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Original article

Preliminary validation of the Malay Yale Food Addiction Scale: Factor structure and item analysis in an obese population

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SUMMARY

Background and aims: Researchers suggest that the rise in obesity rates may be explained by the addictive properties of certain types of food. In view of the growing obesity epidemic in South-East Asia, there is a need for a psychometric tool to assess the concept of food addiction amongst high-risk populations. The objective of this study is to translate the Yale Food Addiction Scale (YFAS) into the Malay language and subsequently validate its use in an obese population.
Methods: Between the year 2014 and 2015, a total of 250 obese adults were assessed for food addiction utilizing the Malay version of the YFAS at a primary care clinic. An assessment of the psychometric properties of the scale was performed to determine the factor structure, item statistics and internal consistency of the scale.
Results: A one factorial structure of YFAS was confirmed in this study through factor analysis. All items except 4 (items 19, 22, 24 and 25) had factor loadings >0.42. The internal reliability (KR-20) coefficient of the one-factor solution was $\alpha = 0.76$. The mean YFAS symptom count was $M = 2.74$ ($SD = 1.57$) with 10.4% ($N = 26$) of the participants received the diagnosis of food addiction.
Conclusions: The determination of construct validity and the identification of other latent variables in the Malay food addiction model is necessary prior to the formal utilization of the scale as a tool to detect addictive eating patterns in the community.

1. Introduction

Over the span of just a decade, Malaysia has experienced increasing trends in obesity rates in the population [1]. The National Health and Morbidity Survey in 2011 reported a three-fold rise in the prevalence rates of obesity in the country amongst adults aged 18 years old and above. These numbers soared from 4.4% in 1996 to 15.1% in 2011 [1]. Consistent with these findings, Malaysia was recently categorized as the most obese population in South-East Asia [2,3].

The prevalent food environment in Malaysia is known to be associated with the obesity trends seen in Malaysia. Domestically, the availability of food with high sugar content has been identified as a major contributor to diabetes and obesity in the nation [4]. Current literature supports changes in the domestic food environment as a cost-effective step to prevent the exacerbation of obesity levels in the country [4].

Several steps have been taken to mitigate the rising rates of obesity in the country. The cornerstone of these efforts has been health promotion interventions aimed at raising awareness of the health hazards caused by obesity. However, the campaign did not generate health outcomes reflective of a decrease in obesity rates in the population [4]. Therefore, it is necessary to explore alternative strategies that could help ameliorate these escalating trends.

The controversial concept of food addiction was designed to help explain eating behaviours that were related to specific food consumption habits. The idea of food addiction has been discussed as early as the late 1950s [5]. Although not fully recognised as a clinical disorder at present, the theory argues that food rich in carbohydrate, fat or salt levels could potentiate certain symptoms

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related to addiction, especially in an obese population [6–10]. Recent findings suggest that the rise in the rates of obesity, overeating and binge eating habits could be linked to the concept of food addiction [10]. Neuro-imaging studies in obese individuals with abnormal eating behaviors bear close resemblance to drug dependent tendencies [11–13]. Despite preliminary proof that food addiction has neurological similarities in both humans and rats, experts believe that more experiments in this field are required before determining the practicality of this concept [6,11,14].

The Yale Food Addiction Scale (YFAS) appears to facilitate the detection of addictive symptoms related to certain food types, especially food containing high fat and sugar content [15]. The self-administered questionnaire is designed to provide insight into the possibility of food addiction in the population. YFAS has demonstrated good reliability and validity in both clinical and non-clinical participants. The validated English version of the YFAS showed adequate internal consistency (Cronbach $\alpha = 0.86$) and good construct validity [15]. In addition, the scale has also been validated in German, French and Italian with similar psychometric properties [16–18].

Currently, no formal studies have been conducted to evaluate the usefulness of screening for the plausibility food addiction in an obese population in Malaysia. At the time of this study, there were no translated versions of the Binge Eating Scale (BES) and Bulimic Investigatory Test, Edinburgh (BITE) scale in Malay to test the construct validity of the YFAS scale. Thus, this study aims to perform a preliminary validation the YFAS questionnaire amongst obese respondents in Malaysia.

2. Methods

2.1. Population and sample characteristics

A cross-sectional study was conducted between November 2014 and June 2015. The study employed the purposive sampling of obese patients attending a regional primary care clinic. The inclusion criteria for this study were, 1) Malaysian adults between 18 and 65 years of age, 2) participants who were fluent in the Malay language, and 3) obese patients (BMI $\geq$ 30 kg/m^2) [1]. The exclusion criteria include 1) patients suffering from psychological/neurological conditions (any history of eating disorders, depression, anxiety, schizophrenia or stroke was identified through a review of individual patient case records) and, 2) those who were unwilling to participate in the study.

Permission to translate and validate the Malay version of the YFAS questionnaire was acquired from Dr. Ashley Gearhardt. Ethical approval to conduct the study was granted by the Medical Research Ethics Committee, Ministry of Health Malaysia (NMRR ID: NMRR-14-1426-22829).

2.2. The instrument (The Yale Food Addiction Scale)

The Yale Food Addiction Scale (YFAS) is a self-administered questionnaire designed to measure symptoms of food addiction experienced by individuals over a 12 month time period [15]. The questionnaire consists of 7 food addiction criteria which evaluate food addiction symptoms in accordance with the Diagnostic and Statistical Manual of Mental Disorder IV (DSM-IV-TR) [19]. YFAS has a total of 25 items evaluating 7 food addiction constructs.

The constructs examined in the YFAS scale include 1) tolerance (items 20 and 21), 2) withdrawal (items 12, 13, 14), 3) the intake of a substance in larger amounts or over a longer period than was intended (Items 1, 2, 3), 4) a persistent desire or unsuccessful effort to cut down or control substance use (Items 4, 22, 24,25), 5) spending a great deal of time in activities necessary to obtain the substance, use the substance, or recover from it effects (Items 5, 6, 7), 6) giving up social, occupational or recreational activities because of substance use (Items 8, 9, 10, 11), and, 7) continuing the substance with the knowledge that it is causing or exacerbating a persistent or recurrent physical or psychological problem (Item 19) [20]. The YFAS has 2 additional items assessing clinically significant impairment or distress caused by eating behaviour of respondents (items 15 and 16). Items 17, 18, and 23 are not scored and serve as primers for other items in the questionnaire.

The responses to all 25 items in the questionnaire were utilized to calculate individual scores for both symptom count and the diagnosis of food addiction. Specific predetermined cut-offs have been defined (in accordance with the original YFAS study) to allow the classification of the 7 DSM-IV-TR diagnostic criterions when 1 or more items representing that criterion were endorsed [20]. The symptom count version (scores ranging from 0 to 7) describes the level of dependence experienced in the past 12 months. The diagnostic version of the YFAS predicts the diagnosis of food addiction when 3 or more symptoms were present during the past 12 months with clinically significant impairment or distress.

2.3. Translation process

The translation process (Fig. 1) of the YFAS questionnaire was carried out by experts from both medical and linguistic background. A family medicine specialist and a licensed linguist (translator from the Institute of Language And Literature of Malaysia) worked independently to form the team involved in the initial translation process of the questionnaire into the Malay language. The translated version was then back-translated into English separately by 2 medical officers and a language expert.

2.4. Pilot testing

Two rounds of pilot testing were performed on the draft questionnaire (Appendix 1 and 2). A total of 30 respondents were recruited into the study during the first round of pilot testing. The respondents were selected from a group of patients who fulfilled the inclusion criteria of the study. The participants were inquired by the investigators if they faced any difficulty in answering the items in the questionnaire. The feedback obtained from the respondents was then utilized to design an improved version of the questionnaire. Subsequently, the revised version was used during the second pilot testing consisting of 50 participants. Based on the findings of the second pilot testing phase, a consensus on the final revised questionnaire was agreed upon by a panel who were qualified in the discipline of family medicine, nursing and dietetics.

2.5. Preliminary validation study

The preliminary validation of the translated version of the questionnaire was then conducted on the study population. After obtaining their consent to participate in the study, the investigators recruited participants who were found to be obese (BMI more than 30.0 kg/m^2) as determined by individual measurements of weight and height. The patients were then requested to complete the demographic section of YFAS questionnaire. Additionally, the new questionnaire incorporated questions related to food preference of the participants. This information formed a part of a larger study to determine the relationship between food intake patterns and the diagnosis of food addiction or symptom counts.

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