Reliability and Validation of MSCEIT to Evaluate Emotional Intelligence for Chronic Kidney Disease Patients

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ABSTRACT

OBJECTIVE: To evaluate the reliability and validate the method used to test for emotional intelligence (EI) among CKD patients.

METHODOLOGY: This study was conducted in a public hospital for patients with kidney disease. A total of 30 CKD patients were included in this study using the flat rule of thumb and data collected from June until July 2023. The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) question booklet was used in both English and Malay for this study to evaluate the level of EI in CKD patients. The obtained data was analyzed using SPSS and AMOS software.

RESULTS: Most respondents were female, n=17 (56.7%) and Male, n=13 (43.3%). The mean results for MSCEIT indicate that the highest score is for the face component, and the lowest is for sensation. The branches of EI were measured, and the Goodness Fit Index (GFI) is accepted at 0.917, the RMSEA value is at 0.024, and TLI is accepted at 0.993. The Cronbach alpha for MSCEIT is 0.807 for 30 patients with eight categories of items. The Goodness Fit Index is accepted at the value of 0.917, RMSEA 0.024 is accepted, and TLI is accepted at 0.993.

CONCLUSION: Overall, the results of the present study suggest that MSCEIT can be used for other medical conditions for bigger-scale research to evaluate the psychological aspect for further treatment.

KEYWORDS: Chronic kidney disease, MSCEIT, nephrology, emotional intelligence

INTRODUCTION

According to the National Kidney Foundation, chronic kidney disease (CKD) is a condition that damages both kidneys and decreases the ability to stay healthy, as stated in the National Kidney Foundation in 2019. Patients with CKD are required to make ongoing psychological adjustments throughout their disease[1]. The treatment plan that usually CKD patients will need to follow will be dialysis, medication, fluid, and dietary restriction. Studies have proven that CKD patients tend not to comply with the treatment, which causes dilemmas among healthcare members. Impaired cognition was observed in haemodialysis patients, and the results indicate that cognitive impairment was more common among haemodialysis patients[2]. In managing CKD, the therapeutic goals place several behavioural demands on the patient. A treatment burden, non-adherence to treatment remains high. With that, it increases the causes of mortality and strategies to improve self-management behaviours are vital for optimal outcomes. A narrative review on CKD patients and their psychosocial clinical outcome has been conducted, and it has been concluded that patients in their earlier stage of disease experience a few negative illness perceptions that may ultimately influence their coping actions[3].

Emotional intelligence (EI) is the ability to perceive accurately, appraise and express emotion, understand emotion and emotional knowledge and regulate emotions to promote emotional and intellectual growth[4] despite the early controversies as to its validity as a construct that is growing in importance as research demonstrates, which is associated with several wellbeing[5]. Higher levels of EI are associated with better physical well-being, less severe depression, and social anxiety in clinical samples[6]. Emotional intelligence is believed to help people cope better with life challenges and control emotions effectively. This study will be relevant for using the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) among patients with renal problems. This study aimed to determine the reliability and validate the MSCEIT for CKD patients to test their EI.

METHODOLOGY

The researcher self-administered the MSCEIT test, giving each respondent 30 to 45 minutes to answer 141 items. The purpose was explained clearly to the

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patients. It has been administered while the patients were waiting for their appointment time. The participants will only read and give their answers. The Malay version of MSCEIT has been given to patients who cannot read and understand English. For the readability of the questionnaire, the researcher assists the patients with the parts they cannot understand. The multi health system company has trained the researcher on handling MSCEIT. The hospital interpreter assisted with the readability of Chinese patients. The materials required for the test were an MSCEIT Booklet (English and Malay language), a report sheet, a dark, soft lead pencil, an eraser, and a cardiac table. The methodological framework of this study is shown in **Figure I**.

Figure I: Methodological framework
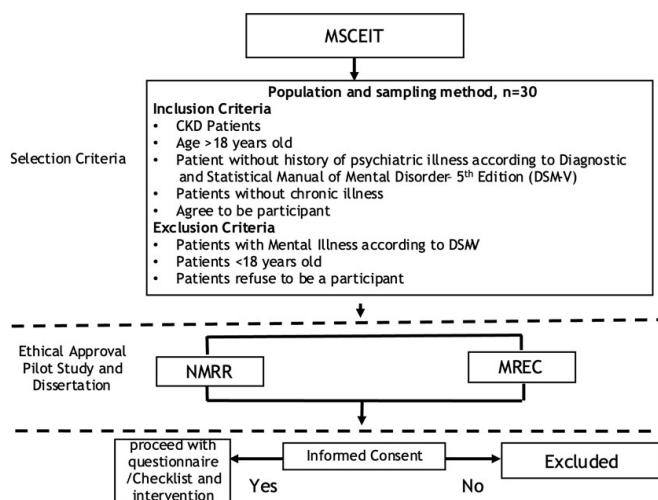
Population and Sample
A consecutive sampling has been taken for 30 patients. The researcher has used a rule of thumb to determine the sample size for an outcome and continuous measures. A flat rule of thumb is suggested for every situation, with 30 being the famous number.[7]

Instrument
A dual language MSCEIT Version 2.0 was chosen[8] to collect the data on EI. This instrument consists of 141 items and 8 task scores that measure the four branches of EI. This is the most recent operationalization of the ability model of emotional intelligence (EI)[9]. The MSCEIT was developed from an intelligence-testing tradition substantially informed by the emerging scientific understanding of emotions and their function. Users of this MSCEIT should understand the limitations and principles of psychological measurement and be familiar with the educational and psychological testing standards. The user of the test has completed university-level courses, which the researcher has already obtained. The MSCEIT consists of the MSCEIT Item Booklet and the MSCEIT Response sheet, which must be purchased. The researcher has purchased the study

as well. The completed response sheet is returned to the health system for scoring. The data that has been scored will be returned for analysis. The MHS company in Toronto, Canada, generates the results in Excel without manipulation.

Data Analysis
This study has been analyzed using SPSS for descriptive statistics, Cronbach alpha for reliability, and Goodness Fix Index, which is analyzed using AMOS software for confirmatory factor analysis.

Ethical Statement
This study was conducted in a public hospital among various levels of CKD patients and obtained ethical approval from the Medical Research Committee (MREC) via the National Medical Research Registry (NMRR), Ministry of Health (MOH) Malaysia (NMRR ID-23-00351-KWK). Unique identifiers of participants will not be collected on the data collection form. None of the identifiers will be disclosed during presentation or publication later. The researcher will keep the data collection form under lock and key mechanism for two years after the final presentation and publication. Hardcopy data was shredded using an office shredder, and all digital copies were deleted.

RESULTS

Characteristic of respondents
This study was conducted in a public hospital for 30 patients with a history of CKD; the results are shown in **Table I**. Most of the respondents were female, n=17 (56.7%). The respondents' age category is mostly between 50 and 60, with n=11 (36.6%). The mean age of the respondents is 45.50. The respondents have secondary education with n=15, 61.6%. Various levels of CKD patients have been included as

Table I: Demographic variables of the respondents

Characteristics	Segregation	Frequency	Percentage
Age (Years)	31 - 40	9	30.0
	41 - 50	10	33.3
	50 - 60	11	36.6
Gender	Male	13	43.3
	Female	17	56.7
Education background	Primary Education	10	37.1
	Secondary Education	15	61.6
	Tertiary Education	5	1.3
Stages of CKD	Stage 1	5	16.7
	Stage 2	3	10.0
	Stage 3 (a)	9	30.0
	Stage 3	10	33.3
	Stage 4	2	6.6
	Stage 5	**1**	**3.3**

participants, and most of them have been diagnosed with CKD stage 3, which is n=10, 33.3%.

Respondents Mean Value of MSCEIT

The mean results for MSCEIT indicate that the highest score was for the face component, and the lowest was for sensation, as indicated in **Table II**.

Table II: Mean score of MSCEIT for respondents

MSCEIT, according to Section	n=30	Mean	Std. Deviation
Face	30	98.82	16.61
Facilitation	30	76.32	16.57
Changes	30	66.62	9.15
Emotion management	30	76.18	9.18
Pictures	30	83.28	16.10
Sensation	30	63.94	4.53
Blends	30	65.49	7.01
Emotional relationship	30	77.37	6.85

Confirmatory Factor Analysis (CFA) of MSCEIT

CFA is used to obtain the model fit to test the discriminant and convergent validity of the constructs in this study. The criteria for evaluating model fit included the values of normed Chi-square, goodness of fit (GFI), and root mean square error of parsimony normed fit index (PNFI). The study has fulfilled the construct reliability Cronbach alpha, which is more significant than 0.70.

This study also shows that the average variance extracted (AVE) was larger than 0.50. The standard factor loading should be significantly linked to the latent construct with the least loading estimate of 0.60, and the results are shown in **Table III**. To address the convergent validity, it has been argued that the standardized factor loading for each item should be significantly linked to the latent construct with at least a loading estimate of 0.60. Furthermore, the AVE for a construct should be more significant than 0.50, and the composite reliability for the constructs should be greater than 0.70. The AVE stated in Table 3 was more than 0.50. and the composite reliability is more than 0.70.

To address convergent validity, the standardized factor loading for each item should be significantly linked to the latent construct with at least a loading estimate of 0.60. Furthermore, the AVE for a construct should be larger than 0.50, and the composite reliability for the constructs should be greater than 0.70. The AVE stated in Table 3 was more than 0.50. the composite reliability is more than 0.70. The discriminant validity of the measurement scales was assessed using the guideline, where the squared root of AVE values should be greater than the correlations between the paired constructs. **Table III** shows that the squared root of AVE values of all the constructs is greater than the correlations between paired constructs. In sum, all the measurement constructs

included in this study have demonstrated adequate discriminant validity, convergent validity, and reliability.

Table III: Confirmatory factor analysis (CFA) of MSCEIT Branches

|	C.R	F.L	AVE	B1M	B2M	B3M	B4M
B1M	0.797	0.76 - 0.84	0.624	**0.790**			
B2M	0.726	0.73 - 0.79	0.529	*0.348*	**0.727**		
B3M	0.780	0.66 - 0.76	0.601	*0.069*	*0.222*	**0.775**	
B4M	0.738	0.64 - 0.71	0.534	*0.181*	*0.273*	*0.205*	**0.731**

*The diagonal entries (in bold) represent the squared roots average variance, and the off-diagonal entries (*in italics*) are the correlations between constructs.
C.R - Composite Reliability; F.L - Factor Loading; AVE - Average Variance Extracted; B1M- Branch 1 MSCEIT; B2M - Branch 2 MSCEIT; B3M - Branch 3 MSCEIT; B4M - Branch 4 MSCEIT.

Model Fit of MSCEIT

Figure 2 shows the branches of EI according to MSCEIT. The goodness fit index GFI with more and greater than 0.9. The branches of EI were measured, and the GFI is accepted at the value of 0.917, RMSEA at 0.024 is accepted, and TLI is accepted at 0.993. The Cronbach alpha for MSCEIT was also tested; the value is 0.807 for 30 patients with eight items.

Figure II: EI branches and the model fit
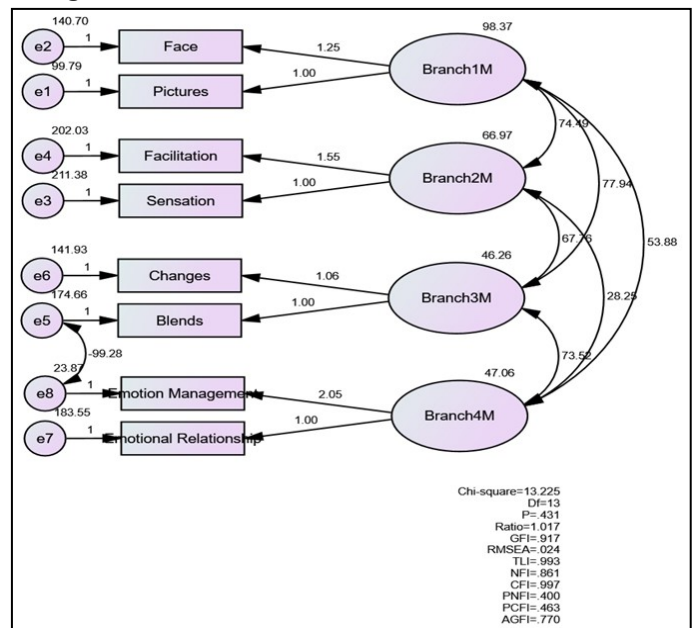
DISCUSSION

The study conducted for CKD patients using MSCEIT shows that it is reliable at Cronbach alpha at 0.807, tested for eight items. A study on psychiatric patients using MSCEIT shows that the reliability is 0.709[8]. The results of their research also stated that the scores contribute to what is known about EI in the field of

psychiatric nursing and raise awareness of EI's relevance to psychiatric nurses' practice. The Goodness Fit Index is accepted at the value of 0.917, RMSEA 0.024 is accepted, and TLI is accepted at 0.993. Confirmatory factor analysis has been used to obtain the model fit to test the discriminant and convergent validity of the constructs in this study. Based on the suggestion, the selected criteria in evaluating model fit will include the values of Chi-square, goodness fit index (GFI), and root mean square error of parsimony normed fit index (PNFI), indicating a research model with a good fit. In this study, the convergent reliability is greater than 0.7. AVE for each construct is larger than 0.5, and the standard factor loading is significantly linked to the latent construct with an estimated loading of 0.60. The composite reliability is more than 0.70[10].

Establishing a standard emotion processing battery for treatment evaluation in adults with autism spectrum disorder: Evidence supporting the MSCEIT has supported that CFA is founded on the principle that covariation between measures is partly attributable to their communality in measuring a latent construct that cannot be directly measured[11]. Multigroup CFA is conducted by constraining different sets of parameters to equivalence across the two diagnostic groups and examining differences in the fits of nested models with increasingly restrictive invariance constraints using the CFI. Fit indices aided with examining the extent to which a factor structure appropriately captures the relationship within and among factors; model fit was evaluated using the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Squared Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), adequate fit indicated when CFI and TLI≥.90 and good fit indicated when CFI and TLI≥.95, RMSEA≤.06, and SRMR ≤.08 [12].

In this study, the discriminant validity of the measurement scales was assessed using the guideline, where the squared root of AVE values should be greater than the correlations between the paired constructs[13]. The squared root of AVE values of all the constructs is greater than the correlations between paired constructs. Overall, all the measurement constructs included in this study have demonstrated adequate discriminant validity, convergent validity, and reliability. This study was a cross-sectional study conducted only to determine the reliability and validity of MSCEIT for CKD patients. The target population was only CKD patients. This study has specific limitations. Firstly, it was conducted in one hospital. The patients that have been chosen are all chronic kidney disease patients. No intervention was provided during the study. Somehow, the participants chosen have no history of mental illness to prevent the alteration of the results, and they volunteer to be a part of the study.

CONCLUSION

Overall, the results of the present study suggest that

MSCEIT is an appropriate method for CKD patients to evaluate their level of EI. Furthermore, this study has found the level of EI among CKD patients. The reliability results of this study can be used for future studies on a bigger scale. This study shows that patients with medical problems other than chronic kidney disease can also use this test to evaluate their EI level to decide on treatment.

Data Sharing Statement: The data supporting this study's findings are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

AUTHORS CONTRIBUTION

Supramanian K: Conceived the idea, designed and collected the literature, interpreted and analyzed the data, and drafted and revised the manuscript.

Sekar Z: Study design, data collection, review, and interpretation; have engaged in the drafting or revision of the article; have agreed to submit to the current journal; have given final approval of the version to be published and have agreed to be responsible for all aspects of the work.

Ishak Z: Study design, data collection, review, and interpretation; have engaged in the drafting or revision of the article; have agreed to submit to the current journal; have given final approval of the version to be published and have agreed to be responsible for all aspects of the work.

Sharuddin R: Study design, data collection, review, and interpretation; have engaged in the drafting or revision of the article; have agreed to submit to the current journal; have given final approval of the version to be published and have agreed to be responsible for all aspects of the work.

Ramaiah P: Study design, data collection, review, and interpretation; have engaged in the drafting or revision of the article; have agreed to submit to the current journal; have given final approval of the version to be published and have agreed to be responsible for all

aspects of the work.

Ahmed A: Study design, data collection, review, and interpretation; have engaged in the drafting or revision of the article; have agreed to submit to the current journal; have given final approval of the version to be published and have agreed to be responsible for all aspects of the work.

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