

ORIGINAL PAPER

Adaptation and Validation of the Malay Eating Disorder Examination-Questionnaire 6.0 (EDE-Q 6.0) among University Students: A Pilot Study

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Abstract

Background: The latest epidemiological data on eating disorders in Malaysia is still unavailable, probably due to lack of assessment tool to screen and diagnose eating disorders for the Malaysian population. Due to this, the current study aims to: i) adapt Eating Disorder Examination-Questionnaire 6.0 (EDE-Q 6.0) to Malay language, ii) conduct pre-testing, and iii) conduct small-scale reliability and validity analyses prior to conducting the main study on its psychometric properties. EDE-Q 6.0 was chosen to be adapted and validated due to its established relationships with a ‘gold standard’ assessment for eating disorder i.e. Eating Disorder Examination. **Methods:** The pilot study was conducted on undergraduate students in Psychology ($N=94$) at a public university by using cross-sectional survey design. Prior to conducting the pilot study, pre-testing procedure was conducted on five postgraduate students in Psychology. **Results:** The results from the pilot study revealed Malay EDE-Q 6.0 has excellent internal reliability with alpha coefficient of .94. The Malay EDE-Q 6.0 has shown to have positive and strong relationship with English EDE-Q 6.0 with coefficient of equivalence of $r = .97$. The pilot study also revealed that Malay EDE-Q 6.0 has acceptable convergent and divergent validities, nevertheless with a weak positive relationship with the measures for anxiety and depression symptoms. **Discussion:** This study indicates that the Malay version of EDE-Q 6.0 has a great potential to be used as a valid and reliable screening tool for eating disorders in Malaysia. Considering the limitations of pilot study, main study ought to be carried out to validate the current findings.

Keywords: Eating Disorder Examination-Questionnaire 6.0, Malay, Validation, University Students

Introduction

The prevalence of eating disorders is increasing, and most studies reported a higher prevalence of eating disorder in Western countries than Asian countries [1]. However, several studies have reported that the case of eating disorders is escalating in Asian countries since the last three decades, possibly because of the economic transformation, globalization, and Westernization [2]. Unfortunately, in Malaysia, the latest epidemiological data on eating disorders is still unavailable probably due to the lack of assessment tool to screen and diagnose eating disorders even though eating disorders have been forecasted to continue to grow in Asia [2]. To the best of our knowledge, only one study has conducted epidemiological study on the psychiatric patient sample in Malaysia and the results suggested that about 0.05% were diagnosed with anorexia nervosa [3].

For this reason, it is essential for researchers in Malaysia to either develop or adapt the existing assessment tools to be used in the local community. This exercise will enhance the detection of eating disorder and may improve the process of diagnosis. Several eating disorders screening tools have been developed in the Western countries, such as Eating Attitudes Test-26 (EAT-26) and Eating Disorder Inventory-II (EDI-II) [4, 5]. In Malaysia, only one eating disorder screening tool has been adapted to the Malay language and validated to suit the local community, namely Eating Disorder Examination-Questionnaire (EDE-Q) [6]. However, this is an older version of EDE-Q, plus the validation process was conducted among school students only [6]. The older version of EDE-Q has more items (i.e. 36 items) to gauge eating disorder symptoms, and it also includes the measures of subjective binge eating [7, 8]. Subjective

binge eating can be defined as a perceived loss of control despite normal amount of food consumed. The latest EDE-Q (i.e. EDE-Q 6.0) disregards these items and only assesses the loss of control with the occasion when a large amount of food consumed to accurately screen for eating disorder [9]. In addition, the adapted Malay EDE-Q needs to be updated since the latest version of EDE-Q (i.e. EDE-Q 6.0) has been used in several countries around the world compared to the earlier version.

EDEQ 6.0 is a self-report measure with 28 items, and it can measure the severity and frequency of eating disorder symptoms based on the number of episodes and number of days, in which the eating disorder behaviours occurred [10]. It has four main subscales, namely *Restraint*, *Eating Concern*, *Shape Concern*, and *Weight Concern*. EDE-Q 6.0 allows the test users to assess the eating disorder symptoms of the test takers within the past 28 days. EDE-Q 6.0 has established its relationship with the 'gold standard' assessment for eating disorder, (i.e. Eating Disorder Examination (EDE)), and has been widely used in clinical and non-clinical settings. Thus, EDE-Q 6.0 has been adapted into several languages, such as Finnish, Norwegian, Portuguese, and Japanese [8, 11-15]. Based on these studies, it was found that the adapted EDE-Q 6.0 is a valid and reliable tool for each of their populations.

Although many studies have adapted and validated the latest EDE-Q 6.0, there is yet an adapted and validated EDE-Q 6.0 in the Malaysian population. Therefore, this warrants the researchers to adapt the EDE-6.0 into the Malaysian national language (i.e. the Malay language) and validate its psychometric properties. As part of the process of validation, the current study aimed to conduct small scale reliability and

validity analyses of the adapted Malay EDE-Q 6.0 on university students before conducting the full validation study. The small scale study is conducted as a pre-testing and pilot study.

Methods

Study design

This research used cross-sectional survey as the research design. The survey contained Malay EDE-Q 6.0 and several other tools as criterion measures to validate Malay EDE-Q 6.0. This study is divided into pre-testing and pilot study.

Participants

The pre-testing study involved Malaysian post-graduate students ($n=5$) with bilingual abilities (i.e., Bahasa Malaysia and English) with ages ranging from 25 to 35 years. They were all with a Psychology background and had experience in research. Meanwhile, the pilot study was conducted on Psychology undergraduate students ($n=94$) from a public university in Kuala Lumpur, Malaysia. The students were eligible to be recruited as pilot test participants if they are undergraduate students and Malaysian with bilingual abilities.

Measures used

Sociodemographic profile

The sociodemographic profile consists of items on the details of the participants, namely gender, age, race, marital status, occupational status, and information on the medical and mental health condition. Weight and height of the participants were also obtained as part of the EDE-Q 6.0 data.

Adapted Malay version of Eating Disorder Examination-Questionnaire 6.0 (Malay EDE-Q 6.0)

The Malay version of EDE-Q 6.0 was adapted from the original of EDE-Q 6.0, which was developed by Fairburn and Beglin [10]. It can be used as a screening tool in both clinical and non-clinical population. It has 28 items with item 13 to 18 assessing behavioural frequency in terms of days and episodes of eating disorder behaviours. It uses a 7-point Likert scale with a score from 0 to 6. The global score of EDE-Q 6.0 is the summation of four subscales score divided by the number of subscales (i.e., four). The higher the score indicates the greater severity of the eating disorder. However, the results must be compared with the normative values. Following a study by Fairburn and Beglin, there are four main subscales of EDE-Q 6.0 (i.e., *Restraint, Eating Concern, Shape Concern and Weight Concern*) [10]. The original EDE-Q 6.0 has been studied among adult students and non-adult samples and have generated a good to excellent internal reliability ($\alpha = .83$ to $.96$) for individual factor and global score [16].

Adapted Malay version of Eating Attitude Test-26 (Malay EAT-26)

EAT-26 is a self-report screening tool with 26 items to assess the risk of an eating disorder [4]. It can be used in both clinical and non-clinical population. It has three domains, which are *Dieting, Bulimia and Food Preoccupation*, and *Oral Control*. It uses a 6-point Likert scale with the scale ranging from 1 (never) to 6 (always). The current study shows that Malay EAT-26 has high internal reliability ($\alpha = .82$).

Becks Depression Inventory-Malay (BDI-Malay)

BDI-Malay has established its psychometric soundness among the Malaysian population. It has 20 items to measure the severity of depressive symptoms for the past one week. Higher severity of depressive symptoms is reflected by higher BDI score. There are two main subscales in BDI-Malay, which are cognitive/affective subscale and somatic/performance subscale [17]. BDI-Malay has been reported to have a good to excellent internal reliability with Cronbach's alpha value ranging from $\alpha = .71$ to $.91$ when tested among students, general community, and clinical population [17]. BDI-Malay also has generated high internal reliability in the current study with Cronbach's alpha value of $.89$.

Becks Anxiety Inventory-Malay (BAI-Malay)

BAI-Malay consists of 21 items to measure anxiety symptoms. It is the validated Malay language version of original English BAI. The higher the score of BAI-Malay indicates greater severity of anxiety symptoms. BAI-Malay uses a 4-point Likert with the score of 0 indicating "not at all" to the score of 4 indicating "severely". Mukhtar and Zulkefily conducted a psychometric study on BAI-Malay and established an internal reliability of $\alpha = .91$ [18]. It has also established an acceptable concurrent validity ($r = .22$ to $.67$) with its criterion measures that gauge a similar construct of anxiety. In this study, the internal reliability of BDI-Malay is found to be comparable with a study by Mukhtar and Zulkefily with Cronbach's alpha value of $.92$ [18].

World Health Organization Quality of Life Brief Version Malay (WHO-QoL-BREF-Malay)

WHO-QoL-BREF-Malay has 26 items with a 5-point Likert scale. It assesses individuals' quality of life based on four domains; physical health, psychological, social health, and environment. WHO-QoL-BREF-Malay generated good internal reliability in the range of $\alpha = .64$ to $\alpha = .89$ for all four domains [19]. Nonetheless, in the current study the overall items produced high internal reliability with $\alpha = .92$, which suggest that WHO-QoL-BREF-Malay is a homogenous test in measuring an individual's quality of life. In addition, it has an excellent discriminating ability in distinguishing patients and healthy people [19].

Procedures

Adaptation Procedures

The original English version of EDE-Q 6.0 and EAT-26 were first translated and adapted into the Malay language, nuances, and contexts by two content experts. The content experts have both bilingual abilities (i.e., Malay and English) and doctorate qualifications in Psychology. Next, another two different content experts with bilingual abilities and qualification in psychology back translated the items in EDE-Q 6.0 and EAT-26. Forward and backward translation processes produced two versions of the back-translated questionnaire. A clinical psychologist with a doctorate qualification reviewed, edited, and harmonised the items to ensure they are contextually and semantically relevant to the Malay language and culture, and conceptually relevant to eating disorder. The overall process of adaptation is conducted based on the Guidelines for Test Adaptation by the International Test Commission (ITC) [20].

Pre-Testing and Pilot Testing Procedure

Before the pilot study was conducted, pre-testing procedure was first carried out to test the face validity of the instrument. The participants ($n=5$) signed an informed consent form, completed the questionnaire, and later they were interviewed. The time taken for them to complete the questionnaire was noted, and pre-testing form was handed out in order to get feedback regarding their experience as test-takers.

In the pilot study, 115 questionnaires were distributed, with 94 returned (81.7% response rate). Participants were provided with the information sheet and asked to sign an informed consent form, and later to complete the questionnaire. Next, they were asked regarding the difficulty of answering the items and whether they found any of the items confusing. Again, this is to validate the face validity of the adapted tools.

Ethical Approval

Prior to the administration of questionnaires to the participants, ethics approval (ID No: IREC 2018-228) were obtained from the university research committee where the participants are affiliated to.

Statistical Analyses

For the pilot study, statistical analysis was conducted using IBM SPSS Statistics version 25.0 using the descriptive and inferential statistics. Reliability indices for the internal reliability of Malay EDE-Q 6.0 were measured using Cronbach's alpha coefficient while for equivalent reliability, concurrent, convergent, and divergent validities, Pearson's correlations analyses were used [21]. Magnitudes of .70 for internal reliability is considered acceptable while the correlation indices of more than r

$=.50$ is considered to be moderate to high strength. An Exploratory Factor Analysis (EFA) was run in order to explore the structural indices underlying Malay EDE-Q 6.0.

Results

Pre-testing results

The time taken for the pre-testing participants to complete the questionnaire was within the range of 11 to 18 minutes for 163 items. At the pre-testing levels, two main concerns were raised by the participants regarding the definition of difficult items (i.e., laxatives were translated into Malay as *julap*) and the organization of the questionnaire. Therefore, steps were taken to improve the questionnaire layout and sentence structure.

Pilot test result

After the revision of the pre-testing comments, a pilot test was conducted on 115 undergraduate students of Psychology. A total of 94 students comprising 16 males (17%) and 78 females (83%) completed the questionnaire with a response rate of 82%. The students' age was within the range from 20 to 26 years old, with the mean age of 22.5 ($SD=1.18$). Only eight participants (8.5%) were from races other than Malays (i.e. Chinese and others). Most of them were full-time students, with only nine of them were working part-time. The demographic data are presented in Table 1. Four of the participants had an underlying medical illness, such as slip disc, skin-related illness, and gynaecology problem. Only one of the participants reported underlying depression and bulimia.

Table 1. Sociodemographic profile of the participants ($n= 94$)

		Frequency	%
Gender	Male	16	17
	Female	78	83
Race	Malay	86	91.5
	Chinese	1	1.1
	Others	7	7.4
Marital status	Single	92	97.9
	Married	1	1.1
	Divorced	1	1.1
Occupational status	Full-time	85	90.4
	Student		
	Study and Work Part-Time	9	9.6

Reliability analyses

Data analyses showed that the internal reliability estimation of Malay EDE-Q 6.0 was $\alpha = .94$ at the global level, which is within the acceptable and excellent range. The equivalent reliability between the original English version of EDE-Q 6.0 and Malay EDE-Q 6.0 was shown to be significant at $r = .97$. This indicates that items in both the Malay and English scales are strongly correlated with one another.

Validity analyses

Concurrent validities, convergent, and divergent validities are presented in Table 2. Malay EDE-Q 6.0 showed a strong positive correlation with Malay EAT-26, and at the same time, showed a weak negative correlation with WHO-QoL-BREF-Malay. For construct validity, with six factors that have Eigenvalues of more than 1.0 generated, Malay EDE-Q 6.0 is said to have six underlying constructs among the samples chosen.

Table 2. Validity test of Adapted Malay version EDE-Q 6.0

Validity test of Adapted Malay version of EDE-Q 6.0	Scale (Validity value)
Concurrent	BDI-Malay ($r = .31^*$) BAI-Malay ($r = .27^*$)
Convergent	Adapted Malay version of EAT-26 ($r = .72^*$)
Divergent	WHO-QoL-BREF-Malay ($r = -.37^*$)
Construct validity	EFA: 6 Factors revealed (Eigenvalues >1.0, factor loading >0.3)

Notes: *Correlation is significant at the 0.01 (two-tailed). **Measures:** EDE-Q 6.0 = Eating Disorder Examination Questionnaire 6.0 (EDE-Q 6.0), BDI-Malay = Beck Depression Inventory-Malay, BAI-Malay = Beck Anxiety Inventory-Malay, EAT-26 = Eating Attitude Test-26, WHO-QoL-BREF-Malay = World Health Organization Quality of Life Brief Version Malay. **Analyses:** EFA= Exploratory Factor Analyses.

Discussion

This study conducted small scale reliability and validity analyses of Malay EDE-Q 6.0 among university students. In general, the results indicate Malay EDE-Q 6.0 is a homogenous test with excellent internal reliability in the Malaysian population. This is consistent with the internal reliability of other EDE-Q 6.0 in various languages with high and excellent internal reliability, such as English and the Japanese [15, 16]. Besides, the strong correlation between Malay EDE-Q 6.0 and the original English EDE-Q 6.0 might suggest that these two tests were equally measuring the same construct of eating disorder. Therefore, for this sample, we can either use Malay or English EDE-Q 6.0 scale to measure eating disorder.

In terms of concurrent validities, Malay EDE-Q 6.0 was found to have a weak but positive correlation with the construct of depression and anxiety. A review article by Godart and colleagues conducted a critical literature review to study comorbidity between anxiety and eating disorder, and their results suggested that the extant literature showed scarce and conflicting results with regards to comorbidity between the two conditions [22]. Additionally, a study by Swinbourne and colleagues revealed a high prevalence of eating and anxiety disorder comorbidity [23]. However, several limitations were highlighted in the study, such as focusing on the clinical sample that might cause over-representation

of the illness, and difficulty in identifying the chronology of both eating and anxiety disorder [23].

For convergent validities, the significant positive correlation suggested that the tool studied has strong correlation with Malay EAT-26, and the significant results showed that the scales appeared to be similar in evaluating both constructs of eating disorder. This result is comparable with a study by Mitsui and colleagues, who conducted convergent validation between the Japanese EDE-Q 6.0 original subscales and EAT-26 subscales, which generated moderate correlation with the values of r between .12 to .64 [15]. In terms of divergent validity, divergence to a construct of eating disorder was shown by the significant negative correlation between the instrument and WHO-QoL-BREF-Malay. Thus, it is evident that Malay EDE-Q 6.0 is measuring a different construct than what is measured by WHO-QoL-BREF-Malay. Nevertheless, since none of the present literature conducted divergent validity of EDE-Q 6.0 with WHO-QoL-BREF, the current results cannot be compared.

Most of the literature that conducted construct validation of either the English or their adapted version of EDE-Q 6.0 in population found that their construct validity fit into the three-factor model instead of four [24-28]. None of the studies supported the theoretical four subscales, as suggested by Fairburn and Beglin [10]. This finding, however, is comparable with the results of the current pilot study since the results generated six factors instead of four. However, it should be noted that the participants of this study were only 94 students, which can be considered inadequate sample size to ascertain the factors underlying Malay EDE-Q 6.0 among undergraduate students as the general rule of

thumb for sample size required for EFA is 300 cases [29].

Even though the current study only utilized five samples for the pre-testing and 94 samples for the pilot test, it has several strengths. Firstly, this is the first adaptation and validation study of EDE-Q 6.0 among university students in the Malaysian population. Secondly, the study used a rigorous method of adaptation in line with international guidelines. In addition, the pilot study might enhance the success likelihood of the main study in confirming the assumptions related to psychometrics of EDE-Q 6.0 among the Malaysian population [30]. Also, although the researchers conducted the EFA with 94 participants only, the literature suggested that EFA can be considered significant with only 100 participants when the item loading is 0.3 as reported by the current study [31].

Despite the strengths mentioned, there are several limitations of this research, which included the participants' academic background that was limited to students of Psychology only; hence, limiting the generalizability of the results. Testing different population in both the clinical and non-clinical settings with a larger number of participants is warranted to determine the exact reliability and validity of EDE-Q 6.0 for the Malaysian population. Future validation study may take into consideration these limitations by employing a bigger sample size from various settings (i.e. clinical and non-clinical) and with a wider range of age and ethnicity.

Conclusion

Based on the pre-testing and pilot test results, Malay EDE-Q 6.0 has great potential to be used as a valid and reliable screening tool for eating disorders. However, full

validation study is highly encouraged to be conducted using higher and more varieties of population in order to increase its generalizability. Thus, the main study ought to be carried out to

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