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Grupo Aula Médica
Madrid, España

Available in: http://www.redalyc.org/articulo.oa?id=309226786043
Validation of a questionnaire on emotional eating for use in cases of obesity; the Emotional Eater Questionnaire (EEQ)

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Abstract

Introduction: Emotions have a powerful effect on our choice of food and eating habits. It has been found that in some people there is relationship between eating, emotions and the increased energy intake. This relationship should be measurable to better understand how food is used to deal with certain mood states and how these emotions affect the effectiveness of weight loss programs.

Objective: To develop and analyze the psychometric characteristics of a questionnaire on emotional eating for obesity easy to apply in clinical practice.

Subjects and methods: A ten-item questionnaire called Emotional-Eater-Questionnaire (EEQ) was developed and administered to a total of 354 subjects (body mass index, 31 ± 5), aged 39 ± 12, who were subjected to a weight-reduction program. The questionnaire was specifically designed for obesity. Analysis of the internal structure, internal consistency, test-retest reliability and convergent validity with Mindful-Eater-Questionnaire (MEQ) were conducted.

Results: After principal components analysis, the questionnaire was classified in three different dimensions that explained 60% of the total variance: Disinhibition, Type-of-food and Guilt. Internal consistency showed that Cronbach’s alpha was 0.773 for the “Disinhibition” subscale, 0.656 for the “Type of food” subscale and 0.612 for the “Guilt” subscale. The test-retest stability was r = 0.70. The data showed that the percentage of agreement between the EEQ and the MEQ was around 70% with a Kappa index of 0.40; P < 0.0001.

Conclusion: We have presented a new questionnaire, which classifies individuals as a function of the relation between food intake and emotions. Such information will permit personalised treatments to be designed by drawing up early strategies from the very beginning of treatment programmes.

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DOI:10.3305/nh.2012.27.2.5659

Key words: Emotional-Eater. Obesity. Questionnaire. Validity.

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Recibido: 10-XII-2011.
Aceptado: 15-XII-2011.
Introduction

Obesity is a heterogeneous syndrome with an increasing prevalence in many countries.1,2 It is considered the result of a variety of interactions between genetic, social, economic, endocrine, metabolic and psychopathological factors.3 Association between obesity and psychopathology is a controversial issue. However, there is substantial evidence that obesity increase the risk of depression,4 and moderate evidence about positive association between obesity and anxiety disorders.5

Emotional eating has been defined as “eating as a response to a range of negative emotions, such as anxiety, depression, anger and loneliness”.6 It is well known that our emotions have a powerful effect on our choice of food and eating habits.6-12 As we seek emotional well being.13 Until now, seeking relief in food has been considered a strategy to alleviate anxiety, sadness and other negative emotions, in many cases as a result of following a long term diet or other problems that occur in our daily lives.3,14-16

Several studies support the idea that there is a relationship between eating, emotions and the increased energy intake.17-19 This relationship should be measurable to better understand how food is used to deal with certain mood states and how these emotions affect the effectiveness of weight loss programs.

The exact process by which emotions affect eating behavior emerges as one of the central unanswered questions in the field of emotional eating.20 It has been found empirical support that the influence of emotions on eating behavior is stronger in obese people than in non-obese people than in non-dieters and in dieters than in non-dieters.20 It also has been suggested that emotion itself may not be responsible for overeating but rather the way in which the emotion is dealt with.21

One of the most commonly used psychological tools for studying eating behavior is the Three Factor Eating Questionnaire22 (TFEQ), which explores three dimensions of eating behaviour: restraint (cognitive restraint of eating), disinhibition and hunger. However, this questionnaire is very long (51 items) and its usefulness for obese women is unclear since the correlation between the subscales of restraint and disinhibition and the values of weight and basal Body Mass Index (BMI) is weak.23 In contrast, the Mindful Eating Questionnaire (MEQ),24 which describes a non-judgemental awareness of physical and emotional sensations associated with eating, has been proposed as a useful weight loss tool. Moreover, the mean MEQ summary score has previously been associated with obesity. Other questionnaires, such as The Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire, the Dutch Eating Behaviour Questionnaire (DEBQ) and the Emotional Eating Scale (EES) are also useful to assess emotions and other non-traditional factors that contribute to overweight and obesity.25-27 However, some of these questionnaires are designed to assess eating disorders, are not specific for obesity, or are too long or complicated to be applied in the clinical practice of obesity by the nutritionist.

Methods

Participants

The anthropometric characteristics of the study population are shown in Table I.

The initial sample was composed of 354 overweight or obese subjects (84% women) aged 39 ± 12 years; BMI 31.6 ± 5.4 kg/m². All the subjects were voluntarily attending a nutrition clinic in south-eastern Spain for dietetic and behavioural treatment to lose weight based on the principle of the Mediterranean diet and behavioural and cognitive techniques (Método Garaulet©) as described previously.28 Exclusion criteria were: Aged under 14 or above 75 years and BMI ≤ 25 kg/m². Also excluded were patients diagnosed as bulimic, prone to binge eating or undergoing treatment with anxiolytic or antidepressive drugs. A test-retest study was conducted in 122 participants. These participants completed the Emotional Eater Questionnaire (EEQ) twice, with a an average interval period of 3.5 (SD:1.1) months. The same number of subjects completed the MEQ questionnaire.

Procedures

Administration of the questionnaires took place during the period from January 2011 to May 2011. Each questionnaire was completed anonymously during group therapy in weight loss treatment, under the supervision of a nutritionist. The questions were carefully explained by the nutritionist to ensure complete understanding and to avoid any questions remaining unanswered.

The written informed consent was obtained before subjects were accepted and was performed in accordance with the Helsinki Declaration of Human Studies and approved by the Ethical Committee of the University of Murcia.
Instruments

A ten-item questionnaire was developed to assess to what extent emotions affect eating behaviour. This questionnaire was called the Emotional Eater Questionnaire (EEQ). All the questions had four possible replies: 1) Never, 2) Sometimes; 3) Generally and 4) Always. Each reply was given a score of 1 to 4, the lower the score, the healthier the behaviour. For the clinical practice subjects were classified in four groups attending to the score obtained. Score between 0-5: non-emotional eater. Score between 6-10: low emotional eater. Score between 11-20: emotional eater. Score between 21-30: very emotional eater. See table IIa in English and table IIb in Spanish.

The Mindful Eating Questionnaire (MEQ) (24) describes a nonjudgmental awareness of physical and emotional sensations associated with eating. It was validated with adults (range 18 to 80 years), mostly validation of a questionnaire on emotional eating
women (81%), some of them enrolled in different weight loss programs. It has 28 items scored one to four, where four indicated higher mindfulness. Exploratory factor analysis found a solution of following factors: disinhibition (8 items; ex., “When I eat at “all you can eat” buffets, I tend to overeat”), awareness (7 items; ex., “I notice when there are subtle flavors in the foods I eat”), external cues (6 items; ex., “I recognize when food advertisements make me want to eat”), emotional response (4 items; ex., “When I’m

| Table IIb | Cuestionario de Comedor Emocional Garaulet (CCE) |

| 1. ¿La báscula tiene un gran poder sobre ti? ¿Es capaz de cambiar tu estado de humor? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 2. ¿Tienes antojos por ciertos alimentos específicos? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 3. ¿Te cuesta parar de comer alimentos dulces, especialmente chocolate? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 4. ¿Tienes problemas para controlar las cantidades de ciertos alimentos? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 5. ¿Comes cuando estás estresado, enfadado o aburrido? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 6. ¿Comes más de tus alimentos favoritos, y con más descontrol, cuando estás solo? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 7. ¿Te sientes culpable cuando tomas alimentos “prohibidos”, es decir, aquellos que crees que no deberías, como los dulces o snacks? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 8. Por la noche, cuando llegas cansado de trabajar ¿es cuando más descontrol sientes en tu alimentación? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 9. Estás a dieta, y por alguna razón comes más de la cuenta, entonces piensas que no vale la pena y ¿comes de forma descontrolada aquellos alimentos que piensas que más te van a engordar? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

| 10. ¿Cuántas veces sientes que la comida te controla a ti en vez de tú a ella? |
|-------------------|-------------------|-------------------|-------------------|
| Nunca             | A veces           | Generalmente      | Siempre           |

Valores: Valor “0” = Nunca; Valor “1” = A veces; Valor “2” = Generalmente; Valor “3” = Siempre.

Para la práctica clínica:

Puntuación entre 0-5: Eres un Comedor No Emocional. Tus emociones influyen poco o nada en tu comportamiento alimentario. Ya puedes decir que eres una persona con gran estabilidad en lo que se refiere al comportamiento alimentario, y que seguramente comes cuando fisiológicamente sientes apetito, sin tener en cuenta los factores externos ni tus emociones.

Puntuación entre 6-10: Eres un Comedor poco Emocional. Sigues siendo una persona poco emotiva respecto a tu alimentación. Es raro que soluciones tus problemas o tus nervios con la comida. Sin embargo, ya sientes que ciertos alimentos influyen sobre tu voluntad y que la comida, es algo más que comida.

Puntuación entre 11-20: Eres un Comedor Emocional. Tus respuestas indican que en cierta medida tus emociones influyen en tu alimentación. Los sentimientos y el estado de ánimo en algunos momentos de tu vida determinan cuánto y cómo comes. Aún así, aunque eres un comedor emocional, todavía la comida no controla tus acciones sino que sigue siendo tú quien domina tu alimentación.

Puntuación entre 21-30: Está claro que eres un Comedor Muy Emocional. Si no te cuidas, la comida llegará a controlar tu vida. Tus sentimientos y emociones girarán constantemente alrededor de tu alimentación y, si no tomas las medidas, puedes llegar a sufrir algún tipo de desorden en el comportamiento alimentario que te puede llevar a enfermedades como la anorexia y la bulimia.”
sad I eat to feel better”), and distraction (3 items; ex., “My thoughts tend to wander while I am eating”). The internal consistency (Cronbach’s alfa) were 0.83, 0.74, 0.70, 0.71 and 0.64 respectively. The total mean MEQ score was 2.92 ± 0.37, with Chronbach’s alfa of 0.64.

Statistical analysis

Figure 1 represents the different steps followed for the validation. The psychometric assessment was conducted in two distinct phases. First, we studied the internal structure of the scale. The replies to the questionnaires were analysed by principal components analysis to determine whether the different variables could be grouped in a lower number of factors. A rotation of maximum variance method (varimax) was used. The number of factors to be extracted from the rotated pattern matrix was determined by factor eigenvalues above 1.0.30 Items were to be used if their primary factor loading was at least (0.40).29,30

Internal consistency of the questionnaire was assessed by means of Cronbach’s alpha reliability index. Second, temporal stability and convergent validity were analyzed in a subsample. To determine temporal stability, test-retest reliability was estimated by means of Pearson’s correlation coefficient. Convergent validity between the EEQ and the previously validated MEQ was assessed by means of Kappa’s Index concordance. We considered as satisfactory reliability indicators Cronbach’s alpha and test-retest correlations higher than 0.7.31 All the analyses were carried out with SPSS for Windows (version 15.0).

Result

Validity and reliability of EEQ

Internal structure of the EEQ

Table III shows the results of the principal components analysis after giving the questionnaire to the patients of the total sample (n = 354).

Varimax rotation identified three factors that explained 60% of the total variance. The first (which explained 25% of the variance) included questions related with disinhibition, like “Do you feel less control over your diet when you are tired after work at night?” or “Do you eat more of your favourite food and with less control when you are alone?”. The second factor (explaining 18.5% of the variance) included questions related with the type of food for which patients find it most difficult to exercise control; for example, “Do...”
you crave specific foods?”. Finally, the factor that least explained the variance (16%) included questions related with patients’ emotions and their relation with the weighing scales and the sense of guilt that eating “forbidden” foods (e.g. sweets or snacks) produces.

Cronhach’s alpha was 0.773 for the “Disinhibition” subscale, 0.656 for the “Type of food” subscale and 0.612 for the “Guilt” subscale.

Test-retest reliability and convergent validity

Linear correlations demonstrated good agreement between the first and second administrations of the EEQ (test-retest reliability) ($r = 0.702; P < 0.0001$).

For testing convergent validity the EEQ was compared with MEQ. Data showed that the percentage of agreement between the EEQ and the MEQ was around 70% with a Kappa index of 0.40; $p < 0.0001$.

Discussion

The present work develops a compact questionnaire that is easy to administer in clinical practice. It is valid and reliable in evaluating the degree of emotion in relation with food intake in subjects considered overweight or obese.

An often forgotten aspect in treating obesity and one that is often overlooked by nutritionists is the emotional state of patients and the consequences of different behavioural patterns on weight loss and the effectiveness of treatment. From the results of this study and based on the grouping of the questions after principal components analysis, three important aspects can be identified for treating patients. The first factor, or F1, “Disinhibition” groups the questions that refer to discontrol in terms of eating. The second factor (F2) includes questions related with the “type of food” that patients eat most frequently in given situations. Lastly, the third factor (F3) refers to the “sense of guilt” felt by individuals when they look at the weighing scales or the consumption of forbidden foods.

“Disinhibition” (F1) corresponds to a tendency to lose control over one’s eating behaviour and ingest excessively large quantities of food substances in response to a variety of cues and circumstances.33 It has already been described how the inability to control food-related impulses and cravings is determined by the individual character of each person. In this respect, application of the present questionnaire should help detect those patients who have the greatest need to develop self-control in the face of impulses since these are precisely the patients who will have greatest difficulty in achieving weight loss. The questionnaire should also help in the early detection of eating disorders since “fearing loss of control over eating” is one of the feelings that help to discriminate between eating disorder and healthy groups of women.34

The construct of disinhibition, was recently found to be one of the feelings that help to discriminate between eating disorder and healthy groups of women.34 The construct of disinhibition, was recently found to be one of the feelings that help to discriminate between eating disorder and healthy groups of women.34 The construct of disinhibition, was recently found to be one of the feelings that help to discriminate between eating disorder and healthy groups of women.34 The construct of disinhibition, was recently found to be one of the feelings that help to discriminate between eating disorder and healthy groups of women.34 The construct of disinhibition, was recently found to be one of the feelings that help to discriminate between eating disorder and healthy groups of women.34 The construct of disinhibition, was recently found to be one of the feelings that help to discriminate between eating disorder and healthy groups of women.34

The second factor (F2) in our questionnaire explained 18.5% of the variance (table II) and contained questions like Is it difficult for you to stop eating sweet things, especially chocolate? And “Do you crave specific foods? and mentions the “types of food” ingested in the above mentioned situations. Foods with a high calorie content, such as ice cream, biscuits and chocolate are closely related with discontrol36 and are used to combat negative emotions37,38 since their consumption is associated with the production of endogenous opiates and serotonin,39 both directly involved with the emotions.20,40

Guilt and fear of the scales are variables in the third factor (F3) of the analysis, or third subscale. It has been described how food is converted into a conflict between guilt and pleasure in more emotional individuals.32 Our findings show this to be the least important factor since it only explains 16% of the variance. Moreover, this dimension presents a reliability index (Cronbach’s alpha) of 0.62, being only represented by two items. Even so, the dimension could be useful in clinical practice since it is related to the early prediction of binge eating disorders.42

When the EEQ was compared with the previously validated Mindful Eater Questionnaire (MEQ), there was a high degree of agreement. For both questionnaires the subscales with the greatest weight in the principal components analysis was “Disinhibition”, although in the MEQ this subscale mainly refers to “external disinhibition”, which in general is more weakly related with weight loss. In the EEQ, on the other hand, the relevant questions refer to emotional or cognitive situations (internal disinhibition). The main purpose of the EEQ is detect a propensity to obesity and to predict weight loss success in further studies and it was previously demonstrated that of the 5 subscales of the MEQ the largest difference between BMI categories was for the emotional response.24 Another important difference between the EEQ and MEQ is that the latter considers critically important the study of environmental cues, which makes the questionnaire very specific and poorly applicable to people living in the Mediterranean region with its different environment from the North American environment. Lastly, the MEQ includes an important subscale “awareness” which confers further complexity to the questionnaire since our patients found these questions the most difficult to answer (data not shown).

The strengths of the present study are the following: 1) It was specifically designed for obesity; 2) Validation of the questionnaire was performed through prin-
pential component analysis, internal consistency, test-retest reliability and convergent validity with MEQ.

One limitation is that, although the overall reliability of the questionnaire is high, the “Guilt and fear of the scales” subscale presented a relatively low reliability index of around 0.60. Subsequent refinement of the test could include new questions to increase the reliability of these dimensions.

In summary, we have presented a new questionnaire which classifies obese individuals as a function of the relation between food intake and emotions in the clinical practice. Such information will permit personalised treatments to be designed by drawing up early strategies from the very beginning of treatment programmes.

Acknowledgements

This work was supported by the The Spanish Government of Science and Innovation (project BFU2011-24720).

References