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Cultural Translation and Validation of the Bariatric Quality of Life Index to European Portuguese

Tradução e Validação Cultural para Português do Bariatric Quality of Life Index

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ABSTRACT

Introduction: Obesity is a chronic noncommunicable disease, defined by a body mass index over 30 kg/m². Its impact is not restricted to its association with higher risks of mortality and morbidity from other noncommunicable diseases, but also with a decrease in quality of life (QoL). There are several tools to assess QoL, from generic health-related tools to obesity-related specific ones. However, to assess QoL in patients undergoing bariatric surgery, only the Bariatric Analysis and Reporting Outcome System was available, which presented some significant problems. Therefore, the Bariatric Quality of Life (BQL) Index was developed. The aim of this study was the validation and cultural adaptation of the BQL Index for European Portuguese.

Methods: A cross-sectional study was conducted, with the presentation of two questionnaires to the participants: BQL Index and EQ-5D-3L (European Quality of Life 5 Dimensions and 3 Level) Index. Direct translation followed reviewing, back-translation, comparison, and pilot testing were performed. Retest was done six months after the baseline. The following psychometric properties were assessed: convergent validity using the Spearman *r* correlation coefficient between BQL Index and EQ-5D-3L Index; internal consistency based on Cronbach alpha coefficient; and reproducibility between test and retest through Spearman *r* correlation coefficient and intraclass correlation coefficient (ICC).

Results: A total of 260 participants were included, the mean age was 45 ± 10 years old, the mean body mass index was 44 ± 6.5 kg/m² and 78% were females. The most frequent obesity-related comorbidities were osteoarticular disease (69%), anxiety/depression (60%), and hypertension (54%). The most common eating patterns were volume eater (67%) and sweet eater (62%). Quality of Life scores were 41.3 ± 9.3 for the BQL Index, 0.35 ± 0.19 for the EQ-5D-3L Index and 55.7 ± 19.8 for the EQ-5D-3L VAS. The translation yielded good convergent validity (*r* = 0.62), good internal consistency (alpha = 0.94), and good reproducibility (r = 0.62 and ICC = 0.79).

Conclusion: Our translation exhibited good parametric properties, with validity within the original BQL values, higher internal consistency, and good reproducibility.

Keywords: Bariatric Surgery; Quality of Life; Reproducibility of Results; Surveys and Questionnaires; Translations

RESUMO

Introdução: A obesidade é uma doença crónica não transmissível, definida por um índice de massa corporal acima de 30 kg/m². O seu impacto não se associa apenas a riscos mais elevados de mortalidade e morbilidade, mas também à possível diminuição na qualidade de vida (QdV). Existem vários instrumentos para avaliar a QdV, desde instrumentos genéricos relacionados com a saúde, a específicos de obesidade. Contudo, para avaliar a QdV em pacientes submetidos a cirurgia bariátrica, existe apenas o *Bariatric Analysis and Reporting Outcome System* que apresentava problemas significativos. Por conseguinte, foi desenvolvido o *Bariatric Quality of Life* (BQL) *Index*. O objetivo deste estudo foi a validação e adaptação cultural do BQL *Index* para a língua portuguesa.

Métodos: Realizou-se um estudo transversal com a apresentação de dois questionários aos participantes: o BQL *Index* e o EQ-5D-3L (*European Quality of Life 5 Dimensions and 3 Level*) *Index*. Foi feita a tradução direta, revisão, contra tradução, comparação e um teste piloto. Após seis meses realizou-se um reteste. Foram avaliadas as seguintes propriedades psicométricas: a validade convergente através do coeficiente de correlação *r* de Spearman entre o BQL e EQ-5D-3L; a consistência interna baseada no coeficiente alfa de Cronbach; e a reprodutibilidade entre o teste e o reteste utilizando o coeficiente de correlação *r* de Spearman e o coeficiente de correlação intraclasse (CCI).

Resultados: Num total de 260 participantes, a idade média foi de 45 ± 10 anos, o índice de massa corporal médio de 44 ± 6,5 kg/m² e 78% eram mulheres. As comorbilidades associadas à obesidade mais frequentes foram: doença osteoarticular (69%), ansiedade/depressão (60%) e hipertensão (54%). Os padrões alimentares mais comuns foram: volume (67%) e doces (62%). Os resultados dos questionários para a QdV foram: 41,3 ± 9,3 para o BQL *Index*; 0,35 ± 0,19 para o EQ-5D-3L *Index* e 55,7 ± 19,8 para o EQ-5D-3L VAS. A tradução apresentou uma boa validade convergente (*r* Pearson = 0,62), uma boa consistência interna (alfa Cronbach = 0,94) e uma boa reprodutibilidade (*r* Pearson = 0,62 e CCI = 0,79).

Conclusão: A nossa tradução apresentou boas propriedades paramétricas, com validade dentro dos valores do BQL original, alta consistência interna e boa reprodutibilidade.

Palavras-chave: Cirurgia Bariátrica; Inquéritos e Questionários; Qualidade de Vida; Reprodutibilidade dos Testes; Traduções

INTRODUCTION

Obesity is a chronic noncommunicable disease, defined by a body mass index (BMI) over 30 kg/m².[1] It affects over 13% of the world's population and is responsible for significant morbidity and mortality.[1] Therefore, its treatment is essential, along with public health measures to prevent its development.

Bariatric surgery is currently the most effective treatment for severe obesity.[2,3] Several procedures have been developed over the last 50 years, but currently there are four that are commonly performed: the Roux-en-Y gastric bypass, the sleeve gastrectomy, the adjustable band (currently in decline) and the biliopancreatic diversion with

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duodenal switch (relatively rare).[2] In surgical procedures, there is up to 70% of excess weight loss in one year.[2,3]

Weight loss in bariatric surgery is not the only benefit, as it can also result in the improvement and/or remission of obesity-associated comorbidities. In particular, its role in the remission of diabetes mellitus has resulted in being named metabolic surgery and having very specific indications in its treatment.[4]

However, the obesity burden is not restricted to weight loss and comorbidities, and patient-reported outcomes (PROs), such as quality of life (QoL) have been explored recently.[5] QoL in individuals with obesity is known to be lower compared to the general population, being lower in older patients, women, and those with higher BMIs.[6–8] Bariatric surgery been has shown to also improve PROs, such as body image and quality of life.[9–11]

QoL is assessed by specific tools in a questionnaire format. There are several generic health-related QoL tools available, which consider physical disability and mental health,[12] but that have difficulties in grasping obesity-related QoL issues.[13] Therefore, obesity-specific questionnaires were developed,[5] such as the Obesity-specific QoL instrument (OSQOL),[14] the Obesity-related Problems scale (OP),[15] and the Impact of Weight on Quality of Life (IWQOL) questionnaire.[16] However, these fail to assess surgery-specific issues, which were minimized by the inclusion of gastrointestinal symptom-specific questionnaires, such as the Gastrointestinal Quality of Life Index (GIQLI),[17] but not solved. The Bariatric Analysis and Reporting Outcome System (BAROS) questionnaire can be used for bariatric surgery patients, but its first version was not validated, and could only be administered after bariatric surgery.[18] This led to the development of a new tool, which incorporated weight, weight-related comorbidities and surgery-related GI symptoms, the Bariatric Quality of Life (BQL) Index.[19] The BQL Index includes the following domains: psychological well-being, social functioning, physical functioning, and problems and symptoms related to obesity surgery and obesity-related comorbidity. the score ranges from 0 to 78 points, with the lower scores meaning worse QoL.[19]

The aim of this study was to adapt and validate the BQL Index for European Portuguese.

METHODS

Questionnaires

Two questionnaires were administered to the population in question: the BQL Index[19] (Appendix 1: https://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/19598/15332) and the validated Portuguese version of EQ-5D-3L.[20] As described earlier, the BQL Index was designed to surpass issues with other generic health-related QoL instruments that did not address obesity-specific issues, and most specifically surgery-related issues, following bariatric surgery. It is a 19-item tool, focusing on psychological well-being, social functioning, physical functioning, and problems and symptoms related to obesity surgery and obesity-related comorbidity domains.[19] The score ranges from 0 to 78, with lower scores yielding worse QoL.[19]

The EQ-5D-3L questionnaire is a generic health-related QoL tool, commonly used in cost-utility analysis.[20] It includes five dimensions or health profiles: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, with three levels each.[20] These health states have different values from country to country, and the Portuguese estimates have also been established.[21] It also assesses QoL by the use of a visual analog scale (VAS) that ranges from 0 to 100 (worse to better health state ever), by asking the patient how their health is at the present day.[20]

Study design

The study has a cross-sectional design and was carried out at a bariatric surgery clinic in a Portuguese central hospital, in Lisbon. Recruitment lasted from January 2020 to December 2021.

All patients admitted to the bariatric surgery clinic were invited to participate, if they were over 18 years old and Portuguese was their first language.

Patients willing to participate signed an informed consent form and filled out both QoL questionnaires while in the waiting room, with the option to clarify doubts during the medical appointment. Six months later, the questionnaires were then sent by mail to be filled again by the participants (retest).

Translation and validation

The translation followed an international model[22]:

1. Forward/Initial translation: the original version of BQL was translated into Portuguese, by a bilingual healthcare professional;
2. Reviewing: a team reviewed the translated and original version for some semantic and conceptual changes, reaching a consensus;
3. Back-translation: a second bilingual healthcare professional, blinded to the original version, performed back translation;
4. Comparison: the original and back-translated versions were compared, to optimize the translated version;
5. Pilot testing: the translated version was administered to 25 participants, with whom a short interview regarding suggestions and issues with the translated questionnaire was performed after filling out the questionnaire.

Assessment of psychometric properties

Assessment of psychometric properties (field validation) was carried out after administration of the resulting version of the BQL to patients with obesity that are candidates for bariatric surgery, and are followed at our bariatric surgery clinic. The psychometric properties of interest were:

1. Validity by measuring convergent validity, through the correlation between BQL and EQ-5D-3L;
2. Reliability is assessed by determining internal consistency, using Cronbach's alpha (α) coefficient;
3. Reproducibility (temporal) is assessed by measuring the intraclass correlation coefficient (ICC) between test and retest.

Ethical issues

The project had approval by the Centro Hospitalar Universitário Lisboa Central Ethics Committee (reference number INV 27). All patients signed an informed consent form, and their data was anonymized.

Statistical analysis

Categorical variables were expressed as absolute values (percentages), and continuous variables were expressed as mean ± standard deviation.

This study used Spearman's rank correlation coefficient (*r*), Cronbach's alpha coefficient, and ICC. Spearman's *r* ranges between -1 and 1, and r > 0.6 or 0.8 indicate a good or very good correlation, respectively. Cronbach´s alpha is a reliability coefficient and ranges between 0 and 1, with higher values > 0.9 indicating excellent internal consistency. ICC ranges between 0 and 1, ICC > 0.6 or 0.75 indicate good or excellent correlation, respectively.

Convergent validity was measured by assessing whether the BQL correlated well with the EQ-5D-3L, using Spearman's *r*. Reliability was tested through internal consistency with Cronbach's alpha. Reproducibility, as assessed by the ICC between test and retest, and Spearman's *r*.

Statistical analysis was performed using STATA (StataCorp. Stata statistical software: release 14. College Station, TX: StataCorp LP). A *p*-value < 0.05 was considered statistically significant.

RESULTS

We included a total of 260 participants, of which the majority were female (78%), with a mean age of 45 ± 10 years old. These participants had a mean BMI of 44 ± 6.5 kg/m^2 (68% of them had a BMI of 40 or higher). The mean total fat mass was 49.7 ± 6.6%, with visceral fat of 13.9 ± 4.6% and a waist circumference of 129.9 ± 13.9 cm (Table 1).

Regarding obesity-related comorbidities, the most common were osteoarticular disease (69%), anxiety/depression (60%) and hypertension (54%). The most frequent eating patterns were volume eater (67%) and sweet eater (62%) (Table 1).

Table 1 – Participant characteristics regarding demographics, anthropometrics, obesity-related comorbidities, and eating patterns (n = 260)

Demographics	**n = 260**
Age (years)	45 (10)
Gender	
Female	197 (78%)
Male	56 (22%)
Anthropometrics	
Weight (kg)	120 (22)
Height (m)	1.65 (0.08)
BMI (kg/m^2)	44 (6.5)
BMI class	
I	14 (5%)
II	61 (23%)
III	176 (68%)
Total fat mass (%)	49.7 (6.6)
Visceral fat (%)	13.9 (4.6)
Waist circumference (cm)	129.9 (13.8)
Obesity-related comorbidities	
Hypertension	139 (54%)
Diabetes Mellitus	48 (19%)
Dyslipidemia	90 (35%)
Sleep apnea	70 (27%)
Osteoarticular disease	180 (69%)
Anxiety/depression	155 (60%)
Venous insufficiency	115 (44%)
Liver steatosis	90 (35%)
Eating patterns	
Sweet eater	160 (62%)
Volume eater	174 (67%)
Snacking	65 (25%)
Night eating	26 (10%)
Nibbling/picking	18 (7%)
Emotional eating	121 (47%)
Compulsion	38 (15%)
Binge eating	6 (2%)

QoL scores were, on average, 41.3 ± 9.3 for the BQL Index, 0.35 ± 0.19 for the EQ-5D-3L Index and 55.7 ± 19.8 for the EQ-5D-3L VAS.

As for the psychometric properties, validity measured by convergent validity through the correlation between the BQL Index and EQ-5D-3L questionnaire Index, yielded a

Table 2 – Psychometric properties of the translated BQL Index

Psychometric properties	
Converging validity	
Spearman coefficient	0.62
p-value	< 0.001
Internal consistency	
Cronbach alpha coefficient	0.94
Reproducibility	
Intraclass correlation coefficient	0.79
Spearman coefficient	0.62
p-value	< 0.001

Spearman's *r* coefficient of 0.62. Since it is over 0.6, we consider the questionnaire valid (Table 2).

Reliability was assessed through internal consistency using the Cronbach alpha coefficient which was 0.94, therefore exhibiting excellent reliability (> 0.9) (Table 2).

Finally, reproducibility over time between test and retest, was assessed in a total of 103 participants, who answered the retest. Reproducibility was good, with a Spearman's *r* coefficient of 0.62 and an ICC of 0.79 (Table 2).

DISCUSSION

The BQL Index is a short (the time needed to fill it out is around 10 minutes) and user-friendly tool to assess QoL in patients with obesity undergoing bariatric surgery, with a major role in the postoperative assessment of PROs. However, this tool is supposed to be used particularly in populations with a high prevalence rate of obesity and is not intended for populations where most individuals have a normal weight.[19]

The aim of this study was to perform a cross-cultural translation and validation of the BQL Index questionnaire for European Portuguese. Our translated version exhibited good psychometric properties regarding validity, reliability, and reproducibility.

Our validity was 0.69 towards EQ-5D-3L, which lies between the validity estimate of the original version of BQL regarding SF-12 ($r = 0.79$) and GIQLI ($r = 0.13$).[19] Also, our internal consistency was higher than that of the original version with a Cronbach alpha of 0.94, versus a range of 0.71 - 0.86 at different time points.[19] Finally, reproducibility, despite being deemed adequate ($r = 0.62$ and ICC = 0.79), remains the only issue in the psychometric properties. Usually, the higher the ICC the better, with values above 0.9 being optimal, even if above 0.7 are acceptable.

Our study has several limitations. The first one relates to our somewhat low reproducibility by ICC. We assume the main cause for this is the time point for a retest, of six months. However, due to the COVID-19 pandemic, the re-evaluation of the first enrolled patient could not be done face-to-face, so we had to pursue alternatives. It was decided afterwards to maintain the time gap, so as to standardize. Secondly, we chose the EQ-5D-3L questionnaire for comparison, considering its wide use as a QoL tool, with the advantage of a cost-utility tool. However, perhaps other QoL instruments would have been more pertinent, namely obese-related, such as IWQOL or BAROS. Nevertheless, there are some strengths related to a large sample size, which accurately describes the population.

CONCLUSION

We believe this cross-cultural translation and validation is of value for patient follow-up in the bariatric surgery setting regarding PROs. Future work should include an assessment of QoL following bariatric surgery and a comparison with BAROS regarding sensitivity and specificity.

AUTHOR CONTRIBUTIONS

IRF: Study design, data collection and analysis, writing of the manuscript.

MVC: Study design, data collection.

NC, DM: Data collection, critical review.

JSN: Study design, critical review.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

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