

# Translation and adaptation of Preterm Infant Breastfeeding Behavior Scale into Brazilian Portuguese

Tradução e adaptação para o português da *Preterm Infant Breastfeeding Behaviour Scale*  
Traducción y adaptación al portugués de la *Preterm Infant Breastfeeding Behaviour Scale*

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## Abstract

**Objective:** To translate, culturally adapt and validate the Preterm Infant Breastfeeding Behavior Scale (PIBBS) content

**Methods:** This is a methodological study, whose steps were: initial translation; synthesis of translations; back-translation; review of translated versions; content validity; pre-test; and sending the documentation to the Cross-Cultural Adaptation Review Committee. Both the original scale and the translated and adapted scale have six items, and each item contains 03 to 06 sub-items with score scores ranging from 0 to 6. The total score can range from 0 to 20. For the validity step, the Content Validity Index (CVI) of all scale items was calculated. A minimum CVI of 0.8 was considered acceptable for assessing each item individually, and 0.90, for generally assessing the instrument.

**Results:** The Brazilian version of PIBBS was called the “*Escala Comportamental de Amamentação do Pré-Termo*”. The scale was translated, adapted and its content was validated, achieving conceptual and idiomatic equivalence ranging from 83.3% to 100%. The CVI was 0.93.

**Conclusion:** After translation, adaptation and validity by health professionals, the scale proved to be valid, easy to apply and easy to understand language. The scale will allow health professionals to observe preterm infants' behavior and guide mothers, thus encouraging exclusive breastfeeding, since the breastfeeding process of a preterm infant is complex. Its use in future research and clinical practice will complement more robust psychometric analyses.

## Resumo

**Objetivo:** Traduzir, adaptar culturalmente e validar o conteúdo da *Preterm Infant Breastfeeding Behaviour Scale (PIBBS)*

**Métodos:** Estudo metodológico, cujas etapas foram: tradução inicial; síntese das traduções; retrotradução; revisão das versões traduzidas; validação do conteúdo; pré-teste; e encaminhamento da documentação ao Comitê de Revisão da Adaptação Transcultural. Tanto a escala original quanto a traduzida e adaptada possuem seis itens e cada item contém 03 a 06 subitens com escores de pontuação que variam de 0 a 6. A pontuação total pode variar de 0 a 20. Para a etapa de validação foi realizado o cálculo do índice de validade de conteúdo (IVC) de todos os itens da escala. Foi considerado IVC mínimo de 0,8 como aceitável, para avaliação de cada item individualmente; e de 0,90, para avaliação geral do instrumento.

**Resultados:** A versão brasileira da escala PIBBS foi denominada de Escala Comportamental de amamentação do pré-termo. A escala foi traduzida, adaptada e seu conteúdo foi validado, alcançando equivalência conceitual e idiomática que variou de 83,3% a 100%. O índice de validade de conteúdo foi de 0,93.

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Conflicts of interest: nothing to declare.

**Conclusão:** Após a tradução, adaptação e validação pelos profissionais de saúde a escala se mostrou válida, de fácil aplicação e linguagem de fácil entendimento. A escala permitirá que os profissionais de saúde possam observar o comportamento do prematuro e orientar a mãe, estimulando assim o aleitamento materno exclusivo, já que o processo de amamentação do prematuro é complexo. Sua utilização em pesquisas futuras e prática clínica permitirá complementar as análises psicométricas mais robustas.

## Resumen

**Objetivo:** Traducir, adaptar culturalmente y validar el contenido de la *Preterm Infant Breastfeeding Behaviour Scale (PIBBS)*.

**Métodos:** Estudio metodológico, cuyas etapas fueron: traducción inicial, síntesis de las traducciones, retrotraducción, revisión de las versiones traducidas, validación de contenido, prueba piloto y envío de la documentación al Comité de Revisión de Adaptación Transcultural. Tanto la escala original, como la traducida y adaptada, contienen seis ítems y cada uno contiene de tres a seis subítems con puntuación que varía de 0 a 6. La puntuación total puede variar de 0 a 20. Para la etapa de validación se realizó el cálculo de índice de validez de contenido (IVC) de todos los ítems de la escala. Se consideró IVC mínimo de 0,8 como aceptable para la evaluación de cada ítem individualmente, y de 0,90 para la evaluación general del instrumento.

**Resultados:** La versión brasileña de la escala PIBBS fue denominada “*Escala Comportamental de amamentação do pré-termo*” (Escala de Comportamiento de Lactancia del Recién Nacido Prematuro). La escala fue traducida y adaptada, y su contenido fue validado, con una equivalencia conceptual e idiomática que varió de 83,3 % a 100 %. El índice de validez de contenido fue de 0,93.

**Conclusión:** Después de su traducción, adaptación y validación por parte de los profesionales de la salud, la escala demostró ser válida, de fácil aplicación y con un lenguaje de fácil comprensión. La escala permitirá que los profesionales de la salud puedan observar el comportamiento del prematuro y orientar a la madre, con el objetivo de estimular la lactancia materna exclusiva, ya que el proceso de lactancia del prematuro es complejo. Su uso en investigaciones futuras y en la práctica clínica permitirá complementar análisis psicométricos más sólidos.

## Introduction

One of the great challenges for neonatology has been the feeding and nutrition of preterm infants. Preterm infants may not be able to breastfeed at birth, but they may receive the benefits of human milk immediately.<sup>(1)</sup> Breastfeeding can be a challenge due to immaturity of preterm infants' physiological and neurodevelopment systems, because depending on gestational age, they have poor sucking and difficulty coordinating breathing and swallowing.<sup>(2)</sup>

In clinical practice, it is noticed that there is difficulty in specifying the ideal moment for the beginning of the transition from gavage feeding to the mother's breast in preterm infants (PTI).<sup>(3)</sup> The transition process must be encouraged and supported by health professionals, who assist the mother/child pair for early breastfeeding in the Neonatal Intensive Care Unit (NICU).

To perform the oral feeding transition, numerous instruments were developed to evaluate breastfeeding in at-risk infants,<sup>(4)</sup> such as the Preterm Infant Breastfeeding Behavior Scale (PIBBS), which is an instrument used for health professionals and mothers.

The PIBBS was developed in 1996 by two nurses and a neonatologist from the University of Uppsala, Sweden, to assess breastfeeding in PTI aged 30-36 weeks admitted to the NICU. The scale was developed and based on the Assessment of Preterm

Infants' Behavior (APIB) and Infant Individualized Developmental Care and Assessment Program (NIDCAP).<sup>(5)</sup>

The PIBBS study comprises the scale for health professionals to assess PTI's breastfeeding behavior, the breastfeeding diary that is completed by the mother and the term definition manual. It is noteworthy that this article presents the process of translation and cultural adaptation only of the scale for health professionals.

The authors justify the creation of PIBBS due to the fact that existing clinical instruments do not include the description of PTI's behavior regarding sucking-swallowing during a breastfeeding session with the participation of mothers.<sup>(5-8)</sup> The behaviors observed during the breastfeeding session help the mother to identify PTI's maturational steps and skills. Despite the low gestational age at birth, there was an early emergence of efficient breastfeeding behavior and a high prevalence of breastfeeding.<sup>(5,6)</sup>

It is believed that the PIBBS can be used by health professionals during the breastfeeding session with the mother at a neonatal unit, enabling the elaboration of an individualized care plan in support of exclusive breastfeeding, since interventions to support breastfeeding in PTIs are scarce.<sup>(5)</sup> The present study aims to: Translate, culturally adapt and validate the PIBBS (breastfeeding behavioral scale for health professionals).

## Methods

This is a methodological study of translation, cross-cultural adaptation and validity of PIBBS into Brazilian Portuguese, following the following steps: <sup>(7,8)</sup> (1) initial translation; (2) synthesis of translations; (3) back-translation; (4) review of translated versions; (5) content validity; (6) pre-test; and (7) sending the documentation of all reports produced, and the final version of PIBBS to the Cross-Cultural Adaptation Review Committee.

Authorization for translation and cultural adaptation was granted by the original version authors. The initial translation was carried out by two bilingual translators, each with proficiency in English, and knowledgeable of Brazilian language and culture. Translator 1 is a nurse with a doctoral degree in nursing, she works as a professor and researcher at a federal university, speaks both languages fluently (Portuguese/English), lived in Canada and was informed about the purpose of the translation.

Translator 2 is an English teacher in a language course in the city of Rio de Janeiro, has a degree in Languages and Literature from the *Universidade Federal do Rio de Janeiro*, and received no information about the study. The two translators did not know who was performing the other translation, and did not keep in touch with each other. This first step resulted in independent translations T1 and T2.<sup>(7)</sup>

The synthesis of the two translations was performed by the two translators based on the original scale, on the T1 and T2 versions and on the respective translation reports. Discrepancies were presented in the synthesis report, which was forwarded to a third translator, and discrepancies were resolved by consensus between the translators, thus originating version S12.

For the back-translation stage, blindly, the researcher made contact with two companies that offer translation service, and that were indicated by renowned scientific journals that use North American translators. In order to comply with methodological rigor, companies were informed that the translators would have to be Native Americans with proficiency in Portuguese and that they would carry out the

translation individually and independently. The process generated two versions named B1 and B2, and the consensus was reached at B12.<sup>(7)</sup>

Step 4 consisted of consolidating all translated versions (T1, T2, T12, B1, B2 and B12) together with the original instrument, to assess semantic, idiomatic, conceptual and cultural equivalence of the versions and pre-final version preparation for field testing. For this stage, nine health professionals were selected through *the Plataforma Lattes* (a resume website) who met the following criteria: professionals over 18 years of age, higher education, having clinical experience related to infant/child health, breastfeeding, having experience in instrument validity (participated more than once in validity surveys of instruments with certification). All those who, despite issuing the first acceptance, did not respond with the return of the instruments were excluded. Thus, a committee of judges was constituted, composed of five experts: four nurses and one pediatrician.

The nurses hold, respectively, expert, master, doctoral and post-doctorate degrees in nursing, all with qualification and experience in the neonatal area. The neonatologist was a breastfeeding consultant certified by the International Board Certified Lactation Consultant (IBCLC). The professionals were invited to participate in the study and informed about the objective and signed the Informed Consent Form.

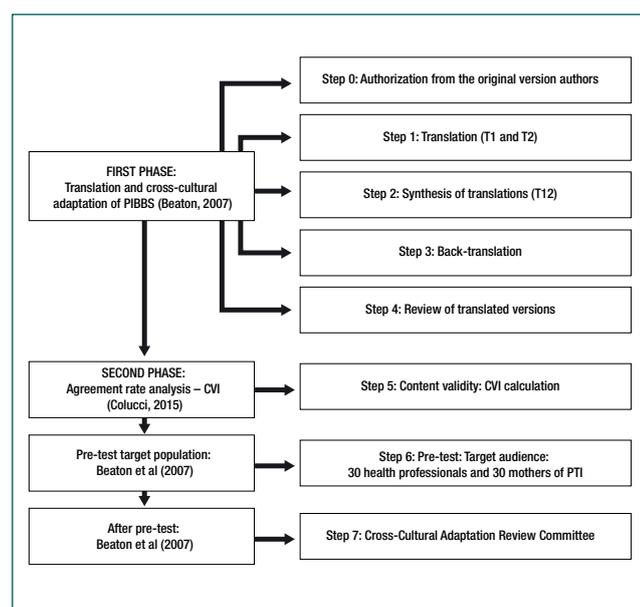
The five judges analyzed the scale items according to criteria established for technical review, evaluation of semantic, idiomatic, conceptual and experiential equivalences of the versions and pre-final version preparation.<sup>(7)</sup>

After preparing the pre-final version, the fifth stage was carried out, in which CVI was calculated to verify the agreement rate of expert judges before the pre-test stage. The CVI was calculated using a Likert scale of 5 ordinal points: 1 - Totally agree; 2 - Agree; 3 - Neither agree nor disagree; 4 - Disagree; and 5 - Totally disagree. Thus, the calculation is made from the sum of answers "1" and "2" of each judge in each questionnaire item and this sum is divided by the total number of answers.<sup>(8)</sup> A minimum CVI of 0.8 was considered acceptable for the

assessment of each item individually, and 0.90 for the overall assessment of the instrument.<sup>(8)</sup>

For this stage, 11 health professionals were selected according to the following criteria: having clinical experience related to infant/child health, breastfeeding, having experience in instrument validity (participating more than once in validity surveys of certified instruments). The professionals who agreed to participate in the study were sent the ICF, the translated versions, the original scale and an instrument containing questions about the clarity, understanding and relevance of each item. Health professionals analyzed the scale items according to criteria established for technical review and assessment of semantic, idiomatic, conceptual and cultural equivalence of the versions. Each PIBBS item was analyzed by all judges. After content validity of the pre-final version, the pre-test was performed.

For the pre-test stage, the final version of PIBBS into Brazilian Portuguese was presented to 30 health professionals. The selected professionals were specialists in the area of breastfeeding of PTI, they worked in a neonatal unit in the city of Rio de Janeiro and dealt directly with breastfeeding. The pre-test collection occurred from November 2019 to February 2021. Pre-test data analysis was performed by calculating the CVI (Figure 1).



**Figure 1.** Phases of PIBBS translation, cultural adaptation and validity.

Both the original and the translated and adapted PIBBS have 06 items (rooting, areolar grasp (how much of the breast was inside the baby's mouth, latched on and fixed to the breast, sucking, longest sucking burst and swallowing), and each item contains 03 to 06 sub-items with score scores ranging from 0 to 6. The total score can range from 0 to 20, as follows: 0 – 5 (no readiness to breastfeed); 6 – 12 (some readiness); 13 – 16 (readiness); 17 – 20 (excellent readiness). For each of these criteria, the higher the score, the greater the PTI readiness for breastfeeding. The determination of score scores is used by health professionals to carry out the individualized care plan for the mother-infant dyad. It is recommended that the scale be applied until the full establishment of breastfeeding.<sup>(5)</sup> At all stages, we comply with all ethical and legal aspects of the research, approved by the Ethics Committee, according to Opinion 4.376.750, CAEE 98373718.0.0000.5238 (*Escola de Enfermagem Anna Nery*) and Opinion 4,405,672, CAEE (*Certificado de Apresentação para Apreciação Ética - Certificate of Presentation for Ethical Consideration*) 98373718.0.3001.5275 (Maternity School of the *Universidade Federal do Rio de Janeiro*).

## Results

The Brazilian version of PIBBS was called the “*Escala Comportamental de Amamentação do Pré-Termo*”. After the first stage of translation, the second stage, translation synthesis elaboration, was carried out (S12), where translators identified some divergences, which were altered by consensus, generating version S12. Some items of version S12 undergone modifications in the translation review stage, after judges' agreement, giving rise to the pre-final version. The word “*enraizamento*” was replaced by “*reflexo de busca*”; “*acoplou*” became “*abocanhou*”. “*Seio*” was replaced by “*peito*” and “*bico do peito*” by “*mamilo*”. These changes aimed to use expressions that facilitate the understanding of mothers during breastfeeding care. Regarding the assessment of semantic, idiomatic, cultural and conceptual equivalence, the “*Escala Comportamental de Amamentação do Pré-Termo*” ranged from 83.3% to 100%, according to Table 1.

**Table 1.** Assessment of semantic, idiomatic, cultural and conceptual equivalence of the “*Escala Comportamental de Amamentação do Pré-Termo*” (n=5)

5 judges	Agreement		Agreement		Agreement		Agreement	
	Semantic equivalence	%	Idiomatic equivalence	%	Cultural equivalence	%	Conceptual equivalence	%
Item 1: Reflexo de busca	5	100	4	80	2	40	5	100
Item 2: Quanto do peito estava na boca do bebê	5	100	5	100	5	100	5	100
Item 3: Pega e fixação no peito	5	100	5	100	4	80	5	100
Item 4: Sucção	4	80	4	80	4	80	5	100
Item 5: Série mais longa de sucção	5	100	5	100	5	100	5	100
Item 6: Deglutição	5	100	5	100	5	100	5	100
Scale agreement:		96.6		93.3		83.3		100

**Table 2.** “*Escala Comportamental de Amamentação do Pré-Termo*” item validity before pre-test (n=11)

Item	Agreement	Percentual	CVI*
Item 1: Reflexo de busca	10	90.90	0.90
Item 2: Quanto do peito estava na boca do bebê	11	100	1
Item 3: Pega e fixação no peito	11	100	1
Item 4: Sucção	9	81.81	0.81
Item 5: Série mais longa de sucção	10	90.90	0.90
Item 6: Deglutição	11	100	1
Overall CVI			0.93

\*Content Validity Index considered to be acceptable minimum 0.80

As for the “*Escala Comportamental de Amamentação do Pré-Termo*” item validity before pre-test, CVI ranged from 0.81 to 1.0, and an overall CVI of 0.93 was obtained by the 11 expert judges, according to Table 2.

The pre-final version pre-test was performed with 30 health professionals of a neonatal unit. All health professionals have experience with breastfeeding and 46.7% had more than 10 years of professional experience. As for qualification, 33.3% (10) were specialists, followed by 23.3% (7) with residency and master’s degrees, respectively. It was also observed that 66.7% (20) of health professionals work directly in care, and that 40% (12) have previous experience with instrument validity (Table 3).

It is noteworthy that in the final stage of the adaptation process, all reports and forms were forwarded to the Transcultural Adaptation Review Committee, consisting of three researchers, to ensure that all steps were followed and the necessary reports written and submitted, prior to sending the original version to the authors. Once the assessment was completed, the committee requested clarification regarding the adjustments to items 1 and 4 of the scale, performed after the pre-test. After the requested revisions and clarifications, the scale trans-

lation and adaptation were approved by the committee. The adapted version of PPIBBS is presented in annex 1.

## Discussion

The “*Escala Comportamental de Amamentação do Pré-Termo*” presented a satisfactory agreement regarding the translation and cultural adaptation into Brazilian Portuguese and this fact will be of great importance for clinical practice during the care provided by professionals in neonatal units. The original scale presented an acceptable agreement between the observer, but lower among mother and observers.<sup>(6)</sup> Several studies have shown the PIBBS as one of the reliable tools for assessing breastfeeding behavior in PTI.<sup>(3,9-11)</sup>

A pilot study, in order to determine the inter-rater reliability of PIBBS assessment scores in the observation of infants’ behavior between 34 and 36 weeks of gestational age and between mothers and health professionals, showed that the six components of the PIBBS were scored from independently and the agreement ranged from 81.8% to 100% for all items.<sup>(9)</sup>

In order to describe the breastfeeding and swallowing of a 42-week-old gestational infant diagnosed with mild ischemic hypoxia encephalopathy, from admission to hospital discharge, the PIBBS was used to monitor the progress of breastfeeding by mothers and health professionals, from the sixth to the thirteenth day of life.<sup>(10)</sup> The researcher remained close to the mothers in a position that provided a clear view of infants’ face and chin. The reliability and validity of PIBBS was considered sat-

**Table 3.** Distribution of Content Validity Index in the pre-test with health professionals from a neonatal unit (n=30)

Variables	Totally agree	Agree	Disagree	Totally disagree	CVI'
The PIBBS is appropriate for the purpose for which it is intended (facilitator of the breastfeeding process of preterm infants)	10(33.3)	19(63.3)	1(3.3)	-(-)	0.96
The PIBBS facilitates the learning of concepts used and their applications	8(26.7)	22(73.3)	-(-)	-(-)	1
PIBBS provides help in a complete way, informs health professionals what to observe in breastfeeding	12(40)	16(53.3)	2(6.7)	-(-)	0.93
PIBBS content provides help in the breastfeeding process in a non-tiring way	-(-)	28(93.3)	2(6.7)	-(-)	0.93
Did the PIBBS content promote a change in behavior in relation to its support of breastfeeding preterm infants?	14(46.7)	14(46.7)	2(6.7)	-(-)	0.93
Is the information/content adequate for your guidance to mothers of preterm infants regarding breastfeeding?	20(66.7)	10(33.3)	-(-)	-(-)	1
The PIBBS content is attractive to you	-(-)	28(93.3)	2(6.7)	-(-)	0.93
The content is motivating and encourages you to continue completing the scale	-(-)	28(93.3)	2(6.7)	-(-)	0.93
Has the PIBBS contributed to your knowledge in the field of breastfeeding?	21(70)	9(30)	-(-)	-	1
The PIBBS has sparked interest in the area of breastfeeding	3(10)	26(86.7)	-(-)	1(3.3)	0.96
The material is suitable for use by healthcare professionals	22(73.3)	7(23.3)	1(3.3)	-(-)	0.96
The PIBBS is easy to apply	-(-)	30(100)	-(-)	-(-)	1
The language used on the PIBBS is easy to understand	-(-)	30(100)	-(-)	-(-)	1
The PIBBS interface is attractive	-(-)	30(100)	-(-)	-(-)	1
The PIBBS is appropriate for you to guide mothers on breastfeeding	13(43.3)	17(56.7)	-(-)	-(-)	1
The information presented in the PIBBS is scientifically correct	15(50)	15(50)	-(-)	-(-)	1
The size and type of letters of titles, subtitles, and text is appropriate	-(-)	30(100)	-(-)	-(-)	1
The amount of information contained in the PIBBS is adequate	3(10)	27(90)	-(-)	-(-)	1
Overall CVI					0.97

\*Content Validity Index considered to be acceptable minimum 0.80

isfactory and increased the study accuracy. A video-fluoroscopic swallowing device was also used with the support of a radiologist.<sup>(10)</sup>

In order to assess the effect of the reflexology strategy on mothers regarding breast milk volume and preterm weight gain, three scales were used, one of which was PIBBS. Instrument validity was performed by a panel of experts composed of seven professors of pediatric nursing and three physiotherapists. The value of structure validity in terms of simplicity of content, purpose, accessibility and clinical significance was 95%.<sup>(11)</sup>

A pilot study of a randomized clinical trial, aiming at assessing the effectiveness of non-nutritive sucking at the mother's breast in PTIs, used the PIBBS to assess behavioral maturity regarding breastfeeding after the intervention.<sup>(3)</sup>

Regarding judges' content validity, before the pre-test, the scale was considered valid in terms of content, obtaining a high CVI in the individual items and global item, so the content is valid to express PTI' breastfeeding behavior during feeding. Similar results were found in the validity of other instruments to guide the health professional regarding breastfeeding of infants, such as the LACTH scale that obtained a content equivalence index (CVI) of the sentences greater than 0.90, as well as the general index (CVI), which was 0.91.<sup>(12)</sup>

Supporting mothers of PTI in NICUs requires health professionals' skills in terms of knowledge, attention and safety, enabling the early identification of possible problems, as well as preparing them for exclusive breastfeeding at hospital discharge.

The application of instruments aimed at assessing the readiness of PTI to start breastfeeding and continuing education can promote innovative opportunities for nurses to engage in supporting mothers of PTI to maintain lactation.<sup>(13)</sup>

A study conducted with health professionals in Sweden, in order to develop an instrument to measure the attitudes of professionals related to breastfeeding and skin-to-skin contact, taking into account the Baby-Friendly Hospital Initiative for neonatal intensive care, concluded that NICUs need to increase their efforts to support breastfeeding, as the support of well-trained health professionals with a positive attitude towards breastfeeding is critical for mothers during the PTI's hospitalization..<sup>(14)</sup>

The limitation of this study was the lack of construct analysis. In order for PIBBS to be incorporated into clinical practice as a technology, it is necessary to carry out more robust psychometric tests, according to the Consensus-based Standards for the selection of health Measurement Instruments (COSMIN).

## Conclusion

The PIBBS was translated and adapted to Brazilian Portuguese. The results of the pre-test with health professionals showed that the scale is easy to apply and understand. After validating the psychometric properties, PIBBS will be a useful technology to assist health professionals in assessing the behavior of PTI in the breastfeeding process, which is so complex for mothers and PTIs.

## Collaborations

Gomes SF, Christoffel MM contributed to the manuscript design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and approval of the final version to be published. Gomes ALM, Rodrigues EC, Machado MED, Silveira ALD contributed with data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published. Guimarães BR, Wolf MGO contributed with data analysis and interpretation, article writing, data collection and approval of the final version to be published.

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