Transcultural adaptation of a scale for exclusive breastfeeding to be used in Brazil

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SUMMARY

OBJECTIVE: The aim of this study was to perform a cross-cultural adaptation of the Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding for use in a Brazilian-Portuguese context.

METHODS: The cross-cultural adaptation process involved the translation from original English into Brazilian Portuguese by two qualified and independent translators. Both translations were synthesized into a single version that was back-translated into English. An expert committee was created to assess linguistic equivalences, formulating a pre-final version that was tested on ten nursing women attending a maternity hospital. To assess its psychometric properties, a cross-sectional study was carried out. The population consisted of 99 nursing women from a reference maternity hospital in southern Brazil. The scale's stability and internal consistency were measured through Cronbach's alpha. The Pearson's correlation coefficient and the intraclass correlation coefficient between two applications were assessed to ascertain the Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding-Br scale's reliability. The construct validity was evaluated through exploratory factorial analysis.

RESULTS: The Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding-Br showed a general Cronbach's alpha of 0.849. The test-retest analysis showed a Pearson's correlation coefficient of 0.483 and intraclass correlation coefficient of 0.645. The exploratory factorial analysis showed two domains among the nine items of the Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding-Br: the functional domain, including six items, and the cognitive domain, including three items, explaining 59.77% of the variance.

CONCLUSION: The Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding-Br was considered adequate for the cultural context and reliable and valid for Brazilian nursing women.

KEYWORDS: Exclusive breastfeeding. Surveys and questionnaires. Validation study. Psychometrics.

INTRODUCTION

Exclusive breastfeeding for at least 6 months has a profound relationship with the prevention of disease and influences babies' cognitive development[1]. Despite the importance of the exclusive breastfeeding process identified in scientific studies, it is the lactating mother's knowledge that significantly influences whether this practice is adopted. Thus, the relationship between breastfeeding knowledge and adherence to exclusive breastfeeding is direct and expressive[2]. The better the maternal understanding of breastfeeding, the greater the chance of success in exclusive breastfeeding[2]. National and international organizations have taken measures to improve breastfeeding practices worldwide and have been analyzing breastfeeding programs[1]. Incentives for breastfeeding practices are necessary, making it important to measure them based on indicators, such as breastfeeding self-efficacy.

A systematic review with meta-analysis showed that breastfeeding self-efficacy is a modifiable factor that health professionals can target to improve breastfeeding rates in mothers of full-term infants[3]. Moreover, higher breastfeeding self-efficacy is associated with a lower risk of expressed human milk feeding and a longer duration of any and exclusive breastfeeding[4].

Thus, researchers emphasize the importance of studies that validate and develop instruments that can increase knowledge about the causal factors underlying breastfeeding decisions and how the breastfeeding process can be better supported[5].

The first known instrument to assess breastfeeding self-efficacy, known as the Breastfeeding Self-Efficacy Scale (BSES) was published by Dennis and Faux in 1999[6]. The BSES includes 33 items that seek to measure mother's expectations regarding self-efficacy; in other words, her confidence in her ability to breastfeed her new child. In 2003, Dennis proposed and

validated another version of the self-efficacy scale, the so-called Self-Efficacy Scale Short Form (BSES-SF), which includes 14 items[7]. This version was validated for several different languages and populations[8-10], including Brazilian women[11].

More recently, Boateng et al.[12] adapted the BSES-SF scale to measure exclusive breastfeeding self-efficacy among women in Uganda. The result was an instrument called the Breastfeeding Self-Efficacy Scale-Exclusive Breastfeeding (BSES-EBF), composed of nine items that measure the cognitive and functional dimensions of exclusive breastfeeding in women in Uganda[12]. Authors pointed out that the BSES-EBF was valid and reliable for measuring exclusive breastfeeding self-efficacy in northern Uganda and was considered ready for adaptation and validation for clinical and programmatic use elsewhere[12].

The Brazilian literature lacks a valid and reliable instrument to measure the self-efficacy scale for exclusive breastfeeding. As self-efficacy is an important determinant of breastfeeding behaviors[12], and the existing measures do not specifically assess the self-efficacy of exclusive breastfeeding but rather the self-efficacy of any breastfeeding, it is important to have an exclusive scale for this purpose in Brazil. Considering the need to identify possible mothers at risk of non-adherence to the exclusive breastfeeding process or premature cessation of this practice, this study aims to propose a Brazilian version of the BSES-EBF scale and assess its psychometric properties.

METHODS

The guidelines of the COSMIN Study Design Checklist for Patient-Reported Outcome Measurement Instruments[13] were followed in this study. The author of the original scale authorized using the BSES-EBF to perform the transcultural adaptation to Brazilian Portuguese and validate its psychometric properties.

The cross-cultural adaptation and psychometric analysis to validate the BSES-EBF scale were carried out from June 2020 to March 2021, involving nursing mothers admitted to the childbirth of a maternity hospital in southern Brazil, after the local research ethical committee approved it.

The process started with the direct translation of BSES-EBF in its original English version into the Portuguese language spoken in Brazil. The translation was carried out by two independent translators, one native to Brazil and the other native to a country in which English is spoken as a native language, producing two different translations. Then, the researchers compared these two versions and synthesized them into a single version that was translated back into English by a third independent translator who was a native English speaker and had a master's degree in the Portuguese language. This process

made it possible to correct minor misunderstandings or unclear wordings in the initial translations.

Next, a committee of experts comprised two obstetricians, a nurse specialized in obstetrics, an epidemiologist, and a medical student who evaluated all the processes and linguistic equivalences, discussing synonyms, reformulating questions to facilitate the understanding of questions by people with different levels of education, and finally formulating a pre-final version. This was tested on 10 nursing women attending the selected maternity hospital who had agreed to participate in the research and had signed the informed consent form. The researchers evaluated possible interpretation or understanding difficulties, any constraints caused by the questions, or eventual inadequacies in the given answers. Without the need for adjustments, the Brazilian version was proposed (BSES-EBF-Br).

An epidemiological study of cross-sectional design was carried out to analyze the psychometric properties of BSES-EBF-Br. The scale was applied on two different occasions with an interval of 2 weeks, in accordance with the test-retest method. The second approach was performed by phone, after consent was obtained.

The sample size was calculated using the proportion of 10 interviewees per question[14], plus 10% for losses, totaling 99 women. The inclusion criteria were women whose birth event took place between 24 and 48 h before the interview, who were breastfeeding, who were aged 18 years or over, who knew how to read and write in Portuguese, and who agreed to participate in the study by signing the informed consent form. The sample selection was performed consecutively according to the date of the birth event. Patients with psychiatric disorders that prevented their participation in the data collection were excluded.

The resulting data were entered into and analyzed by the Statistical Package for Social Science for Windows (SPSS), version 18.0 (IBM©, Chicago, Illinois, USA). The Pearson's correlation coefficient and the intraclass correlation coefficient (ICC) between the two applications were assessed to ascertain the scale's reliability. A Bland-Altman graph was created to determine the distribution of responses for the two applications. The scale's internal consistency was tested using Cronbach's alpha, calculated with the results of the first moment of response for general analysis by domains and by items.

The instrument's apparent validity was defined and assessed by the experts involved in the study. For the construct validity of the proposed scale, exploratory factor analysis (EFA) was used after observing its suitability with the linear correlation matrix, Kaiser-Meyer-Olkin test (KMO), and Bartlett's sphericity test. The Kaiser criterion for eigenvalues more significant or close to one and the Scree plot were used to define the number of factors

extracted. The main components' extraction was performed by rotation of Varimax to determine the BSES-EBF-Br items and to minimize the number of variables with high loads in each factor.

RESULTS

The transcultural adaptation process led to a Brazilian-Portuguese version of the BSES-EBF scale. For the instrument's psychometric analysis, 99 nursing women were interviewed, and of these, 42 undertook a second interview.

The participants' mean age was 26.8±6.1 years, with a minimum age of 14 years and a maximum age of 45 years. In the socio-demographic evaluation, 31.3% had completed more than 11 years of schooling, and 84.8% lived with their partner. During the interviewees' obstetric information evaluation, 1–6 previous pregnancies were observed, with 35.4% of women having delivered their first child and 31.3% having delivered their second child. Of the postpartum women interviewed, 45.5% had never breastfed, and only 33.4% had breastfed their children for more than 6 months previously (Table 1).

Table 1. Descriptive statistics of socio-demographic, obstetric, and breastfeeding characteristics of Brazilian study participants.

Characteristics	n	%
Household income/month (US$)		
Up to 250	17	17.2
Between 251 and 500	44	44.4
More than 500	38	38.4
Living with partner		
Yes	84	84.8
No	15	15.2
Educational level		
Up to 8 years of study	25	25.3
Between 8 and 11 years of study	31	31.3
More than 11 years of study	42	42.4
Previous pregnancies		
0	39	24.7
1	37	23.4
2	14	8.2
≥3	12	6.3
Previous breastfeeding time		
Never breastfed	45	45.5
1–4 months	13	13.1
4–6 months	7	7.1
More than 6 months	34	34.3

Brazil, 2021 (n=99).

The test-retest analysis demonstrated moderate stability, with a Pearson's correlation coefficient of 0.483 (p<0.001) and an intraclass correlation coefficient (ICC) of 0.645 (95%CI 0.335–0.810; p<0.001). The uniform distribution of the responses to the two applications of the instrument corroborated its reliability.

The BSES-EBF-Br presented a general Cronbach's alpha of 0.849. If each item was removed from the scale, the Cronbach's alpha of the instrument identified values close to or above 0.810, showing good internal consistency in maintaining all items of the proposed scale (Table 2).

To determine the adequacy of the EFA against the data, the linear correlation matrix between the items was calculated and showed Pearson's correlation indices between 0.300 and 0.800 in most cases. The KMO test value was 0.751, and a Bartlett's sphericity test with statistical significance (p<0.001) demonstrated the suitability of the data set for use in the EFA.

By extracting the main components and through visual confirmation using the Scree plot, two domains were obtained among the nine items of the BSES-EBF-Br: the functional domain, consisting of six items reflecting the participants' confidence and ability to breastfeed. The other domain was cognitive, comprising three items reflecting the participants' beliefs about the importance of maintaining exclusive breastfeeding. The Cronbach's alpha results for each domain were 0.803 and 0.597, respectively. Only items 4, 6, 7, and 9 scored in a single domain, and the others were included in the domain in which they presented the highest factor load (Table 3).

The initial analysis of the eigenvalues of the two domains after rotation explained 59.77% of the variance, and the commonality values varied between 0.31 and 0.79. The items with lower commonalities were as follows: "*I can always determine that my baby is getting enough milk*" (0.31), "*I can always deal with the fact that breastfeeding can be time-consuming*" (0.41), and "*I can continue exclusively breastfeeding for as long as I want*" (0.51). Thus, as most of the items presented high factor loads, the two extracted domains could explain the expected variance of the indicators.

DISCUSSION

The scale under study is a modification of the original BSES-SF to target exclusive breastfeeding. According to the authors[12], the following two dimensions of the BSES-EBF emerged: cognitive and functional. The authors concluded that it was a valid and reliable scale ready for adaptation and validation for clinical and programmatic use elsewhere. The present study is the first to be developed to propose a Brazilian version of the BSES-EBF

Table 2. Reliability analysis from the Cronbach's alpha of the Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding-Br.

Items BSES-EBF-Br	Cronbach's alpha if an item is deleted
1. I can always give my baby only breast milk without using animal milk, formula, or other liquids or foods as a supplement / *Eu sempre consigo dar ao meu bebê apenas leite materno, sem usar leite de origem animal, fórmula ou outros líquidos e alimentos como suplemento.*	0.829
2. I can continue exclusively breastfeeding for as long as I want / *Eu posso continuar amamentando exclusivamente durante o tempo que eu quiser.*	0.829
3. I can always exclusively breastfeed without my baby receiving even a drop of water or any other liquid / *Eu sempre consigo amamentar exclusivamente o meu bebê sem que ele receba nem uma gota de água ou qualquer outro líquido.*	0.828
4. I can always stop someone from trying to feed my baby liquids or foods other than breast milk, including purchased baby foods (e.g., infant formula, milk, porridge, juice, tea [whatever is commonly given]), before 6 months of age / *Eu sempre consigo impedir qualquer um que tente alimentar meu bebê com líquidos ou outros alimentos além do leite materno, incluindo alimentos infantis como fórmula infantil, leite, mingau, suco e chá, antes dos seis meses.*	0.845
5. I can always determine that my baby is getting enough milk / *Eu sempre consigo perceber se meu bebê está mamando o suficiente.*	0.846
6. I can always be satisfied with my breastfeeding experience / *Eu sempre sinto satisfação com minha experiência em amamentar.*	0.833
7. I can always deal with the fact that breastfeeding can be time consuming / *Eu sempre consigo lidar com o fato de que a amamentação pode ser demorada.*	0.844
8. I can always continue to breastfeed my baby for every feeding / *Eu consigo amamentar meu bebê quando necessário.*	0.822
9. I can always manage to keep up with my baby's breastfeeding demands / *Eu sempre consigo atender as necessidades de amamentação do meu bebê.*	0.819

Brazil, 2021 (n=99).

Table 3. Analysis of each item's factorial components on the Breastfeeding Self-Efficacy Scale in Exclusive Breastfeeding-Br obtained by the Varimax rotation method.

Items on the BSES-EB-Br	Factors	
	1	2
Functional		
2. I can continue exclusively breastfeeding for as long as I want / *Eu posso continuar amamentando exclusivamente durante o tempo que eu quiser.*	0.539	
5. I can always determine that my baby is getting enough milk / *Eu sempre consigo perceber se meu bebê está mamando o suficiente.*	0.497	,256
6. I can always be satisfied with my breastfeeding experience / *Eu sempre sinto satisfação com minha experiência em amamentar.*	0.771	
7. I can always deal with the fact that breastfeeding can be time consuming / *Eu sempre consigo lidar com o fato de que a amamentação pode ser demorada.*	0.632	
8. I can always continue to breastfeed my baby for every feeding / *Eu consigo amamentar meu bebê quando necessário.*	0.815	
9. I can always manage to keep up with my baby's breastfeeding demands / *Eu sempre consigo atender as necessidades de amamentação do meu bebê.*	0.863	
Cognitive		
1. I can always give my baby only breast milk without using animal milk, formula, or other liquids or foods as a supplement / *Eu sempre consigo dar ao meu bebê apenas leite materno, sem usar leite de origem animal, fórmula ou outros líquidos e alimentos como suplemento.*		0.810
3. I can always exclusively breastfeed without my baby receiving even a drop of water or any other liquid / *Eu sempre consigo amamentar exclusivamente o meu bebê sem que ele receba nem uma gota de água ou qualquer outro líquido.*		0.722
4. I can always stop someone from trying to feed my baby liquids or foods other than breast milk, including purchased baby foods (e.g., infant formula, milk, porridge, juice, tea [whatever is commonly given]), before 6 months of age / *Eu sempre consigo impedir qualquer um que tente alimentar meu bebê com líquidos ou outros alimentos além do leite materno, incluindo alimentos infantis como fórmula infantil, leite, mingau, suco e chá, antes dos seis meses.*		0.814

Brazil, 2021 (n=99).

scale for assessing the self-efficacy of exclusive breastfeeding in Brazilian nursing mothers.

The uniform distribution of the two applications of the instrument corroborated its reliability. The scale's stability in the Brazilian instrument was superior to that observed in the original scale (correlation coefficient=0.54), probably due to the long interval between the original study interviews[10]. Other transcultural adaptations of BSES-EBF were not found in the literature for comparing these indicators.

The internal consistency confirmed by the Cronbach's alpha of the full BSES-EBF-Br scale was considered excellent, demonstrating good internal consistency in maintaining all items of the proposed instrument in the same way as the original scale[10]. No tests were applied to assess external validity.

When testing suitability using the KMO test and the Barlett test, the results found for the BSES-EBF-Br were comparable to the original scale. They showed that the sample size was adequate to perform the EFA. These data were identical to those found for the original scale[10].

When submitting the data to the EFA, the total variance explained on the BSES-EBF-Br scale resulted in two domains, including the one determined by Boateng et al.[10] However, the distribution of the items in each domain was different, so that, in the original scale, the domain "Functional," reflecting the competence and ability of the participants to breastfeed, consisted of five items, while the domain "Cognitive," reflecting the belief of participants in exclusive breastfeeding, consisted of four items[10]. This difference may be attributable to the time elapsed between birth and the scale application, which was different in the two studies.

As most of the items presented high factor loads, the initial analysis of the two domains' eigenvalues, after rotation, was able to explain the expected variance of the indicators in the same way as observed by Boateng et al. for the original scale[10].

Some limitations require caution when interpreting the results of this study. The absence of a control group, which would have allowed further analyses and the calculation of an essential cutoff point to determine which score should be considered to indicate a higher risk of early breastfeeding interruption in the Brazilian population. Another limitation was the non-inclusion of a comparative questionnaire to help with the external validation of the studied instrument.

As the research was carried out at a single public health institution in Santa Catarina, the scale may behave differently when applied to other socioeconomic strata or in different Brazilian regions.

It is believed that the variability in the psychometric parameters observed in the versions of the scale under study is the result of the socio-cultural characteristics peculiar to each country, which reinforces the need for rigorous scientific transcultural adaptation. Thus, the few psychometric differences found in the original version do not indicate flaws in the process of transcultural adaptation.

The proposed scale is understandable and appropriate to the Brazilian cultural context and can be reliable and valid for Brazilian nursing women. We believe that it could help identify nursing women with low confidence in exclusive breastfeeding and allow for stimulus measures to be strengthened.

CONCLUSION

The Brazilian version of the BSES-EBF can be considered adequate for the cultural context and reliable and valid for Brazilian nursing women.

AUTHORS' CONTRIBUTIONS

LKV: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **LSG:** Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. **GKR:** Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing. **RDN:** Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft, Writing – review & editing. **JT:** Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

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