ORIGINAL ARTICLE

Universiti Sains Malaysia (USM) Pre-clinical Medical Students' Guidance and Counselling Needs Questionnaire: A Confirmatory Factor Analysis

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ABSTRACT

Introduction: The USM Pre-clinical medical students' guidance and counselling needs questionnaire (USM-MS-GCN-Q) is an English-language guidance and counselling needs questionnaire which was developed specifically for pre-clinical medical students. The aim of this study is to highlight the construct validity of USM-MSGCN-Q among pre-clinical medical students. **Methods:** In June 2017, a cross-sectional study on 208 pre-clinical medical students was conducted in Universiti Sains Malaysia (USM). This self-administered USM-MSGNC-Q consisted of four constructs and 20 items with a 5-point Likert scale within each item. A confirmatory factor analysis was employed to test the hypothesized measurement model. **Results:** The final measurement model fitted the data well. The four-factor model initially consisted of 20 items however, it was reduced to 18 items with the goodness of fit indices suggesting good model fit (RMSEA 0.89, GFI .915 and ChiSq/df 2.642). Internal consistency reliability (Cronbach's alpha) was 0.879 for self-leadership skills, 0.929 for communication skills, 0.871 for learning skills, and 0.870 for psychological coping skills. The overall Cronbach's value was 0.922. Respective composite reliability values were 0.879, 0.952, 0.879 and 0.835 while the Average Variance Extracted values were 0.729, 0.911, 0.595 and 0.630. **Conclusion:** This study has confirmed that self-leadership, communication, learning and psychological coping skills were the components of guidance and counselling needs which influences the effectiveness of guidance and counselling sessions with pre-clinical medical students.

Keywords: Measurement model, Guidance and counselling, Confirmatory factor analysis, Pre-clinical medical students

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INTRODUCTION

The guidance and counselling (GC) terms were used interchangeably in the helping profession (1). Guidance is advice from a senior person in the respective field, given to the individual on matters to empower them to handle their difficulties. (2, 3) Uba (2008), describes counselling as the psychological process of helping an individual to achieve self-direction, understanding and mental balance. Counselling is considered as a talking therapy, where the client voluntarily share his/her personal or socio-psychological issues and feelings, with a trained counsellor in a confidential and therapeutic atmosphere (1). By combining these terms, John defines guidance and counselling as multiple twin word that is used to designate circumstances where a trained counsellor struggles to navigate a troubled client out of the typified glitches. It is a helping relationship meant to

safeguard a maintainable adjustment and development of the individual clients. (4, 5). On the other hand, counselling need can be defined as a professional service offered by counsellors when their clients need one. For examples, mental counselling service is relevant to a client who suffered psychological issues (6) and study skills guidance is more suitable for the early phase of students in a higher education institution (4).

Guidance and counselling are not a cure mechanism but an effective prevention instrument for people who suffered seriously due to psychological circumstances. In a study on a group of adolescents who have experienced the incarceration of a parent, it was found that school-based mental counselling services offer greater access for distressed clients in receiving support to promote a sense of school connection. It is because such services increase the accessibility of clinical support to high risk populations and increase chances for mental health promotion and prevention (6, 7). In responding to the high level of psychological issues, GC has always become a significant service. This is because such service has been recognized and has received positive

feedback from clients (8),(9).

In the context of higher education, GC service is effective to help students develop their personal and professional skills (10-13). Previous studies have indicated that students who suffered from psychological issues are finally able to manage his/herself properly after receiving GC sessions (6, 14). They became more confident and the high self-esteem instilled then, contributes to psychological well-being's stability. In a qualitative study, a mindfulness class carried out among 41 students found such activity has contributed to the reduction of stress by increasing their awareness and acceptance of their feelings and bodily states related to stress. Participants were also explained that through this acceptance and awareness activity, they increased their ability to cope with stress, increased their confidence in ameliorating stress, and increased their self-compassion (15, 16),(17). Studies reported that in the medical education context, stability in psychological well-being was positively related to the doctor-patient relationship, internal and external motivation, self-confidence and stress management.

In one survey, it was found that 30% of medical students who experienced mental ill health feel under-supported by their medical schools. A total of 1122 respondents had participated in the study. From this group, 80% (276) thought the level of support available to them was either poor or only moderately adequate. Just under 15% (167) of the survey's respondents also revealed that they had considered committing suicide at some point during their studies (18).

Currently, a few validated instruments have been utilized in the counselling service. For instance, LV Gordon and RL Mooney (1950) developed the Mooney checklist in 1950 and a group of researcher at the University of New South Wales, Australia developed the Depression, Anxiety and Stress Scale instrument (DASS-21) in 1995 (19). These instruments are widely used as primary tools in such service (20-23). Apart from that, Patient Satisfaction Feedback on Counselling (PSF) questionnaire (24), Patient Reported Outcome Measure (PROM) and Genetic Counselling Outcome Scale (GCOS) (25) have been introduced to seek clients' feedback on counselling service. Almost all of the questionnaires aim to obtain information regarding the effectiveness of a counselling service from the client's perspective, but they do not measure the counselling needs from the clients' perspective itself. This has led to an inaccurate tool and information in assessing the counselling needs in medical schools. Thus, this study which is specifically designed to measure the counselling needs among preclinical medical students is justified to close the existing hole. Furthermore, by utilizing the CFA method in completing the study, it will help to produce a credible instrument.

The USM-MSGCN-Q is an English-language guidance and counselling needs (GC) questionnaire which was developed based on a Theory of Human Motivation by A. H. Maslow and is known as Maslow's hierarchy theory (26). This theory proposes the basic needs of human being which are psychological, safety, belonging, and self-esteem and self-actualization components. Other significant data were also gained from the related opinions' group and literature reviews as well. The justification on the usage of the questionnaire was due to its relevancy to the research objectives which is to propose a questionnaire of guidance and counselling needs among the pre-clinical students. In the context of the present study guidance and counselling needs, it is defined as a helping service offered, to represent the real desire of the clients. It was also developed to assess the GC needs of pre-clinical medical students in Universiti Sains Malaysia (USM). The exploratory factor analysis (EFA) was utilized in the validation process of the instrument and it was described as having a good construct validity and internal consistency reliability (9). A four-structure model explaining 69.9% of the variance was obtained from EFA.

This study aims at demonstrating a stronger evidence of USM-MSGCN -Q's construct validity by means of Confirmatory factor analysis (CFA).

MATERIALS AND METHODS

Study population and ethical approval.
This study was conducted as a cross-sectional research design in June 2017 involving medical students in the School of Medical Sciences, USM Health Campus in Kubang Kerian Kelantan, Malaysia. The Inclusion criteria include all registered medical students in the pre-clinical years (year one and year two). Ethical permission from the Human Research Ethics Committee of Universiti Sains Malaysia was obtained prior to the initiation of this study.

Sample size determination and sampling method
The sample size was determined based on a recommended ratio of 5-10 subject per item. Since the questionnaire consisted of 20 items, the required sample was 100 to 200 subjects. Kline (2011) suggested that a path model with a sample size of 200 or more is necessary for the estimates to be comparably stable (27). Based on the rule of thumb and suggestion by Kline (2011), the required sample size, after taking into consideration of a 10% drop-out rate, was 220 students. The students were invited to join the study after a short briefing. They were allowed not to complete all items on questionnaire if they chose not to. The total number of medical students in year one and year two in the medical school was 208. Therefore, no sampling method was applied, and all eligible students were included in this study.

With a sample size of 208, sampling adequacy assessed by Kaiser-Meyer-Olkin (KMO) of 0.890 in EFA indicates that the items in the questionnaire are suitable for factorization and it also indicates the degree of common variance among the items. Bartlett's Test of sphericity χ^2 (190)=2850.38 with P<0.001 indicates that there are worthwhile correlations among the items based on the correlation matrix.

Instrument

The construct validity of the English version of USMM.-MSGCN-Q was previously assessed using EFA (9). The questionnaire was designed as a self-reporting questionnaire that assesses the students' need of GC on four skills domains; self-leadership (7-items), communication (5 items), learning (5 items) and psychological coping skills (3 items). The response of all items applies a 5-Likert scale which ranges from 1 for "extremely not needed" to 5 for "extremely needed". Self-leadership skills are assessed with items number 1 to 7, which focuses on time management in life, as well as academic and self-management. Communication skills are assessed with items number 8 to 12, which focuses on verbal and non-verbal elements. Learning skills are assessed with items number 13 to 17, which inquire about examination competence and finally, psychological coping skills are assessed with items number 18 to 20, which inquire about stress, anxiety, and depression coping skills.

Data analysis

The study data was analysed using the Analysis of Moment Structure Software version 24 (IBM SPSS AMOS 24). Before conducting the statistical analysis, the exploratory data analysis was conducted to screen for error in data entry and for missing data. In this study, to avoid from missing any data during data collection, the researcher has specifically reminded all participants to answer all questions. The researcher then collected all the answer sheets individually from each participant and browsed through their responses to ensure that there was no missing response.

In CFA, The proposed SLD, COM, LER and PSY measurements validity were evaluated by assessing the measurement model for pooled constructs [24]. This method of assessment was chosen rather than assessing the individual measurement model as the issues of model identification problem in case of small item per construct (less than four items within each construct) can be solved with this method of assessment. Apart from that, this method is also able to analyze all constructs at once (28). Three categories of model fit were presented namely, absolute fit using Root mean square error of approximation (RMSEA) and Goodness of fit index (GFI), incremental fit using comparative fit index (CFI) and parsimonious fit using a ratio of Chi-squared to its degree of freedom (ChiSq/df). The level of acceptance used were >0.8 for RMSEA, >0.90 for GFI, >0.90 for CFI

and ChiSq/df of <5.0 (Table I).

Table I: Index category and the level of acceptance for every index

Name of category	Name of index	Level of acceptance	Remarks
1. Absolute fit	Chisq	P > 0.05	Sensitive to sample size > 200
	RMSEA	**RMSEA < 0.08**	Range 0.05 to 0.1 is acceptable
	GFI	**GFI > 0.90**	**GFI = 0.95 is acceptable**
2. Incremental fit	AGFI	AGFI < 0.90	AGFI = 0.95 is a good fit
	CFI	**CFI > 0.90**	**CFI** = 0.95 is a good fit
	TLI	TLI > 0.90	TLI = 0.95 is a good fit
	NFI	NFI > 0.90	NFI > 0.90
3. Parsimonious fit	**Chisq/df**	**Chisq/df < 5.0**	The value should be less than 5.0

Source: Zainuddin (2012)

Cronbach Alpha was used to examine the internal consistency reliability and value of more than 0.7 is considered as acceptable (29, 30). Convergent validity was assessed by factor loading of each item with their statistical significance, Average Variance Extracted (AVE) and Composite Reliability (CR). Convergent validity was indicated by an item factor loading ≥ 0.5 and p< 0.05 (31), AVE ≥ 5, and CR ≥ 0.7 (32).

RESULTS

In this study, 208 medical students were included. Majority were female (n=145, 69.7%) and Malay ethnicity (n=150, 72.1%). This study included only year-1 (n=123, 59.1%) and year-2 (n=85, 40.9%) undergraduate medical students (Table II).

Two assessment of model fit for the initial 20 items model of USM-MSGCN-Q suggests that the model is not fit with CFI of 0.887 and RMSEA of 0.95. Assessment of model fit by ChiSq/df however, indicates that the model is fit (chiSq/df = 2.886). To seek a model with better fit, item with lowest factor loading (item Q6) was deleted. As a result of item Q6 deletion, two fit indices indicate that the model is fit (CFI = 0.915, ChiSq/df = 2.642) whereas RMSEA was still below cut off value for model fit (RMSEA = 0.80). To further improve the model, item Q12 was removed because of its low factor loading. With this second item deletion, all three fit indices indicated that the model fit was acceptable (RMSEA = 0.89, CFI = 0.915, ChiSq/df = 2.642). The factor loading of all remaining items (18 items) ranges from 0.60 to 0.92 (Figure 1). All these values are acceptable to confirm model fit.

The final model, therefore, consists of 18 items with four factors; self-leadership skills (6 items), communication skills (4 items), learning skills (5 items) and psychological coping skills (3 items). The internal consistency

Table II: Profile of study participants (n=208)

Variables	Frequency (%)
Gender (n=208)	
Male	63 (30.3)
Female	145 (69.7)
Ethnic (n=204)	
Malay	150 (72.1)
Chinese	24(12.5)
Indian	26(11.5)
Others	4 (1.9)
Year of study (n=208)	
Year 1	123 (59.1)
Year 2	85 (40.9)
Qualification (n=206)	
High School Certificate	5 (2.4)
Matriculation	98 (47.1)
Science Foundation Programme	68 (32.7)
Other	35 (16.8)
Origin (n=208)	
Urban	158 (76.0)
Rural	20 (34.0)
Status of accommodation (n=208)	
Hostel	206 (99.0)
Non-hostel	2 (1.0)
Scholarship (n=208)	
Yes	90 (43.3)
No	118 (56.7)

reliability of the final model USM-MSGCN-Q examined by Cronbach Alpha was 0.92. Good convergent validity was observed as indicated by the high factor loading, acceptable AVE and high CR value. Fit indices for these factors are presented in Table III.
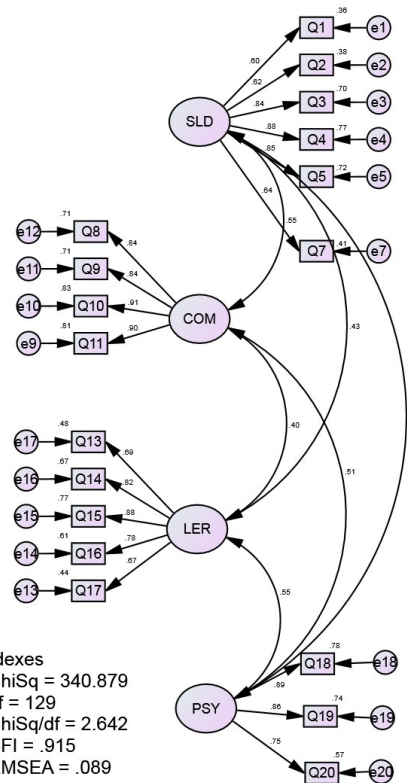

Fitness Indexes
1. ChiSq = 340.879
2. df = 129
3. ChiSq/df = 2.642
4. CFI = .915
5. RMSEA = .089

Figure 1: The new measurement model after items Q6 & Q12 were deleted

Table III: Reliability analysis of the 18 items based on the final model

[a] Domain	Item (Q)	Factor Loading	[b]Cronbach alpha (Above 0.6)	[c]CR (Above 0.6)	[d]Ave (Above 0.5)
1 Self-Leadership skills	Q1 need the skills of managing my time for academic matters	0.60			
	Q2 need the skills of managing my time for co-curriculum	0.62			
	Q3 need the skills of managing my time for self-care	0.84			
	Q4I need the skills of managing my time for family	0.88	0.879	0.869	0.73
	Q5 I need the skills of managing my time for social life	0.85			
	Q6I need the skills for leading a group work. This item was deleted due to lower factor loading				
	Q7I need the skills for being a good group follower	0.64			
2 Communication skills	Q8Verbal communication skills: I need a guide for understanding my lecturers' language	0.84			
	Q9Verbal communication skills: I need a guide for understanding my colleagues' language	0.84			
	Q10Non-verbal communication skills: I need a guide for understanding my lecturers' language	0.91	0.929	0.872	0.87
	Q11Non-verbal communication skills: I need a guide for understanding my colleagues' language	0.90			
	Q12 Non-verbal communication skills: I need a guide for understanding my patients' language. This item was deleted due to lower factor loading				
3 Learning skills	Q13 I need a guide for understanding and remembering lecture notes	0.69			
	Q14 I need the following skills: Time management in examination	0.82			
	Q15 I need the following skills: Understanding the topic's learning outcomes	0.88	0.871	0.873	0.595
	Q16 I need the following skills: Tackling of questions	0.78			
	Q17 I need the following skills: Technique for scoring good marks	0.62			
4 Psychological coping skills	Q18 I need the following skills: Coping mechanism of stress	0.89			
	Q19 I need the following skills: Coping mechanism of anxiety	0.86	0.870	0.873	0.630
	Q20 I need the following skills: Coping mechanism of depression	0.75			

[a]Domains
[b]Reliability analysis; Over Cronbach's Alpha Coeffcient = 0.922
[c]CR (composite Reliability) was calculated manually
[d]AVE (Average Variance Extracted) was calculated manually
Overall Cronbach alpha=0.922

DISCUSSION

Consistent with the intention of the USM-MSGCN-Q; to assess the needs of GC service among the pre-clinical medical students, it is significant to investigate its reliability to make the questionnaire credible. The proposed four-factor model of GC was fit after the removal of two items from the initial 20 items in USM-MSGCN-Q. The four-factor model is consistent with Maslow's Hierarchy theory. The self-leadership skills, communication skills, learning skills, and psychological coping skills factors cover five categories of human needs in this theory (26). It indicates that the areas of GC needs among pre-clinical medical students are crucial in making them a well functional person (33). The analysis by CFA indicates that the final 18 items of the four-factor model have an acceptable construct. This also means that the items can measure the GC needs consisting of four skills; self-leadership, communication, learning, and psychological coping skills. This is aligned with the previous study which reported that these component are important to such a group (34). The reliability analysis revealed that the USM-MSGCN-Q domains have high internal consistency reliability suggesting that the instrument has a good reliability value (35) and is feasible to be used for the target group.

Apart from that, we found the association between GC domains were autonomous as all the association coefficient values were below 0.95, indicating good discriminating validity, it also means that there were fewer redundancy items measuring similar features in a scale (36). This evidence showed that USM-MSGCN-Q can assess diverse features of GC needs among the target group, hence supporting the multi-dimensionality of such instrument. This finding was also supported by a previous study in a similar field where self-management, social management, and academic overview were the competencies needed during the early phase of medical trainees (34).

CONCLUSION

This study provided evidence for the construct, convergent and discriminant validities as well as reliability of the scale. The hypothesized measurement model was valid and appropriate in measuring guidance and counselling needs among medical students in their pre-clinical years. Despite the precious findings, this study has its limitation. Since the study employed a single-centre source of population, its findings were limited and unable to generalize to other medical schools in Malaysia. Therefore, future studies need to include other similar institutions to seek a more comprehensive result of the similar matter.

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