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Original Article

Translation, cross-cultural adaptation, and validation of an oral health survey for pregnant women*

Tradução, adaptação transcultural e validação de um inquérito de saúde bucal para gestantes

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ABSTRACT

Objective: to translate, cross-culturally adapt, and validate the Conocimientos, Actitudes y Prácticas en Salud Bucal Materna survey for the Brazilian context. **Methods:** methodological research is carried out in three stages: translation of the instrument into the target language, synthesis of the translated versions, and analysis of the synthesis by expert judges and the target audience for adaptation, content, and construct validation. With the synthesis evaluation, the proportion of agreement with the instrument was measured using the Content Validation Index and the Likert-type scale. The construct validation included literate pregnant women over 18 in any gestational trimester**. Results:** the translation of the instrument was successful, resulting in a synthesis of the versions that took context and language into account. All the 10 items analyzed met the Content Validation Index criterion of ÿ ≥0.80 for clarity and practical and theoretical relevance in content validation. The composite reliability showed an adequate value of >0.65. **Conclusion:** it was concluded that the Conocimientos, Actitudes y Prácticas en Salud Bucal Materna survey, adapted and translated into Portuguese, can be used reliably for pregnant women in the Brazilian context. **Contributions to practice:** to provide a translated, adapted, and validated instrument for prenatal and dental practice in Brazil.
Descriptors: Oral Health; Prenatal Care; Dental Health Surveys; Validation Study.

RESUMO

Objetivo: traduzir, adaptar transculturalmente e validar o inquérito *Conocimientos, Actitudes y Prácticas en Salud Bucal Materna* para o contexto brasileiro. **Métodos:** pesquisa metodológica realizada em três etapas: tradução do instrumento para o idioma-alvo, síntese das versões traduzidas e análise da síntese por juízes *experts* e público-alvo para adaptação, validação de conteúdo e de constructo. Com a avaliação da síntese, mediu-se a proporção de concordância sobre o instrumento por meio do Índice de Validação de Conteúdo e da escala tipo Likert. Na validação de constructo, incluíram-se gestantes alfabetizadas, maiores de 18 anos, em qualquer trimestre gestacional. **Resultados:** a tradução do instrumento foi bem-sucedida, resultando em uma síntese das versões que considerou o contexto e a linguagem. Do total de 10 itens analisados, todos atenderam ao critério Índice de Validação de Conteúdo de ÿ ≥ 0,80 para clareza, pertinência prática e teórica na validação de conteúdo. A confiabilidade composta apresentou valor adequado >0,65. **Conclusão:** concluiu-se que o inquérito *Conocimientos, Actitudes y Prácticas en Salud Bucal Materna,* adaptado e traduzido para o português, pode ser utilizado de forma confiável para gestantes no contexto brasileiro. **Contribuições para a prática:** fornecer um instrumento traduzido, adaptado e validado para a prática pré-natal e odontológica no Brasil.
Descritores: Saúde Bucal; Cuidado Pré-Natal; Inquéritos de Saúde Buca; Estudo de Validação.

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Introduction

The gestational period is a unique time in a woman's life, with primary and significant changes in all spheres of her life, especially adapting to the arrival of a new family member, which, together with the physiological and biopsychosocial changes, can cause worry and anxiety. It is, therefore, essential to establish links to promote health and strengthen health care for women and pregnant women, from preconceptions to postpartum periods[1-2].

During pregnancy, there may be a predisposition to or worsening of some oral alterations due to hormonal and physiological changes, increased food consumption, and irregular oral hygiene. Since it is possible to identify the gestational risk of these habits, it was found, for example, that periodontal disease increased the likelihood of preterm and/or low birth weight babies by 7.5 times, making prenatal dental care an apparent necessity[3]. This highlights the importance of dental surgeons caring for pregnant women, as they can prevent the proliferation of pathogens through the body system and promote oral health in the pregnant fetus by raising awareness in maternal care[4]. Given this, the dental surgeon's action must be joined with other primary health care professionals through objective communication and qualified assistance for health promotion and prevention[5].

Thus, public policies and educational strategies that guide pregnant women on the need for prenatal dental care are necessary, as is accessible material with clear and concise information about prenatal care to assist the teams' work and reinforce the health of the mother-baby binomial[6].

After researching databases over the last five years in the Virtual Health Library (VHL), Portal of Journals of the Coordination for the Improvement of Higher Education Personnel and Scientific Electronic Library Online (SciELO), using the descriptors "Inquérito de Saúde Bucal" (Dental Health Surveys), "Educação pré-natal" (Prenatal Education) and "Cuidado pré-natal" (Prenatal Care), no formal and objective instruments suitable for use with pregnant women on oral health during pregnancy were found in Brazil.

From this perspective, an instrument, the Conocimientos, Actitudes y Prácticas en Salud Bucal Materna (CAPSOM) questionnaire, was built and validated in Mexico. This 10-item self-administered questionnaire in English is valid and reliable for assessing pregnant women's oral health knowledge, attitudes, and practices[7]. Identified in the international literature after a search, the instrument developed in Mexico has not yet been translated and validated for another language and context.

Considering the above, the aim was to translate, cross-culturally adapt, and validate the Conocimientos, Actitudes y Prácticas en Salud Bucal Materna survey for the Brazilian contexto.

Methods

This is a methodological study, carried out from January to December 2022 in Paraíba, with a quantitative approach to the translation and cross-cultural adaptation of an instrument Knowledge, Attitudes, and Practices (KAP) of oral health in pregnancy built and validated in Mexico, Conocimientos, Actitudes y Prácticas en Salud Bucal Materna (CAPSOM), for the Brazilian context.

The instrument aims to assess oral health knowledge, attitudes and practices during pregnancy, and contains ten questions about oral health during pregnancy divided into three groups: knowledge, practices and attitudes, with items related to knowledge and perception of oral diseases during pregnancy, oral hygiene measures, tooth loss and the possible risks involved in dental care during pregnancy[7]. Although the instrument's original language was Spanish, it was only available in English on research platforms. Therefore, the CAPSOM instrument was translated from English into Portuguese.

Cronbach's alpha reliability coefficient was used to validate the internal consistency of the original instrument, which resulted in a total of 0.70 for the ten items. Each dimension had resulting values of ÿ=0.66 for knowledge, ÿ=0.74 for attitudes, and

ÿ=0.66 for practices. Experts conducted content validity using a modified test with a value of ÿ=0.60. In the case of assessing construct validity, factor analysis was carried out using tests that respect the correlation between variables, such as the Sphericity test[7].

The described topics in the study follow general recommendations for reports and studies on measurement properties[8]. Regarding the method, we followed the one proposed by Borsa, Damásio, and Bandeira. This method presents the first and second stages of translation and adaptation, subdivided into three phases: translation of the instrument into the target language, synthesis of the translated versions, and analysis of the synthesized version by expert judges and the target audience[9].

In the translation phase, two independent bilingual translators who were skilled in writing scientific articles translated from English into Portuguese after signing the Free and Informed Consent Form sent by e-mail along with the guidelines and the CAPSOM instrument.

To synthesize the translated versions, a review committee comprised of three people, two advisors, and a master's student, in partnership with the translators, proceeded to synthesize the versions. Subsequently, a committee of invited expert judges was set up to analyze the synthesized version. The professionals involved knew the construction analysis (oral he alth in pregnancy) and psychometrics. They evaluated aspects such as practical and theoretical relevance, structure, layout, instrument guidelines, comprehensiveness, and adequacy of the expressions contained in the items. The judges were chosen based on recommendations from other professionals; however, their CVs were analyzed, and they had at least a bachelor's degree and specialization in the dental field, mostly a master's degree.

In addition, the judges evaluated the translated version in four different areas: semantic equivalence - checking for multiple meanings in the words or grammatical errors in the translation; idiomatic equivalence - making sure that items that were difficult to translate, when adapted, remained equivalent to the context; experiential equivalence - referring to observing the compatibility of the adapted item with the new culture, if not, adapting it; conceptual equivalence - identifying whether, after adequate translation, the items correspond to the same meaning in different cultures[9].

The second and third stages consisted of the instrument validity evidence process proposed by the Standards for Educational and Psychological Testing[10]. After translation, a questionnaire was sent to five judges for content validation, who were invited to provide their CVs in areas related to the research using Google Forms (Figure 1). The Delphi technique of content validation was used to build a consensus among the group of experts anonymously[11].

CONTENT VALIDATION TOOL FOR THE KAP SURVEY (CAPSOM) ON ORAL HEALTH DURING PREGNANCY				
INSTRUCTIONS Read the CAPSOM survey questions carefully, which have been translated into Brazilian Portuguese. Then, analyze the instrument by marking an "X" in one of the numbers before each statement. Give your opinion according to the statement that best represents your degree of agreement with each criterion below: **1- Inadequate 2- Little adequate 3- Adequate 4- Very adequate** **Please note:** In the lines below each box, describe why you considered options 1 and 2. If necessary, include any comments and/or suggestions. They will be required to evaluate this tool.				
1. OBJECTIVES: These refer to the purposes, goals, or ends we want to achieve through this oral health survey for pregnant women				
1.1 The contents are consistent with the objective of the CAP survey	1	2	3	4
1.2 Objectives of the survey on oral health assessment in pregnancy	1	2	3	4
1.3 The information presented in the CAP survey (quantity and level of depth) covers the content on oral health in pregnancy well	1	2	3	4
1.6 The objective of the KAP survey is to invite and/or instigate changes in the behavior and attitude of pregnant women about oral health during pregnancy	1	2	3	4

(the Figure 1 continue in the next page...)

2. STRUCTURE AND PRESENTATION: refers to how the questions are developed. This includes their general organization, structure, coherence, and presentation strategy				
2.1 Is the CAPSOM survey appropriate for pregnant women concerned about the importance of oral health during this period?	1	2	3	4
2.2 The questions are presented in a structured and objective manner	1	2	3	4
2.3 The language used is easy for pregnant women to understand	1	2	3	4
2.4 There is a logical sequence to the proposed content	1	2	3	4
2.5 The questions are varied and sufficient to achieve the objectives	1	2	3	4
2.6 The questions are well structured in terms of agreement and spelling	1	2	3	4
2.7 The survey profile provides sufficient data for assessing oral health in pregnancy	1	2	3	4
2.8 The pages or sections appear organized	1	2	3	4
3. RELEVANCE: refers to the characteristic that evaluates the degree of significance of the educational tool presented				
3.1 The KAP survey allows reflection on knowledge, attitudes, and practices concerning oral health in pregnancy	1	2	3	4
3.2 The theme portrays key aspects that should be reinforced in prenatal dental care	1	2	3	4
3.3 It can be used by health professionals and/or educators	1	2	3	4
3.4 The KAP survey can be circulated in the scientific field	1	2	3	4

KAP: Knowledge, Attitudes and Practices; CAPSOM: Conocimientos, Attitudes e Practicas en Salud Bucal Materna

Figure 1 – Content validation tool for the survey on oral health during pregnancy. Crato, CE, Brazil, 2022

The Content Validation Index (CVI) and the Likert scale were used to measure the proportion of judges who agreed with the instrument and its items. Responses could include: 1-inadequate; 2-little adequate; 3-adequate; 4-very adequate; the index score was calculated using the sum of agreement for items marked "3" or "4". Items that received a score of "1" or "2" were revised or eliminated[12]. The CVI was equal to or greater than 80%.

In the third stage of construct validation, literate pregnant women aged over 18 and in any trimester of pregnancy were included. The sample size was calculated based on a minimum of 10 women per item in the questionnaire (n =10k, where k is the number of items in the instrument analyzed and n is the sample size) to carry out a factor analysis of an instrument made up of 10 items[13]. Thus, the sample consisted of 104 literate pregnant women who had access to the final version of the instrument and the Free and Informed Consent Form. Data collection occurred between September and December 2022 in basic health units in Paraíba, PB, northeastern Brazil.

The estimation method used was Weighted Least Squares Mean and Variance-adjusted (WLSMV), considered the most appropriate for categorical data. It provides weighted least squares estimates using a weighted matrix, mean, and robust standard deviations, adjusting the variance for the Chi-square test[14].

The Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA) were used to assess the overall fit of the models. A value of 0.90 was considered the minimum to infer model fit for the comparative fit index and the Tucker-Lewis Index, while a Root Mean Square Error of Approximation (RMSEA) value of between zero and 0.08 was considered acceptable[15-16]. Factor loadings greater than 0.30 were deemed appropriate. Values of $p<0.05$ were considered significant. Jasp software was used for confirmatory factor analysis.

All the stages complied with the ethical and legal requirements, and the research was approved by the Research Ethics Committee of the Regional University of Cariri, with a Certificate of Presentation for

Ethical Appraisal 59774522.2.0000.5055 and opinion no. 5,541,327/2022.

Results

After the original Conocimientos, Actitudes y Prácticas en Salud Bucal Materna (CAPSOM) instrument was given to the bilingual translators participating in the research; two versions were obtained and evaluated for a synthesis version, Oral Health Knowledge, attitudes and Practices during Pregnancy (CAPSOM-BR), shown in Figure 2, by a review committee made up of advisors and master's students in partnership with the translators.

Original instrument	Portuguese translation-draft 1	Portuguese translation-draft 2	Overview of items
Oral health knowledge, attitudes, and practices during pregnancy	Conhecimento em saúde bucal, atitudes e práticas durante a gravidez	Conhecimento em saúde bucal, atitudes e práticas durante a gravidez	Oral health knowledge, attitudes, and practices during pregnancy
Please read each question carefully and place in the box option that most closely matches your opinion.	Por favor, leia cuidadosamente cada questão e marque a que mais se assemelha com a sua opinião	Por favor, leia cuidadosamente cada questão e marque a que mais se assemelha com a sua opinião	Please read each question carefully and mark the one most closely resembles your opinion.
1. Issues with tooth decay and bleeding gums can get worse during pregnancy	1. Problemas com cáries e sangramento na gengiva pioram durante a gravidez	1. Problemas com cáries e sangramento na gengiva pioram durante a gravidez	1. Problems with cavities and bleeding gums worsen during pregnancy
2. Gum problems can affect my pregnancy and create problems with my baby´s birth	2. Problemas com cáries podem afetar minha gravidez a criar problemas com o nascimento do meu bebê	2. Problemas com cáries podem afetar minha gravidez a criar problemas com o nascimento do meu bebê	2. Problems with tooth decay can affect my pregnancy and create problems with the birth of my baby
3. It is inevitable to lose a tooth during pregnancy	3. É inevitável perder um dente durante a gravidez	3. É inevitável perder um dente durante a gravidez	3. Losing a tooth during pregnancy is inevitable
4. My baby's development will extract calcium from my teeth	4. O desenvolvimento do meu bebê extrairá cálcio dos meus dentes	4. O desenvolvimento do meu bebê extrairá cálcio dos meus dentes	4. My baby's development will extract calcium from my teeth
6. It is important to go to the dentist before, during and after pregnancy	6. É importante ir ao dentista, antes, durante e depois da gravidez	6. É importante ir ao dentista, antes, durante e depois da gravidez	6. It's essential to go to the dentist before, during and after pregnancy
7. I brush my teeth twice or more times a day	7. Eu escovo meus dentes duas vezes ou mais durante o dia	7. Eu escovo meus dentes duas vezes ou mais durante o dia	7. I brush my teeth twice or more during the day
8. I use other methods of oral hyigiene such as mouthwash, flossing, etc.	8. Eu uso outros métodos de higiene bucal, como enxaguante bucal, fio dental etc.	8. Eu uso outros métodos de higiene bucal, como enxaguante bucal, fio dental etc.	8. I use other oral hygiene methods, such as mouthwash, floss, etc.
9. I have received information from a dental professional about oral health care during my pregnancy	9. Eu tenho recebido informações de um profissional de saúde bucal durante minha gravidez	9. Eu tenho recebido informações de um profissional de saúde bucal durante minha gravidez	9. I have received information from an oral health professional during my pregnancy
10. I have visited a dentist during my pregnancy	10. Eu tenho visitado um dentista durante minha gravidez	10. Eu tenho visitado um dentista durante minha gravidez	10. I visited a dentist during my pregnancy

Figure 2 – Translation and adaptation of the instrument Conocimientos, Actitudes y Prácticas en Salud Bucal Materna into Portuguese language. Crato, CE, Brazil, 2022

During content validation, the Content Validation Index was calculated, as shown in Table 1.

Of the 10 items analyzed by the experts, all met the CVI criteria of ÿ ≥ 0.80 for clarity, practical relevance, and theoretical relevance. Table 2 shows each item's value in the criteria the judges evaluated. Thus, no changes were made after the judges' analysis, and the content validation process could be completed in just one round.

After the experts carried out the content validity, the instrument was applied to the target population. A confirmatory factor analysis was conducted to evaluate the theoretically defined one-dimensional structure of the CAPSOM. The overall fit indices showed excellent results (CFI=0.99; TLI=0.99; RMSEA = 0.008[0.003-0.001]). Table 2 shows the factor loadings and composite reliability of the items.

Table 1 – Content Validation Index values of the items according to clarity, practical and theoretical relevance. Crato, CE, Brazil, 2022

Items	Clarity	Relevance practical	Relevance theoretical
1. Problems with tooth decay and bleeding gums worsen during pregnancy	0.90	1	1
2. Problems with tooth decay can affect my pregnancy and create problems with the birth of my baby	0.90	0.90	0.90
3. Losing a tooth during pregnancy is inevitable	0.90	0.90	0.90
4. My baby's development will extract calcium from my teeth	0.80	0.90	0.90
5. Hygiene measures are essential to reduce complications that can arise during pregnancy	0.90	1	1
6. It's essential to go to the dentist before, during and after pregnancy	0.90	0.90	0.90
7. I brush my teeth twice or more during the day	0.80	0.90	1
8. I use other oral hygiene methods, such as mouthwash, floss, etc.	0.80	0.80	1
9. I have received information from an oral health professional during my pregnancy	0.80	0.80	0.90
10. I visited a dentist during my pregnancy	0.80	0.90	0.80

Table 2 – Factor loadings and composite reliability. Crato, CE, Brazil, 2022

Items	Factorial load	Composite reliability
1. Problems with tooth decay and bleeding gums worsen during pregnancy	-0.022	
2. Problems with tooth decay can affect my pregnancy and create problems with the birth of my baby	0.105	
3. Losing a tooth during pregnancy is inevitable	-0.102	
4. My baby's development will extract calcium from my teeth	0.054	
5. Hygiene measures are essential to reduce complications that can arise during pregnancy	0.225	0.65
6. It's essential to go to the dentist before, during and after pregnancy	0.581	
7. I brush my teeth twice or more during the day	0.783	
8. I use other oral hygiene methods, such as mouthwash, floss, etc.	0.646	
9. I have received information from an oral health professional during my pregnancy	0.487	
10. I visited a dentist during my pregnancy	0.606	

Most items had adequate factor loadings >0.30, except for items 1, 2, 3, and 4. However, even though the factor loadings were below the desired value, the question was kept since the dimensional structure, assessed by the TLI, CFI, and RMSEA indices, was unaffected. All the items showed good content validity in the three criteria assessed, reinforcing the need to keep the items in the Brazilian version. The composite reliability also showed an adequate value of >0.65.

Discussion

Health education should be part of PHC work processes so that changes in knowledge and behavior regarding oral health are consolidated, thus strengthening the universality and comprehensiveness of care for pregnant women. FHS professionals should implement new guidance methods for women during pregnancy, emphasizing prenatal dental care[17].

Although studies have evaluated the knowledge of pregnant women regarding their oral health or that of their baby and, in some cases, the knowledge and practices of dentists regarding the oral health of pregnant women, there has been little discussion of the attitudes and practices exercised by women during the gestational period[18-20]. This scenario reinforces the importance of research to change health services by implementing policies, innovations, and tools for caring for pregnant women[21].

Using KAP instruments allows professionals to understand pregnant women's perceptions of oral care while encouraging the identification of influential risk variables in this scenario, which may or may not be subject to professional intervention. In this sense, constructing validity, as a fundamental step, confirms the instrument's compatibility with intellectual and psychological aspects[22].

Analyzing pregnant women's knowledge and practices in this context is also necessary, given the belief in taboos and myths that generate misinformation. The adapted KAP instrument should be used with regular prenatal care to adjust to this reality due to its potential to reduce the belief in myths and awaken professional integration[23].

The translation and adaptation process followed protocols to maintain equivalence between the source and target languages. This resulted in a version of CAPSOM-BR for Brazilian Portuguese, adapted to the context of Brazilian pregnant women[10]. The literature indicates that the literal translation must be adapted to the language and target population[24].

In statistics, CVI values greater than 0.90 are gold standard models that successfully validate an instrument, while values equal to or greater than 0.80 are considered admissible. All the items in the instrument evaluated obtained a CVI higher than or equal to 0.8, most of them equal to 0.9, indicating that each item is relevant and representative, like another cross-cultural adaptation study in Brazil[12,25].

To ensure the reliability of the translated instrument, its internal consistency was measured using confirmatory factor analysis. Reliability dictates the stability and consistency of the instrument. Internal consistency complements the analysis by measuring reliability. The reliability value shows whether the instrument can measure the clinical competencies investigated[26]. In this evaluation, good overall fit indices were obtained for the one-dimensional model, in which the factor loadings were higher than 0.30, except for items 1, 2, 3, and 4. However, as the expert judges had already attested to their relevance in the content validation process with CVIs higher than 0.90, and they are relevant items for verifying knowledge and existing myths about oral health during pregnancy, it was decided to keep the above items.

It is essential to evaluate internal consistency, reliability, and semantic validation to ensure the greatest reliability to the instrument's reality and target audience, considering social, economic, and intellectual aspects, among others. In addition to demonstrating validity in the research, this is analogous to cross-cultural adaptation studies in the dental field[27-28].

The statistical results showed reliable measures for the adapted version of the CAPSOM, such

as constructing and validating this instrument in its original version in Mexico[7]. The results of this study corroborate the relevance of using different phases to ensure the validity of an instrument translated and adapted to the reality of another culture[10].

In addition, the study's relevance is shown by the need to discuss dental care for pregnant women, whether from the perspective of the knowledge of pregnant women, such as the translated instrument or of orthodontists, when providing care in another study[29]. Furthermore, keeping this public in the focus of scientific research implies improving the quality of life since it instigates the development or improvement of care practices[30].

Study limitations

The limitations of this research include the fact that the instrument was applied to a convenient sample of basic health units located in the northeast of Brazil, which may not represent the knowledge and practices of other pregnant women in the country. The short time it took to apply the translated instrument to the public is also worth mentioning.

Contributions to practice

Adapting instruments to realities other than those initially proposed is essential to contributing to professional health practice and improving care by providing different tools developed in other countries that can bring new insights. The instrument in question could be used to care for pregnant women in the Family Health Strategy in Brazil.

Conclusion

As the process of translation and cultural adaptation of the instrument to Brazil was carried out systematically, following the steps proposed in the scientific literature, a successful translation was obtained, which resulted in a synthesis of the versions that considered the context and language. Likewise, the content and construct validation provided good coefficients, such as the 10 items of the instrument having a CVI of ÿ ≥ 0.80 for clarity, practical relevance, and theoretical relevance, making this instrument valid for use in dental health work processes in Brazil.

It is recommended that the cross-culturally adapted survey in this study be used to assess pregnant women's oral health knowledge, attitudes, and practices in Brazil's Family Health Strategy and formulate health education strategies during pregnancy, guaranteeing comprehensive care for pregnant women.

Authors' contribution

Conception and design or analysis and interpretation of the data; writing of the manuscript or relevant critical review of the intellectual content; final approval of the version to be published and agreement to be responsible for all aspects of the manuscript related to accuracy or completeness being investigated and resolved appropriately: Lacerda LAS, Santos MHC, Bandeira PFR, Beltrão ICSL, Cruz RSBLC, Oliveira DR.

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