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PSYCHOMETRIC PROPERTIES OF THE MALAY VERSION OF THE EQ-5D IN MALAYSIA

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ABSTRACT

This cross-sectional study was designed to investigate the psychometric properties of the Malay version of the EQ-5D in Malaysia. A total of 150 respondents was recruited and administered with the questionnaire. Content validity was evaluated by expert panel reviews, while item-scale correlation and factor analysis with orthogonal varimax rotation were performed to assess the construct validity. For test-re-test reliabilities, all 150 respondents were repeatedly administered with the questionnaire after a two-week interval. Intraclass correlation (ICC) and Spearman Rank correlation coefficients were estimated. Cronbach's alpha was used to examine the internal consistency. Non-parametric test was as used to evaluate whether the Visual Analogue Scale (VAS) score was significantly different among various demographic factors. Item-scale correlation ranged from 0.35 to 0.81. Factor analysis produced rotated loadings of -0.02 to 0.91 and -0.04 to 0.76 respectively for test and re-test of the questionnaire. The value of ICC ranged from <0.01 to 0.81, while the Spearman Rank correlation coefficients ranged from 0.01 to 0.86. Cronbach's alpha values of 0.58 and 0.59 were obtained. The median VAS score was found to be significantly different for age groups and marital status. The Malay version of the EQ-5D exhibited acceptable psychometric properties.

1.0 Introduction

EQ-5D is widely used in a variety of population in different countries. To date, there are approximately 500 registered studies in the EQ-5D database [1]. The EQ-5D descriptive system comprises five dimensions, namely mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has three levels; no problems, some problems and severe problems. This questionnaire is designed to be self-completed by respondents and is ideally suited for use in postal surveys, in clinics and in face-to-face interviews [2]. The Malay version of the EQ-5D was translated by an European research group known as the EuroQol Group, but no validation has been done so far in Malaysia. One cannot simply assume that the validity of the items can be transferred from one questionnaire to another [3]. Therefore, this study was aimed to evaluate the psychometric properties of the Malay version of the EQ-5D in Malaysia.

2.0 Methods
2.1 Subjects and Study Design

This cross-sectional study was approved by the Malaysian Research Ethics Committee (MREC). The sample size consisted of 150 respondents [4], who were conveniently chosen from the vicinity of the Klang Valley All respondents who were at least 18 years of age, proficient in Bahasa Malaysia and had no cognitive impairment were included in this study. Each respondent was given a questionnaire and asked to self-complete it. The respondents who completed and returned the questionnaire were asked to re-administer the

same questionnaire after a two-week interval. This interval was carefully determined to avoid the possibility of respondents in recalling what he answered in the questionnaire previously.

2.2 Instrument

EQ-5D is a standardised measure of health status to provide a simple, generic measure of health for clinical and economic appraisal [5]. The EQ-5D consists of two components, namely the EQ-5D descriptive system and the EQ VAS.

In EQ-5D, the respondents were asked to rate their health today on a three-point scale (no problems, some problems and severe problems). The self-rated evaluation used a VAS. The respondents were asked to evaluate their health today on a scale of 0-100, where 0 represented the worst imaginable health state and 100 represented the best imaginable health state [2].

2.3 Statistical Analysis

Psychometric properties, such as the validity and reliability of the Malay version of the EQ-5D were evaluated. The validity of the questionnaire was examined by both content validity and construct validity. The content validity was assessed by expert panel reviews, while the construct validity was demonstrated by using the item-scale correlation results from convergent and discriminant validities. An item-scale correlation coefficient of 0.2 and above is considered adequate [6]. Exploratory factor analysis involving principal component analysis extraction and orthogonal varimax rotation was also used to assess the construct validity of the questionnaire [7].

The test-re-test reliability and internal consistency were used to examine the reliability of the Malay version of the EQ-5D. An ICC generated based on a single rater using the one way analysis of variance (ANOVA) model was used to evaluate the test-re-test reliability [6], while Cronbach's alpha was used to assess the internal consistency. By convention, ICC and Cronbach's alpha values of 0.70 are considered to be an acceptable reliability coefficient [8, 9]. Low Cronbach's alpha value signifies low homogeneity among items, whereas a very high value reflects redundancy [6]. All correlations were examined by using Spearman Rank correlation coefficients.

VAS score was summarized by using descriptive statistics. The Mann-Whitney or Kruskal-Wallis nonparametric test was used to test whether VAS score was significantly different among the various demographic measures. A STATA software version 9.0 was used to perform the analyses and statistical significance was set at 5% level. All missing data were imputed by using the mean value.

3.0 Results
3.1 Demographic Data and VAS Score

A total of 150 respondents was recruited for this study. All the respondents' characteristics respondents were; younger than 30 years old (46%), married (62%), female (67%), government employees (76%) and with tertiary academic qualifications (53%). The mean (SD-standard deviation) age of the respondents was 33 (9.5) years (Table 1).

Table 2 summarized the VAS scores by demographic measures. The VAS score ranged from 30 to 100 with mean (SD) value of 85.9 (11.9), which showed the health state of the sample to be above average. A non-parametric test indicated the median VAS score was significantly different among various age groups and marital status.

Table 1. Sample Characteristics for the Malay Version of the EQ-5D (n=150)	n	%
Mean age in years (SD, range)	33	(9.5, 21-61)
Age group (years)		
18 - <30	68	46
30 - <40	35	23
40 - <50	41	27
50 - <60	5	3
60 - <70	1	1
Gender		
Male	49	33
Female	101	67
Marital status		
Single	55	37
Married	93	62
Widow	2	1
Occupational status		
Government employee	114	76
Non government employee	28	19
Unemployed	8	5
Academic qualification		
No formal education	2	1
Primary	3	2
Secondary	66	44
Tertiary	79	53

Table 2. EQ VAS Values for the Malay Version of the EQ-5D (n=150) Demographic	Mean (SD)
Age group (years)*	
18 - <30	89.3 (8.6)
30 - <40	84.5 (12.6)
40 - <50	82.9 (13.4)
50 - <60	72.0 (17.9)
60 - <70	81.0 (-)
Gender	
Male	86.6 (11.3)
Female	85.5 (12.2)
Marital status*	
Single	88.6 (10.5)
Married	84.7 (11.1)
Widow	60.0 (42.4)
Occupational status	
Government employee	84.8 (12.8)
Non government employee	90.0 (7.2)
Unemployed	86.3 (7.9)
Academic qualification	
No formal education	83.0 (2.8)
Primary	88.3 (7.6)
Secondary	83.6 (13.9)
Tertiary	87.7 (9.9)
* P<0.05, unmarked P≥0.05.	

3.2 Validity of the Malay Version of the EQ-5D

The content validity was conducted by expert panel review. On the other hand, for construct validity, the item-scale correlation coefficient ranged from 0.35 to 0.77 (Table 3). The factor analysis with Varimax rotated loadings ranged from 0.02 to 0.91 and 0.04 to 0.76 in absolute value for test and re-test of the Malay version of the EQ-5D respectively. The numbers of dimension was determined by using the Kaiser-Guttman rule with Eigen value greater than one [10]. Therefore, only one dimension was revealed for both test and re-test of the Malay version of the EQ-5D.

3.3 Reliability of the Malay Version of the EQ-5D

The ICC coefficients ranged from <0.01 to 0.81 were summarized in Table 4. The values were great for dimensions such as pain/discomfort (0.81) and anxiety/depression (0.57), but self-care dimension (<0.01) showed otherwise.

Table 5 showed the Cronbach's alpha values for both test and re-test of the Malay version of the EQ-5D. These values were relatively the same. The Cronbach's alpha value for the similar study conducted in Italy and Japan was also presented in this table.

The Spearman Rank correlation coefficient was used to examine the correlation between dimensions in EQ-5D. The coefficients ranged from 0.01 to 0.86 and 0.02 to 0.49 for test and re-test of the Malay version of the EQ-5D respectively (Table 6). Interestingly, these coefficients indicated the dimensions mobility and usual activity, mobility and pain/discomfort as well as the usual activity and pain/discomfort were positively correlated.

Table 3. Item-scale Correlation for the Malay Version of the EQ-5D

Dimension	Item-Scale correlation
Mobility	0.77
Self-care	0.35
Usual activity	0.81
Pain / Discomfort	0.67
Anxiety / Depression	0.48

Table 4. Intraclass Correlation of the Malay Version of the EQ-5D

Dimension	Intraclass correlation
Mobility	0.29
Self-care	<0.01
Usual activity	0.76
Pain / Discomfort	0.81
Anxiety / Depression	0.57

Table 5. Cronbach's Alpha for the Malay Version of the EQ-5D

Study	Cronbach's alpha	
	Test	Re-test
This study	0.59	0.58
Italian study [11]	0.73	-
Japanese study [12]	0.83	0.87

Table 6. Spearman Rank Correlation Coefficients for the Malay Version of the EQ-5D

Dimension		Mobility	Self-care	Usual activity	Pain / discomfort	Anxiety / depression
Mobility	Test	1.00				
	Re-test	1.00				
Self-care	Test	0.01	1.00			
	Re-test	0.02	1.00			
Usual activity	Test	0.86	0.01	1.00		
	Re-test	0.38	0.02	1.00		
Pain / discomfort	Test	0.39	0.03	0.46	1.00	
	Re-test	0.46	0.04	0.49	1.00	
Anxiety / depression	Test	0.11	0.02	0.14	0.19	1.00
	Re-test	0.13	0.03	0.16	0.43	1.00

4.0 Discussion

This study provided us with a great opportunity to evaluate the psychometric properties of the Malay version of the EQ-5D in Malaysia.

The item-scale correlation coefficients were used to observe the homogeneity of the underlying scale. In general, we would expect the items belonging to the scale would show a high correlation with that scale compared to items not belonging to it. Although the correlations for domains such as self-care and anxiety/depression were the lowest compared to the rest, using a cut-off point of 0.2 still qualified all items as belonging to the same scale [13].

An ICC that was less than 0.25 indicated a relatively small between-respondent variation. In other words, a measure of equity had been achieved whereby all respondents responded

in an approximately the same manner. A high ICC demonstrated some respondents responded well and some responded badly [14].

The Cronbach's alpha value for the Malay version of the EQ-5D was lower compared to the Italian [11] and Japanese [12] studies. Since about half (46%) of the respondents were younger than 30 years old, therefore the wording used in the Malay version of the EQ-5D produced by the EuroQol Group may not be suitable for the younger generation due to the evolution of Malay language in Malaysia.

There are some limitations in this study. Firstly, our respondents generally reported good health status. For example, less than 3% of the respondents reported any problem in dimensions such as mobility, self-care and usual activities, while approximately 7% and 9% of the respondents reported any problem respectively in pain/discomfort and anxiety/depression dimensions. This could be due to the fact that about half of the respondents (46%) were younger than 30 years old. Therefore, this group of respondents was less likely to report any problem with their health status. Hence, this outcome could potentially reduce the ability of the study to report the true health status of the Malaysian population.

Secondly, this study does not present the EQ-5D index score due to the unavailability of the Malaysian utility function as of this moment. Previous studies reported that the utility function differed between countries and it was suggested a country's own social value set was necessary to be established [8, 15]. Therefore, it is important to conduct a pilot study in establishing the utility function for Malaysia [16].

In conclusion, our findings demonstrate that the Malay version of the EQ-5D translated by the EuroQol Group has the acceptable psychometric properties with reasonable validity and reliability results. With this instrument, it is hoped that the clinicians in Malaysia can assess the health status of patients undergoing treatments and procedures for various diseases.

5.0 Acknowledgement

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