jelas tentang objektif pembelajaran dalam kursus ini</i>	0.614	0.816
44 The teaching encourage me to be an active learner/ <i>Kaedah pengajaran memberikan semangat kepada saya untuk menjadi pelajar yang aktif</i>	0.639	0.812
47 Long-term learning is emphasized over short-term/ <i>Pembelajaran jangka panjang lebih ditekankan berbanding jangka pendek</i>	0.535	0.821
48 The teaching is too teacher-centered*/ <i>Kaedah pengajaran terlalu menekankan pendekatan berpusat pada pengajar</i>	-0.089	0.867
SPoT		
2 The teachers are knowledgeable/ <i>Pensyarah berpengetahuan luas</i>	0.687	0.792
6 The teachers are emphasizes on patient-centered during their interaction with patients/ <i>Pensyarah menekankan pendekatan berpusat kepada pesakit semasa berinteraksi bersama pesakit</i>	0.478	0.813
8 The teachers are ridicule the students*/ <i>Penyarah menyindir para pelajar</i>	0.563	0.805
9 The teachers are authoritarian*/ <i>Pensyarah terlalu memerintah</i>	0.674	0.795
18 The teachers have good communication skills with the patients/ <i>Pensyarah mempunyai kemahiran komunikasi yang baik dengan para pesakit</i>	0.481	0.813
29 The teachers are good at providing feedback to students/ <i>Pensyarah bagus dalam menyediakan maklum balas kepada pelajar</i>	0.675	0.794
32 The teachers provide constructive criticism here/ <i>Pensyarah memberikan kritikan yang membina di sini</i>	0.520	0.810
37 The teachers give clear examples/ <i>Pensyarah memberikan contoh-contoh yang jelas</i>	0.647	0.801
39 The teachers get angry is class*/ <i>Pensyarah adakala marah di dalam kelas</i>	0.272	0.832
40 The teachers are well prepared for their classes/ <i>Pensyarah bersedia dengan baik untuk kelas-kelas yang akan diajar</i>	0.637	0.800
50 The students irritate the teachers*/ <i>Para pelajar ada menyebabkan kemarahan kepada pensyarah</i>	0.002	0.859
SASP		
5 Learning strategies which work for me before continue to work for me now/ <i>Strategi pembelajaran yang digunapakai oleh saya sebelum ini masih berkesan untuk saya sekarang</i>	0.494	0.805
10 I am confident about my passing this year/ <i>Saya yakin dengan keputusan peperiksaan saya untuk lulus pada tahun ini</i>	0.634	0.782
21 I am feel I am well prepared for my profession/ <i>Saya merasakan saya telah bersedia secukupnya untuk kerjaya saya</i>	0.546	0.795
26 Last year work has been a good preparation for this year's work/ <i>Usaha pada tahun lepas telah menjadikan persediaan yang baik kepada usaha tahun ini</i>	0.594	0.788
27 I am able to memorize all I need/ <i>Saya berkebolehan untuk mengingat semua yang perlu saya ingati</i>	0.539	0.797
31 I have learn a lot about empathy in my profession/ <i>Saya telah belajar banyak tentang rasa empati dalam kerjaya saya</i>	0.429	0.810
41 My problem skills are well developed here/ <i>Kemahiran penyelesaian masalah saya ditingkatkan dengan baik di sini</i>	0.586	0.792
45 Much of what I have to learn seem relevant to career in health care/ <i>Kebanyakan perkara yang saya perlu belajar dilihat berkaitan dengan kerjaya saya dalam bidang kesihatan</i>	0.487	0.804
SPoA		
11 The atmosphere was relax during ward teaching/ <i>Suasana sangat menenangkan semasa pengajaran di dalam wad</i>	0.405	0.857
12 The school is well timetabled/ <i>Universiti ini mempunyai jadual yang bagus</i>	0.563	0.846
17 Cheating is a problem in this school/ <i>Meniru adalah satu masalah di dalam universiti ini</i>	0.199	0.881
23 The atmosphere is relaxed during lectures/ <i>Suasana tenang semasa mendengar kuliah</i>	0.629	0.842
30 There are opportunities for me to develop interpersonal skills/ <i>Di sini terdapat banyak peluang untuk saya meningkatkan kemahiran interpersonal</i>	0.727	0.836
33 I feel comfortable in class socially/ <i>Saya berasa selesa di dalam kelas ketika bersosial</i>	0.674	0.842
34 The atmosphere is relaxed during seminars/tutorial/ <i>Suasana tenang semasa seminar/tutorial</i>	0.608	0.844
35 I found the experience disappointing/ <i>Saya merasakan pengalaman disini adalah mengecewakan</i>	0.616	0.843
36 I am able to concentrate well/ <i>Saya mampu menumpukan perhatian dengan baik</i>	0.593	0.846
42 The enjoyment outweighs the stress of studying medicine/ <i>Keseronokkan telah mengatasi tekanan belajar ilmu perubatan</i>	0.500	0.851
43 The atmosphere motivates me as a learner/ <i>Suasana memotivasikan saya sebagai pelajar</i>	0.629	0.842
49 I feel able to ask the questions I want/ <i>Saya boleh bertanya soalan yang saya mahu</i>	0.563	0.847
SSSP		
3 There is good support system for students who get stressed/ <i>Terdapat sistem sokongan yang baik untuk para pelajar yang tertekan/stress</i>	0.479	0.763
4 I am too tired to enjoy this course/ <i>Saya terlalu letih untuk menikmati kursus ini</i>	0.416	0.774
14 I am rarely bored on this course/ <i>Saya jarang berasa bosan di dalam kursus ini</i>	0.588	0.744
15 I have good friends in this school/ <i>Saya mempunyai ramai kawan-kawan yang baik di dalam universiti ini</i>	0.505	0.758
19 My social life is good/ <i>Kehidupan sosial saya adalah baik</i>	0.661	0.727
28 I seldom feel lonely/ <i>Saya jarang berasa keseorangan</i>	0.503	0.759
46 My accommodation is pleasant/ <i>Tempat penginapan saya adalah selesa</i>	0.456	0.774

*Negative item; CITC = Corrected Item-Total Correlation; CAID = Cronbach's Alpha if Item Deleted; Green Color is Malay Language. Notes: Items in italics are the negative statements. SPoL- Students' perceptions of learning; SPoT- Students' perceptions of teaching; SASP- Students' academic self-perceptions; SPoA- Students' perceptions of atmosphere; SSSP- Students' social self-perception. SPoL: Students' perception of learning, SPoT: Students' Perception of Teachers, SASP: Students' academic self-perception, SPoA: Students' perception of atmosphere, SSSP: Students' social self-perception

Table 6: Reliability analysis on individual item of the best fit DREEM model

Domain	No.	Statement	CITC	CAID
SPoL	Q1	I am encouraged to participate/ <i>Saya terdorong untuk mengambil bahagian</i>	0.518	0.795
	Q7	The teaching is often stimulating/ <i>Setiap pengajaran selalu meransangkan</i>	0.723	0.687
	Q13	The teaching is student-centered/ <i>Pengajaran menekankan pendekatan berpusat pada pelajar</i>	0.532	0.782
	Q16	The teaching is helpful to develop my skills / <i>competency/Kaedah pengajaran membantu untuk meningkatkan kemahiran/kecekapan saya</i>	0.680	0.714
SPoT	Q2	The teachers are knowledgeable/ <i>Pensyarah berpengetahuan luas</i>	0.554	0.695
	Q18	The teachers have good communication skills with the patients/ <i>Pensyarah mempunyai kemahiran komunikasi yang baik dengan para pesakit</i>	0.483	0.736
	Q32	The teachers provide constructive criticism here/ <i>Pensyarah memberikan kritikan yang membina di sini</i>	0.585	0.679
	Q40	The teachers are well prepared for their classes/ <i>Pensyarah bersedia dengan baik untuk kelas-kelas yang akan diajar</i>	0.593	0.677
SASP	Q26	Last year work has been a good preparation for this year's work/ <i>Usaha pada tahun lepas telah menjadikan persediaan yang baik kepada usaha tahun ini</i>	0.410	0.743
	Q41	My problem skills are well developed here/ <i>Kemahiran penyelesaian masalah saya ditingkatkan dengan baik di sini.</i>	0.600	0.494
	Q45	Much of what I have to learn seem relevant to career in health care/ <i>Kebanyakan perkara yang saya perlu belajar dilihat berkaitan dengan kerjaya saya dalam bidang kesihatan</i>	0.538	0.567
SPoA	Q30	There are opportunities for me to develop interpersonal skills/ <i>Di sini terdapat banyak peluang untuk saya meningkatkan kemahiran interpersonal</i>	0.676	0.690
	Q35	I found the experience disappointing/ <i>Saya merasakan pengalaman disini adalah mengecewakan</i>	0.558	0.754
	Q43	The atmosphere motivates me as a learner/ <i>Suasana memotivasikan saya sebagai pelajar</i>	0.590	0.732
SSSP	Q49	I feel able to ask the questions I want/ <i>Saya boleh bertanya soalan yang saya mahu</i>	0.553	0.751
	Q4	I am too tired to enjoy this course/ <i>Saya terlalu letih untuk menikmati kursus ini</i>	0.434	0.721
	Q14	I am rarely bored on this course/ <i>Saya jarang berasa bosan di dalam kursus ini</i>	0.528	0.666
	Q15	I have good friends in this school/ <i>Saya mempunyai ramai kawan-kawan yang baik di dalam universiti ini</i>	0.566	0.642
	Q19	My social life is good/ <i>Kehidupan sosial saya adalah baik</i>	0.562	0.647

CITC: Corrected item-total correlation, CAID: Cronbach's alpha if item deleted, SPoL: Students' perceptions of learning, SPoT: Students' perceptions of teaching, SASP: Students' academic self-perceptions, SPoA: Students' perceptions of atmosphere, SSSP: Students' social self-perception

a spirit, a culture; a big buzzing confusion, a complex, chaotic kind of situation, with countless components, myriad dynamics and interactions of inputs and processes, inevitable conflicts, and constantly in a state of flux [60]." In terms of the clinical teaching-learning setting, there were lot untold differences observed, as "differences in the orientation toward teaching and learning, the level of autonomy, variety, and workload, the quality of supervision and social support, type and quality of opportunities for practice of important skills and the availability of educational resources [61]." Afterward, the DREEM is certainly a valuable tool for assessing the educational environment in medical education, and its extensive transnational use discloses the necessity of such inventory [4]. Nevertheless, there has conceivably evidence that the DREEM has an insufficient emphasis on founding and upholding its psychometric properties [4]. This study considered the psychometric properties of the DREEM-M in a sample of Malaysian medical students. In this sample, the overall DREEM-M inventory demonstrated a high-level internal consistency. This finding is exactly similar with another Ghanaian study [62]. CFA of the current study found that the one factor model of DREEM-M (Model A), consisting 50 items were not fit, indicating it was multidimensional - which is similar with the original DREEM inventory [6]. Furthermore CFA, it gives the impression that the proposed five-factor structure was not fit (Model B) as all the goodness-of-fit indices did not signify a model fit. This finding also similar with another study of Malaysia [41,63]. SFL for the proposed five-factor structure of the 50-item DREEM-M (Model A) ranged between 0.05 and 0.79, suggesting that certain items did not represent the internal construct validity being measured; it is in conflicting with original DREEM inventory [6] but similar with another study Swedish study [41]. Whereas, for the best fit model (i.e., model G), the SFL ranged between 0.49 and 0.81 (Fig. 1), indicating that all items contributed highly to the constructs being measured [64]. The Cronbach's alpha values for the five subscales of the 50-item DREEM-M ranged between 0.78 and 0.85 while for the 19-item DREEM-M ranged between 0.69 and 0.79. The subscales for both versions showed acceptable to a high-level of internal consistency in measuring the five aspects of students' perception of educational climate. The current

study findings are quite like a number studies of the translated version of the DREEM inventory in different countries [41,42,65,66].

CONCLUSION

The current study findings regarding the Bahasa Melayu version of DREEM inventory 50-item inventory failed to achieve a model fit, but it demonstrated a high of internal consistency. The proposed 19-item DREEM-M revealed good model fit as its goodness-of-fit indices achieved an acceptable level, and confirmed a high level of internal inconsistency.

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