Validation of a new Brazilian version of the “Night Eating Questionnaire”

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ABSTRACT

Objectives: The Night Eating questionnaire (NEQ) is regarded as an important tool for the assessment of the severity of the Night Eating Syndrome. The objective of this study was to validate a new Brazilian Portuguese version of the NEQ that could be easily applied to patients from the public health system. Methods: In order to develop the Brazilian Portuguese version of the NEQ, we adopted the following steps: (a) translation, (b) back-translation, (c) comparison between translation and back-translation and (d) pretest. Subsequently, intra and inter-observer reproducibility were assessed in 37 patients from the Endocrinology Outpatient Clinic at the University Hospital of the Federal University of Ceará, Brazil. The reliability of the questionnaire was evaluated in 90 individuals from the same Institution. The construct validity of the NEQ was assessed by correlations with clinical variables. Results: This new translated and culturally adapted version showed excellent internal consistency (alpha coefficient = 0.87) and reproducibility both intra-observer and inter-observer (individual item coefficients ranging from 0.95 to 1.0 and 0.92 – 1.0, respectively). Conclusions: These results indicate that this Brazilian Portuguese version of the NEQ is a valid and reliable instrument for the assessment of patients with nocturnal eating problems and is equivalent to its original version. No major cultural adaptations were introduced to the questionnaire during the validation process, despite significant linguistic and cultural differences.

Keywords: adaptation, circadian rhythm, eating disorders, obesity, questionnaires, sleep.

INTRODUCTION

Night Eating Syndrome (NES) is a common clinical condition that affects about 1.5% of adults and may be associated with impaired daytime performance, poor quality of sleep and excess weight\textsuperscript{1,2}. NES is currently characterized by night hyperphagia preceding the onset of sleep; initial or midphase insomnia; nighttime awakenings, usually without amnesia and accompanied by eating, and morning anorexia\textsuperscript{3}.

NES should be differentiated from Sleep-Related Eating Disorder, a syndrome in which the abnormal eating behavior involves the ingestion of bizarre or atypical foods after partial arousal with a reduced level of consciousness. In such cases, unlike patients with NES, episodes of food intake are usually described as involuntary or “out of control” and occur with partial or complete amnesia of the events\textsuperscript{8}.

NES was originally described more than 50 years ago in patients with resistant obesity from a specialist clinic\textsuperscript{9}. Subsequent studies have generally confirmed the presence of a significant association between NES and obesity. In subjects of normal weight, the prevalence of NES was 0.4%; in contrast, the prevalence of the disorder was between 6% and 14% for patients seeking weight reduction treatment\textsuperscript{10-12}. Unfortunately, the data currently available are insufficient to determine whether NES promotes weight gain and to what extent excess weight can increase nocturnal food intake\textsuperscript{11}. The high prevalence of NES has also been reported in elderly patients with type 2 diabetes (3.8%)\textsuperscript{10}, in patients with sleep apnea (8.6%)\textsuperscript{11} and in psychiatric patients (12%), particularly those presenting with substance abuse\textsuperscript{10}.

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One of the main features of NES is the delay in the circadian rhythm of food intake. In normal subjects there is a period of prolonged fasting during nocturnal sleep that can last about 12 consecutive hours. During this entire period, mechanisms related to circadian rhythms and sleep operate together to promote the regulation of glucose metabolism and appetite modulation. This is contrary to what can be seen in fasting during sedentary wakefulness, where glucose levels are gradually reduced. In subjects with NES, a 90-minute delay has been described in the circadian rhythm of ingestion of calories, carbohydrates and fats, which is accompanied by a significant delay in the rhythm of the regulatory hormones insulin and leptin. There is also a delay in the rhythms of melatonin, cortisol, prolactin and thyroid-stimulating hormone. It is speculated that these changes are due to the involvement of three distinct neuroendocrine systems: the glucocorticoid system, the melanocortin system and the serotonergic system.

The Night Eating Questionnaire (NEQ) is an instrument designed to assess the severity of symptoms and to assist in identifying patients with NES. The first version of the NEQ in English (unpublished), contained nine items with four points each on a Likert scale. The instrument assessed morning anorexia (two items); nocturnal hyperphagia (one item), initial insomnia (one item); maintenance insomnia (one item); food intake at night (one item) and mood (three items). With the increase in knowledge concerning NES, the NEQ was revised, and new items were included. Subsequently, two updates were published. The current version of the NEQ contains 14 items with five options each. The five new questions were introduced to better address the psychological aspects of the disorder, such as wishes and feelings regarding control of night eating and binge eating to get back to sleep.

A critical factor to be considered when using any questionnaire is its suitability to the country where it will be used and knowledge of its measurement properties in that context (i.e., its reproducibility, reliability, validity and sensitivity to changes). Briefly, reproducibility is a measure of consistency of results when the questionnaire is repeated at different times (intra-observer reproducibility) or by different observers (interobserver reproducibility). The intraclass correlation coefficient is the most suitable for the determination of reproducibility, as it accounts for the variability due to observers, patients, and random error in its calculation. Reliability is measured by the Cronbach alpha coefficient, which assesses the internal consistency of the questionnaire components. The validity of an instrument is its ability to measure what is intended to be measured. The main types of validity to be considered when selecting a questionnaire are content, criterion and construction validity. Content validity concerns the relevance of the questions that compose the instrument, including understanding and lack of ambiguity of the scale. Criterion validity refers to the correlation of the scale with other measurements of the disease considered the gold standard, which eventually may not be available. Another way to measure validity is to determine whether there are correlations with other supposedly related variables. These correlations derive theoretically from hypotheses that are based on the concept that the variables being measured are associated. Sensitivity to change is defined as the scale’s ability to detect changes due to treatment or associated with the history of the disease. This property is more important when the measure has an evolving purpose and is of little relevance to predictive or discriminative instruments.

A Portuguese version of the NEQ was previously published. For its construction, translation, back translation, correction, adaptation and validation of the semantic content were performed. A limitation of that study was the inclusion of individuals from Southern Brazil who had very high education levels compared to the national average. It is widely recognized that educational level influences health and lifestyle outcomes assessed by self-reported measures. Therefore, it is reasonable to assume that the comprehension of questions and, consequently, the answers obtained may have been affected. Because education level closely reflects the socio-economic situation, it is likely that the subjects studied belonged to a more favorable socio-economic category than the general Brazilian population and, therefore, were endowed with greater cognitive ability and greater access to information and health services.

Given these facts, a new Portuguese translation was completed in the present study; this was followed by cultural adaptation, with content and construction validation, and determination of reliability and reproducibility. We use a more representative sample of public health system users in an attempt to obtain a more appropriate instrument to be used widely in our country.

**MATERIAL AND METHODS**

**Translation and cultural adaptation of the Night Eating Questionnaire**

The Portuguese translation of the instrument, followed by cultural adaptation for application to Brazilian patients, was based on the latest version of the English questionnaire, which consists of 14 questions, each with five options. In this version of the NEQ, the following aspects are addressed: morning anorexia (two questions); desires and control over eating behavior after dinner and before bed (two questions) and during nighttime awakenings (two questions); percentage of food consumed after dinner (one question); insomnia (one question); frequency of night awakenings and food intake (three questions); mood swings (two questions); and awareness of nocturnal episodes of food intake (one question). For the translation, the following steps were performed:

**Initial Translation** - Two independent translators, aware of the objectives of the study, translated the English questionnaire into Portuguese. Then the two translations were compared, and in cases of differences, modifications were made by consensus.

**Back translation** - Two new translators, who were not aware of the goals of the study and without prior...
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knowledge of the questionnaire in English, performed a back translation (from Portuguese into English). The two English versions were then compared to the original questionnaire.

Revision of translations - Researchers met and discussed all differences and discrepancies arising from the questionnaire translation and back translation processes and obtained a Portuguese version by consensus.

Evaluation of cultural equivalence - The Portuguese version was administered to groups of six subjects who were consecutively recruited among overweight and obese patients who attended regular appointments at the endocrinology clinic at the Walter Cantidio University Hospital of the Ceara Federal University (Hospital Universitário Walter Cantidio / Universidade Federal do Ceará - UFC). For each question, the patients were asked to report whether they understood and to provide their interpretation of the question. After administering the questionnaires to the six individuals, the authors made modifications as needed. A final version was obtained after administering the questionnaire to 12 patients.

Measurement properties of the Night Eating Questionnaire

Reproducibility - The reproducibility of the final version of the NEQ in Portuguese was measured by applying the questionnaire to overweight or obese patients who consecutively attended regularly scheduled consultations at the Endocrinology and Obesity Surgery Clinic of the UFC Hospital. Patients of both genders, aged between 18 and 60 years, with a BMI above 25 were asked to participate in this stage of the study. We excluded patients with serious comorbidities, including neoplasms, congestive heart failure, kidney failure or liver failure, amaurosis, severe psychiatric disorders, history of alcohol or drug abuse; patients using sedatives or hypnotics; women who were pregnant or breastfeeding, patients who had previously undergone bariatric surgery; and patients who opted out. The final sample consisted of 37 patients, 11 with 25≤BMI<30 and 26 with BMI≥30. They completed the questionnaire in three distinct stages. On the first day, they were interviewed separately by two investigators (observer 1 and 2) with an average interval of 30 minutes between interviews to determine interobserver reproducibility. After one week, they were contacted by telephone and interviewed again by observer 1 (intra-observer assessment). Reproducibility (intra- and interobserver) was calculated using the intra- and inter-class correlation coefficients, respectively. All interviews were conducted in the morning.

Reliability - The reliability of the scale was determined by Cronbach’s alpha coefficient, which measures the homogeneity of the components of the scale; i.e., the internal consistency of the 14 items that make up the final score of the instrument. For this purpose, the scale was administered to 90 adult patients of both genders, with or without overweight or obesity, with regular follow-up in the Endocrinology and Obesity Surgery outpatient clinics of the UFC Hospital. Similar exclusion criteria to those described in the previous step of reproducibility were adopted to evaluate reliability.

Validation - Content validity was determined, as previously described, for the item of cultural equivalence. Construct validity was determined through correlation analysis between the NEQ score and BMI, which was considered to be an associated variable; this was done concomitant with the reliability assessment.

The study followed international standards for research involving human subjects and was approved by the UFC Committee on Research Ethics. All participants signed informed consent forms.

Statistical analysis

Cronbach’s alpha was used to determine the reliability of the NEQ. We used the inter- and intra-class correlation coefficients to analyze inter- and intra-observer reproducibility, respectively. In comparing the obese and non-obese groups, we used Student’s t-test to evaluate the age, BMI and NEQ total score variables; Fisher’s test was used to analyze the gender, NEQ≥ 25 and NEQ≥ 30 variables. For the analysis, we used SPSS version 16.0 (SPSS Inc., Chicago, USA). Data are presented as the mean and standard deviation (SD) or percentages when appropriate. The significance level was set at p<0.05.

RESULTS

Translation and cultural adaptation of the Night Eating Questionnaire

The stages of translation and cultural adaptation of the NEQ content are summarized in Table 1. The instrument in its final version is presented in Table 2.

Evaluation of the reproducibility of the translated and culturally adapted version of the Night Eating Questionnaire

To assess the reproducibility of the new translated version of the NEQ, we evaluated 37 patients (mean age (±SD) of 45.0±11.0 years). Of the sample, 10 (27%) were male. The educational level was determined in 35 patients and is as follows: 64.9% finished elementary school, and 29.7% finished high school. The NEQ score was 13.3±9.5 in patients who completed elementary school and 14.2±6.1 in patients who completed high school with no significant difference between groups (p=0.7). The intra- and inter-class correlation coefficients were above 0.70 for all questions (Table 3).

Evaluation of reliability and construct validity of the translated and culturally adapted version of the Night Eating Questionnaire

To assess the reliability of the NEQ, 90 patients were studied (ages ranging from 19 to 78 years [mean age = 46.2 ± 11.5 years]). Of the sample, 26 were male (28.9%). The BMI ranged from 16.6 to 67.5, averaging 33.6 (± 9.2). The NEQ score ranged from 1 to 44 points, averaging 11.4 (± 6.9) (Table 4). Assessing the reliability of the NEQ using Cronbach’s alpha showed an overall coefficient of 0.87. The alpha coefficient calculated for each item is presented in Table 5.
Table 1. Evaluation of semantic equivalence between the original instrument "Night Eating Questionnaire" in English, the translated and back-translated versions and the final version in Portuguese.

<table>
<thead>
<tr>
<th></th>
<th>Original version</th>
<th>Translated version</th>
<th>Back-translated version</th>
<th>Final version</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>When do you usually eat for the first time?</td>
<td>2. Quando você se alimenta pela primeira vez?</td>
<td>2. What time do you have your first meal?</td>
<td>2. Quando você geralmente se alimenta pela primeira vez?</td>
</tr>
<tr>
<td>3.</td>
<td>Do you have cravings or urges to eat snacks after supper, but before bedtime?</td>
<td>3. Você tem desejo ou necessidade de fazer lanches depois do jantar e antes da hora de dormir?</td>
<td>3. Do you feel like having snacks after dinner or before going to bed?</td>
<td>3. Você tem um forte desejo ou uma necessidade de fazer lanches no período após o jantar até a hora de dormir?</td>
</tr>
<tr>
<td>4.</td>
<td>How much control do you have over your eating between supper and bedtime?</td>
<td>4. Que controle você tem sobre a sua fome entre o jantar e a hora de dormir?</td>
<td>4. Are you able to control your hunger between dinner and going to bed?</td>
<td>4. Que controle você tem sobre sua alimentação entre o jantar e a hora de dormir?</td>
</tr>
<tr>
<td>5.</td>
<td>How much of your daily food intake do you consume after supertime?</td>
<td>5. Que quantidade de sua ingestão diária de comida você consome depois do jantar?</td>
<td>5. How much of your daily food intake you have after dinner?</td>
<td>5. Considerando toda a sua ingestão diária de alimentos, que quantidade você come depois do jantar?</td>
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<tr>
<td>7.</td>
<td>When you are feeling blue, is your mood lower in the:</td>
<td>7. Quando você está triste, seu humor é mais baixo?</td>
<td>7. When you are sad, your mood is usually down?</td>
<td>7. Quando você está triste, seu humor é mais baixo?</td>
</tr>
<tr>
<td>8.</td>
<td>How often do you have trouble getting to sleep?</td>
<td>8. Com que frequência você tem dificuldade para dormir?</td>
<td>8. How often do you have difficulties to sleep?</td>
<td>8. Com que frequência você tem dificuldade para adormecer?</td>
</tr>
<tr>
<td>9.</td>
<td>Other than only to use the bathroom, how often do you get up at least once in the middle of the night?</td>
<td>9. Com exceção de idas apenas ao banheiro, com que frequência você se levanta no meio da noite pelo menos uma vez?</td>
<td>9. Except for going to the bathroom, how often do you wake up at least once in the middle of the night?</td>
<td>9. Quantas vezes por semana você se levanta no meio da noite, sem contar as vezes em que você vai somente ao banheiro?</td>
</tr>
<tr>
<td>10.</td>
<td>Do you have cravings or urges to eat snacks when you wake up at night?</td>
<td>10. Você tem desejo ou necessidade de comer quando acorda à noite?</td>
<td>10. Do you feel like eating when you wake up at night?</td>
<td>10. Você tem desejo ou necessidade de comer quando acorda à noite?</td>
</tr>
<tr>
<td>11.</td>
<td>Do you need to eat in order to get back to sleep when you awake at night?</td>
<td>11. Você precisa comer para voltar a dormir quando acorda à noite?</td>
<td>11. When you wake up at night, do you need to eat to go back to sleep?</td>
<td>11. Você precisa comer para voltar a dormir quando acorda à noite?</td>
</tr>
<tr>
<td>12.</td>
<td>When you get up in the middle of the night, how often do you snack?</td>
<td>12. Quando você acorda no meio da noite, com que frequência você come?</td>
<td>12. When you wake up in the middle of the night, how often do you eat?</td>
<td>12. Quando você acorda no meio da noite, com que frequência você lancha?</td>
</tr>
<tr>
<td>13.</td>
<td>When you snack in the middle of the night, how aware are you of your eating?</td>
<td>13. Quando você faz um lanche no meio da noite, você tem consciência de que comeu?</td>
<td>13. If you have snacks in the middle of the night are you aware of your hunger?</td>
<td>13. Quando você faz um lanche no meio da noite, você tem consciência de que comeu?</td>
</tr>
<tr>
<td>14.</td>
<td>How much control do you have over your eating while you are up at night?</td>
<td>14. Que controle você tem sobre a sua alimentação quando está acordado à noite?</td>
<td>14. Do you have control of your hunger when you stay awake at night?</td>
<td>14. Que controle você tem sobre a sua alimentação quando está acordado à noite?</td>
</tr>
<tr>
<td>15.</td>
<td>How long have your current difficulties with night eating been going on?</td>
<td>15. Há quanto tempo você tem dificuldades com a alimentação durante a noite?</td>
<td>15. How long have you had difficulties in eating during the night?</td>
<td>15. Há quanto tempo você tem tido dificuldades com a alimentação durante a noite?</td>
</tr>
</tbody>
</table>

Table 2. Portuguese version, translated and culturally adapted, of the Night Eating Questionnaire.

1. Como é geralmente sua fome pela manhã?
   Nenhuma (0) Pouco (1) Alguma (2) Moderada (3) Muita (4)
2. Quando você geralmente se alimenta pela primeira vez?
   Antes das 9.00 (0) Entre 9.00 até 12.00 (1) Entre 12.01 até 3.00 (2) Entre 3.01 até 6.00 (3) Às 6.01 ou mais tarde (4)
3. Você tem um forte desejo ou uma necessidade de fazer lanches no período após o jantar até a hora de dormir?
   Nunca (0) Um pouco (1) Às vezes (2) Muito (3) Bastante (4)
4. Que controle você tem sobre a sua alimentação entre o jantar e a hora de dormir?
   Nenhuma (0) Menos da metade (1) Metade (2) Mais da metade (3) Quase tudo (4)
5. Considerando toda a sua ingestão diária de alimentos, que quantidade você come depois do jantar?
   Nada (0) Menos da metade (1) Metade (2) Mais da metade (3) Quase tudo (4)
To assess construct validity, the 90 selected patients were divided into two groups: non-obese (BMI<30) and obese (BMI≥30). The non-obese group consisted of 49 individuals, 13 of whom were male (26.5%), who had a mean BMI of 26.6 (±2.6). The mean NEQ score of the non-obese group was 8.6 (±3.8) points. The obese group consisted of 49 individuals, 13 of whom were males (26.5%), who had a mean BMI of 39.5 (±8.6). The mean NEQ score in the obese group was 13.73 (±7.91). The mean age of the non-obese group was 49.4 (±11.9) years, and the mean age of the obese group was 43.5 (±10.5) years, with a significant difference between groups (p<0.01). In the obese group, using an NEQ threshold of 25, 4 patients were considered positive and 45 patients were considered negative. When the threshold was 30, 2 patients were considered positive and 47 were considered negative. We observed a statistically significant difference between groups with and without obesity related to the NEQ (p<0.01) (Table 6).

**DISCUSSION**

In this study, a new Portuguese translation and cultural adaptation of the NEQ was performed with the purpose of using it on the Brazilian population. We also studied the properties of the questionnaire with respect to its reproducibility, reliability and validity. The final translated version of the questionnaire showed excellent measurement properties.

The need to translate and adapt health measurement scales for use in another language than the original is widely recognized. This option is preferable to building ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another language than the original ment scales for use in another 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be culturally adapted to maintain the validity of the content in different populations with different lifestyles. Any changes resulting from this adaptation may alter the psychometric properties of the instrument. Therefore, it is highly recommended that preservation of the measuring properties of the new version be verified after the translation and adaptation process. Thus, the new instrument should retain the characteristics of the questions, as well as their relationship with the scale, internal consistency, and response capacity.

The NEQ was designed as a measure of severity for symptoms related to NES in the USA\(11,17\). In this study, in addition to the process of translation and back translation of the instrument, we conducted a semantic and cultural equivalence evaluation because without this step, the adaptation of this instrument loses in terms of its overall meaning. The Brazilian scale showed excellent internal consistency, with an alpha coefficient slightly below 0.9. It is believed that an alpha coefficient greater than 0.9 may suggest the presence of redundant items, while that below 0.7 may reflect low internal consistency\(5,25,26\). The translated version also showed excellent intra- and inter-observer reproducibility. A theoretical hypothesis was drawn and correlations were constructed to measure construct validity. This hypothesis was based on works from international literature showing that patients with a high BMI often present with NES symptoms as assessed by the NEQ\(5,9,27\). We note that in this translated version (Questionário Alimentar Noturno - QAN), the NEQ was in fact positively correlated with BMI, i.e., the greater the degree of obesity was, the greater the nocturnal eating disorder.

During cultural adaptation, the NEQ was applied to adult users of the Unified Health System, which will supposedly be the main targets of future applications of the instrument, thus allowing better representativeness in the study. Stratification by education was also performed, although the differences in NEQ scores were not statistically significant.

The frequency of patients who were evaluated by NEQ who presented with NES characteristics in the obese population of this study was 8.2% and 4.1%, respectively, when using a threshold score greater than or equal to 25 and a threshold greater than or equal to 30. Previous studies have reported rates of approximately 1.5% in the general population\(9\), 9% to 14% in obesity clinics\(7,8\) and 9% to 42% among candidates for bariatric surgery\(28,29\). The frequency found in this study for the threshold ≥25 is thus similar to that previously reported in obesity clinics\(7,8\).

If we compare this with the other previously published Portuguese version of the NEQ, we can see significant discrepancies in items 3, 9 and 13, and less pronounced differences in items 5, 7 and 12. In the other items, the sentences can be considered very similar. It is likely that the differences mentioned contribute to the increased internal consistency and better understandability of the questions in this study compared to the previous one. Although the previous version in Portuguese has shown reasonable internal consistency, there was better psychometric equivalence when the item assessing mood swings during the day was removed, with alpha coefficient increasing from 0.78 to 0.82. In this version, the measure of internal consistency proved to be higher (Cronbach's alpha = 0.87), and no significant change compared to the original scale was necessary. It is also important to emphasize that in the present study, the sample utilized had an educational level closer to the target audience of interest for questionnaire administration.

**Table 5. Cronbach’s alpha coefficient for each question of Questionário Alimentar Noturno (n=90).**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Alpha value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Como é geralmente sua fome pela manhã?</td>
<td>0.837</td>
</tr>
<tr>
<td>2. Quando você geralmente se alimenta pela primeira vez?</td>
<td>0.828</td>
</tr>
<tr>
<td>3. Você tem um forte desejo ou uma necessidade de fazer lanches no período após o jantar até a hora de dormir?</td>
<td>0.813</td>
</tr>
<tr>
<td>4. Que controle você tem sobre sua alimentação entre o jantar e a hora de dormir?</td>
<td>0.820</td>
</tr>
<tr>
<td>5. Considerando toda a sua ingestão diária de alimentos, que quantidade você come depois do jantar?</td>
<td>0.817</td>
</tr>
<tr>
<td>6. Você geralmente se sente triste ou na fossa?</td>
<td>0.820</td>
</tr>
<tr>
<td>7. Quando você está triste, seu humor é mais baixo?</td>
<td>0.860</td>
</tr>
<tr>
<td>8. Com que frequência você tem dificuldade para adormecer?</td>
<td>0.824</td>
</tr>
<tr>
<td>9. Quantas vezes por semana você se levanta no meio da noite, sem contar às vezes em que você vai somente ao banheiro?</td>
<td>0.803</td>
</tr>
<tr>
<td>10. Você tem desejo ou necessidade de comer quando acorda à noite?</td>
<td>0.800</td>
</tr>
<tr>
<td>11. Você precisa comer para voltar a dormir quando acorda à noite?</td>
<td>0.805</td>
</tr>
<tr>
<td>12. Quando você acorda no meio da noite, com que frequência você lancheia?</td>
<td>0.805</td>
</tr>
<tr>
<td>13. Quando você faz um lanche no meio da noite, você tem consciência de que comeu?</td>
<td>0.790</td>
</tr>
<tr>
<td>14. Que controle você tem sobre a sua alimentação quando está acordado à noite?</td>
<td>0.816</td>
</tr>
</tbody>
</table>

**Table 6. General characteristics and evaluation by Questionário Alimentar Noturno according with obesity (90).**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Non-obese (IMC&lt;30)</th>
<th>Obese (IMC≥30)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>49.4 ± 11.9</td>
<td>43.5 ± 10.5</td>
<td>0.03*</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>13/28</td>
<td>13/36</td>
<td>0.64**</td>
</tr>
<tr>
<td>QAN ≥ 25 (Yes/No)</td>
<td>0/41</td>
<td>4/45</td>
<td>0.12**</td>
</tr>
<tr>
<td>QAN ≥ 30 (Yes/No)</td>
<td>0/41</td>
<td>2/47</td>
<td>0.49**</td>
</tr>
</tbody>
</table>

*Student’s t test; **Fisher’s test; QAN: Questionário Alimentar Noturno; BMI: Body Mass Index.
In summary, this translated and culturally adapted version of the NEQ proved to be suitable for application even in individuals with a low educational level. New studies on the applicability of NEQ using samples stratified by education level, income level and social class should be conducted to further evaluate this instrument with more precision.

REFERENCES