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CROSS-CULTURAL VALIDATION OF A QUESTIONNAIRE TO ASSESS SPINAL PAIN IN CHILDREN

VALIDAÇÃO TRANSCULTURAL DE UM QUESTIONÁRIO DE AVALIAÇÃO DA DOR NA COLUNA EM CRIANÇAS

VALIDACIÓN TRANSCULTURAL DE UN CUESTIONARIO PARA EVALUAR EL DOLOR DE ESPALDA EN NIÑOS

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ABSTRACT

Objective: To validate the cross-cultural adaptation of the English version of theYoung Spine Questionnaire (YSQ) to Portuguese. The questionnaire enables the evaluation, in children, of back pain prevalence and frequency, restrictions on activity, care-seeking behavior, and the influence that the parents' manifestations of back pain can have. Method: The research was conducted in a school setting, with a sample of 128 children aged 9 to 12 years (63 males and 65 females). The questionnaire was completed at two different moments. Test-retest reliability was used to evaluate the degree of reproducibility, and the intraclass correlation coefficient (ICC) between the two sets of observed values was estimated for $p<0.05$. Cronbach's alpha coefficient was used to assess the degree of reliability (internal consistency) of the questionnaire. Results: For most of questions, the ICC ranged between 0.527 and 0.870, with reasonable to excellent correlation to the reproducibility index. The exceptions were foritem c) in two of the first three questions, where the ICC values (0.149 and 0.277) were lower. The value of Cronbach's alpha calculation was 0.8, indicating high internal consistency. Conclusion: It was demonstrated that the cross-cultural adaptation of the YSQ had content validity, was well-understood, and suitable for use in studies with Portuguese children between 9 and 12 years of age. ***Level of evidence II; Development of diagnostic criteria.***

Keywords: Back Pain; Children and Youths; Questionnaire; Validation Study; Translation.

RESUMO

Objetivo: Validar a adaptação transcultural da versão inglesa do "The Young Spine Questionnaire" (YSQ), para a língua portuguesa. O questionário permite avaliar, em crianças, a taxa de prevalência e a frequência de dor na coluna, as restrições de atividade, o comportamento de procura de cuidados e a influência que pode ter a dor de coluna manifestada pelos pais. Método: A pesquisa foi realizada em contexto escolar, com uma amostra de 128 crianças dos 9 aos 12 anos (63 do sexo masculino e 65 do sexo feminino). O questionário foi preenchido em dois momentos distintos. Para avaliar o seu grau de reprodutibilidade utilizou-se o Teste-Reteste, estimando-se o coeficiente de correlação intraclasse (ICC) entre os dois conjuntos de valores observados, para $p<0,05$. Também se recorreu ao coeficiente Alfa de Cronbach, para encontrar o grau de confiabilidade (consistência interna) do questionário. Resultados: Na maioria das questões o intervalo do ICC situou-se entre 0,527 e 0,870, correspondente a uma correlação situada entre razoável a excelente para índice de reprodutibilidade. A exceção foram dois dos itens c) das três primeiras questões, em que o ICC apresentou valores inferiores (0,149 e 0,277). O valor do cálculo do Alfa de Cronbach resultou em 0,8, apresentando elevada consistência interna.Conclusão: Ficou demonstrado que a adaptação transcultural do YSQ tem validade de conteúdo e é bem compreendida para ser utilizada em estudos com crianças portuguesas dos 9 aos 12 anos de idade. ***Nível de evidência II; Desenvolvimento de critérios de diagnóstico.***

Descritores: *Dor nas Costas; Crianças e Jovens; Questionário; Estudo de Validação; Tradução.*

RESUMEN

Objetivo: Validar la adaptación transcultural de la versión inglesa del "The Young Spine Questionnaire" (YSQ) al portugués. El cuestionario permite evaluar, en los niños, la tasa de prevalencia y frecuencia del dolor de espalda , las restricciones de actividad, el comportamiento de búsqueda de atención y la influencia que puede tener el dolor de espalda manifestado por los padres. Método: La investigación se llevó a cabo en un entorno escolar, con una muestra de 128 niños de 9 a 12 años (63 niños y 65 niñas). El cuestionario se completó en dos momentos diferentes. Para evaluar su grado de reproducibilidad, se utilizó el "Test-Retest", estimando el coeficiente de correlación intraclase (CCI) entre los dos conjuntos de valores observados, para $p<0,05$. También se utilizó el coeficiente Alfa de Cronbach, para conocer el grado de confiabilidad (consistencia interna) del cuestionario. Resultados: En la mayoría de las preguntas, el CCI osciló entre 0,527 y 0,870, lo que corresponde a una correlación situada entre razonable y excelente para el índice de reproducibilidad.

Study conducted at the Instituto Superior de Ciências Educativas do Douro.
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Las excepciones fueron dos de los ítems c) de las tres primeras preguntas, donde el ICC mostró valores más bajos (0,149 y 0,277). El valor del cálculo del Alfa de Cronbach dio como resultado 0,8, lo que demuestra una alta consistencia interna. Conclusión: Se demostró que la adaptación transcultural del YSQ tiene validez de contenido y es adecuada para ser utilizada en estudios con niños portugueses de entre 9 y 12 años. ***Nivel de evidencia II; Desarrollo de criterios diagnósticos.***

Descriptores: *Dolor de Espalda; Niños y Jóvenes; Cuestionario; Estudio de Validación; Traducción.*

INTRODUCTION

Back pain has been one of the most frequent causes of reduced work capacity and social adaptation in the adult population, and can lead to a significant decrease in the quality of life.[1,2] However, while in most cases of back pain in children and adults it does not manifest itself in a specific and limiting manner, it can be a high risk factor for the development of chronic pain in adulthood.[3,4] The frequency of back pain tends to increase between 12 and 15 years of age, reaching the highest prevalence at the age of 18.[4] Yao et al.[5] and Beynon et al.[6] recommend conducting studies that illustrate the prevalence of pain in the different spinal regions (cervical, dorsal, and lumbar), as well as the risk factors associated with it, namely with regard to the younger age groups, in order to monitor specific preventative methods, which may be useful in preventing this health issue later in life. Thus, the focus of current research, of prevention and treatment in this area, should be changed from the incidence in the adult population to surveillance and prevention in the young population.

Over the last 10 years there has been increasing interest in studying the prevalence of back pain in children.[7,8]

Epidemiological evidence suggests the existence of significant deviations in the prevalence of pain in different spinal regions (between 11% and 60%), which seem to result from the cultural and age heterogeneity of the different samples studied.[4,5,9,10] In a study conducted by Trigueiro et al.[11] in Portuguese children between 7 and 10 years of age, the prevalence of back pain was around 12%. This value was lower than those recorded in other studies with the same population pattern, although older, where Coelho et al.[12] found values of between 17% and 20% and Oliveira[13] of approximately 39%.

A recent cross-sectional study using questionnaires reported a 33.7% prevalence in low back pain among 1236 participants.[14] However, according to Wirth and Humphreys,[4] adolescents who report pain in more than one spinal region experience greater intensity and frequency of pain than those who manifest pain in only one specific zone of the spine.

Thus, it is most important to have a specific tool to assess pain in the different spinal regions in children and youths, as well as to check restrictions on activity, school absences, and the influence of family history on the manifestation of symptoms.[6]

Questionnaires are widely used as a tool to assess back pain in childrenand adolescents,[15] and the Young Spine Questionnaire (YSQ) by Lauridsen and Hestbaek[16] is a self-reporting questionnaire designed precisely for conducting this evaluation. Its use allows data about the location, intensity, and frequency of spinal pain in children and adolescents to be obtained and restrictions on activity, school absenteeism, and the influence of family history on the manifestation of symptoms to be checked.[6]

However, said questionnaire lacks cross-cultural validation for the Portuguese population, adjusted specifically to respondents younger than 12 years of age.

Thus, the objective of this study was to conduct a cross-cultural validation of the English version of the YSQ for Portugueseso it can be used in future scientific research on the prevalence of back pain in Portuguese children from 9 to 12 years of age. The hypothesis established was that the questionnaire, after translation, is reproducible and presents internal consistency.

METHODS

Study design

The objective of this study was to validate the cross-cultural adaptation of the English version of the YSQ for the Portuguese language, and, for this purpose, considered the guidelines described in the literature by different authors.[17,18]

As suggested by the aforementioned authors, the translation of the English version of the YSQ was intended asan adaptation of an instrument that allows scientific studies that meet the specifications of the original article, without modifying the initially validated version of the questionnaire, to be conducted. The YSQ makes it possible to measure the prevalence rate and frequency of back pain in childhood and at the onset of adolescence, aiming to evaluate the pain intensity, the restrictions on activity, how care is sought, and the possible influence that parental spinal issues have on their children and adolescents.[16]

The authors of the YSQ questionnaire suggest using it because it offers valid estimates of the prevalence and classifications of spinal pain worded to provide a level of understanding suitable for the population in the age range being studied.

Finally, according to Lauridsen and Hestbaek,[16] it has been demonstrated that between 85% and 90% of children aged 9 years and above are able to provide a reliable self-assessment of pain, given that the scale is age appropriate.[19]

These were the factors that justified the selection of YSQ as the appropriate questionnaire for conducting studies on back pain in Portuguese children and youths.

Characterization of the sample

Two classes at three different grade levels (4th, 5th, and 6th grade), all with approximately the same number of students per class, participated in the study.

To keep the number of students per age equivalent, 32 children per age were randomly selected out of the total number of participants, resulting in a total of 128 respondents, 63 of whom were male and 65 of whom were female. We determined that the total number of participating students would be greater than 100 because, according to Hill and Hill,[20] this is a requirement to test the reproducibility of a questionnaire through test-retest reliability.

The characteristics of the sample that participated in the two applications of the questionnaire are shown in Chart 1.

Questionnaire characteristics

Next, we will discuss the YSQ questionnaire characteristics and several of the decisions made during its construction as presented by Lauridsen and Hestbaek.[16] According to these authors, the items

Chart 1. Numbers (N) and respective percentages (%) of the study sample by characteristicsof age and sex.

		N in the sample	Respective% oftotal N in the study
Sex	Male	63	49.2%
	Female	65	50.8%
	Total	128	100.0%
Age (years) 10.5±1.2	9 years	32	25.0%
	10 years	32	25.0%
	11 years	32	25.0%
	12 years	32	25.0%
	Total	128	100.0%

that make up YSQ were chosen in order to adjust to the level of symptoms and functional state associated with health, in addition to the characterization of the individual and the environment.

The YSQ contains a frequency question that can be dichotomized to represent lifetime prevalence, as well as estimates of point and weekly prevalence, for all regions of the spine. At the beginning of each section, a description delimiting the location of the spinal area under analysis was included (Sections 1-3).

With regard to the level of the symptomatic status, questions for estimating the prevalence of spinal pain (daily, weekly, and lifetime prevalence), the absence of episodes of pain, and the pain intensity were included.

Regarding functional status (Section 4), questions are asked that assess the consequences in terms of restriction on sports activities, school absenteeism, and care-seeking behavior.

As for back pain experienced by members of the family, Section 5 poses questions to measure the child's perception of their parents' back problems and their consequences, because Lauridsen and Hestbaek[16] consider that this symptomology may have a potential psychological effect (environment) on the child, just as a genetic component may also have an impact. In fact, some studies have reported a significant relationship between comments about symptoms made by family members and actual low back pain.[21,22]

Also, in this sections on family issues, Lauridsen & Hestbaek[16] justify the use of the father or stepfather and mother or stepmother relationships, since they found that by mentioning only "father" and "mother" in questions 5a and 5c, children from divorced families left the questions unanswered. Or, on the other hand, they realized that children would relate intuitively to the person with the most influence on their behavior.[16]

Questionnaire translation procedures

Regarding the procedures for the translation of the English version of the YSQ to European Portuguese, two orthopedists were asked to translate the questionnaire, who, after having cross-referenced their two translations, presented a first version of the translation (QT1). Subsequently, in order to ensure that the translated version reflected the same content as the original version and to check for gross inconsistencies or conceptual errors in the translation, a back translation of the Portuguese version (QT1) into English was requested, to be performed by a person who had lived in Portugal for more than 10 years, whose mother tongue was English, who did not work in any clinical area, and who had no knowledge of any version of the questionnaire. According to Hambleton,[23] using methods such as back translation is essential for assessing linguistic equivalence. The back translation method confirmed that the translation was effective, as it showed that it did not change the English version.

In the next phase, two Portuguese natives, who teach the Portuguese language at the age levels under study were asked to analyze the available version (QT1) separately and then compare the questions for I) semantic equivalence, II) idiomatic equivalence, III) experimental equivalence, and iv) conceptual equivalence.[20] In this phase, the participation of teacher specialists was fundamental in order to be able to adapt some questions to the reading capacity of children between the ages of 9 and 12 without altering the meaning of the questions presented in the English version.[18]

Subsequently, the translators, the teachers, and a researcher specializing in childhood development met to focus on the harmonization of the working versions.[24] It was proposed, by consensus, that a better explanation of what was intended by completing the questionnaire be included in the introduction, by referring to the study objectives. Thus, when the questionnaire in English states that "This questionnaire is related to the spine and neck", they decided to translate it as "*Este questionário está relacionado com a dor nas costas e no pescoço*"[This questionnaire is related to back and neck pain]. The reason given by the experts was the importance of making the context of the questionnaire to be completed more understandable. The team also suggested changing the translation of the wording "…the answer that is best suited" to "...*resposta que te parece ser a mais próxima da tua situação*" [...the answer that seems to you to be the closest to your situation].

The team also suggested not including a space for the name and class of the student, as it appears in the English version of the YSQ, because it was understood that it should be completed anonymously. However, to provide information essential for conducting scientific studies, areas were added to the questionnaire for recording the sex and birth date of the participants, as well as an individual code to be filled in under the guidance of the administering researchers.

Following joint analysis by these specialists, suggestions were made to adapt questions 1d), 2d), and 3d) so that the children and youths could better understand what was requested. For example, in question 1d) where it states "Put a cross (X) on the face which shows how much pain you have had in the neck when it was worst", the wording proposed was "*Coloca uma cruz (X) no rosto que mostra qual foi o sentimento de dor mais forte que já tiveste na zona do pescoço*" [Put a cross (X) on the face that shows the strongest feeling of pain that you have had in the neck area].In the introduction to these questions, the committee of analysts also proposed changing the translation of the English sentence "The faces below show how much something can hurt. The pain ranges from 'No pain' to 'A lot of pain'" to "*Os desenhos dos rostos apresentados abaixo mostram a quantidade de dor que se pode sentir, desde "sem dor" até "muitíssima dor*" [The face drawings below show the amount of pain you can feel, from "no pain" to "very much pain"].

This interactive process resulted in a preliminary version of the questionnaire that was applied in a pilot study, allowing an assessment of the functional equivalence between the two versions, the questionnaire in English and the translated questionnaire, to be conducted. According to Peña,[17] functional equivalence can be evaluated by interviewing the participants during a pilot study, helping the researchers to understand how the respondents can collaborate in preparing the questions. Interviews can also be used to explore the nature of cultural differences. Furthermore, according to Wild et al.,[24] it is essential to conduct a preliminary application with oral questioning, in a sample offrom 5 to 8 natives of the country for which the translation is intended and which adequately represents the target population in terms of sex, age, education level, and clinical status (recommended to be applied to healthy individuals). The authors reinforce that,in this way, it ispossible to assess the level of cognitive comprehension and translation equivalence, to test any alternatives that have not been resolved by the translators, to highlight any items that may be inappropriate for a certain concept, or to identify any other issues that raise doubts. Thus, 12 native Portuguese children, three per age (9, 10, 11, and 12 years), of both sexes, completed the questionnaire, and as they responded, the researcher interviewed them about their understanding of each one of the questions in order to confirm the perceptibility of the content.

In item 1b), five of the children asked if the question "*Na última semana tiveste dor no pescoço?*" [In the last week have you had neck pain?] meant to include the days prior to the day on which they were completing the questionnaire or the week before. This doubt led to an agreement to change questions 1b), 2b), and 3b) to read "*Na semana passada tiveste dor...*?" [Last week did you have pain...?]. This decision was supported by an analysis of the article by the YSQ authors, who explain that the results should consider estimates of weekly prevalence, in addition to those of point (daily) and lifetime prevalence.[16] Likewise, this interpretation led to a change the answer"*uma ou duas vezes*" [once or twice] in questions1a), 2a), 3a), 4a), 4b), and 4c) to "*uma ou duas vezes ao longo da vida*" [once or twicein your lifetime].

As this procedure continued, the participants voiced doubts about the last two expressions presented on the faces in questions 1d), 2d) e 3d), considering that the next-to-last face already instilled a feeling of "*muita dor*" [much pain]. Because this was the unanimous opinion among the children, a decision was made to classify the last face as "*Muitíssima dor*" [very much pain] and not "*Muita dor*" [much pain], as it can be translated from the English version of the YSQ. This decision seemed to be more consistent when the

team tried to perform the exercise of assigning a degree of intensity to the six faces represented, resulting in a sequence of"*sem dor*", "*pouca dor*", "*alguma dor*", "*dor*", "*muita dor*"; "*muitíssima dor*" [no pain, a little pain, some pain, pain, much pain, very much pain]. This practice of identification, of complete correspondence, was not recorded in the questionnaire so as not to change the structure of the original version.

Also, during the functional equivalence analysis process, the children were asked to indicate with a hand where they understood the end of their back to be. All the children circumscribed the lumbar area, never indicating the coccyx, which demonstrated the understanding of the correspondence between the description and the image presented in the questionnaire. Several authors advocate using a figure of the human body as the ideal method for identification of the body regions.[25,26]

After considering and incorporating the suggested adaptations, we proceeded to create the definitive version of the questionnaire translated into Portuguese (European), ensuring that it would be understood by 9- to 12-year-old children, approximately equivalent to a grade-6 reading level, as described in the general recommendations for questionnaires.[18]

Descriptions of the stages of the cross-cultural validation procedure can be observed in systematized form in Chart 2.

The YSQ questionnaire was titled "*Questionário sobre a coluna jovem*" [Young Spine Questionnaire] and the configuration of the definitive version is described below.

The first three questions are related to the symptomology of pain in three spinal regions, which were identified by images associated with the designations of neck, middle zone of the back, and lower zone of the back, for better comprehension by the children and youths. These questions present the following content for each one of the situations: I) *Costumas ter dor no pescoço* (1a)) *ou zona do meio das costas* (2a)) *ou na zona final das costas* (3a)*?* [Do you usually have pain in your neck (1a) or the middle zone of your back (2a) or the lower zone of your back (3a)?]; II) *Na semana passada tiveste dor no pescoço (1b)) ou na zona do meio das costas (2b)) ou na zona final das costas (3b))?*[In the past week have you had pain in your neck (1b) or in the middle zone of your back (2b) or in the lower zone of your back (3b)?]; III) *Hoje tiveste dor no pescoço (1c)) ou na zona do meio das costas (2c)) ou na zona final das costas (3c))?* [Today have you had pain in your neck (1c) or in the middle zone of your back (2c) or in the lower zone of your back (3c)?].These three groups also include a question (1d, 2d,and 3d)for identifying the facial expression that agrees with the maximum level of pain ever felt in each of the three previously described regions.

In the fourth group the questions address the themes *Escola, Lazer e Tratamento*[School, Leisure Time, and Treatment]: I) *Já faltaste à escola por causa da dor nas costas ou no pescoço? II) Alguma vez não conseguiste praticar desporto por causa da dor no pescoço ou nas costas? III) Alguma vez foste ao médico ou fisioterapeuta ou outro profissional por causa da dor no pescoço ou nas costas?*[I)Have you ever missed school because of back or neck pain? II) Have you ever been unable to play sports because of neck or back pain? III) Have you ever gone to the doctor or physical therapist or another professional because of neck or back pain?].

Finally, in point five of the questionnaire, the questions are related to the family: I) *O teu pai ou padrasto alguma vez teve dor no pescoço ou nas costas?* II) *Se sim, alguma vez o teu pai ou padrasto faltou ao trabalho por causa dessa dor?* III) *A tua mãe ou madrasta alguma vez teve dor no pescoço ou nas costas?* IV) *Se sim, alguma vez a tua mãe ou madrasta faltou ao trabalho por causa dessa dor?* [I) Has your father or stepfather ever had neck or back pain? II) If yes, did your father or stepfather ever miss work because of that pain? III) Has your mother or stepmother ever had neck or back pain? IV) If yes, did your mother or stepmother ever miss work because of that pain?].

Chart 2. Summarized presentation of the procedures used in the validation of the cross-cultural adaptation of the YSQ, with the respective stages, descriptions, participants, and justifications.

Stage	Description	Participants	Justification
1st	Review of the different studies of cross-cultural validation of health-related questionnaires.	Team of researchers.	The guarantee of the quality translation of questionnaires is highly dependent on the methodology used.[20]
2nd	Translation of the English version of the questionnaire to Portuguese. After having cross-referenced the two translations, they presented the firstdraft of the questionnaire (QT1).	Two orthopedists.	Because it is a health-related questionnaire.
3rd	The Portuguese version (QT1) was back translated to English to ensure that the translated version reflected the same content as the original version.	A person, residing in Portugal for over 10 years, with no knowledge of any version of the questionnaire, who was not from a clinical area, and whose mother tongue was English.	To assess linguistic equivalence, using the back translation method is recommended.[21]
4th	Separate analysis of the available version (QT1) and subsequent comparison of the versions in terms of i) semantic equivalence; ii) idiomatic equivalence; iii) experimental equivalence; and iv) conceptual equivalence	Two native Portuguese teachers, specialized in the Portuguese language, who teach the ages studied.	It is essential to adapt the questions to the reading capacity of children without, however, changing the meaning of the questions in the original version.[22]
5th	Harmonization of the translations performed and adjustments to some questions to make the context of the questionnaire more understandable to complete.	Translators, teachers, and a researcher specialized in child development.	It is important to achieve conformity in the understandability of the context among the different specialists.[20]
6th	Pilot study to evaluate the functional equivalence between the versions (English and Portuguese). Interviewing the participants during the application of the questionnaire.	An administrating researcher and 12 Portuguese children from 9 to 12 years of age, of both sexes (male and female).	Functional equivalence leads to an understanding of the collaboration of the respondents in the preparation of the questions andthe nature of the cultural differences.[19]It is essential to conduct a preliminary application with oral questioning with a sample of 5 to 8 natives from the country where the translation will be implemented and who adequately represent the target population.[20]
7th	The definitive version of the cross-cultural adaptation of the YSQ, translated to Portuguese, is prepared.	Research team.	

Validation of the cross-cultural adaptation

The researchers received approval to conduct the validation of the cross-cultural adaptation of the YSQ questionnaire from the Órgão de Administração e Gestão do Agrupamentos de Escolas (OAGAE) do 1.º e 2.º Ciclo do Ensino Básico [Board of Administration and Management of the School Groups of the 1st and 2nd Cycles of Elementary Education] and the respective pedagogical council, as well as the informed consent of the parents or legal guardians via the class directors. All the procedures followed the ethical standards of the Declaration of Helsinki concerning human research and of the Institutional Review Board that approved the research (PROJ1.94/18).

After analyzing the informed consent of the parents or legal guardians, cases of students not authorized to participate in the study did not complete the questionnaires in the two application phases.

The questionnaires were all administered by the same researcher who, according to a schedule previously prepared with OAGAE, went to the respective classrooms during school hours.

For the validation of reproducibility, the questionnaire was completed at two separate times, with an interval of 4 days between them, one at the beginning of the week and the other at the end of the same week. This procedure was based on the orientation of the YSQ authors, who,using the same time frame, demonstrated the viability and validity of the revisions.[16] On the other hand, Hill & Hill,[20] advocated a minimum 7-day interval between the two moments of application given the nature of the questions, as the temporal condition of the questions can influence the response, such as in "*Na semana passada tiveste dores...*" [In the past week have you had pain...]. The suggestion of the authors to conduct the two applications in the same week would be the best fit to avoid skewing of the data.

During the administration of the questionnaire, the researcher gave the students the code that they needed to enter in the space indicated, which was a standard number added to the number of each student in the class and reminded them of the importance of filling in their date of birth and identifying their sex as male or female. The researcher stressed that there were no right or wrong answers and that it was important to complete each item according to their case and not to try to mark what seemed more correct; that they should not associate the answers about feelings of pain to recent situations of surgeries or injuries or any specific illnesses (example: the flu); that completing the questionnaire was individual and did not count towards the grade for any class, so it was important to participate with the utmost sincerity and seriousness. Finally, the member of the research team read the initial part of the questionnaire out loud and informed the children that they could ask questions if they had difficulty understanding any item, without, however, influencing any answer, since the instructions given to the participants could be a potential source of bias.[17] In the second application the children were not allowed to ask questions.[18]

Statistical procedures

Regarding the statistical procedures, a descriptive analysis of the sample was conducted, which included the means and standard deviations of the absolute values of the individual ages, and a frequency analysis was also presented, indicating the percentages (%) for each of the indicators.

To determine the degree of reproducibility of the applied questionnaires, we used the Test-Retest statistical procedure, estimating the interclass correlation coefficient (ICC) between the two sets of values observed, maintaining a confidence level of 95%.

We also calculated Cronbach's alpha to find the degree of reliability, namely the internal consistency of the questionnaire.

The statistical results were computed using Statistical Package for the Social Science (SPSS) software, version 24.0 for Mac.

RESULTS

The two applications of the questionnaire provided two sets of observed values, allowing the evaluation of reproducibility by measuring temporal stability, using the interclass correlation coefficient (ICC).[27]

Chart 3 shows the ICC values calculated for each item in the questionnaire.

Chart 3 presents the intraclass correlation coefficient (ICC) between the two sets of values observed, which ranged from 0.527 to 0.870 for most of the questions. However, it can be seen that lower values were recorded for questions 1c) and 3c) (0.149 and 0.277, respectively).

An internal consistency of 0.8 was found using Cronbach's alpha coefficient.

Chart 3. ICC values for each item of the questionnaire and identification of the significance levels.

Question 1	**a)**	**p**	**b)**	**p**	**c)**	**p**	**d)**	**P**
ICC	.765*	.000	.527*	.000	.149	.185	.870*	.000
Question 2	**a)**	**p**	**b)**	**p**	**c)**	**p**	**d)**	**P**
ICC	.813*	.000	.560*	.000	.690*	.000	.848*	.000
Question 3	**a)**	**p**	**b)**	**p**	**c)**	**p**	**d)**	**P**
ICC	.795*	.000	.728*	.000	.277	.075	.843*	.000
Question 4	**a)**	**p**	**b)**	**p**	**c)**	**P**		
ICC	.335*	.012	.805*	.000	.841*	.000		
Question 5	**a)**	**p**	**b)**	**p**	**c)**	**P**	**d)**	**p**
ICC	.769*	.000	.819*	.000	.691*	.000	.787*	.000

*Statistically significant ($p<0.05$).

DISCUSSION

According to Wild et al.,[24] instruments that present biased translation threaten the validity of the research results and the secure aggregation of global data sets. The same authors consider that quality assurance is, therefore, strongly dependent on the methodology used. Based on these assumptions and after having conducted a review of the literature on cross-cultural validation procedures for questionnaires related to health, we decided to follow the guidelines of Beaton et al.,[18] with adaptations duly supported by other authors.[17-23]

The research team was also concerned that, in the process of cross-cultural validation, the child development and Portuguese language specialists could ensure linguistic equivalence, function equivalence, cultural equivalence, and metric equivalence between the source and target questionnaires.[17,18] Despite the fact that there is a Portuguese (European) translation of the YSQ on the official website of the authors, it was essential to conduct cross-cultural validation for a level of comprehension adjusted to the study population[18] without changing the meaning of the original document. According to Beaton,[18] cross-cultural adaptation is a meticulous appropriation process designed to maximize achieving equivalence, while respecting the perceptibility of the content.

By observing the data in Chart 3, we can see that the intraclass correlation coefficient between the two sets of observed values was between 0.527 and 0.870 for most of the questions, which, according to Cicchetti,[27] indicates a reasonable to excellent correlation. However, we found that in the first three questions,paragraph c), which asks "*Hoje tiveste dor na...*" [Today did you have pain in the..."], had lower ICC values (0.149 and0.277). We believe that this result may have been influenced by the seasonality of the phenomenon investigated on each of the days of application.[15]

However, the questionnaire can be considered to have a good reproducibility index, given that, as argued by Hill and Hill,[20] the correlation values were all positive and significant.

Finally, the calculation of Cronbach's alpha, the result of which was 0.8, indicates that the questionnaire has high internal consistency, classified by Landis and Koch[28] as almost perfect. According to the authors, this circumstance is observed when the result is equal to or greater than 0.8, reinforcingTerwee et al.,[29] who state that results greater than 0.7 are ideal, indicating that all the subparts of the instrument measure what was intended, with consistent responses.[30]

CONCLUSION

The study data indicate that the translation of the YSQ has high

internal consistency and a good reproductivity index.

Therefore, the results demonstrate that the content of the cultural adaptation of the YSQ is both very understandable and valid for use in studies with Portuguese children between the ages of 9 and 12.

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