Assessing Students' Well-being in Primary Health Care Setting as a Clinical Learning Environment

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Well-being in learning environment requires a culture that actively helps students to achieve their own potential. It requires a learning environment (LE) that supports physical, social and spiritual development. It has been shown that medical students experience high levels of stress that can hinder their performance, professionalism, and overall health.

With respect to primary health care (PHC), some studies have shown the relative advantage of PHC centers to provide opportunities for "hands on" practice by pre-clinical students, availability of general practitioners (GPs) to supervise students, and with respect to the scope of PHC, which includes, beside patient care, community health education. Unfortunately, some aspects of the training process in clinical learning environment (CLE) have unfavorable effect on students' well-being. Medical students face personal distress with negative effect on academic achievement, competency, professionalism, and health.

We aimed to measure students wellbeing during their training in primary health care units.

Materials and Methods: This is a cross sectional study to assess well-being of undergraduate students in primary health care (PHC) centers affiliated to the Faculty of Medicine, Suez Canal University (FOM-SCU). In addition, to test psychometric prosperities of The MED-NORD (Medical Education in Nordic Countries) questionnaire through exploratory factor analysis (EFA). A comprehensive (purposive) Sample was taken from year 1, 2, and 3.

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Results: Testing the psychometric prosperities of MED-NORD questionnaire revealed that the questionnaire contained 7 factors and 41 items. The seven factors are: Conceptions of learning and knowledge, Approaches to learning, Perceptions of the learning environment, Problems in studying, Optimism, Reflective learning, and Lack of interest. There were adequate correlations between the factors.
Conclusion: The study concluded that the students positively perceived their well-being. Furthermore, Students preferred collaborative knowledge building in learning. However, they use surface approach in their learning more than deep approach. This study also concluded good reliability and construct validity of MED-NORD questionnaire.

1. INTRODUCTION

The inherent goal of medical education is to graduate high-quality physicians [1], but students often loss their own health and well-being to achieve this goal [2].While medical students are educated to care for their patients in medical school, they are not always adequately prepared to take care of themselves [3].

Therefore, students in medical schools interact with multi-professional faculty, peers, and patients. This can occur under challenging situations due to the intensive workload, competition among peers and at times in an unfriendly environment [4,5].

It has been shown that medical students experience high levels of stress that can hinder their performance, professionalism, and overall health [1,3]. Medical students have elevated rates of overall psychological distress and more susceptible to health problems than the general public and age-matched peers [1]. Furthermore, many medical students learn maladaptive behaviors from their medical educators, who serve as formal or informal models and mentors [2,3,6,7].

CLE defined as the attributes of the clinical work setting, which students perceive to influence their professional development and it encompasses all that surround the student. These include; the clinical setting, equipment, staff, patients, mentors and teachers [8].

Several factors have been shown to influence the effectiveness of student learning in a clinical environment; the mix of patients seen by students, organizational quality, and the growing number and types of learners and the multiple and conflicting responsibilities of the team, i.e. the challenge of appropriately allocating time to teaching, learning, patient care and other commitments [9,10].

Also, constructive feedback, supervision and supported participation are key features of effective clinical learning experiences [11]. Therefore, the challenge facing clinician-teachers is to create a high quality learning environment for students [12].

Quality clinical placement is one key element that successfully achieves the aims of clinical education in the practice environment. These aims include: the quantity and quality of learning that is experienced by students, the degree to which the experience is individualized to meet student needs, adequate preparation for professional practice, and efficient use of resources to achieve this [13].

Unfortunately, some aspects of the training process in clinical learning environment (CLE) have unfavorable effect on students' well-being. Studies propose that medical students face a high rate of personal distress, [14-19] with negative effect on academic achievement, [20] competency, [21] professionalism, [22,23] and health [24].

Both physicians and medical students know the significance of adopting well-being practices and developing essential skills to master the knowledge they require to perform, adjust to their changing environment, and successfully regulate their own life [25]. It can thus be hypothesized that helping physicians and medical students to achieve and maintain a high level of well-being may lead to improved health, as well as enhanced performance through quality patient care and reduced medical errors [26].

Some studies have indicated that pre-clinical students, entering their clerkships, may encounter difficulties when they have to apply clinical skills learned, especially in patient contacts [27]. For example, students feel anxious when they have to perform diagnostic or therapeutic procedures with patients because they fear to harm patients [28].

Training of students can be offered in any clinical setting, including primary, secondary and tertiary health care, with respect to primary health care (PHC), some studies have shown the relative advantage of PHC centers to provide opportunities for "hands on" practice by pre-clinical students, availability of general practitioners (GPs) to supervise students, and with respect to the scope of PHC, which includes, beside patient care, community health education [29].

In FOM-SCU, community-based activities are integrated with other learning activities to

guarantee full integration and horizontal and vertical harmonization of knowledge and skills. Many competencies are developed in this setting such as develop student team work skills, enhance management and leadership skills, and to improve the capacity of self-learning, self-evaluation and learning through rendering services [30].

Students receive weekly training at PHC centers affiliated to either the FOM-SCU or the Ministry of Health and Population. The first three years require weekly visits to urban and rural primary care units. Their work is supervised by their faculty, as they collaborate with all members of health manpower in PHC units. They also have learning activities in other community settings such as monthly family visits [31]. Therefore, this study focused on assessing students well-being in PHC training centers which represents a critical aspect of medical training.

This study measured the relationship between CLE, Primary Health Care Unit here, students' well-being and the academic achievement of the medical students as the medical students' well-being represents a critical aspect of medical training, this highlighted the crucial need to assess the well-being among the students so that early intervention could be done to facilitate students' coping and success. That will enhance the learning abilities which subsequently will improve the patient care by achieving good communication, increasing quality of care and decreasing medical errors.

2. MATERIALS AND METHODS

This is a cross sectional study, where students' perception about their well-being (in the PHC centers) was evaluated.

This study was conducted in PHC centers (three urban and three rural) affiliated to FOM-SCU in Ismailia governorate. Study population were undergraduate students: from years 1, 2 and 3 at the FOM-SCU.

Comprehensive (purposive) Sample was taken. Therefore, all the students in years 1, 2 and 3 were included in the sample.

2.1 Sample Size

The sample size was calculated according to the following equation:

n (per group)= $2\{K\sigma^2/\Delta^2\}$(Dawson-Saunders, 1994)

σ = Standard deviation of the overall mean DREEM score in clinical years of a large UK medical school = 19 [32].

Δ = Difference between means in clinical and academic years in a large UK medical school= 8 (127-119)

K= Constant $(Z_{\alpha+}Z_{\beta})^2$ = (3.8)

Z_α = the point cutting off 5 percent in two tails of the standard normal distribution= 1.96

Z_β = the point cutting off 5 percent in the lower tail of the standard normal distribution= 1.84

$$N = \frac{2(1.96+1.84)^2 (19)^2}{(127-119)^2}$$

According to this equation the sample size was 326 students.

In this study: 337 undergraduate students (Years 1, 2 and 3) were included.

The MED-NORD (Medical Education in Nordic Countries) questionnaire was used to collect data from undergraduate students during their clinical training at the PHC centers to assess the students' well-being.

MED-NORD questionnaire had shown good predictive value, validity and reliability. It was carried out with medical students at two Swedish medical schools [33].

MED-NORD questionnaire consists of 93 questions.

  A. Problems in studying was measured by 13 items which measure stress [34], exhaustion [35], lack of regulation [36], as well as anxiety and lack of interest [37].

B. Students' (motivational) thinking strategies and attributions were measured by Strategy and Attribution Questionnaire (SAQ) [38], comprising of 12 items that measure optimism, task avoidance, and social optimism.

C. Epistemologies were measured by Conceptions of Learning and Knowledge Questionnaire (CLKQ) developed by the Progressive Inquiry Research Group at the University of Helsinki, 26 items measure certainty of knowledge, innate ability, practical value, reflective learning, valuing metacognition, strategic planning, and collaborative knowledge building. In addition, 12 items measured deep and surface approaches to learning.

D. Socio-demographic background, questions, covered information about students' age, sex, ethnicity, and civil status. Students were asked about their typical grades (below average, average, above average or do not know).

Some items in the inventory were constructed using six-point Likert response scales while some others constructed using five and ten ranging from strongly disagree to strongly agree. Each point on the Likert scale is assigned a value ranging from 1 (strongly disagree) to 5, 6, and 10. (strongly agree). 12 items were deleted 10 of them from socio-demographic background questions as they didn't match our learning situation and our culture.

2.2 Statistical Analysis

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS®) version 22 software and IBM SPSS Amos™ version 20. Data were presented as mean ± standard deviation (SD) of each parameter. A *P*-value of <0.05 was considered to be statistically significant. Internal consistency reliability for each scale was analyzed using Cronbach's α statistic. Missing data were treated by replace with mean of missing variables. Descriptive statistics were used to analyze frequencies and percentages.

Testing the psychometric prosperities of MED-NORD questionnaire through Exploratory factor analysis (EFA).

EFA using Principal component analysis with varimax rotation, was carried out to identify the different factors. The number of factors that was extracted and used was based on: Kaiser's criterion, considers factors with an eigenvalue greater than one as common factors [39], Scree test criterion (the Cattell criterion): the point of inflexion displayed by the scree plot [40] and the cumulative percent of variance extracted (In the humanities, the explained variance is commonly as low as 50-60%) [41].

Factor solutions retained according to the psychometric criteria were then subjected to analysis according to the following interpretability criteria [42]:

- A given factor contains at least three variables with significant loadings, a loading of 0.30 being suggested as the cut-off point;
- Variables loading on the same factor share the same conceptual meaning;
- Variables loading on different factors appear to measure different constructs;
- The rotated factor pattern demonstrates 'simple structure', which means that:

  ✓ Most variables load relatively high on only one factor and low on the other factors;
  ✓ Most factors have relatively high factor loadings for some variables and low loadings for the remaining ones.

Furthermore, Product moment-to-moment Pearson correlation coefficient was measured to see the forms of correlation between study variables

Finally, one way ANOVA for examining the differences between the mean values of the three years of the study. In addition, Post-hoc analysis using Bonferroni test was used for examining significant differences between specific years of study.

3. RESULTS

3.1 Descriptive Statistics

Out of the 418 questionnaires distributed to the undergraduate students, 337 completed forms were obtained (response rate =80%). The majority of the respondents were females 207 (61%), while the male respondents were 130 equivalent to 39%.

Descriptive statistics of the seven factors of the MED-NORD questionnaire were summarized in (Table 1). It reveals that the students preferred

the collaborative knowledge building in their learning (F1: Conceptions of learning and knowledge).

3.2 The Psychometric Properties

The psychometric properties of the used instrument (MED-NORD) questionnaire were tested through EFA, and reliability analysis.

3.3 First: Exploratory Factor Analysis

3.3.1 Checking the suitability of data for factor analysis

- *Sample size:*

Sample size is 337 participants which is adequate for factor analysis.

- *Factorability of the correlation matrix*

The correlation matrix reveals statistically significant, moderate correlations among the observed variables used in the analysis. None of the correlation coefficients are large; therefore there is no need to eliminate any variables at this stage.

- *Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity*

The data was appropriate for factor analysis. There were sufficient items predicted by each factor (kMO measure of sampling adequacy was 0.83), and variables were significantly correlated (Barlett's test of sphericity was statistically significant ($p<0.001$).

3.3.2 Extraction of factors

Principal component analysis with varimax rotation was performed to identify and interpret the number of factors that could explain most of the common variance and to remove non-reflective or redundant items. The results revealed that the 59 items of the MED-NORD questionnaire resulted in 15 factors with an eigenvalue >1.00. The 15 factors that emerged from the factor analysis accounted for 59.43 %of the total variance. The number of factors was also confirmed with the visual inspection of the scree plot indicated a sudden drop in the scree beginning with the fifteenth factor.

3.3.3 Rotation of factors

From the initial 59 items, 18 items were removed from the analysis. Finally, the questionnaire contained 7 factors and 41 items as shown in (Table 2). Factor 1 included 10 items, factor 2 included 7 items, factor 3 included 6 items, factor 4 included 6 items, factor 5 included 5 items, Factor 6 included 4 items and finally factor 7 included 3 items. All the previously mentioned interpretability criteria were achieved.

The seven factors were labeled as follows:

Factor 1: Conceptions of learning and knowledge:

Its items measured collaborative knowledge building, certain knowledge, practical value and valuing metacognition.

Factor 2: Approaches to learning:

Its items measured deep and surface approaches to learning

Factor 3: Perceptions of the learning environment:

Its items measured problem solving, scientific perspectives and studying for exams and details.

Factor 4: Problems in studying

Its items measured exhaustion, lack of regulation and stress.

Factor 5: Optimism

Its items measured if the students believed that they do well on different and difficult tasks.

Factor 6: Reflective learning

Its items measured if the students could evaluate the validity and reliability of differing standpoints.

Factor 7: Lack of interest

Its items measured if the contents of studies were interesting or not.

Furthermore, the communalities of the 41 items were presented in (Table 2). The communalities were ranged between 0.50 and 0.74.

3.4 Second: Reliability Analysis

The Cronbach's alpha coefficients of the 7 factors of MED-NORD questionnaire were ranged between 0.57 and 0.85. The overall Cronbach's alpha for the total MED-NORD items was 0.86. This result indicates adequate internal consistency (reliability). Alpha levels did not increase if any items were deleted. Factor 7

(Lack of interest) was the only one which had lower levels of internal consistency (Cronbach's alpha=0.57).

3.4.1 Correlations between variables using product moment-to-moment Pearson correlation coefficient

The Pearson's correlations between different factors of MED-NORD questionnaire (Table 3) revealed that Conceptions of learning and knowledge (F1) correlated significantly and positively to Approaches to learning (F2) ($r =0.48$, $p <.01$), Reflective learning (F6) ($r =0.55$, $p <.01$), Optimism (F5) ($r =0.28$, $p <.01$) and Problems in studying (F4) ($r =0.27$, $p <.01$).

Also Approaches to learning (F2) correlated significantly and positively to Reflective learning (F6) ($r =0.40$, $p <.01$) and optimism (F5) ($r =0.28$, $p <.01$). In addition, Perceptions of the learning environment (F3) correlated significantly and positively to Optimism (F5) ($r =0.27$, $p <.01$) and Reflective learning (F6) ($r =0.25$, $p <.01$).

Furthermore, Problems in studying (F4) correlated significantly and positively with Lack of interest (F7) ($r =0.30$, $p <.01$). Also, Optimism (F5) correlated significantly and positively with reflective learning (F6) ($r =0.43$, $p <.01$).

In turn, Lack of interest (F7) correlated negatively with optimism (F5) ($r =0.20$, $p <.01$) as shown in (Table 3).

3.4.2 ANOVA for examining the differences between the mean values of the three years of the study

Comparison of the three years of the study (MED-NORD questionnaire) using ANOVA revealed that there were 3 statistically significant differences (P<0.01) between the different years for factor 1 (Conceptions of learning and knowledge), factor 2 (Approaches to learning) and factor 7 (Lack of interest) as shown in (Table 4).

Subsequent post hoc analysis using Bonferroni test revealed that there were statistically significant differences regarding factor 1 and factor 7 in between (year 1 and year 2) (P=0.027 and 0.048, respectively) and (year 1 and year 3) (P=0.000) while factor 2 in between (year 1 and year 3) (P=0.000) and (year 2 and year 3) (P=0.000).

Table 1. Means and Standard deviation of students responses towards the seven factors of MED-NORD Questionnaire (n=337)

Factors	Number of items	Mean	Standard Deviation	Percentage %
(F1) Conceptions of learning and knowledge	10	4.75	0.93	79.32
Collaborative knowledge building	4	4.85	1.1	
Certain knowledge	2	4.67	1.2	
Practical value	2	4.72	1.2	
Valuing metacognition	2	4.71	1.1	
(F2)Approaches to learning	7	4.34	1.07	72.49
Surface approach	5	4.47	1.30	
Deep approach	2	4.30	1.10	
(F3)Perceptions of the learning environment	6	5.27	2.22	52.73
Problem solving	3	5.23	2.45	
Scientific perspectives	1	5.60	3.03	
Studying for exams and details.	2	5.16	2.58	
(F4)Problems in studying	6	3.58	0.81	71.69
Exhaustion	4	3.47	0.82	
Lack of regulation	1	3.72	1.14	
Stress	1	3.92	1.16	
(F5)Optimism	5	3.75	0.93	62.63
(F6)Reflective learning	4	4.11	0.92	68.60
(F7)Lack of interest	3	3.17	0.91	63.46

N.B
Factors 1, 2, 5 and 6 were rated out of 6
Factor 3 were rated out of 10
Factors 4 and 7 were rated out of 5

Table 2. Factor structure of MED-NORD questionnaire, using principal components analysis

	Component							Communalities	Factor labelling
	1	2	3	4	5	6	7		
20. In my opinion, it is essential that students are able to express their opinions and ideas in class.	0.72							0.66	
21. In my opinion, it is essential that the issues being studied are discussed together with the teacher and students.	0.70							0.63	
16. By learning to know your own ways of thinking you can greatly enhance your learning.	0.70							0.64	
15. In my opinion, it is essential that students generate new ideas and thoughts together.	0.67							0.58	F1 Conceptions of learning and knowledge
14. It is important that the teacher can confirm whether one's answer was correct.	0.66							0.50	
25. Teachers should share among themselves the same views on issues that are to be learned.	0.61							0.52	
23. It is important that issues being studied are useful in practice.	0.56							0.52	
31. It is important to consciously strive to relate new information with previous knowledge	0.52	.						0.45	
4. In my opinion, it is essential to publish ideas produced by students, as well.	0.50							0.53	
24. A theory is useful only if it can be applied to real life.	0.44							0.56	
38. It is important to try to relate details to a bigger whole.		0.75						0.67	
35. It is not enough to understand the text in itself. One has to also understand the thing or the phenomenon the text is about.		0.73						0.68	

	Component							Communalities	Factor labelling
	1	**2**	**3**	**4**	**5**	**6**	**7**		
33. While studying it is important to strive to understand the meaning of the text.		0.72						0.64	
40. It is important to judge whether the conclusions in study material are valid.		0.68						0.61	
39. It is important especially to memorize knowledge that one thinks will help in the final exam.		0.67						0.59	F2 Approaches to learning
36. It is important to go through the study material systematically part by part.		0.61						0.58	
37. It is important to try to critically evaluate the claims that are presented in the study material.		0.59						0.53	
55. Medical school has encouraged the decision-making skills			0.84					0.74	
56. Medical school has encouraged the ability to argue systematically pro/contra			0.82					0.74	
54. Medical school has encouraged the problem-solving skills			0.79					0.73	F3 Perceptions of the learning environment
59. Medical school has encouraged critical thinking skills			0.76					0.66	
58. Medical school has encouraged the study for details			0.64					0.66	
57. Medical school has encouraged the study for examinations			0.59					0.52	
43. I feel way too stressed by my studies.				0.75				0.64	
44. I worry over my studies during leisure time.				0.66				0.56	
42. I feel like I'm at the end of my rope.				0.59				0.48	F4 Problems in studying
45. I have noticed that I have problems in handling a big amount of text.				0.55				0.55	
53. Do you feel this kind of stress these days?				0.48				0.50	

	Component							Communalities	Factor labelling
	1	2	3	4	5	6	7		
41. I feel I'm working too hard on my studies				0.47				0.50	
9. I have done well on different tasks.					0.76			0.66	
2. When I get ready to start a task, I am usually certain that I will succeed in it.					0.67			0.60	
10. I usually do well, even on more difficult tasks.					0.63			0.61	F5 Optimism
5. When I go into new situations, I usually expect I will manage					0.60			0.59	
1. I regularly set goals for my personal learning.					0.37			0.58	
13. I often try to find the best explanation for a phenomenon by comparing various views on the topic.						0.72		0.64	
7. I often judge whether some statement is valid by evaluating the grounds that are given to support it.						0.62		0.61	F6 Reflective learning
27. As I study a new topic I often think about new questions, which I try to answer myself.						0.59		0.56	
28. I try to evaluate the reliability of differing standpoints by comparing the arguments presented for them.						0.41		0.50	
48. I can hardly find the meaning of the studies							0.68	0.61	
49. The contents of my studies do not interest me							0.63	0.55	F7 Lack of interest
47. It is difficult for me to judge whether I can study the material well enough							0.56	0.57	

Table 3. Pearson's correlations between different factors of MED-NORD questionnaire (n=337)

	(F1) Conceptions of learning and knowledge	(F2) Approaches to learning	(F3) Perceptions of the learning environment	(F4) Problems in studying	(F5) Optimism	(F6) Reflective learning	(F7) Lack of interest
(F1) Conceptions of learning and knowledge		0.48**	0.13*	0.27**	0.28**	0.55**	0.01
(F2) Approaches to learning			0.16**	0.11*	0.28**	0.40**	0.10
(F3) Perceptions of the learning environment				0.14**	0.27**	0.25**	-0.06
(F4) Problems in studying					0.02	0.06	0.30**
(F5) Optimism						0.43**	-0.20**
(F6) Reflective learning							-0.11*
(F7) Lack of interest							

**.Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4. One way ANOVA for examining the differences between the mean values of the three years of the study (MED-NORD questionnaire)

	Year 1 (n=111) Mean (SD)	Year 2 (n=78) Mean (SD)	Year 3 (n=148) Mean (SD)	F	P value
(F1)Conceptions of learning and knowledge	5.03 (0.69)	4.67 (1.03)	4.59 (0.98)	7.73	0.00
(F2)Approaches to learning	4.81 (0.66)	4.53 (0.89)	3.90 (1.22)	28.68	0.00
(F3)Perceptions of the learning environment	5.17 (2.32)	5.41 (1.93)	5.27 (2.30)	0.26	0.76
(F4)Problems in studying	3.67 (0.79)	3.50 (0.76)	3.55 (0.85)	1.14	0.31
(F5)Optimism	3.77 (0.98)	3.75 (0.85)	3.74 (0.95)	0.03	0.96
(F6)Reflective learning	4.13 (0.89)	4.19 (0.87)	4.06 (0.97)	0.55	0.57
(F7)Lack of interest	3.48 (0.94)	3.16 (0.79)	2.94 (0.88)	11.77	0.00

Bonferroni correction applied

4. DISCUSSION

Medical schools are recognized as a burdensome environment that often has an unfavorable effect on students' academic performance and well-being [43]. The capability of medical students to maintain personal well-being continues to be influenced by high levels of psychological distress [44]. Thus, measuring the well-being of medical students is important as this might allow proper support systems to be executed.

To test the construct validity of the used tool (MED-NORD questionnaire), factor analysis (exploratory followed by confirmatory) was conducted. EFA of MED-NORD questionnaire was conducted using PCA with varimax rotation. The data analysis revealed that the MED-NORD questionnaire loaded into seven factors (components). These factors that emerged are: Conceptions of learning and knowledge (collaborative knowledge building, certain knowledge, practical value and valuing metacognition), approaches to learning (deep and surface approaches to learning), perceptions of the learning environment (problem solving, scientific perspectives and studying for exams and details), problems in studying (exhaustion, lack of regulation and stress), optimism, reflective learning and lack of interest.

The current findings are somewhat similar to a study which was conducted in two Swedish universities. The authors performed a second order factor analysis in order to see how the scales are related to each other. PCA with Varimax-rotation was performed and the results showed the emergence of five factors: dysfunctional orientation (exhaustion, anxiety, lack of regulation and stress), collaborative knowledge building orientation (deep approach, reflective learning and valuing metacognition), cookbook orientation (certain knowledge, surface learning, practical vale and strategic planning), social orientation (social optimism and lack of interest) and individual abilities orientation (innate ability) [33], The differences between the some of the factors in both studies might be due to the different statistical methods used for measuring the construct validity. The current study used first order EFA (recognizes the number of constructs and the underlying factor structure of a group of variables) while the other study used second order EFA (demonstrates how the scales relate to each other).

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It is worth-mentioning that this is the first study that measured the internal structure of MED-NORD questionnaire using CFA with different scales and items under different scales. However, other studies have used limited variants of MED-NORD questionnaire [45,46].

Example for those how used limited variants of MED-NORD questionnaire is a study conducted at three medical faculties in Finland, used only one particular section of the MED-NORD questionnaire namely the Higher Education Stress Inventory (HESI). It tested the construct validity by CFA. The study revealed that the hypothesized model had an acceptable fit with the sample data [45]. Another example is a study conducted in Finland at the University of Helsinki, Faculty of Education where other scales were examined for construct validity. In their study, various scales of MED-NORD questionnaire were used: items measured deep and surface approaches to learning, students' (motivational) thinking strategies and attributions, items concerning problems with regulation of learning, three separate scales (Stress, exhaustion and Lack of Interest) were used and epistemological beliefs were measured Certain Knowledge and practical value [46].

In our study, the Cronbach's alpha coefficient value for the total scale was 0.86. This indicates good internal consistency (reliability) of MED-NORD questionnaire. This is comparable with

the study of Lonka and her collegues who found that the Cronbach's alpha coefficients value was 0.87 for the total scale [33].

Therefore, the internal structure of the MED-NORD questionnaire appears to be stable across two different cultures in Europe and Arab countries. Furthermore, our data demonstrates that the difference in curriculum strategies such as CBE didn't affect the psychometric prosperities of the questionnaire.

Therefore, in this study measuring the different types of construct validity evidence for MED-NORD questionnaire through EFA, CFA and reliability analysis revealed good reliability and construct validity of the MED-NORD questionnaire.

An interesting finding in the current study in that, out of the seven constructs of the MED-NORD questionnaire, the students preferred using the collaborative knowledge building in their learning. These findings are different from the study that was conducted in two Swedish universities. By observing the mean scores of the scales, we found that their students prefer knowledge building through "certain knowledge" [33] while our students prefer "the collaborative knowledge building" this means that our students prefer learning through peer communication. This might be due to the way our students used to learn in PHC centers and PBL tutorials where they interact, deal and learn with multi-professional teams from their first year of study.

In the same previous study, regarding the approaches of learning, they demonstrated that their students use the deep approach to learning [()] in contrast to our students who prefer using surface approach. The difference between their study and ours might relate to the different settings as we measured the well-being of the students in PHC centers while they measured well-being of the students in-campus inside the medical schools. Also, this can be explained by focusing on content in the field training program which does not allow enough time for the students to engage with new material more deeply. Finally, the some students might not receive adequate feedback on their progress, taking into consideration the positive effect of feedback on enhancing deep learning.

5. CONCLUSION

The study concluded that students under study positively perceived their well-being in primary care health centers,. In addition, this study concluded good reliability and construct validity of MED-NORD questionnaire after measuring the different types of construct validity evidence through EFA, and reliability analysis. Furthermore, similar studies in other medical schools are required, to test the generalizability of these study findings. Further studies are needed to test the difference student well-being between primary health care training centers and tertiary health care training centers.

ETHICAL APPROVAL

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: Causes, consequences, and proposed solutions. Mayo Clinic Proceedings. Elsevier; 2005.
2. Rakel DP, Hedgecock J. Healing the healer: A tool to encourage student reflection towards health. Medical Teacher. 2008;30:633-635.
3. Lee J, Graham AV. Students' perception of medical school stress and their evaluation of a wellness elective. Medical Education. 2001;35:652-659.
4. Seabrook MA. Clinical students' initial reports of the educational climate in a single medical school. Med Educ. 2004; 38:659-669.
5. Veerapen K, McAleer S. Students' perception of the learning environment in a distributed medical programme. Med Educ Online. 2010;15.
6. Estabrook MK. Medical student health promotion: the increasing role of medical

schools. Academic Psychiatry. 2008; 32:65-68.

7. Wallace JE, Lemaire JB, Ghali WA. Physician wellness: A missing quality indicator. The Lancet. 2009;374:1714-1721.

8. Papp I, Markkanen M, et al. Clinical environment as a learning environment: student nurses' perceptions concerning clinical learning experiences. Nurse Educ Today. 2003;23(4):262-268.

9. Hoffman KG, Donaldson JF. Contextual tensions of the clinical environment and their influence on teaching and learning. Medical education. 2004;38(4):448-454.

10. Durak HI, Vatansever K, et al. Factors determining students' global satisfaction with clerkships: an analysis of a two year students' ratings database. Adv Health Sci Educ Theory Pract. 2008;13(4):495-502.

11. van der Hem-Stokroos HH, Daelmans HE, et al. A qualitative study of constructive clinical learning experiences. Med Teach. 2003;25(2):120-126.

12. Dolmans DH, Wolfhagen IH, et al. Factors adversely affecting student learning in the clinical learning environment: A student perspective. Educ Health (Abingdon). 2008;21(3):32.

13. Rodger S, Fitzgerald C, et al. What makes a quality occupational therapy practice placement? Students' and practice educators' perspectives. Aust Occup Ther J. 2011;58(3):195-202.

14. Givens JL, Tjia J. Depressed medical students' use of mental health services and barriers to use. Academic Medicine. 2002;77:918-921.

15. Roberts LW, Warner TD, Lyketsos C, et al. Perceptions of academic vulnerability associated with personal illness: A study of 1,027 students at nine medical schools. Comprehensive Psychiatry. 2001;42:1-15.

16. Raj SR, Simpson CS, Hopman WM, et al. Health-related quality of life among final-year medical students. Canadian Medical Association Journal. 2000;162: 509-10.

17. Ball S, Bax A. Self care in medical education: Effectiveness of health habits interventions for first year medical students. Academic Medicine. 2002;77: 911-917.

18. Tyssen R, Vaglum P, Grønvold NT, et al. Suicidal ideation among medical students and young physicians: A nationwide and prospective study of prevalence and predictors. Journal of affective disorders. 2001;64:69-79.

19. Carson AJ, Dias S, Johnston A, et al. Mental health in medical students a case control study using the 60 item general health questionnaire. Scottish Medical Journal. 2000;45:115-116.

20. Abdulghani HM, Al-Drees AA, Khalil MS, et al. What factors determine academic achievement in high achieving undergraduate medical students? A qualitative study. Medical Teacher. 2014; 36:S43-S48.

21. Hojat M, Gonnella JS, Mangione S, et al. Empathy in medical students as related to academic performance, clinical competence and gender. Medical Education. 2002;36:522-527.

22. Woloschuk W, Harasym PH, Temple W. Attitude change during medical school: A cohort study. Medical Education. 2004; 38:522-534.

23. Hojat M, Mangione S, Nasca TJ, et al. An empirical study of decline in empathy in medical school. Medical Education. 2004; 38:934-941.

24. Newbury-Birch D, Walshaw D, Kamali F. Drink and drugs: From medical students to doctors. Drug and Alcohol Dependence. 2001;64:265-270.

25. Dobie S. Viewpoint: Reflections on a well-traveled path: Self-awareness, mindful practice, and relationship-centered care as foundations for medical education. Academic Medicine. 2007;82:422-427.

26. Goldman L, Myers M, Dickstein L. The Handbook of Physician Health. Chicago: American Medical Association; 2000.

27. Godefrooij MB, Diemers AD, Scherpbier AJ. Students' perceptions about the transition to the clinical phase of a medical curriculum with preclinical patient contacts; a focus group study. BMC Medical Education. 2010;10:28.

28. Sarikaya O, Civaner M, Kalaca S. The anxieties of medical students related to clinical training. International Journal of Clinical Practice. 2006;60:1414-1418.

29. Johnston B, Boohan M. Basic clinical skills: don't leave teaching to the teaching hospitals. Medical Education-Oxford. 2000; 34:692-699.

30. Hosny S, El Wazir Y, El Kalioby M, et al. Role of suez canal university, faculty of medicine in egyptian medical education reform. Health Professions Education. 2016;2:44-50.

31. Hosny S, Kamel MH, El-Wazir Y, et al. Integrating interprofessional education in community-based learning activities: case study. Medical teacher. 2013;35:S68-S73.

32. Dunne Fidelma, McAleer Sean, Roff Susan. Assessment of the undergraduate medical education environment in a large UK Medical school. Health Education Journal. 2006;65(2):149-158.

33. Lonka K, Sharafi P, Karlgren K, et al. MED NORD–A tool for measuring medical students' well-being and study orientations. Medical Teacher. 2008;30: 72-79.

34. Elo A-L, Leppänen A, Jahkola A. Validity of a single-item measure of stress symptoms. Scandinavian Journal of Work, Environment & Health. 2003:444-51.

35. Maslach C, Jackson SE. The measurement of experienced burnout. Journal of organizational behavior. 1981; 2:99-113.

36. Vermunt JD, Van Rijswijk FA. Analysis and development of students' skill in selfregulated learning. Higher Education. 1988;17:647-82.

37. Mäkinen J, Olkinuora E, Lonka K. Students at risk: Students' general study orientations and abandoning/prolonging the course of studies. Higher education. 2004;48:173-88.

38. Nurmi J-E, Salmela-Aro K, Haavisto T. The strategy and attribution questionnaire: Psychometric properties. European Journal of Psychological Assessment. 1995;11:108.

39. Kaiser HF. The application of electronic computers to factor analysis. Educational and psychological measurement; 1960.

40. Cattell RB. The scree test for the number of factors. Multivariate behavioral research. 1966;1:245-76.

41. Pett MA, Lackey NR, Sullivan JJ. Making sense of factor analysis: The use of factor analysis for instrument development in health care research. SAGE; 2003.

42. Lee N, Saunders J, Hooley G. The evolution of "classical mythology" within marketing measure development. European Journal of Marketing. 2005;39: 365-385.

43. Saravanan C, Wilks R. Medical students' experience of and reaction to stress: The role of depression and anxiety. The Scientific World Journal; 2014.

44. Winseman JS, Higgins EA, Balkoski VI, et al. What affects well-being during medical education? A student and faculty concept map. Annals of Behavioral Science and Medical Education. 2015;21: 19-29.

45. Litmanen T, Loyens SM, Sjöblom K, et al. Medical Students' perceptions of their learning environment, well-being and academic self-concept. Creative Education. 2014;5:1856.

46. Heikkilä A, Lonka K, Nieminen J, et al. Relations between teacher students' approaches to learning, cognitive and attributional strategies, well-being, and study success. Higher Education. 2012:64: 455-471.