ORIGINAL ARTICLE

STABILITY OF USMEQ-i IN MEASURING EMOTIONAL INTELLIGENCE IN MEDICAL STUDENTS

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Abstract

Objective: **Emotional Intelligence (EI) is described as the ability to perceive, express, understand, motivate, control and regulate emotion. The USM Emotional Quotient Inventory (USMEQ-i) was designed to measure EI and it was found to be a reliable and valid tool in a sample of prospective medical students. The objective of this study is to determine stability of the USMEQ-i to measure EI at different time and occasions.** *Methods:* **A prospective cohort study was done on 196 first year medical students. It was administered to the medical students at four different intervals. The Cronbach's alpha and intra-class correlation analysis were applied to measure the internal consistency and agreement level across the intervals. The analysis was done using Statistical Package for Social Sciences (SPSS) version 18. Results: A total of 196 first year medical students participated in this study. Its overall Cronbach's alpha value across intervals ranged between 0.94 and 0.97. The Cronbach's alpha values of emotional control, emotional maturity, emotional conscientiousness, emotional awareness, emotional commitment, emotional fortitude, and emotional expression scale ranged between 0.59 and 0.91. The Cronbach's alpha value for the faking index scale ranged from 0.76 to 0.89. The ICC coefficient values for EI total score was 0.83, EI domain score ranged between 0.62 and 0.76 and the faking index score was 0.76.** *Conclusion:* **The USMEQ-i has demonstrated a good level of stability and internal consistency to measure EI at different time and occasions. It is a promising psychometric instrument that can be used to measure EI.** *ASEAN Journal of Psychiatry, Vol. 13 (1), January – June 2012: XX XX.*

Keywords: Stability, Reliability, Emotional Intelligence, USMEQ-i

Introduction

Emotional Intelligence (EI) is described as the ability to perceive, express, understand, motivate, control and regulate emotion [1-4]. Emotionally intelligent people are self-aware, able to control their emotions well from overwhelming stress, depression, anxiety, or anger and delay their enjoyment in pursuit of long-term rewards, rather than being overhauled by immediate desires [1, 4-6]. There are three theory approaches to EI which include i) the

specific ability approach, ii) the integrative approach, and iii) the mixed model approach [3]. The specific ability approach of EI focuses mainly on specific skill areas that can be considered as basic to EI [3]. The integrative approach of EI focuses on how multiple relevant specific abilities join together so as to obtain an overall sense of EI as an integrated group [3]. The mixed-model approach of EI focuses on mixed where it uses very broad definitions of emotional intelligence that include non-cognitive capability, competency or skill and/or

emotional and socially intelligence behaviour and take account of disposition from the personality domain [3]. It consists of diverse psychological traits, abilities, styles and other characteristics to EI [3].

A number of studies reported that reliability of the EI inventories range from 0.80 to 0.92, which is adequate for research and assessment of an individual [3]. A number of studies suggest that measures of EI do form a coherent, recognizable factor structure and thus an evidence of validity. Intelligence researchers have long found that higher IQ participants are able to solve problems with less brain activity than those with lower IQ. Applying the same concept, researchers have found that those with a higher EI exert less brain activity to solve emotional problems, as indicated by brain wave activity [7, 8]. Studies have shown that there is poor correlation between EI and cognitive functions [3]. There are considerable evidences showing that emotional intelligence is a determinant of success in a variety of occupational settings [3, 9, 10]. Although they vary widely in their quality, they include a number of well-done and convincing demonstrations of the predictive power of EI. EI validly measured, is a predictor of significant outcomes across diverse samples in a number of real world domains. It predicts social relations, workplace performance, mental and physical well-being [3].

Reliability refers to consistency or reproducibility of a measurement over time or occasions and it is gauged in the form of internal consistency and stability [11]; without consistency and stability, measurement is compromised. The internal consistency is measured by various ways such as Cronbach's alpha, Kuder-Richardson and split halves. Stability is measured by the degree of agreement between observations based on multiple administrations in the form of inter-rater reliability, intra-rater reliability and test-retest reliability [11]. The internal consistency of the Universiti Sains Malaysia Emotional Quotient Inventory (USMEQ-i) was established in a sample of prospective medical students [6]. The Cronbach's alpha values for the seven EI

dimensions (i.e. emotional control, emotional maturity, emotional conscientiousness, emotional awareness, emotional commitment, emotional fortitude and emotional expression) ranged between 0.6 and 0.9, the alpha value was 0.96 for overall score of USMEQ-i and for the faking index domain was 0.83 (6). These findings demonstrated that it had a good level of internal consistency. Even so, none of articles reported the stability of the USMEQ-i in measuring EI at multiple administrations. It is worth mentioning that stability is one of important qualities that any instruments to be tested must have to ensure the measurement obtained is reproducible over time and occasion.

This study was designed to answer three questions: 1) What is the internal consistency of the USMEQ-i over multiple administrations? 2) What is the internal consistency of EI scales over multiple administrations? 3) What is the degree of agreement between measurements of EI scales over multiple administrations? The author hypothesized that the USMEQ-i would demonstrate good level of stability and internal consistency in measuring EI over multiple administrations. This study will provide stability evidence of the USMEQ-i to measure EI across time and occasions.

Methods

A prospective study was conducted on first year medical students in a Malaysian public medical school. Purposive sampling method was applied and a total of 196 medical students were selected. They were then followed up at four intervals. The researcher had obtained permission from the School of Medical Sciences and Human Ethical Committee of Universiti Sains Malaysia prior to the start of the study.

Collection of data

The USMEQ-i was administered at four time intervals: 2 months (time 1), 4 months (time 2), 6 months (time 3) and 8 months (time 4) of the first year medical training. Proper instructions were given before the administration of the inventory. Informed consent was obtained from the respondents and they were asked to respond

to all statements completely. Completion of the inventory was voluntary and they were informed that not returning the inventory would not affect their progress in the medical course. Data was collected by guided self-administered questionnaire during face-to-face sessions in a hall. The questionnaires were immediately returned after they were completed. Data was analysed using the Statistical Package for Social Sciences (SPSS) version 18.

The Universiti Sains Malaysia Emotional Quotient Inventory (USMEQ-i)

It was originally developed in Malay language based on the mixed model approach of EI and grouped into seven scales which are emotional control (*pengawalan emosi*), emotional maturity (*kematangan emosi*), emotional conscientiousness (*kehematan emosi*), emotional awareness (*kepekaan emosi*), emotional commitment (*komitmen emosi*), emotional fortitude (*keanjalan emosi*) and emotional expression (*ekspresi emosi*) (5, 6). A Faking Index domain was designed and included in the USMEQ-i to measure tendency of respondents to over-rate themselves. It consists of 39 statements representing the emotional intelligence dimensions and 7 statements representing the faking index domain. Each statement was rated under 5 categories of responses which are 'not like me' (*tidak sama seperti saya*), 'a bit like me' (*sedikit sama seperti saya*), 'quite like me' (*hampir sama seperti saya*), 'a lot like me' (*sama seperti saya*),

and 'totally like me' (*sangat sama seperti saya*), to indicate how close the statement describes respondents' behaviour (5).

Stability analysis

Reliability analysis was applied to determine the internal consistency of the USMEQ-i. Internal consistency of its items was measured using the Cronbach's alpha coefficient. The items were considered to represent an acceptable level of internal consistency if the Cronbach's alpha value within 0.5 to 0.7 and good level if the Cronbach's alpha value more than 0.7 [11, 12].

Intra-class correlation (ICC) analysis was done to determine level of agreement between measurements at four different intervals. The agreement level was represented as ICC coefficient. The ICC coefficient value less than 0.2 was considered as poor agreement, 0.21 to 0.40 was considered as fair agreement, 0.41 to 0.60 was considered as moderate agreement, 0.61 to 0.80 was considered as good agreement and 0.81 to 1.0 was considered as very good agreement [11, 13].

Results

A total of 196 (100%) applicants responded to this study. Majority of the respondents were female (65.3%), Malay (53.6%) and came from the matriculation stream (88.8%) as shown in Table 1.

Table 1. Demographic profile of participants.

Variable		Frequency (%), (N=196)
Gender	Male	68 (34.7)
	Female	128 (65.3)
Race	Malay	105 (53.6)
	Chinese	61 (31.1)
	Indian	22 (11.2)
	Others	8 (3.6)
Entry qualification	Matriculation	174 (88.8)
	HSC	13 (6.6)
	A-level	9 (4.6)

Table 2. Internal consistency and ICC coefficient values across measurements taken at four different intervals.

EQ domain (number of item)	Cronbach's Alpha value					ICC coefficient[a]
	Yusoff et al., 2011	Time 1 (n = 196)	Time 2 (n = 196)	Time 3 (n =196)	Time 4 (n=196)	
Emotional Control (9)	0.90	0.86	0.90	0.91	0.91	0.74**
Emotional Maturity (8)	0.82	0.85	0.86	0.87	0.91	0.74**
Emotional Conscientiousness (5)	0.83	0.80	0.83	0.85	0.86	0.75**
Emotional Awareness (5)	0.79	0.74	0.80	0.83	0.83	0.70**
Emotional Commitment (4)	0.77	0.59	0.77	0.69	0.75	0.67**
Emotional Fortitude (4)	0.66	0.63	0.72	0.70	0.72	0.76**
Emotional Expression (4)	0.60	0.64	0.65	0.72	0.75	0.62**
Total EI score (39)	0.96	0.94	0.96	0.96	0.97	0.83**
Faking Index (7)	0.83	0.76	0.86	0.86	0.89	0.76**

[a] ICC analysis (single measure) between 1st, 2nd, 3rd & 4th administration   ** $p < 0.001$

Reliability analysis (Table 2) showed that the total Cronbach's alpha value of the USMEQ-i at different intervals ranged between 0.94 and 0.97, indicating good level of internal consistency over time and occasions. The Cronbach's alpha value for emotional control scale ranged between 0.86 and 0.91, indicating good level of internal consistency over different measurements. The Cronbach's alpha value for emotional maturity scale ranged between 0.85 and 0.91, indicating good level of internal consistency across the intervals. The Cronbach's alpha value for emotional conscientiousness scale ranged between 0.80 and 0.86, indicating good level of internal consistency across measurements. The Cronbach's alpha value for emotional awareness scale ranged between 0.74 and 0.83, indicating internal consistency levels are stabled over time and occasions. The Cronbach's alpha value for emotional commitment scale ranged between 0.59 and 0.79, indicating acceptable to good level of internal consistency across measurements. The Cronbach's alpha value for emotional fortitude scale ranged between 0.63 and 0.73, indicating acceptable to good level of internal consistency across measurements. The Cronbach's alpha value for emotional expression scale ranged between 0.64 and 0.75, indicating acceptable to good level of internal consistency over measurements. The Cronbach's alpha value for faking index scale ranged between 0.76 and 0.89, indicating good level of internal consistency across measurements.

ICC analysis (Table 2) showed that ICC coefficient values for the seven EI scales ranged from 0.62 and 0.76, indicating good level of agreement between the four different measurements. The ICC coefficient value for the total EI score was 0.83, indicating very good level of agreement between different measurements. The ICC coefficient value for the faking index score was 0.76, indicating good level of agreement between measurements.

Discussion

In general, our data found that USMEQ-i demonstrated a high level of internal consistency over multiple administrations that were done at different time and occasions as the Cronbach's alpha value more than 0.7 [11,12]. This indicated that USMEQ-i had a good level of internal stability over multiple measurements that were done at different time and occasions. On top of that, our finding was similar with a previous study that reported the overall Cronbach's alpha value was 0.96 [6]. Our finding is comparable with a number of other studies which reported reliability of the emotional intelligence inventories ranging from 0.80 to 0.92, which is adequate for research and assessment of an individual [3]. Our data showed that USMEQ-i is a stable tool to measure EI across multiple measurements. Our data also demonstrated that the EI scales had a good level of internal consistency across multiple administrations. This finding suggested

that they had a stable internal consistency across occasions and time; it reflected the reproducibility of a measurement over time and occasions [11]. In addition, this finding is in keeping with previous study findings found that the Cronbach's alpha values of the EI scales ranged from 0.60 to 0.90 [6] and comparable with other studies which reported reliability of the emotional intelligence inventories ranging from 0.80 to 0.92 [3]. These findings provided evidence to support the stability of internal consistency of the EI scales in measuring EI of medical students.

On further analysis, the EI scales showed a good level of agreement between measurements that were done at different time and occasions as the ICC coefficient values ranged from 0.62 and 0.76. This reflected good degree of agreement between the EI scales' measurements over multiple administrations across time and occasions. In other words, they were able to produce similar results for similar individuals over time and occasions. One implication of this finding was that the tendency for respondents to cheat or fake their responses to the items representing EI dimensions was low. Logically, if respondents were cheating, the degree of agreement between measurements at different time and occasions would be very low, but our findings showed good level of agreement across multiple administrations. These findings clearly demonstrated that the EI scales have a good level of stability to measure EI over time and occasions. In addition, the total EI score and the faking index score showed good level of agreement, indicating they had stable internal consistency in measuring intended constructs.

The reliability analysis has provided evidence of stability and internal consistency of the USMEQ-i in measuring EI of medical students. Despite of these encouraging findings, this study has several limitations that should be considered for future research as well as for interpretation. Firstly, this study was confined to first year medical students at a medical school, thus, interpretation of the study findings should be made with caution. A multi-centre validation study should be conducted in future to verify validity and reliability of the USMEQ-i across medical school settings. Secondly, this study had selected subjects based on non-probability sampling method, therefore sampling bias might compromise the accuracy of the current findings. Therefore, a probability sampling method should be applied in future research to minimise the sampling bias as well as to verify this study findings. Interpretation and any attempt to generalise the result should be done with caution. However, this is the first study that reported the stability of the USMEQ-i based on more than three measurements at different time and occasion with two months gap. Further research is required to optimise the usefulness and applicability of this inventory to measure EI in different educational settings.

Conclusion

The USMEQ-i had demonstrated a good level of stability and internal consistency to measure personality traits at different time and occasions. It is a promising psychometric instrument to measure emotional intelligence. This provides evidence for the stability of the USMEQ-i in measuring emotional intelligence in a sample of medical students.

Acknowledgement

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