Translation and cross-cultural adaptation of the Strongkids tool for screening of malnutrition risk in hospitalized children

Tradução e adaptação cultural da ferramenta Strongkids *para triagem do risco de desnutrição em crianças hospitalizadas*

Traducción y adaptación cultural de la herramienta Strongkids *para selección del riesgo de desnutrición en niños hospitalizados*

Fernanda Christina de Carvalho[1], Célia Regina Lopes[2], Laurieny da Costa Vilela[3], Marina Araújo Vieira[3], Ana Elisa M. Rinaldi[4], }Cibele Aparecida Crispim[5]

ABSTRACT

Objective: To translate into Portuguese and to culturally adapt the malnutrition screening tool for hospitalized children, *Strongkids*.

Methods: This study documents the translation of the tool from the original version (English) into Portuguese. The translation and cultural adaptation of the content of this tool consisted of six stages, according to the methodology proposed by Beaton *et al* (initial translation, synthesis of translations, back translation, verification of the cultural equivalence process, pre-test, and evaluation of the cultural adaptation process). In the first stage, translation was performed by two independent translators, followed by their synthesis and reconciliation; in the third one, the reconciled version was back translated and, then, a pre-final one that retained all linguistic equivalence was developed. In the fifth step, a pre-test of the pre-final version was performed in order to verify the understanding of the items and a final version of the tool was developed.

Results: The pre-final version of the tool was applied to 30 parents/guardians and to 20 healthcare professionals in order to verify its understanding by both. The main alterations were the adaptation of technical terms in order to meet the recommendations of health professionals, and the adjustment of terms for parents/guardians understanding.

Conclusions: The Portuguese translation of the tool was easily understood by parents/guardians and health professionals, and it should be useful to screen the risk of malnutrition in hospitalized children.

Key-words: malnutrition/screening; child, hospitalized; nutritional status.

RESUMO

Objetivo: Realizar a tradução para o português e a adaptação cultural da ferramenta para triagem de desnutrição *Strongkids*, em crianças hospitalizadas.

Métodos: Estudo documental no qual foi realizada a tradução da ferramenta da versão original (inglês) para a língua portuguesa. A tradução e a adaptação cultural do conteúdo de tal instrumento consistiram de seis etapas, segundo a metodologia proposta por Beaton *et al* (tradução inicial, síntese das traduções, retrotradução, verificação

do processo de equivalência cultural, pré-teste e avaliação do processo de adaptação cultural). Na primeira etapa, a tradução foi realizada por dois tradutores independentes; na segunda, envolveu síntese e reconciliação das mesmas; na terceira, a reconciliada foi retrotraduzida e, na quarta, elaborou-se versão pré-final, de forma a manter as equivalências linguísticas. Na quinta etapa, foi realizado o pré-teste da versão pré-final para verificar a compreensão dos itens e, na última, foram feitas as correções necessárias e uma versão final da ferramenta foi elaborada.

Resultados: A versão pré-final da ferramenta foi aplicada a 30 pais e/ou responsáveis e a 20 profissionais da saúde para esclarecer o entendimento da mesma por ambos os públicos. As principais alterações realizadas foram adequações de termos técnicos, visando a atender às recomendações dos profissionais da área da saúde, e adequação dos termos para os pais e/ou responsáveis.

Conclusões: A ferramenta em português mostrou-se de simples entendimento para os pais/responsáveis e profissionais da saúde a fim de triar o risco de desnutrição em crianças hospitalizadas.

Palavras-chave: desnutrição/triagem; criança hospitalizada; estado nutricional.

RESUMEN

Objetivo: Realizar la traducción al portugués y adaptación cultural de la herramienta para selección de desnutrición «STRONGkids», en niños hospitalizados.

Métodos: Estudio documental, en el que se realizó la traducción de la herramienta de la versión original (inglés) para el portugués. La traducción y adaptación cultural del contenido de esa herramienta consistieron en seis etapas, según la metodología propuesta por Beaton *et al* (2000): traducción inicial, síntesis de las traducciones, retrotraducción, verificación del proceso de equivalencia cultural, pre-prueba y evaluación del proceso de adaptación cultural. En la primera etapa, la traducción fue realizada por dos traductores independientes, en la segunda, hubo la síntesis y reconciliación de estas traducciones; en la tercera, la versión reconciliada fue retrotraducida y, en la cuarta, se elaboró una versión pre-final de modo a mantener las equivalencias lingüísticas. En la quinta etapa, se realizó la pre-prueba de esta versión pre-final para verificar la comprensión de los ítems y, en la última etapa, se realizaron las correcciones necesarias y se elaboró una versión final de la herramienta.

Resultados: La versión pre-final de la herramienta fue aplicada a 30 padres y/o responsables y a 20 profesionales de salud para aclarar el entendimiento de los dos públicos sobre la misma. Las principales alteraciones realizadas fueron adecuación de términos técnicos, con el objetivo de atender a las recomendaciones de los profesionales del área de salud y la adecuación de los términos para los padres y/o responsables.

Conclusiones: La herramienta en portugués se mostró de simple entendimiento para los padres/responsables y para los profesionales de salud para seleccionar el riesgo de desnutrición en niños hospitalizados.

Palabras clave: desnutrición/selección; niño hospitalizado; estado nutricional.

Introduction

The protein-energy malnutrition (PEM) is the most important nutritional disease in developing countries due to its high prevalence, its association with infant mortality rates, and the impairments it causes in growth and socioeconomic development[1]. It is a disorder or illness resulting from the absence or insufficient amount of protein and energy to satisfy the body's needs or due to a problem in the use of the supply that is offered to the body[2].

In the hospital environment, malnutrition is, often, poorly recognized and not always treated, which may lead to morbidity and mortality, especially due to infections[3]. Thus, the early diagnosis and treatment reduce hospital length of stay and actions that are nutritionally iatrogenic[3]. Furthermore, the identification of children with nutritional depletion at admission allows for adequate treatment and estimation of the prognosis[4].

Few studies have been adequately designed to assess the prevalence of malnutrition in hospitalized children with certainty[5]. Some studies have shown that the prevalence of malnutrition in hospitalized patients is a problem that affects about 40% of hospitalized children[5]. In developed countries, particularly France, Germany, and the UK, the prevalence of malnutrition in children under 10 years is of 6 to 14%[6].

Anthropometry is the most common method to evaluate, classify, and monitor nutritional status, due to ease of implementation, low cost, safety, and especially for its universal use, being recommended by the World Health Organization (WHO)[6,7]. The anthropometric parameters commonly used to assess the nutritional status of children are weight and stature (length or height), which must be

analyzed according to sex and age[8]. The methods for screening of nutritional status have also been widely used to screen for malnutrition[9]. In adults, its use is well established and can assist in the early identification of risk of malnutrition and in the institution of nutritional therapy (or nutritional intervention)[9,10].

Currently, there is no consensus on the ideal method of screening for risk of malnutrition on admission and during hospitalization[11]. There are a few tools available in the literature, such as the "Pediatric Nutritional Risk Score"[12]; the "Subjective Global Nutritional Assessment"[13]; the "STAMP tool"[14]; the "Paediatric Yorkhill Malnutrition Score"[15] and the "*Strongkids*"[16]. In general, these tools identify the risk of malnutrition through the evaluation of anthropometric measures, presence of underlying or high-risk diseases, presence/absence of weight loss, food intake, and presence of vomiting and/ or diarrhea[11].

The use of tools such as these is important to identify, at the time of admission and the continuing evaluation during hospitalization, the risk of malnutrition or change in nutritional status for early intervention. Furthermore, these methods are inexpensive, non-invasive, and can be performed at the bedside. In Brazil, up to the present time, there are no publications that present these kinds of tools translated and cross-culturally adapted. Thus, the aim of this study was to perform the translation into Brazilian Portuguese and the cross-cultural adaption of the tool "*Strongkids*" for screening the risk of malnutrition in hospitalized children, assessing the level of understanding of parents (and/or guardians) and health care professionals for its use in Brazil.

Method

This is a documentary study, approved by the Research Ethics Committee of Universidade Federal de Uberlândia (Protocol 005/11 – analysis/final approval n. 172/11) and performed in the period between April and December 2011.

The translation and cultural adaption of the tool were conducted at Universidade Federal de Uberlândia. The interviews with 30 parents and/or guardians and 20 health professionals to assess the level of understanding of the tool occurred at the Pediatric Ward of Hospital de Clínicas da Universidade Federal de Uberlândia. Inclusion criteria for parents and/or guardians were: admission of the child, at most, in the previous 48 hours and, for the health professional, to have practical experience in pediatric clinics.

The *Strongkids* screening tool for risk of malnutrition was chosen because it was of easy and quick administration (on average, 5 minutes) and because it presented results that were compatible with objective data (weight and height). The other tools presented in literature consume more time for administration, making them impractical due to the limited time healthcare professionals have to assess and take the appropriate therapeutic measure.

Strongkids was developed by Dutch researchers and the assessment of its administration was carried out in 44 hospitals, in children from 1 month to 18 years old. This tool is composed by items that assess the presence of a high-risk disease or major surgery planned, loss of muscle mass and fat by subjective clinical evaluation, dietary intake, nutritional losses (decreased food intake, diarrhea, and vomiting) and weight loss or no weight gain (in children younger than 1 year). Each item in the tool displays a certain score, when the answer to the question is affirmative, and the sum of these points identifies the risk of malnutrition, and guides the applicator on the intervention and follow-up needed.

The translation and cultural adaption of the contents of this tool consisted of six steps, according to the proposals of Beaton *et al*[17]: initial translation, synthesis of the translations, back-translation, verification of the process of cultural equivalence, pre-testing, and evaluating the process of cultural adaption.

The first stage consisted of two translations of the original instruments from English to Portuguese. The translations were performed independently by two different professionals graduated in Languages with emphasis in translation, assisted by two translation students and a professional with experience in the field (Nutrition), fluent in both languages. These professionals were asked to use clear language, in order to capture the meaning of the item, without using a literal translation.

In the second stage, the translators involved in the first phase and an observer with experience in the subject area (Nutrition) performed the synthesis of the two translations resolving discrepancies and errors to generate a single document.

In the third stage the back-translation of the version was performed by a translator (English teacher) whose native language was the source language (English) and who was fluent in the target language (Portuguese). The translator involved in this stage was not conscious of the concepts explored and did not have access to the original document in order to avoid information bias and the appearance of

unexpected meanings. This step is a verification process to ensure the validity of the translation to ensure the translated version is reflecting the same content as the original version.

In the fourth stage, a team was formed by professionals involved in all stages in order to conclude the prefinal version of the tool by checking semantic, idiomatic, cultural, and conceptual equivalences between the source version and the Portuguese version.

In stage five of the adaption process, the pre-test of the pre-final version was performed. According to Beaton *et al*[17] pre-testing should be done with 30 to 40 individuals to verify the understanding of the content of the translated tool. This step was performed with 30 parents and/or guardians, who were also interviewed to assess their understanding of the questions performed. Firstly, the researcher administered the questionnaire asking the father and/or guardian to answer the questions regarding his son. If the parent asked to rephrase the question, the researcher questioned which part of the question the parent did not understand and considered the request as evidence that the term was not easy to understand. The design of the questionnaire also involved 20 health care professionals (nutritionists, nurses and doctors) so that they could read the tool and make suggestions with the aim to adequate it to the Brazilian context, improve the comprehension of the items and their level of clarity. In this stage, the questionnaire was given to the professional, so that he could perform the reading of the tool and report the level of understanding of translated items in order to avoid duplicity of meaning or difficulty in understanding. The pre-test was performed with these two kinds of public, once the tool has questions directed to parents and to health professionals.

The sixth and final stage involved the preparation of the final version of the tool. The changes recommended by health professionals and the difficulties raised by parents were considered in the review of the final version.

Results

The original and final versions of the tool *Strongkids* are presented in Chart 1. Some words and expressions differed in the translations of the professionals. The presence of the observer with experience in the field helped on the definition of the synthesized version on the second stage. It was decided to keep the terms that most matched the reality of the tool so as to improve understanding of the items and their level of clarity.

The modifications performed after the completion of the pre-test are as follows. In the title where there is *"On admission and once a week thereafter"* the translation *"Preencher na admissão e uma vez por semana"* was chosen because "thereafter" gives the idea of continuous evaluation and, hence, the need to apply the tool during the entire week, which in reality, will depend on each result. Still on the title, on the translation of the item "Points when scored Yes" as *"Quando a resposta for Sim, pontue"* the words *"resposta"* and *"pontue"* were used to refer, respectively, "scored" and "points", because it was understood that the original item was described in order to score when the answer was affirmative. In the item "High risk disease" the term "underlying illness" and in the item "Nutritional intake and losses" the term "excessive diarrhea (>5 per day)" were translated, respectively, as *"doença de base"* and *"diarréia excessiva (5x/dia)"* because they are terms commonly used by health professionals; and in the field "High Risk disease" the translation chosen for "Dysmaturity/prematurity (corrected age 6 months*)"* was *"Dismaturidade/ prematuridade (usar idade corrigida até o sexto mês)"* to make clear the need for correction of age for children up to the 6th month.

For the cultural adaption of the tool the pre-test was applied and some items were changed in order to clarify the understanding of the content of the tool by both groups of respondents (parents/ healthcare professionals). This concern is justified by the fact that the non-comprehension of the terms would lead to change in the final result. The main changes were: in *"Doença de alto risco"* the term *"(ver lista abaixo)"* was replaced by *"quadro 1"* to facilitate the reading of the tool, according to the suggestions of health professionals and in the item *"Ingestão alimentar e perdas"* the term *"redução"* was replaced by *"diminuição"*, due to the difficulties in understanding by the parents/guardians.

All comments, questions and suggestions were considered relevant, but some did not significantly alter the original meaning and the intelligibility of the item, not being, therefore, applied to the process of cultural adaption.

Discussion

The present study performed the translation and cultural adaption of a nutrition screening tool for use in hospitalized children, in order to systematize nutritional care. Such screening tools are extremely useful to identify the risk of malnutrition in the hospital environment, but of scarce availability for use in pediatrics.

Chart 1 - Original version and final version of the tool *Strongkids*

Original Version	Final Version
Strongkids: Screening for risk of malnutrition	**Strongkids: Triagem do risco de desnutrição**
On admission and once a week thereafter (children aged 1 month – 18 years)	Preencher na admissão e uma vez por semana (crianças de 1 mês a 18 anos de idade)
Points when scored Yes	Quando a resposta for Sim, pontue
High risk disease - Is there an underlying illness with risk for malnutrition (see list below) or expected major surgery?	Doença de alto risco (Quadro 1) - Existe alguma doença de base que pode causar desnutrição ou cirurgia de grande porte prevista?
Subjective clinical assessment - Is the patient in a poor nutritional status judged by subjective clinical assessment (diminished subcutaneous fat and/or muscle mass and/or hollow face)?	Avaliação clínica subjetiva - O paciente apresenta estado nutricional prejudicado de acordo com a avaliação clínica subjetiva (massa muscular e/ou gordura subcutânea reduzidas e/ou face encovada)?
Nutritional intake and losses – Is one of the following items present? • Excessive diarrhea (>5 per day) and/or vomiting (>3 times/day) the last few days? • Reduced food intake during the last few days before admission (not including fasting for an elective procedure or surgery)? • Pre-existing dietetically advised nutritional intervention? • Inability to consume adequate intake because of pain?	Ingestão alimentar e perdas – Apresenta alguns dos itens abaixo? • Diarréia (> 5 vezes por dia) e/ou vômito (> 3 vezes por dia) excessivos nos últimos dias? • Diminuição da ingestão alimentar durante os últimos dias antes da internação (não incluindo jejum para procedimento ou cirurgia eletivos)? • Recomendação de intervenção nutricional pré-existente? • Incapacidade de ingestão alimentar adequada por causa de dor?
Weight loss or poor weight gain – Is there weight loss or no weight gain (infants < 1 year) during the last few weeks/months?	Perda de peso ou baixo ganho de peso – Houve perda de peso ou nenhum ganho de peso (em crianças menores de 1 ano) durante as últimas semanas/os últimos meses?
High risk disease	Doença de alto risco (Quadro 1)
Anorexia nervosa; Burns; Bronchopulmonary dysplasia (maximum age 2 years); Celiac disease; Cystic fibrosis; Dysmaturity/prematurity (corrected age 6 months); Cardiac disease, chronic; Infectious disease (AIDS); Inflammatory bowel disease; Cancer; Liver disease, chronic; Kidney disease, chronic; Pancreatitis; Short bowel syndrome; Muscle disease; Metabolic disease; Trauma; Mental handicap/retardation; Expected major surgery; Not specified (classified by doctor)	Anorexia nervosa; Queimaduras; Displasia broncopulmonar (idade máxima de 2 anos); Doença celíaca; Fibrose cística; Prematuridade/dismaturidade (usar idade corrigida até o sexto mês); Doença cardíaca crônica; Doença infecciosa (AIDS); Doença inflamatória intestinal; Câncer; Doença hepática crônica; Doença renal crônica; Pancreatite; Síndrome do intestino curto; Doença muscular; Doença metabólica; Trauma; Deficiência/retardo mental; Cirurgia de grande porte prevista; Não especificada (classificada por um médico)
Risk of malnutrition and need for intervention	**Risco de desnutrição e necessidade de intervenção**
Score – Risk – Intervention and follow up	Pontuação – Risco – Intervenção e acompanhamento
4–5 points – High risk – Consult doctor and dietician for full diagnosis and individual nutritional advice and follow-up. Start prescribing sip feeds until further diagnosis.	4–5 pontos – Alto risco – Consulte um médico e um nutricionista para fazer um diagnóstico completo, orientação nutricional individual e acompanhamento. Comece prescrevendo pequenas porções de alimento até o diagnóstico definitivo
1–3 points – Medium risk – Consult doctor for full diagnosis, consider nutritional intervention with dietician. Check weight twice a week and evaluate the nutritional risk after one week.	1–3 pontos – Médio Risco – Consulte um médico para um diagnóstico completo, considere uma intervenção nutricional com um nutricionista. Verifique o peso duas vezes por semana e avalie o risco nutricional após uma semana
0 points – Low risk – No nutritional intervention necessary. Check weight regularly and evaluate the nutritional risk weekly (or according to hospital policy).	0 pontos – Baixo Risco – Não é necessária intervenção nutricional. Verifique o peso regularmente e avalie o risco nutricional toda semana (ou de acordo com o protocolo do hospital).

Hospital nutrition is that diagnosed during the patient's stay in the hospital environment. If confirmed in the first 72 hours after admission, it is partly or entirely due to external causes; after that, it is more related to several factors during hospitalization. In both cases, hospital malnutrition is a known risk factor for child morbidity and mortality[18,19]. Hospital malnutrition is common in children and recent research shows that its prevalence reaches about 40% of hospitalized children[5,20]. In a Brazilian tertiary care hospital, it was found that only 35% of children in a pediatric ward were eutrophic at admission, 32% had chronic malnutrition, 15% acute malnutrition and 18% acute chronic malnutrition[20].

Currently, the process of nutritional assessment in children, both in inpatient and outpatient care, are based on various methods such as anthropometry, biochemical exams, and food intake, which, although useful, are not all used in clinical practice because they require a long time for administration and because there are not enough professionals to use and evaluate these methods is clinical practice[11]. The objective methods (weight and height) to assess the nutritional status identify patients who already suffer from malnutrition and not those subjected to the risk of installing this process[21]. To prevent the development of hospital malnutrition and its complications, nutritional risk must be identified at admission so that appropriate nutritional interventions can be introduced early[22]. In this context, methods of screening of nutritional status are useful to track the risk of malnutrition in a quick and practical manner, besides enabling early intervention[11].

The goal of nutritional screening is to indicate the patient's nutritional risk in order to program the frequency of nutritional assessment and establish a therapeutic approach. It identifies the risk of malnutrition, changes in clinical condition affecting the nutritional status of the patient, and factors that may have as consequences problems related to nutrition[23,24]. In selecting this tool it is recommended to choose the most complete, and, at the same time, the one with the better applicability. It is necessary to check which method gathers more technical specifications and qualities such as: the largest number of health professionals who can apply it, the duration of its application to patients, whether it requires financial resources and if those are available at the institution, and if they are capable to detect the nutritional risk reliably[25]. To be used, the nutritional screening tool should be incorporated into the routine of employees[26]. It is noteworthy that, despite the implementation of nutritional screening requires time from the health team, it is cheaper and simpler than laboratory exams and assessment of body composition[25]. While there

is no consensus on the optimal method of screening for malnourished children or at risk of malnutrition at admission and during hospitalization[11], it is known that this tool needs to be understandable and applicable to the target population. In the present study, we chose to translate and cross-culturally adapt the tool *Strongkids* because it is quick and of easy administration for healthcare professionals, which enables a better diagnosis of malnutrition in Brazilian hospitals.

The tool *"Strongkids* – Screening Tool for Risk on Nutritional Status and Growth"* was tested during a national survey in the Netherlands[16]. It consists of four items that can be quickly obtained soon after admission, immediately providing the risk of malnutrition through the sum of the items[16]. The study was performed in 44 Dutch hospitals (7 academic and 37 general) with 424 children (1 month to 18 years). The comparison of the results of the nutritional status by anthropometric indexes (weight/age, height/age and weight/height) with those obtained by the tool showed that, in 98% of children included, the tool was successfully applied[16]. The scores of high risk and negative in weight/height were significantly associated with longer hospital stays[16].

The process of translation and cross-cultural adaption has been increasing due to the large number of multinational and multicultural researches, the need to adopt measures that assess health-related items, and the fact that most of the tools developed are from English-speaking countries and administered in other languages other than the original[17,27]. In Brazil, there are no publications available as yet on screening instruments for malnutrition in children that have been translated and adapted to the local population.

In the translation and cultural adaption of assessment instruments, the greater equivalence between the original version and the target version must be reached, considering that the words may have different conceptual meanings between the cultures, that the items must match the experiences of cultural and daily life of the local target population, that there may be grammatical difficulties, and that the same item can have multiple meanings[17]. The term "cross-cultural adaption" is used to encompass a process that assesses both languages (source and target) and the cultural issues in the method of preparation of a questionnaire for use in another setting[17]. This is a lengthy and costly process that, until now, is the best way to get metric equivalence and allow the use of the instrument by all professionals or patients unable to fill out a form in English[17]. In this context, the present study carried out these processes so that the tool *Strongkids* became accessible to all publics.

The stages of translation, back-translation and synthesis of the tool were performed satisfactorily. In the fourth stage, the assessment by the professional group, there was a very high proximity for most items and all suggestions were accepted because they facilitated understanding. It is also noteworthy that the assessment of the tool through the pre-test, both by parents/guardians and by health professionals (nutritionists, nurses and doctors), was extremely important to increase the quality and ensure a multidisciplinary approach to the content.

The main limitation of this study was the level of education of parents and/or guardians interviewed, since previous studies demonstrated that educational level influences the understanding of the subject by the public, which may have affected the understanding of the questions and, consequently, the diagnosis of risk of malnutrition – object of assessment by the tool[28-30].

It may be concluded that the translation of the tool to Brazilian Portuguese did not modify its original version structurally and proved to be of easy understanding both to parents/guardians and to health professionals. Therefore, this study presents sufficient grounds to give continuity to the process of validation of the tool, so that it can be used by researchers and Brazilian professionals to detect early risk of malnutrition in hospitalized children.

Acknowlegements

References

1. Torun B, Chew F. Desnutrição energético-protéica. In: Shils ME, Olson JA, Shike M, Ross AC, editors. Tratado de nutrição moderna da saúde e na doença. 9ª ed. São Paulo: Manole; 2003. p. 1029-55.

2. World Health Organization. United Nations Administrative Committee on Coordination Sub-Committee on Nutrition (ACC/SCN). Nutrition throughout life. 4th Report on the world nutrition situation. Geneva: WHO; 2000.

3. Silva AA, Gomes UA, Tonial SR, Silva RA. Risk factors for hospitalization of children aged one to four years in São Luís, Maranhão, Brazil. Cad Saude Publica 1999;15:749-57.

4. Filho LA, Penna FG, Rodrigues FG, Santana DP, Hanan B, Oliveira GN *et al*. Nutritional status evaluation of inpatient children at a public hospital general ward. Pediatria (São Paulo) 2005;27:12-8.

5. Bittencourt SA, Niquini RP, Reis AC, Leal MC. Care for malnourished children: an analysis of Brazilian National Health Service Hospital Information System data. Rev Bras Saude Mater Infant 2009;9:263-73.

6. World Health Organization. The world health report 1995: bridging the gaps. Geneva: WHO; 1995.

7. Soares NT, Parente WG. Malnutrition and results of rehabilitation in the city of Fortaleza, Ceará, Brazil. Rev Nutr 2001;14:103-10.

8. Sigulem DM, Devincenzi MU, Lessa AC. Diagnosis of child and adolescent nutritional status. J Pediatr (Rio J) 2000;76 (Suppl 3):S275-84.

9. Detsky AS, McLaughlin JR, Baker JP, Johnston N, Whittaker S, Mendelson RA *et al*. What is subjective global assessment of nutritional status? JPEN J Parenter Enteral Nutr 1987;11:8-13.

10. Beghetto MG, Manna B, Candal A, Mello ED, Polanczyk CA. Nutritional screening in inpatients. Rev Nutr 2008;21:589-601.

11. Joosten KF, Hulst JM. Malnutrition in pediatric hospital patients: current issues. Nutrition 2011;27:133-7.

12. Sermet-Gaudelus I, Poisson-Salomon AS, Colomb V, Brusset MC, Mosser F, Berrier F *et al*. Simple pediatric nutritional risk score to identify children at risk of malnutrition. Am J Clin Nutr 2000;72:64-70.

13. Secker DJ, Jeejeebhoy KN. Subjective global nutritional assessment for children. Am J Clin Nutr 2007;85:1083-9.

14. McCarthy H, McNulty H, Dixon M, Eaton-Evans MJ. Screening for nutrition risk in children: the validation of a new tool. J Hum Nutr Diet 2008;21:395-6.

15. Gerasimidis K, Keane O, Macleod I, Flynn DM, Wright CM. A four-stage evaluation of the Paediatric Yorkhill Malnutrition Score in a tertiary paediatric hospital and a district general hospital. Br J Nutr 2010;104:751-6.

16. Hulst JM, Zwart H, Hop WC, Joosten KF. Dutch national survey to test the STRONGkids nutritional risk screening tool in hospitalized children. Clin Nutr 2010;29:106-11.

17. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976) 2000;25:3186-91.

18. Feferbaum R, Delgado AF, Zamberlan P, Leone C. Challenges of nutritional assessment in pediatric ICU. Curr Opin Clin Nutr Metab Care 2009;12:245-50.

19. Corish CA, Kennedy NP. Protein-energy undernutrition in hospital in-patients. Br J Nutr 2000;83:575-91.

20. Delgado AF. Hospital malnutrition [editorial]. Pediatria (São Paulo) 2005;27:9-11.

21. Quadros AP, Venturi I. Avaliação nutricional subjetiva global: sua contribuição no diagnóstico e tratamento nutricional. Prat Hospitalar 2009;6:65-8.

22. Sermet-Gaudelus I, Poisson-Salomon AS, Colomb V, Brusset MC, Mosser F, Berrier F *et al*. Simple pediatric nutritional risk score to identify children at risk of malnutrition. Am J Clin Nutr 2000;72:64–70.

23. Barrocas A. Rastreamento nutricional. In: Waitzberg DL, editor. Nutrição oral, enteral e parenteral na prática clínica. São Paulo: Atheneu; 2001.

24. American Society for Parenteral and Enteral Nutrition board of directors. Definition of terms used in ASPEN guidelines and standards. JPEN J Parenter Enteral Nutr 1995;19:1-2.

25. Huhmann MB, Cunningham RS. Importance of nutritional screening in treatment of cancer-related weight loss. Lancet Oncol 2005;6:334-43.

26. Kyle UG, Genton L, Pichard C. Hospital length of stay and nutritional status. Curr Opin Nutr Metab Care 2005;8:397-402.

27. Silva FC, Thuler LC. Cross-cultural adaptation and translation of two pain assessment tools in children and adolescents. J Pediatr (Rio J) 2008;84:344-3.

28. Grassi-Oliveira R, Stein LM, Pezzi JC. Translation and content validation of the childhood trauma questionnaire into Portuguese language. Rev Saude Publica 2006;40:249-55.

29. Reichenheim ME, Moraes CL, Hasselmann MH. Semantic equivalence of the Portuguese version of the abuse assessment screen tool used for the screening of violence against pregnant women. Rev Saude Publica 2000;34:610-6.

30. Pasquali L. Princípios de elaboração de escalas psicológicas. In: Gorestein C, Andrade LH, Zuardi AW, editors. Escalas de avaliação clínica em psiquiatria e psicofarmacologia. São Paulo: Lemos; 2000. p. 15-21.