



Cross-cultural adaptation to Portuguese of the Research Diagnostic Criteria for Temporomandibular Disorders for adolescents: A semantic evaluation

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Abstract

Objective: To describe the process of cross-cultural adaptation and present the Portuguese version of the instrument Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) for use in adolescents.

Methods: The RDC/TMD adapted for adolescents was fully translated into Portuguese by a translator and then back translated into English by a second translator who was blind to the original text. The back translation was compared with the original by the author and the final version defined by consensus. Part I of the instrument was administered to 186 students aged 12 to 17 years in the town of Três Rios/Rio de Janeiro State, Brazil, to assess comprehensibility.

Results: One question was considered inaccurate in the back translation. The young respondents struggled with five of other questions. The original version of the instrument in English and the final version in Portuguese were presented.

Conclusion: The process of translation and back translation ensured the semantic equivalence of the original version relative to the translated version. The application of the questionnaire met wide acceptance and contributed to the final version of the instrument.

Key words: TMJ Disorders; Temporomandibular Joint Dysfunction Syndrome; Myofascial Pain Dysfunction Syndrome; Temporomandibular Joint Syndrome; Facial pain

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Adaptação transcultural do instrumento Research Diagnostic Criteria for Temporomandibular Disorders, para adolescentes: Uma avaliação semântica

Resumo

Objetivo: Descrever o processo de adaptação transcultural e apresentar a versão em português do *Instrument Research Diagnostic Criteria for Temporomandibular Disorders* (RDC/TMD) para uso em adolescentes.

Métodos: O RDC/TMD para adolescentes foi inteiramente traduzido para o português, por um tradutor e retraduzido para o inglês, por um segundo, cego para o texto original. A retradução foi confrontada com o original pelo seu autor e a versão final definida por consenso. A parte I do instrumento foi aplicada em 186 estudantes de 12 a 17 anos, de Três Rios/RJ, visando a avaliar a facilidade de entendimento.

Resultados: Uma questão apresentou diferença de sentido na versão retraduzida. Os jovens respondentes tiveram dificuldades em cinco questões.

Conclusão: O processo de tradução e retradução garantiu a equivalência semântica da versão em original com a versão traduzida. A aplicação do questionário revelou boa aceitação e contribuiu para a elaboração da versão final do instrumento.

Palavras-chave: Disordens têmporo-mandibulares; Síndrome da disfunção têmporo-mandibular; Síndrome da dor miofascial; Síndrome da junção têmporo-mandibular; Dor facial

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Received: July 25, 2013

Accepted: December 19, 2015

Conflict of Interests: The authors state that there are no financial and personal conflicts of interest that could have inappropriately influenced their work.

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Introduction

Questionnaires are essential tools in Epidemiology. The quality of epidemiological findings is inextricably linked to the quality of the instruments used in research, and obviously the use of invalid instruments means a waste of time and money. According to the International Epidemiology Association, although properly preparing questionnaires is essential for data quality, attention given to the development and validation of a questionnaire is often insufficient compared to the amount of time and resources spent to define the study design, the selection of the population and sampling [1].

One way to ensure the quality of data collected through questionnaires is to use only those that have been validated, i.e., those that were subjected to a validation procedure meant to prove that they indeed measure accurately and unequivocally that which they were designed to measure, regardless of who the subjects are, when and to whom they are supposed to respond. Moreover, a questionnaire should be well accepted by respondents given that the subjects' motivation to participate and provide the necessary information is of utmost importance [1].

The term temporomandibular disorder (TMD) can be defined as a set of painful and/or non-functional conditions involving the masticatory muscles and/or the temporomandibular joint (TMJ) [2]. Since they do not share a common biological explanation, TMDs can be characterized as a diverse group of health problems whose etiology is often multifactorial. The key characteristics are pain, joint sounds and mandibular dysfunction [3,4].

TMD-related pain can be well tolerated by most people, but a minority of patients – even in the absence of specific physical deterioration – can experience excessive, nonspecific psychosocial stress [5]. Thus, painful TMD conditions resemble other common chronic pain conditions, notably headache and back pain.

TMD-related pain in adolescents is still poorly understood. Studies on pain conducted at this stage of life are mainly based on the prevalence of pain through parental reports [6]. Yet another problem lies in the diversity of criteria used for the definition of pain in different studies. Furthermore, it is noteworthy that in adolescents the pain can reach greater proportions, interfering with daily activities, increasing the consumption of drugs, causing addiction or, in other cases, being used as support for this difficult phase of their lives [7].

Even in cases where it is non-disabling, where the pain does not play a prevalent role, and nor is it an observable clinical symptom, a diagnosis of TMD in adolescents showed a significant association with the development of hyperdivergent mandibular growth pattern [8]. This diagnosis is based on characteristic signs and symptoms, and not on etiologic factors. Therefore, one should take into account the fact that the TMJ may be affected by numerous diseases with similar signs and symptoms, which can be misleading in terms of the expected diagnosis and prognosis [5].

The Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD), developed by Dworkin and LeResche [9] in 1992, allows the classification of TMD patients, thereby allowing a comparison of results between different population groups [10]. The similarities found as a result of administering the RDC/TMD in different countries corroborate the consistency of this diagnostic tool [10].

Given the limited resources available to Dworkin and LeResche at the time the RDC/TMD was developed it was not possible to assess whether or not their standard examination methods, procedures and questionnaires, originally developed for adult patients, could be applied in adolescents [9]. Indeed, a later study identified inconsistencies in some of the questions, which compromised its application in this population group [11]. Furthermore, in the late 1990s, Wahlund et al. [12] published the results of a validation study of a questionnaire that sought to provide the same type of evaluation conducted in adult patients.

The questionnaire developed by the authors assessed self-reported TMD-related pain and symptoms, having been revised and pretested on a group of 24 12-year-old teenagers who were blinded to the experiment. This pretest assessed vocabulary, level of clarity and format for future application. The adolescents were able to answer the questionnaire in the format in which it was presented [12].

Subsequently, the authors applied the tested instrument to a sample of 50 Swedish adolescents, 12-18 years of age, 30 of who were patients of a TMD clinic in Linköping. A nurse helped to clarify issues and ensure the questionnaire was filled out correctly. The results revealed that the RDC/TMD is a reliable method that significantly correlates subjective reports with clinical findings [12]. Moreover, a high prevalence of TMD signs and symptoms was observed in this specific population, with a predominance of female involvement [13,14]. These findings were corroborated by a subsequent study also based on RDC/TMD application [15].

Although convenient, the use of existing tools outside the sociolinguistic context in which they are designed entails the development of an adaptation process [14-17]. Although such adaptation is often restricted to translation-back translation aimed at establishing an equivalence of meanings, it is important to stress that this semantic evaluation is but one of the components of cross-cultural adaptation [16].

Reichenheim and Moraes [16] acknowledge that there is a lack of consensus on the strategies to implement cultural adaptation, and therefore endorse the guide proposed by Herdman et al. [17] for assessing the equivalence between the original instrument and the instrument being adapted from six different angles: Conceptual, item, semantic, operational, measurement and functional equivalence.

Semantic equivalence involves the ability to transfer the meaning of concepts contained in the original instrument to the translated version, thus producing a similar effect in the respondents of both cultures. A roadmap to evaluate this aspect of equivalence involves: Translation and back translation, evaluation of semantic equivalence between the original and back translation, discussion with the target

population, discussion with experts for final adjustments and a pretest version [16].

This article aimed to describe the process of cross-cultural adaptation and present the Portuguese version of the instrument “Research Diagnostic Criteria for Temporomandibular Disorders” for use in adolescents.

Methods

The project was developed in accordance with the Declaration of Helsinki and the regulations laid down by the Brazilian National Health Council (CNS 196/96). It was presented to and approved by the Research Ethics Committee at the School of Medicine, city of Petrópolis, Rio de Janeiro State, Brazil, under submission nº 0405/2006.

The original version of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) for use in children and adolescents, proposed by Whalund et al. [12] consists of 2 parts. Part I comprises a questionnaire about the characteristics of pain, its consequences and associated symptoms. It is self-reported and consists of 17 questions arranged in three blocks – organized to assess the frequency and location of pain, parafunctional habits and reduction in mandibular movement. It also contains 3 scales designed to assess pain intensity, pain interference with daily activities and frequency of drug consumption.

The first block is composed of nine questions that address the frequency of symptoms such as headache, pain in the temporal region, facial pain and temporomandibular joint pain. The answers are given on a scale ranging from 0 (never) to 4 (daily). The second block consists of 6 yes/no questions covering mandibular functions and parafunctions and issues that could potentially influence treatment. The last block consists of two questions that require the patient to report (a) the duration of TMD-related pain, and (b) interference with daily activities. The former was measured in number of months and the latter in the number of days the subjects missed school activities in the previous month.

The first scale measures pain intensity using a visual analogue scale (VAS) anchored by the terms “no pain” and “worst pain imaginable.” The second 6-point scale, called a behavioral scale, measures the perception of pain and pain related disabilities. This scale ranges from 0 to 5 and measures absence of pain, pain awareness and the ability to ignore it, and the level of pain interference with daily activities. The last scale, also a 6-point scale, measures the frequency of use of painkillers, ranging from never to daily.

Part II of the instrument consists of a list of 10 items comprising the procedures and criteria to be followed in the clinical evaluation of patients. It encompasses the clinical evaluation of the following signs and symptoms: Pain site, pain associated with mandibular movements, joint noises, and muscle and joint sensitivity to palpation. Some variability was observed in the adult version. In assessing pain intensity on palpation of specific muscle and joint regions of the face and neck, adolescent patients were required to respond using a scale ranging from 0 (no pain or pressure) to 1 (mild pain)

to 2 (severe pain). There is no score for moderate pain as in the original version of the RDC/TMD.

It is worth noting that this adjustment made by Whalund et al. [12] in the RDC/TMD for adults was originally meant to address the population between 12 and 18 years old, known generically by the authors as “children and adolescents.” The World Health Organization (WHO) defines adolescence as the period between ages 10 and 19 years, and youth from 15 to 24 years [19]. This same classification is also adopted in Brazil. It can be found in the National Guidelines for Comprehensive Health Care of Adolescents and Youth in the Fostering, Protection and Recovery of Health, whose target population are individuals aged between 10 and 24 years. For legal purposes, Article 2 of the Child and Adolescent Statute (ECA) – Law nº 8069 of 07/13/1990 [19] – defines a child as a person under 12 years of age, and an adolescent between 12 and 18 years old. In light of these legal frameworks, the term “children and adolescents” found in the original RDC/TMD instrument was replaced by “adolescents” in this text and in the adapted instrument, since neither in official documents issued by the Ministry of Health nor in the Statute (ECA) are individuals older than 12 considered children.

At first (step 1), the instrument developed by Whalund et al. [12] was fully translated into Portuguese and back translated into English using the same process applied to the translation of the original RDC/TMD into other languages. These adjustments are available in the official website of the International RDC/TMD Consortium, a Designated Network of the International Association for Dental Research (<http://www.rdc/tmdinternational.org>).

Translation of the instrument into Portuguese was carried out by a translator, fluent in both languages, who endeavored to preserve the original meaning of the text as accurately as possible. The instrument was then back translated by a second bilingual translator, blind to the original text. The back translation was then confronted with the original version by its respective author. Issues pertaining to differences in the meaning of the original text were pointed out and addressed by replacing certain terms in Portuguese until a consensus was reached.

In a second step, a project was developed for application in the target population, i.e., part I of the questionnaire of pain characteristics in a self-report format, in order to evaluate the translation in terms of clarity and comprehensibility of the questionnaire items. A trained examiner evaluated 186 adolescents of both genders aged 12 to 18 years, randomly selected from among students of public and private schools in the town of Três Rios, Rio de Janeiro State, Brazil. The adolescents hailed from both urban and rural areas. Sixty-six boys and 120 girls between the ages of 12 and 18 years, with a mean age of 15 and 12 years, respectively, took part in the research.

The participant recruitment process included a visit to every school in the town of Três Rios. It entailed contacting the school board and teachers to raise their awareness, as well as evaluating the infrastructure conditions, and availability for the interviews and examinations. After

approval by the school board, meetings were scheduled with the adolescents and families to explain the nature of the investigation. Exclusion criteria comprised students undergoing orthodontic treatment, and those suffering from migraine or rheumatoid arthritis.

The students underwent clinical examination and answered the questionnaire individually, with their answers reviewed by the examiner to ensure understanding and forestall inconsistencies. Furthermore, students were asked to express their opinion about the clarity and comprehensibility of the questionnaire, pointing out any issues that might emerge while filling it out.

The students felt motivated after having been informed that no similar research existed, and its importance in improving the diagnosis of TMD in adolescents, which would ensure that appropriate therapeutic protocols would be applied to prevent future problems. Procedures were only initiated after the signing of an informed consent form by the legal guardians, and a Statement of Consent by adolescents.

The questionnaires were not identified by names but rather by number and gender. Access to this database is for research purposes only, and those who accessed it were also sworn to secrecy and confidentiality. Individuals whose psychological response was unfavorable when completing the questionnaire were provided special care to avoid an increase in anxiety or trepidation, given that these individuals presented with some of the symptoms included in the questionnaire. Physical examination was performed in the presence of parents and/or legal guardians.

Results

At the end of the process of translation and back translation of the original version, only question number 8 of the questionnaire showed some difference from the back translated version, enough to significantly alter its original meaning. The original question “Does your face or jaw ache or get hard?” was initially translated into Portuguese as “Sua mandíbula ou face dói ou sente-se rígida?,” and then back translated into English as “Do you have tiredness or stiffness in the face or the jaws?.” There was therefore a change in the original sense of the term “ache,” which would be better translated into Portuguese with the term “dói,” and not by a literal translation of the term “tiredness,” which would refer to “fadiga”.

As regards the comprehensibility and clarity of the questions, the following was observed:

- In block 1, the second question “Do you feel any pain in the temples?” all adolescents inquired about the meaning of temples. In questions 4 and 5: “Do you feel any pain when opening the mouth or when chewing?” and “Do you feel any discomfort when wide opening your mouth or when chewing?” two thirds of the respondents were unable to differentiate pain from discomfort.
- In the second block on mandibular function and aspects that could potentially influence the treatment, in question

No. 4, “Do you have migraine?” many adolescents, regardless of age, answered yes, believing it was just a common headache.

- In block 3, on pain duration and interference, in question No. 1: “How long does your pain in the face, jaw or joint last? The duration of pain was answered in minutes rather than months, as originally planned. Thus, the best translation for this question would be: “Há quanto tempo você tem dor na face, mandíbula ou articulação?”

After assessing the results in the target population, the translated version was reevaluated by experts for final adjustments. Table 1 shows the original version in English and the translation adapted for the Portuguese language.

Discussion

Studies in different countries found that TMD determines to a large extent the quality of life of children and adolescents. Use of medications is increased as well as school absenteeism, number of diagnostic errors and, consequently, the indication of unnecessary and potentially harmful treatments [11-13,20-23].

The correlation found in the literature [8] between the occurrence of articular TMD and facial growth hyperdivergent patterns indicate the need for greater attention to early diagnosis. For this purpose, it is imperative that professionals learn and manage diagnostic tools that have been extensively tested for their validity and accuracy.

By administering the Portuguese version of the RDC/TMD in adolescents it becomes possible to evaluate the signs and symptoms of a group of patients that has not yet been adequately studied. It also enables the improvement of tests and diagnostic methods [6,24], and consequent development of specific therapeutic protocols that are better suited for this age group.

Just like in original version of the RDC/TMD for adult patients, the version used in this investigation has no score for moderate pain, since it is known that the different levels of cognitive development, understanding and ability to cope with different situations vary with age. Cognitive development during this period is characterized by an improvement in the individual’s ability to assess and understand the world in a more abstract fashion, and to describe the pain from a physiological and psychological point of view [11], but it does not enable adolescents to accurately distinguish between the various intensities of pain included in the questionnaire for adults. It is worth noting that according to the literature using short measurement periods such as on a weekly basis seems to be more appropriate in view of the difficulties found by adolescents to report episodes occurring over a long period of time, e.g. pain present in last six months [25].

An “undiagnosed” option was added to all possible diagnostic subgroups. This option was not comprised in the version of the RDC/TMD for adults. Furthermore, the division of myofascial pain according to limited mouth

Table 1. Original version and translation adapted for the Portuguese language – Part I of the Questionnaire of pain characteristics from the RDC/TMD

Original English Version	Portuguese Adapted Version
<p>Block 1 – Symptom frequency</p> <p>1 - Do you have a headache? 2 - Do you have pain in the temple regions? 3 - Do you have pain in the facial area, the jaws or the jaw joint? 4 - Do you have pain when you open your mouth wide or when chewing? 5 - Do you have discomfort when you open wide or chew? 6 - Does your jaw click or pop when you open or close your mouth when chewing? 7 - Do you have pain in the facial area, the jaws or the jaw joint? 8 - Do you have pain when you open your mouth wide or when chewing? 9 - Do you have a restricted opening of your mouth?</p> <p><i>Answer's options for this block:</i> a - never, b - 1 to 2 times a month, c - once a week, d - several times a week, e - daily</p>	<p>Bloco 1 – Frequência dos sintomas</p> <p>1 - Você tem dor de cabeça? 2 - Você tem dor na região das têmporas? 3 - Você tem dor na face, mandíbula ou articulação? 4 - Você tem dor quando abre bem a boca ou quando mastiga? 5 - Você tem algum desconforto quando abre bem a boca ou quando mastiga? 6 - Sua mandíbula estala ou crepita quando você abre e fecha a sua boca ou quando mastiga? 7 - Sua mandíbula range quando você abre, fecha ou mastiga? 8 - Sua mandíbula ou face dói ou sente rígida ou retesada? 9 - você tem restrição na abertura de boca (abre pouco)?</p> <p><i>Opções de resposta para este bloco:</i> a - nunca, b - 1 a 2 vezes no mês, c - 1 vez por semana, d - várias vezes na semana, e - diariamente</p>
<p>Block 2 – Mandibular functions and parafunctions, and other factors that influence treatment</p> <p>1 - Have you ever had your jaw lock or catch so that it will not open all the way? 2 - Have you been told or have you noticed that you grind your teeth or clench your jaws? 3 - Have you had a recent injury to your face or jaw? 4 - Do you have migraine? 5 - Have you had or are you receiving orthodontic treatment? 6 - Would you receiving orthodontic treatment?</p> <p><i>Answer's options for this block:</i> YES/NO</p>	<p>Bloco 2 – Funções e parafunções mandibulares e outros fatores que influenciam o tratamento</p> <p>1 - Você já teve sua mandíbula travada ou se sentiu incapaz de abrir totalmente a boca? 2 - Você já percebeu ou já falaram a você que você aperta a mandíbula ou range os dentes? 3 - Você sofreu alguma injúria recente na face ou mandíbula? 4 - Você tem enxaqueca? 5 - Você está fazendo correção ortodôntica? 6 - Você gostaria de receber tratamento para sua dor de cabeça ou dor facial?</p> <p><i>Opções de resposta para este bloco:</i> SIM/NÃO</p>
<p>Block 3 – Pain duration and interference with daily activities</p> <p>1 - How long have you had pain in the face, TMJ, or jaws? Number of months _____</p> <p>2 - How many days in the last month have you been home from school as a result of pain in the face, TMJ, or jaws? Number of days _____</p> <p>Scale VAS Intensity pain No pain 0 ___ 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10 worst pain imaginable</p> <p>Behavioral rating scale: Effect of the pain on patient's daily activities 0 - no pain 1 - pain, I am only aware of it if I pay attention to it 2 - pain, but I can ignore it at times 3 - pain, I can't ignore it but I can do my usual activities 4 - pain, it's difficult to concentrate, I can only do easy activities 5 - pain, such that I can't do anything</p> <p>Scale of pain medication 1 - daily 2 - 3 to 4 times a week 3 - 1 to 2 times a week 4 - once in a while 5 - every month 6 - never or almost never</p>	<p>Bloco 3 – Duração da dor e interferência nas atividades de vida diária</p> <p>1 - Há quanto tempo você tem dor na face, mandíbula ou articulação? Nº. de meses _____</p> <p>2 - Por quantos dias você se ausentou no colégio por dor na face, ATM ou mandíbula? Nº. de dias _____</p> <p>Êscala VAS Intensidade da dor Sem dor 0 ___ 1 ___ 2 ___ 3 ___ 4 ___ 5 ___ 6 ___ 7 ___ 8 ___ 9 ___ 10 pior dor imaginada</p> <p>Escala comportamental: Interferência da dor nas atividades diárias 0 - sem dor 1 - dor, mas só tenho consciência dela se prestar atenção 2 - dor, mas posso ignorá-la algumas vezes 3 - dor, não posso ignorá-la, mas posso fazer minhas atividades diárias 4 - dor, é difícil concentrar, só faço atividades simples 5 - nunca ou quase nunca de forma que não posso fazer nada, nenhuma atividade</p> <p>Êscala para uso de medicamento analgésico 1 - diariamente 2 - 3 a 4 vezes na semana 3 - 1 a 2 vezes na semana 4 - de vez em quando 5 - todo mês 6 - nunca ou quase nunca</p>

opening was discarded since the measures for adult patients cannot be applied in patients who are still being influenced by the growth and development of their stomatognathic system [12].

It is also noteworthy that in performing the clinical examination some youths had pain in the masseter with the presence of trigger points although their history indicated no probable cause for such condition. The adolescents were then asked about the habit of chewing gum and the response was positive for 87% of cases, with many reporting that they spent many hours chewing gum every day. Thus, this habit, although not included in the mandibular parafunctions questionnaire, may be related to the development of TMD in this age group [22].

Faced with the challenge of interpreting some questions and understanding certain terms, another issue arises which deserves investigation, i.e., the possible use of a self-report instrument. The mistakes observed during the study would not have been adequately clarified if the examiner had been absent, suggesting that – in the event that it is used to support the clinical diagnosis – the questionnaire might prove more reliable if it is completed by a trained interviewer or professional assistant. Regarding the latter point, completing the questionnaire prior to the clinical examination is of paramount importance in confirming the physical diagnosis, as stressed by List [10], which found a positive correlation between pain reports recorded once a week or more, and the confirmation of a diagnosis of TMD.

Conclusions

The process of translation and back translation ensured the semantic equivalence of the original version relative to the translated (Portuguese) version. Administration of the questionnaire in adolescents met with wide acceptance and contributed to the adjustments made to the final version of the instrument.

Nevertheless, given the difficulties in interpreting and understanding some of the terms, which were lost in translation, self-reporting with the current format is ill-advised.

The following are suggestions that may help to enhance this important diagnostic tool: Reformulating some of the questions so as to enable adolescents to respond to the questionnaire appropriately without the assistance of the researcher, adding questions about parafunctional habits – especially questions related to the habit of chewing gum, determining the amount of gum used and the length of time it remained in the mouth – and conducting validity and reliability studies in the Brazilian population.

Acknowledgements

The research that laid the groundwork for this study was developed within the scope of the Master's degree program in Health Sciences at Heliópolis Hospital/SP.

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