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## PUBLIC HEALTH RESEARCH

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### Psychometric Evaluation of the Malay Version of the Impact of Weight on Quality of Life-Lite (IWQOL-LITE) Questionnaire

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#### ABSTRACT

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**Introduction** The availability of obesity specific quality of life measurement tool is limited. The Malay version of Impact of Weight on Quality of Life-Lite is an obesity specific quality of life questionnaire which has been translated for use in Malaysia. The aim of this study is to evaluate the validity and reliability of this questionnaire to measure quality of life among different body mass index (BMI) groups.

**Methods** One hundred and twenty subjects with different BMI categories who attended an outpatient government clinic were recruited for this study. The translated Malay version of IWQOL-Lite was used to assess the impact of weight on quality of life of respondents. Content validity, criterion validity and construct validity were used to assess the questionnaire validity while internal consistencies and test-retest reliability were used to assess the questionnaire reliability.

**Results** The Malay version of IWQOL-Lite showed good psychometric properties. The content validity was agreed upon by expert panels. The mean score of all IWQOL-Lite domains were able to discriminate between different BMI groups. Good internal consistency was demonstrated by Cronbach alpha of 0.936. Test-retest reliability ranged from 0.828 to 0.932. The physical function score (IWQOL-Lite) correlated positively with Physical Component Summary of Short Form-36 questionnaire. Exploratory factor analysis found that the questions loaded on their respective five domains.

**Conclusions** The results suggested that the Malay version of IWQOL-Lite is a valid and reliable tool to measure quality of life among obese and overweight subjects in Malaysia.

**Keywords** psychometric properties - validity - reliability - Malay version - IWQOL-LITE - SF-36.

## INTRODUCTION

There are increasing number of obese people in the developed and developing countries. Malaysia is a developing nation which is not spared from having this problem. According to WHO (2010), Malaysia has the highest prevalence of obesity among Asian countries. The situation was alarming and much proactive actions are needed to overcome this issue. Quality of life is a multidimensional concept and it consists of three dimensions namely physical functioning, psychological functioning and social functioning. The impact of being an obese person on the three dimensions of quality of life require further studies because it is important for future health planning and for effective prevention strategies in Malaysia. Measuring their quality of life is of paramount importance and specific tool is needed to achieve these objectives.

The Impact of Weight on Quality of Life-Lite (IWQOL-LITE) is an obesity specific quality of life questionnaire developed by Kolotkin et al. in 2001. The questionnaire has been translated into various languages including Malay language (Malay Version). This questionnaire consists of 31 items which measures quality of life among obese individuals. The questionnaire is divided into five domains namely the physical function, self-esteem, sexual life, public distress and work. The respondents were then required to rate each items in the questionnaire on a five point scale with answers ranging from 'never true' (1) to 'always true' (5). It is a self-measured questionnaire with a total score ranges from 0-100. A score of 100 represents the best quality of life while 0 indicates the most impaired quality of life.

The questionnaire proven to have excellent psychometric properties as shown in studies involving American samples, German and Portugese samples. It is one the proven tools to effectively measure quality of life conditions. The IWQOL-Lite has a good internal consistency values ranging from 0.90 to 0.96<sup>1</sup> and good test-retest reliability value ranging from 0.83 to 0.94.<sup>2</sup> The questionnaire is also sensitive to measure quality of life across different body mass index groups.<sup>1</sup> Although IWQOL-Lite has been translated into different languages, there has been no published article to date on the validity and reliability of the Malay version of IWQOL-Lite.

The objective of this study is to evaluate the psychometric properties of the Malay version of IWQOL-Lite for future utilisation among local studies.

## METHODOLOGY

The samples for this study were recruited from a medical centre which provides outpatient medical

services to the surrounding population living around Cheras, Kuala Lumpur. Ethical approval was obtained from Ethical and Medical Research Committee in UKMMC (FF-266-2011) and Ministry of Health Malaysia (NMRR-11-202-9017). Subjects were selected by convenient sampling from those who attended the outpatient clinics. A total of 120 respondents were recruited for this study. These subjects consist of 40 samples with normal Body Mass Index (BMI), 40 overweight samples and 40 obese samples. The WHO (2004) BMI classifications were used in this study. Selections of the respondents were based on the following criteria: age 18 and above, not pregnant, not physically or mentally disabled and not on any active obesity treatment/intervention programme.

The Malay version of IWQOL-Lite was initially translated from its original version (English) by the Duke University researchers. A back translation technique was implemented locally for comparison with the original version by two Malay native speakers. After reviewing the comments and feedback from both translators, no significant changes were made to the questions. The Malay Version of IWQOL-Lite were then pre-tested and finalized before it can be used for this study. The permission for using the IWQOL-Lite was obtained from the Licensing Unit, Duke University. All subjects were then required to complete the IWQOL-Lite in the Malay version.

All subjects in this study were also requested to fill-up a generic health related quality of life questionnaire, the Malay version of Short Form 36 (SF-36). Analyses of the SF-36 scores were done only using the component summary scores which are the physical component summary (PCS) and the mental component summary (MCS). Both PCS and MCS were derived from the eight SF-36 sub-scales.

The Statistical Package for Social Science (SPSS) version 17.0 was used to analyse the data. The psychometric properties analysed in this study were the internal consistency, test-retest reliability, concurrent validity, criterion validity, discriminant validity and construct validity. The internal consistency for the Malay Version of IWQOL-Lite was determined by the value of Cronbach's alpha coefficient.

## RESULT

### *Characteristics of Subjects*

The socio-demographic data of subjects in this study was presented in Table 1. The mean ages of samples were 35.72 years old with standard deviation of 11.45 years.

## Malay Version of IWQOL-LITE

**Table 1** Sociodemographic Characteristics of Respondents (n=120)

Factors	Total (n=120)	Percentage (%)
Age (years)		
Mean (s.d)	35.72 (11.45)	
Gender		
Male	65	54.2
Female	55	45.8
Race		
Malay	82	68.3
Chinese	21	17.5
Indian	14	11.7
Others	3	2.5
Marital status		
Single	23	19.2
Married/Ever married	97	80.8
Education level		
Primary	7	5.8
Secondary	60	50.0
Tertiary	53	44.2
Employment status		
Working	88	73.3
Not working	32	26.7

### Internal consistency

Table 2 shows the internal consistencies (Cronbach alpha values) of the five domains in IWQOL-Lite Malay version ranged from 0.917 to 0.933. The

Cronbach alpha value for total score is 0.936. The results were comparable with the data from the original IWQOL-Lite studies and other psychometric evaluation studies.

**Table 2** Comparisons of internal consistencies (Cronbach alpha) of IWQOL-Lite with other studies.

IWQOL-LITE Scale	Internal consistencies (Cronbach's alpha)	Kolotkin et al. 2001	Kolotkin & Crosby 2002	Engel et al. 2005	Andres et al. 2012
Physical Function	0.933	0.94	0.935	0.91	0.93
Self-esteem	0.928	0.93	0.944	0.93	0.92
Sexual life	0.933	0.91	0.921	0.89	0.91
Public distress	0.917	0.90	0.916	0.90	0.90
Work	0.928	0.90	0.816	0.77	0.88
Total	0.936	0.96	0.958	0.95	0.95

### Test-retest reliability

All 120 subjects involved in this study were asked to complete the same questionnaire within two weeks. The agreement of their ratings on the

questions between the first session and the second session showed a high correlation value ranged from 0.828 to 0.932 (Table 3).

**Table 3** Test Retest Reliability

IWQOL-LITE	Pearson Correlation (r) (n=120)	p value	Kolotkin & Crosby 2002
Physical Function	0.874	<0.0005	0.877
Self-Esteem	0.856	<0.0005	0.870
Sexual Life	0.932	<0.0005	0.849
Public Distress	0.849	<0.0005	0.814
Work	0.828	<0.0005	0.857

### Criterion validity

The same subjects were asked to complete the Short Form 36 (SF-36) questionnaire besides the

IWQOL-Lite. The correlation between the Physical Function domain (IWQOL-Lite) with Physical Component Summary of SF-36 scores were high

(0.545) while the correlation of Self-Esteem domain (IWQOL-Lite) with Mental Component

Summary of SF-36 were also noted to be high (Table 4).

**Table 4** Correlations between IWQOL-Lite and SF-36 scores (PCS and MCS)

IWQOL-LITE Scale	Malaysian sample (n=120)		Engel et al. 2005		Kolotkin & Crosby 2002	
	PCS	MCS	PCS	MCS	PCS	MCS
Physical Function	0.545	0.237	0.514	0.122	0.659	0.091
Self esteem	0.429	0.291	0.201	0.287	0.250	0.346
Sexual life	0.300	0.380	0.341	0.131	0.278	0.283
Public distress	0.285	0.306	0.337	0.151	0.357	0.097
Work	0.318	0.321	0.381	0.199	0.479	0.151
Total	0.475	0.332	0.439	0.219	0.534	0.239

Significant level  $p < 0.01$

*Discriminant validity*

The Malay version of IWQOL-LITE showed an excellent ability in discriminating between various categories of body mass index (BMI) namely for those who are normal, overweight and obese. The five domains in IWQOL-LITE (Malay) namely the physical function, self-esteem, public distress,

sexual life and work were significantly lowest among obese subjects. Normal subjects showed significantly highest score for all the domains except for sexual life. Overweight subjects were moderately impaired as compared to obese and normal subjects (Table 5).

**Table 5** Comparison of BMI Groups on IWQOL-Lite Scales

IWQOL-LITE Domain	Normal (n=40)	Mean (s.p.)		p value
		Overweight (n=40)	Obese (n=40)	
Physical Function	90.11 (13.54)	80.74 (19.20)	62.67 (21.60)	<0.001
Self Esteem	95.18 (12.22)	83.75 (19.43)	67.77 (27.28)	<0.001
Sexual Life	93.02 (13.91)	93.06 (16.62)	82.12 (25.67)	<0.008
Public Distress	95.13 (15.71)	91.50 (17.77)	76.25 (24.33)	<0.001
Work	95.94 (11.63)	93.13 (15.36)	85.00 (17.61)	<0.030
Total	96.25 (5.70)	88.52 (13.16)	71.21 (19.62)	<0.001

Kruskal Wallis test

*Construct validity*

Table 6 shows the exploratory factor analysis of the scores for all questions. The principal component method was used and a correlation matrix was derived. The result showed a Kaiser-Meyer-Olkin value of 0.904 (above the recommended value of 0.5) and a significant value for Bartlett's Test of Sphericity ( $p < 0.0005$ ). Question 1 to 10 formed the

core of Physical Function domain, question 11 to 18 formed the core of Self Esteem domain, question 19 to 22 form the core of Sexual Life domain, question 23 to 28 form the core of Public Distress domain and question 29 to 31 form the Work domain. All 31 questions were grouped under the correct factor.

**Table 6** IWQOL-LITE factor loadings for the Malaysian samples

Scale and item	Physical function	Self esteem	Factor Sexual life	Public distress	Work
Q1	.824				
Q2	.810				
Q3	.786				
Q4	.765				
Q5	.760				
Q6	.679				
Q7	.663				
Q8	.663				

Q9	.617		
Q10	.541		
Q11		.834	
Q12		.812	
Q13		.767	
Q14		.766	
Q15		.748	
Q16		.653	
Q17		.647	
Q18		.543	
Q19			.823
Q20			.799
Q21			.771
Q22			.744
Q23			.805
Q24			.737
Q25			.707
Q26			.626
Q27			.592
Q28			.587
Q29			.585
Q30			.568
Q31			.560

*Extraction Method: Principal Component Analysis.*

*Rotation Method: Varimax with Kaiser Normalisation.*

## DISCUSSION

The main objective for this study was to evaluate the psychometric properties of a Malay version of IWQOL-Lite. It was found that all the domains in this questionnaire exhibited excellent internal consistencies and comparable to those found in previous studies.<sup>3-7</sup>

The internal consistency or Cronbach alpha value derived from this study were ranged from 0.917 to 0.933 for all the five domains and 0.936 for total score. In addition, the factor analysis performed in this study showed wide range of factor loadings value between 0.541 to 0.834 with all the questions loaded on the appropriate domains. The result is parallel to the Spanish version of IWQOL-Lite validation study.<sup>4</sup>

It was observed that the Malay version of IWQOL-Lite was able to discriminate between various categories of BMI's with those who are obese scored the lowest indicating lower quality of life while those who are normal obtained the highest score which reflects higher quality of life. This shows that the questionnaire is an instrument which is sensitive and responsive to subject with weight problems.

The IWQOL-Lite score was found to have a strong and significant correlation with SF-36 questionnaire. There were significant correlation between the Physical Function domain (IWQOL-Lite) with PCS (SF-36) scores as well as between Self-Esteem domain (IWQOL-Lite) with MCS (SF-36) scores. The findings are similar with previous studies conducted.<sup>4,6</sup>

The results suggest that the Malay version of IWQOL-Lite is a valid and reliable tool to measure quality of life among obese and overweight subjects in Malaysia.

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