


# Translation and cross-cultural adaptation of the NutriQoL<sup>®</sup> questionnaire to the Portuguese language: Brazilian version

## *Tradução e adaptação do questionário NutriQoL<sup>®</sup> para a língua portuguesa: versão Brasileira*

João Paulo Lima de OLIVEIRA<sup>1</sup>  0000-0002-9623-5474

Mônica Sabrina Ribeiro dos SANTOS<sup>1</sup>  0000-0001-5652-3319

Hellen Custódio MACHADO<sup>1</sup>  0000-0002-4710-673X

Sarah Leão Fiorini de AGUIAR<sup>2</sup>  0000-0002-9735-626X

Lívia Garcia FERREIRA<sup>1</sup>  0000-0002-8089-351X

<sup>1</sup> Universidade Federal de Lavras, Departamento de Nutrição, Programa de Pós-Graduação em Nutrição e Saúde. Caixa Postal 3037, 37200-900, Lavras, MG, Brasil. Correspondence to: L. G. GARCIA. E-mail: <livia.ferreira@ufla.com>.

<sup>2</sup> Centro Universitário Una Pouso Alegre, Curso de Nutrição, Pouso Alegre, MG, Brasil.

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**ABSTRACT****Objective**

The objective of this study was to translate and cross-culturally adapt the NutriQoL® into Brazilian Portuguese.

**Methods**

The NutriQoL® comprises 17 questions that evaluate the quality of life of patients receiving home enteral nutrition therapy. The methodological procedures included the translation from the Spanish version into Portuguese by two translators, synthesis of the translations, back translation, evaluation by a committee of judges composed of 24 individuals in which a content validity index > 0.78 was considered acceptable, and generation of the pre-final version. A pre-test to analyze its semantic equivalence was administered to 12 patients receiving home enteral nutrition therapy. The final version of the questionnaire was then prepared.

**Results**

A summary version of the questionnaire was obtained using two versions of the translation. Both back translations were identical for 73.6% of sentences (n=25). Twenty-four volunteers were included in the committee of judges. The content validity index was  $0.88 \pm 0.11$ , and 14.7% (n=5) of questions had a low content validity index and were thus reformulated. In the pre-test, 35.3% (n=12) of items obtained low levels of understanding and required adjustment. In the preparation of the final version, the inconsistencies of the items mentioned were corrected and/or adjusted.

**Conclusion**

After completing the methodological procedures, a Brazilian Portuguese version of the NutriQoL® questionnaire was obtained. Following the validation process, it can be used by dietitians and other health professionals to assess the quality of life of patients receiving home enteral nutrition therapy to contribute to improvements in care practices.

**Keywords:** Homebound persons. Nutrition therapy. Quality of life. Surveys and questionnaires.

**RESUMO****Objetivo**

*O intuito deste estudo foi realizar a tradução do NutriQoL para a língua portuguesa e a adaptação transcultural para o Brasil.*

**Métodos**

*O NutriQoL® é composto de 17 pares de perguntas que avaliam a qualidade de vida de pacientes em terapia nutricional enteral domiciliar. Os procedimentos metodológicos foram: tradução da versão em espanhol para a língua portuguesa por dois tradutores; síntese das traduções; retrotradução; avaliação, da versão traduzida, por um comitê de juízes composto por 24 indivíduos, na qual o índice de validade de conteúdo > 0,78 foi considerado, gerando a versão pré-final e realização de um pré-teste no qual a versão pré-final do questionário foi aplicada a 12 pacientes em uso de terapia nutricional enteral domiciliar para análise da equivalência semântica e elaboração da versão final do questionário.*

**Resultados**

*Observou-se que, a partir das duas versões traduzidas, foi possível obter uma versão síntese do questionário. As duas retrotraduções geradas foram idênticas em 73,6% das sentenças (n=25). O índice de validade de conteúdo foi  $0,88 \pm 0,11$ , e 14,7% (n=5) das questões tiveram baixo índice de validade de conteúdo, sendo então reformuladas. No pré-teste foi observado que 35,3% (n=12) dos itens obtiveram baixos índices de compreensão e necessitaram de ser reformulados. Na elaboração da versão final do questionário as inconsistências dos itens mencionados foram sanadas e/ou adaptadas.*

**Conclusão**

*Após conclusão dos procedimentos metodológicos, foi possível obter a versão brasileira do questionário NutriQoL® em língua portuguesa para que, após processo de validação, o instrumento seja utilizado pelo nutricionista ou demais profissionais de saúde para avaliação da qualidade de vida de pacientes em uso de terapia nutricional enteral domiciliar, a fim de contribuir com melhorias nas práticas assistenciais.*

**Palavras-chave:** Pacientes domiciliares. Terapia nutricional. Qualidade de vida. Inquéritos e questionários.

## INTRODUCTION

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Home Enteral Nutrition Therapy (HENT) is a form of nutritional care provided at home, with the objective of recovering or maintaining nutritional status [1]. HENT is a long-term alternative to meet the nutritional demands of an individual who does not require intensive care, but who, due to an acute or chronic illness, started enteral nutrition during hospitalization, and after discharge, will receive HENT [2]. HENT allows greater involvement of the family in patient care, enabling greater humanization of health practices and improvement of quality of life [3].

As with enteral nutritional therapy in the hospital setting, HENT is not risk-free and may have physical effects on patients because of mechanical problems in the probe, such as leakage, displacement, and occlusion, and due to the formation of granular tissue at the insertion site, making the individual more susceptible to infections [1,2]. Other recurrent problems include gastrointestinal problems, mainly constipation, diarrhea, nausea, and vomiting, as well as metabolic complications, such as dehydration and body weight adjustment [2]. There may also be psychological complications, as the patient's transition from hospital to home can be stressful, confusing, and oppressive [4].

Because HENT affects the daily life of individuals, it is essential to evaluate their quality of life. The term quality of life is an extremely important concept in the areas of health and medicine, in addition to being an effective variable to be used in clinical practice [5,6]. The assessment of the quality of life provides an improvement in care practices and understanding of the health-disease process, incorporating socioeconomic, psychological, and cultural aspects that are essential in strategies for the promotion, prevention, treatment, and recovery of health [6]. Measures to evaluate the quality of life are useful to assess clinical conditions and the effectiveness of interventions, and to obtain the patient's perception of their disease and the proposed treatment [7]. Furthermore, it can identify treatments that have had little success and contribute to medical decisions, since the quality of life acts as a predictor of treatment success and patient prognosis [5].

However, many existing methods of assessing the quality of life are centered on standardized models and pre-selected domains, measuring the general health status at the expense of quality of life, or even using non-specific questionnaires that are not appropriate for a condition [7,8]. Consequently, Cuerda *et al.* [9] and Apezetxea *et al.* [10] developed and validated NutriQoL® in Spain to assess the health-related quality of life of patients receiving HENT, regardless of the disease and route of administration of the diet. NutriQoL® is a tool that has proven to be valid, reliable, sensitive to change, and beneficial for measuring the quality of life in individuals who receive HENT and is effective in detecting changes in the health status of patients [10,11]. However, NutriQoL® was developed in the Spanish language, specifically targeting the local population, which is a limitation when used in the Brazilian population.

Therefore, the objective of this study was to translate into Portuguese and cross-culturally adapt the NutriQoL® questionnaire to evaluate the quality of life of Brazilian patients receiving HENT.

## METHODS

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This is a methodological study in which the NutriQoL® questionnaire, originally in the Spanish language, was translated into Brazilian Portuguese and cross-culturally adapted for the Brazilian population [10]. The NutriQoL® contains 17 pairs of items divided into two columns and two dimensions, where the first dimension includes aspects of physical functioning and activities of daily living and the second dimension includes aspects of social life [9]. Regarding the columns, the first (column A) depicts the respondent's general perception of HENT and interactions within the social environment, and in the column B, respondents

answer regarding their own perception in certain situations of how HENT influences their quality of life [9]. The sum of the scores obtained determines the degree of quality of life as very poor (-51 to -30 points), poor (-29 to -11 points), acceptable (-10 to 10 points), good (11 to 31 points), or excellent (32 to 51 points) [9].

The present study was submitted to and approved by the Human Research Ethics Committee of the *Universidade Federal de Lavras* (UFLA) (Opinion: 3.049.680/2018). A copy of the informed consent form was provided, and the volunteers who agreed to participate in the study were asked to sign it. In addition, authorization from the authors of the original study to conduct the study was obtained. To obtain an accurate linguistic translation of the original questionnaire, the methodology proposed by Beaton *et al.* [12] was used in this study, divided as follows.

Step 1: Initial translation (T) – Two bilingual translators were used, one of whom was a professional in the field (nutritionist). Both translated the NutriQoL® questionnaire from Spanish to Portuguese, obtaining two versions (T<sub>1</sub> and T<sub>2</sub>). From the T<sub>1</sub> and T<sub>2</sub> versions, the translators together with the researchers held a meeting where semantic divergences, technical terms and language adequacy were discussed, generating a single version of the questionnaire (T<sub>1,2</sub>).

Step 2: Back translation (BT) – Two other translators without knowledge of the subject area and who were blind to the original questionnaire were invited to perform the back translation process, i.e., to translate the version obtained in Portuguese (T<sub>1,2</sub>) into Spanish, thus obtaining the BT<sub>1</sub> and BT<sub>2</sub> versions.

After the development of the BT<sub>1</sub> and BT<sub>2</sub> versions, a meeting was held with the researchers and all four translators to analyze the BT<sub>1</sub> and BT<sub>2</sub> versions, the original instrument and version T<sub>1,2</sub>. After the researchers and translators verified that the translated version (T<sub>1,2</sub>) did not differ in meaning from the original version, T<sub>1,2</sub> was used in the next step.

Step 3: Evaluation by a panel of judges – In this step, the 17 pairs of questions on the NutriQoL® questionnaire were entered into Google Forms® (Mountain View, California, United States), in the original language and in Portuguese, i.e., version T<sub>1,2</sub> [13,14]. The purpose of this step was to evaluate the semantic, idiomatic, cultural and conceptual equivalence. This evaluation was performed by a panel of judge's bilingual (Spanish/Portuguese), composed of 24 individuals, six of them in the health area, among them a specialist in collective health and the others in the biological and exact sciences.

In the Google Forms® platform, it was possible for each volunteer to compare the items of the original and translated versions and to evaluate the translation on a four-point ordinal Likert scale: (1) nonrelevant or unrepresentative item; (2) item needs major revision to be representative; (3) item needs minor revision to be representative; and (4) relevant or representative item [15]. To assess the agreement between the judges, the Content Validity Index (CVI) of each item was calculated from the sum of the frequency of responses rated three or four divided by the total number of responses. A CVI equal to or greater than 0.78 was considered to indicate reliability of the evaluated items [16]. In addition, an option was included in which individuals could, if necessary, write words, complete sentences or fragments of a sentence to improve the Portuguese translation.

Thus, after analyzing the results of the CVI, the same translators from step 01 and the researchers held a meeting, and a prefinal version of the questionnaire (T<sub>1,3</sub>) was prepared, where all grammatical and language inconsistencies were resolved.

Step 4: Semantic equivalence – The semantic equivalence consisted of the application of the prefinal version of the questionnaire by the researcher himself to 12 individuals to receiving HENT, considering the sample size used by Chaves *et al.* [17]. The questionnaire was administered at the Oncology Outpatient Clinic of the '*Bom Pastor*' Hospital in the municipality of *Varginha, Minas Gerais* (MG), Brazil. Individuals receiving HENT aged 18 years or older who were lucid and oriented to time and space, receiving enteral nutrition therapy via tube feeding (exclusive or mixed) and for a period greater than or equal to three months were selected. All eligible individuals were interviewed to assess their understanding of the 17 pairs of questions, using the following responses: "I did not understand"; "I had a lot of difficulty understanding"; "I had little

difficulty understanding” or “I understood perfectly”. As another form of evaluation and understanding of the questionnaire, the researcher also evaluated how many times a volunteer requested for each question to be repeated. Thus, the questions that obtained high rates of lack of understanding and/or were repeated more than three times for a volunteer to understand were reviewed by the researchers and translators. Notably, to facilitate the understanding and preparation of the final version of the questionnaire, the researcher suggested some verbs during the interview to gather from the participants which of these verbs would best fit the sentences in order to ensure that the questionnaire would be understood. At this step, a form specifically designed to collect the socioeconomic data of patients, such as gender, age, marital status, with whom the patient resides, education level and dietary characteristics, was applied.

Step 5: Preparation of the final version of the questionnaire – All questions raised during the pretest were discussed between the translators and researchers, and at this step, all inconsistencies were resolved. The final version of the NutriQol® (T<sub>1,4</sub>) questionnaire was prepared for the Brazilian population.

At all steps, a report was generated noting the differences discussed and how these were solved. In this article, as the questionnaire has two columns, the nomenclature adopted includes the question number and the addition of numbers one and two to identify the column number, establishing pairs of questions.

The data were tabulated in Microsoft Excel® (Redmond, Washington, United States) and analyzed by the software Statistical Package for the Social Sciences®, version 20.0 (Chicago, Illinois, United States) in which the categorical variables were presented in absolute and relative numbers, and the numerical variables were presented with mean and standard deviation (Kolmogorov-Smirnov test  $p > 0.05$ ).

## RESULTS

The authors compared the two translations (T<sub>1</sub> and T<sub>2</sub>), checking the technical terms and terminology and adjusting the sentences so that they were accessible to the target audience.

At this step, the following issues were discussed. The “more or less important” and “relatively important” alternatives were not appropriate, and there was a consensus that “moderately important” was the most appropriate terminology to be used. Regarding the terms “is for me” and “for me is”, there was a consensus that the terminology “for me is” was more appropriate in that context. In addition, one of the translators used the terminology “the fact that” in many sentences, and the decision to remove this terminology was unanimous to make the language more informal due to the audience for whom the questionnaire would be applied.

In the comparison between the BT<sub>1</sub> and BT<sub>2</sub> versions, of the 34 items, 73.6% (n=25) were equivalent. The remaining items were not identical due to the use of synonymous words but did not affect the context of the questions nor were they detrimental to the understanding of the questionnaire as a whole. The divergences between synonymous words found are explained by the nationality of the translators in question (countries of origin located in North America and South America), whereas the original questionnaire was prepared in Spain.

Of the 34 items that compose the questionnaire, no question was rated as a nonrelevant or unrepresentative item, 21 items (61.8%) were rated a relevant or representative item, 12 items (32.3%) were rated as requiring a minor revision to be representative, and one item (2.9%) was classified as needing a major revision to be representative. The mean CVI was  $0.88 \pm 0.11$ . For five items (14.7%) with low CVI values (Table 1), changes were made to the questions. However, eight other items (23.5%) that had CVI values between 0.79 and 0.92 were also changed by the translators and researchers based on the suggestions made by the panel of judges. In total, 13 questions were changed.

The changes made to the items with a good level of agreement were as follows. For item 3.2, to improve the question, the expression “*mais facilmente* [more easily]” was added. For item 6.1, the verb

"*adquirir* (to acquire)" was removed, and the verb "*obter* (to obtain)" was added. For item 6.2, the words "*serem* (are)" and "*de adquirir* (to acquire)" were removed, and the expression "*obter facilmente* (easily obtain)" was added. For item 8.1, the expression "*tenho recuperado* (I have recovered)" was removed, and the verb "*recuperei* (recovered)" was added. For item 10.2, the term "*que minha pele seja prejudicada* (my skin is damaged)" was added, and for item 12.1, the pronoun "*eu* (I)" was added. For item 12.2, the word "*possa* (might)" was removed, and the verb "*poder* (it may)" was added. Regarding item 14.1, the gastrointestinal symptoms "*ardores* (burning)" and "*regurgitações* (regurgitations)" were removed and replaced with "*queimações* (burning sensations) and "*refluxos* (reflux)". For item 14.2, the phrase "*devido a* (due to)" was added, leading to a better understanding of the question. Regarding item 15.1, the word "*vigia* (lookout)" was removed, and the word "*monitora* (monitor)" was added. For item 15.2, the verb "*vigiar* (lookout)" was removed, and the verb "*monitorar* (monitor)" was added. For both items 15.1 and 15.2, the expression "*familiares e/ou cuidadores* (family and/or caregivers)" was also added to expand the categories of individuals who could take care of the patient's diet. Finally, for items 16.1 and 16.2, the

**Table 1** – Mean CVI values calculated for each item of the NutriQoL®

Question	CVI
1.1	0.88
1.2	0.92
2.1	0.83
2.2	0.83
3.1	0.96
3.2*	0.71
4.1	0.92
4.2	0.92
5.1	0.96
5.2	0.83
6.1*	0.79
6.2*	0.71
7.1	1.00
7.2	1.00
8.1*	0.75
8.2	1.00
9.1	0.88
9.2	1.00
10.1	0.88
10.2*	0.67
11.1	1.00
11.2	1.00
12.1*	0.83
12.2*	0.67
13.1	0.96
13.2	1.00
14.1*	0.83
14.2*	0.92
15.1*	0.88
15.2*	0.83
16.1*	0.83
16.2*	0.79
17.1	1.00
17.2	1.00
CVI (Mean±SD)	0.88±0.11

Note: \*Questions that were changed; CVI: Content Validity Index; SD: Standard Deviation.

diacritical mark in the pronoun “*àquelas* (those)” was added. Through the changes made at this step, the prefinal version of the questionnaire (T<sub>1,3</sub>) was prepared.

The questionnaire was administered to 12 individuals undergoing outpatient cancer treatment who were receiving HENT; 83.3% (n=10) were male, and the mean age of the participants was 59.6 ± 12.6 years. Of the selected individuals, 66.7% (n=8) were married, and 58.4% (n=7) had incomplete primary education. Regarding the use of a feeding tube, 66.7% (n=8) of the sample was receiving HENT as an exclusive form of nutrition. The main route of administration was gastrostomy (66.7%; n=8), and 100% (n=12) used gravity feeding.

Regarding the evaluation of semantic equivalence, 64.7% (n=22) of the items were understandable by the volunteers, without any adjustment being made. Notably, none of the items in the questionnaire were rated “I did not understand”. All items that had issues regarding understandability (Table 2) were analyzed for the final preparation of the questionnaire (next step).

In the final meeting, the use of the term Home Enteral Nutrition (HEN) in all items of the questionnaire was questioned, and thus, it was determined that the term HEN would be replaced with Home Enteral Nutrition Therapy (HENT) because it is more commonly used in the Brazilian context.

For items 2.1 and 2.2, the substitution of the verb “*adaptar* (adapt)” to a more common and simpler verb was discussed to improve understanding by respondents. Thus, the verbs “*ajustar* (adjust)” and “*adequar* (adapt)” were proposed in the pretest. The substitution of the verb “*adaptar* (adapt)” with “*ajustar* (adjust)” was unanimous among the participants and was thus approved by the members at the meeting.

Based on the pretest results, items 6.1 and 6.2 did not exactly match the context of the patients, and examples were added that best fit the way the diet is obtained or prepared in the Brazilian setting. For questions 9.1 and 9.2, 75.0% (n=9) of the participants suggested adding the word “*familiares* (family)” to the sentence, and the suggestion was accepted.

The poor understanding of items 10.1 and 10.2 was due to the lack of understanding of why HENT might cause damage to the skin; therefore, the word “*sonda* (tube)” was added to facilitate understanding by the respondent.

Items 12.1, 12.2, 16.1 and 16.2 were long and were thus difficult to understand. Therefore, it was necessary to reformulate the questions to make them more objective and make them understandable by any respondent, taking into account age and, especially, education level.

Thus, after the correction of all items, the final version of the NutriQoL® (T<sub>1,4</sub>) translated to Brazilian Portuguese and culturally adapted to the Brazilian population (Tables 3, 4 and 5) was obtained.

**Table 2** – Percentage of the response scale of NutriQoL® items that indicated a difficulty in understanding

Items*	I had a lot of difficulty understanding		I had little difficulty understanding		I understood perfectly	
	n	% Freq	n	% Freq	n	% Freq
2.1	1	8.3	7	58.3	4	33.3
2.2	1	8.3	5	41.7	6	50.0
6.1	0	0	7	58.3	5	41.3
6.2	0	0	4	33.3	8	66.7
10.1	0	0	2	16.7	10	83.3
10.2	0	0	3	25.0	9	75.0
12.1	2	16.7	2	16.7	8	66.7
12.2	2	16.7	2	16.7	8	66.7
16.1	6	50.0	1	8.3	5	41.7
16.2	5	41.7	2	16.7	5	41.7

Note: \*In all the items mentioned there was no marking of the sentence: I did not understand (n= 0). % Freq: Percentage of frequency.

## DISCUSSION

Assessments of quality of life in patients who receive HENT are usually difficult to obtain and interpret because the questionnaires used for evaluations in these individuals are non-specific [8]. To date, the NutriQoL® is the only questionnaire that assesses the quality of life specifically in this population, regardless of the underlying disease and route of administration of the diet; for these reasons, it is recommended by the European Society for Clinical Nutrition and Metabolism [18].

Faruque *et al.* [8] used three questionnaires to assess the quality of life of patients receiving HENT: the Greater Metropolitan Clinical Taskforce, the Home Enteral Nutrition Patient Satisfaction Survey (developed by home care services in Australia), and the World Health Organization Quality of Life Survey. Similarly, Schneider *et al.* [19] used two questionnaires for this purpose: the non-disease-specific Health-Related Quality of Life Questionnaire and the European Quality of Life Questionnaire. The authors of both studies have reported challenges related to conducting studies on HENT due to the lack of standardized questionnaires, making it difficult to compare results among different studies. Campos *et al.* [20] recently evaluated the quality of life of patients receiving HENT by comparing the NutriQoL® to the 12-Item Short-Form Health Survey (SF-12) and showed that the NutriQoL® was able to identify specific factors that affected quality of life in patients receiving HENT, unlike the SF-12. Thus, the development of a questionnaire to assess the quality of life in patients receiving HENT is essential for measuring the quality of life in these individuals [8,18], reinforcing that the Spanish version of the NutriQoL® is a tool capable of evaluating the quality of life of patients receiving HENT [10,20].

The use of instruments already available in languages instead of developing new instruments is a method used by several researchers because the development of new questionnaires is strenuous and requires more time than the translation, adaptation, and validation of instruments already developed with proven effectiveness [21]. The present study followed the translation and cross-cultural adaptation method proposed by Beaton *et al.* [12]. Studies with the same purpose at the national and international levels have partially or fully used the same methodology [22,23]. Regarding the panel of judges, the study involved a larger number than necessary, with healthcare professionals representing 25% of the panel. However, notably, the contribution of individuals from other areas of knowledge was enriching because some items with CVI values  $\geq 0.78$ , were modified based on their suggestions. That is, the participation of experts in areas other than the study subject favored the adaptation of the questionnaire, as these participants made suggestions necessary to improve the understanding of the questions, which would benefit the population for whom the questionnaire was intended.

Notably, there were some differences between the present study and the original study. In the NutriQoL® developed for the Spanish population, the questionnaire was answered not only by the patients themselves but also by caregivers [10,11]. The authors performed an interobserver reliability test in 35 patients and caregivers, and the degree of agreement obtained was excellent [11]. However, in our study, the questionnaire was only administered to patients, mainly due to the structure and characteristics of the questions addressed in NutriQoL®. In addition, when the subject themselves is responsible for their own quality of life, there is a reduction in unintentional errors, which generates even more reliable results.

In our study, we included only individuals who were receiving HENT via tube feeding during the pretest phase, unlike in the original study. The questionnaire was administered to a majority of patients who were receiving oral nutrition therapy (54.3%), with 61.4% using enteral formulas as supplementation medium [10]. In the current study, in the pre-test phase, the researchers decided not to include patients who received oral nutrition therapy only as a route of feeding, and there were several items specifically related to the use of a feeding tube (*e.g.*, HENT damages my skin; with HENT, I miss chewing and tasting food; and with HENT, I feel physical discomfort with feeding).



**Table 3** – Column A: NutriQol® designing steps for the Portuguese language

Item	Original version	Consensus for the prefinal version (T <sub>1,3</sub> )	Final version
1.1	Con la NED mantengo mis horarios habituales para comer (ejemplo: desayuno, almuerzo, merienda y cena)	With HEN (home enteral nutrition), I maintain my usual eating times (example: breakfast, lunch, snack and dinner)	With HENT (home enteral nutrition therapy), I maintain my usual eating times (example: breakfast, lunch, snack and dinner)
2.1	La NED se adapta a mis preferencias por las características de la alimentación (ejemplo: textura, color, olor, temperatura, sabor)	HEN can be adapted to my preferences in terms of food characteristics (example: texture, color, smell, temperature, flavor)	HENT can be adjusted to my preferences in terms of food characteristics (e.g., texture, color, smell, temperature, flavor)
3.1	Desde que tomo la NED me es más fácil moverme, me siento más ágil	Since receiving HEN, I move more easily, and I feel more agile	Since receiving HENT, I move more easily, and I feel more agile
4.1	Con la NED puedo seguir haciendo mis tareas cotidianas (ejemplo: leer el periódico, cocinar, lavar el coche, limpiar, ver la TV)	With HEN, I can continue doing my daily activities (example: reading the newspaper, cooking, washing the car, cleaning, watching TV)	With HENT, I can continue doing my daily activities (example: reading the newspaper, cooking, washing the car, cleaning, watching TV)
5.1	Desde que tomo la NED veo que mi aspecto físico va mejorando (ejemplo: me veo más saludable)	Since I started receiving HEN, I can see that my physical appearance is improving (example: I see myself as healthier)	Since I started receiving HENT, I can see that my physical appearance is improving (example: I see myself as healthier)
6.1	Conseguir los preparados de la NED es sencillo (ejemplo: está disponible en las farmacias, obtengo la receta fácilmente)	Obtaining HEN preparations is simple (example: it is available in pharmacies, the prescription is easily available)	Obtaining HENT preparations is simple (example: buy online, buy in a physical store, provided by the municipality), or I make the recipe at home
7.1	Con la NED confío en que estoy bien nutrido	With HEN, I trust that I am well nourished	With HENT, I trust that I am well nourished
8.1	Con la NED he recuperado peso	With HEN, I regained weight	With HENT, I regained weight
9.1	La NED me permite poder salir con mis amigos	HEN allows me to go out with my friends	HENT allows me to go out with my friends and/or family
10.1	La NED daña mi piel (ejemplo: sequedad, irritación, infecciones)	HEN damages my skin (example: dryness, irritation, infections)	The tube used for HENT damages my skin (example: dryness, irritation, infections)
11.1	La NED me impide dormir bien	HEN prevents me from sleeping well	HENT prevents me from sleeping well
12.1	Me preocupa que mi cuerpo se adapte a la NED y no pueda volver a alimentarme como antes	I worry that my body will adapt to HEN and that I cannot go back to eating as before	I worry that my body will get used to HENT and that I cannot go back to eating as before
13.1	Con la NED echo de menos masticar y saborear alimentos	With HEN, I miss chewing and tasting food	With HENT, I miss chewing and tasting food
14.1	Con la NED tengo molestias físicas por la alimentación (ejemplo: pesadez de estómago, ardores, sequedad de boca, regurgitaciones)	With HEN, I feel physical discomfort due to feeding (e.g., heavy stomach, burning sensations, dry mouth, reflux)	With HENT, I feel physical discomfort due to feeding (e.g., heavy stomach, burning sensations, dry mouth, reflux)
15.1	Con la NED mi familia vigila más mi alimentación	With HEN, my family monitors my diet better	With HENT, my family and/or caregiver monitors my diet better
16.1	Con la NED limito las actividades con mis amigos a aquellas que no estén relacionadas con la comida	With HEN, I limit activities with my friends to those that are not related to food	With HENT, I limit the activities with my friends to activities that do not involve food
17.1	Desde que tomo la NED estoy más preocupado por mi salud	Since I started receiving HEN, I am more concerned about my health	Since I started receiving HENT, I am more concerned about my health

Note: NED: Nutrición Enteral Domiciliaria; HEN: Home Enteral Nutrition; HENT: Home Enteral Nutrition Therapy.

Thus, the present study proposed the application of the questionnaire to a more specific target audience (patients who had used a feeding tube for at least three months and who were lucid and oriented to space and time), thus making the results more reliable. To obtain a sample size that met the inclusion criteria, a pretest was conducted with patients from an oncology outpatient clinic, where all patients were undergoing cancer treatment. In a study by Apezetxea *et al.* [10], 58.6% (n=82) were individuals with cancer, but patients with intestinal (27.1%; n=38) and neurological diseases (13.6%; n=19) were also included. However, it is important to note that, in Brazil, most individuals receiving HENT have neurological diseases [3,24,25].

**Table 4** – Column B: Designing stages of NutriQoL® for the Portuguese language

Item	Original version	Consensus for the prefinal version (T <sub>1,3</sub> )	Final version
1.2	Mantener mis horarios habituales para comer, para mí es	Maintaining my usual eating times is, for me	Maintaining my usual eating times is, for me
2.2	Que la NED se adapte a mis preferencias por las características de la alimentación, para mí es	HEN can be adapted to my preferences in terms of food characteristics, for me is	HENT being adjusted to my preferences in terms of food characteristics, for me is
3.2	Que me sea más fácil moverme, sentirme más ágil, para mí es	Being able to move more easily, feeling more agile, for me is	Being able to move more easily and feeling more agile, for me is
4.2	Poder seguir haciendo mis tareas cotidianas, para mí es	To be able to continue doing my daily activities, for me is	Being able to continue doing my daily activities, for me is
5.2	Que mi aspecto físico vaya mejorando, para mí es	My physical appearance is improving, for me is	Improving my physical appearance, for me is
6.2	Que sea sencillo conseguir los preparados de la NED para mí es	To easily obtain the HEN preparations, for me is	Easily obtaining or preparing HENT preparations, for me is
7.2	Confiar en que estoy bien nutrido, para mí es	Trusting that I am well nourished, for me is	Trusting that I am well nourished, for me is
8.2	Recuperar peso, para mí es	To regain weight, for me is	Regaining weight, for me is
9.2	Poder salir con mis amigos, para mí es	Being able to go out with my friends, for me is	Being able to go out with my friends and/or family, for me is
10.2	Que mi piel se dañe, para mí es	That my skin is damaged, for me is	Skin damage caused by the use of the tube, for me is
11.2	Dormir bien, para mí es	To sleep well, for me is	Sleeping well, for me is
12.2	Que mi cuerpo se adapte a la NED y no pueda volver a alimentarme como antes, para mí es	My body has adapted to HEN and I cannot eat again as before, for me is	My body getting used to HENT and not being able to eat as before, for me is
13.2	Masticar y saborear alimentos, para mí es	Chewing and tasting food, for me is	Chewing and tasting food, for me is
14.2	Tener molestias físicas por la alimentación, para mí es	Feeling physical discomfort due to food, for me is	Feeling physical discomfort due to food, for me is
15.2	Que mi familia vigile más mi alimentación, para mí es	My family being able to better monitor my diet, for me is	The ability to my family and/or caregiver to better monitor my diet, for me is
16.2	Limitar las actividades con mis amigos a aquellas que no estén relacionadas con la comida, para mí es	To limit activities with my friends to those that are not related to food, for me is	Limiting activities with my friends to activities that do not involve food, for me is
17.2	Estar más preocupado por mi salud, para mí es	Being more concerned with my health, for me is	Being more concerned with my health, for me is

Note: NED: Nutrición Enteral Domiciliaria; HEN: Home Enteral Nutrition; HENT: Home Enteral Nutrition Therapy.

Based on the sample characteristics of the original study and the content of the questionnaire, the NutriQoL® should be used in patients who can answer the questionnaire, such as those with some types of cancer or intestinal diseases and mild neurological diseases, such as those who go to hospitals in outpatient care using HENT, since the evaluation made from the owner's perception of the probe provides more reliable results when compared to the caregiver's responses.

This study is a pioneer in translating a specific questionnaire into Portuguese and cross-culturally adapting it for the Brazilian population to assess the quality of life of patients receiving HENT. Although the population who evaluated semantic equivalence comprised exclusively oncological patients, the adaptation of the NutriQoL® for the Brazilian population demonstrated satisfactory results for use in patients receiving HENT and can be validated in a general or specific population.

**Table 5** – Final version of the NutriQoL® questionnaire after its translation into Portuguese and adaptation for the Brazilian population

Item	Never/Sometimes/Always	Not at all important/Moderately important/Very important
1*	With HENT (home enteral nutrition therapy), I maintain my usual eating times (example: breakfast, lunch, snack and dinner)	Maintaining my usual eating times, for me is
2*	HENT can be adjusted to my preferences in terms of food characteristics (example: texture, color, smell, temperature, flavor)	HENT being adjusted to my preferences in terms of food characteristics, for me is
3*	Since receiving HENT, I move more easily, and I feel more agile	Being able to move more easily and feeling more agile, for me is
4*	With HENT, I can continue doing my daily activities (example: reading the newspaper, cooking, washing the car, cleaning, watching TV)	Being able to continue doing my daily activities, for me is
5*	Since I started receiving HENT, I can see that my physical appearance is improving (example: I see myself as healthier)	Improving my physical appearance, for me is
6*	Obtaining HENT preparations is simple (e.g., buy online, buy in a physical store, provided by the municipality), or I make the recipe at home	Easily obtaining or preparing HENT preparations, for me is
7*	With HENT, I trust that I am well nourished	Trusting that I am well nourished, for me is
8*	With HENT, I regained weight	Regaining weight, for me is
9**	HENT allows me to go out with my friends and/or family	Being able to go out with my friends and/or family, for me is
10*	The tube used for HENT damages my skin (example: dryness, irritation, infections)	Skin damage caused by the use of the tube, for me is
11*	HENT prevents me from sleeping well	Sleeping well, for me is
12*	I worry that my body will get used to HENT and that I cannot go back to eating as before	My body getting used to HENT and not being able to eat as before, for me is
13*	With HENT, I miss chewing and tasting food	Chewing and tasting food, for me is
14*	With HENT, I feel physical discomfort due to feeding (e.g., heavy stomach, burning sensations, dry mouth, reflux)	Feeling physical discomfort due to food, for me is
15*	With HENT, my family and/or caregiver monitors my diet better	The ability of my family and/or caregiver to better monitor my diet, for me is
16**	With HENT, I limit activities with my friends to activities that do not involve food	Limiting activities with my friends to activities that do not involve food, for me is
17**	Since I started receiving HENT, I am more concerned about my health	Being more concerned with my health, for me is

Note: \*Aspects of physical functioning and activities of daily living; \*\* Aspects of social life; HENT: Home Enteral Nutrition Therapy.

## CONCLUSION

Thus, to date, NutriQoL® has been proven effective regarding its translation and cross-cultural adaptation for use in Brazilian patients receiving HENT. Furthermore, it is expected that with its validation, this instrument can be used in the clinical practice of nutritionists or health professionals who work in home care, to assess the effectiveness of the proposed treatment, contributing to improvements in care practices.

## CONTRIBUTORS

JPL OLIVEIRA worked on the literature review, study design, data collection and interpretation and writing of the article. MSR SANTOS and HC MACHADO contributed to the literature review, study design and data collection, SLF AGUIAR and LG FERREIRA were the supervisors of the research supervising the collection, data analysis, writing and revision of the final version of the paper. All authors declared that they had read and approved the final version of the paper.

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