ORIGINAL ARTICLE

PSYCHOMETRIC PROPERTIES OF THE BRAZILIAN VERSION OF THE INFANT FEEDING INTENTIONS SCALE

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ABSTRACT

Objective: to assess the psychometric properties of the Brazilian version of the Infant Feeding Intentions Scale. **Methods:** this is a methodological study, which was conducted in three Family Health Strategy units in the city of Macaé, Rio de Janeiro, Brazil, between July 2019 and March 2020, where pregnant women, over 18 years old, who underwent prenatal care in one of the settings. In order to confirm the factor structure, the confirmatory factor analysis was adopted; and to assess the reliability of the scale, the analysis of internal consistency was used, measured by Cronbach's alpha. **Results:** it was attended by 59 (100.0%) pregnant women, with a mean age of 24.9 years and 33.1 weeks of gestation. The adjustments obtained in the factor analysis were satisfactory, that is, the Brazilian version of the scale has the same factor structure as the original version, being a one-dimensional model consisted of five items. Cronbach's alpha was 0.70 for the total of five items. **Conclusion:** the Brazilian version of the scale is internally consistent and reliable to assess maternal intention to exclusively breastfeed until the infant is six months old in the Brazilian context.

Keywords: Intention. Pregnant women. Infant nutrition. Validation study. Breast feeding.

INTRODUCTION

Exclusive breastfeeding (EBF) is recommended by the World Health Organization (WHO), the American Academy of Pediatrics (AAP) and the Brazilian Ministry of Health (MS, as per its Portuguese acronym) for the first six months of life and, in a complementary manner, until two years of age or older[1-4]. At this stage of life, breast milk represents the most complete and nutritious food, since its components, such as carbohydrates, proteins, mineral salts, fats, vitamins and water, are essential for healthy and harmonious child growth and development. Furthermore, it provides immunity and protection against infections, allergies, diarrhea and respiratory diseases, in addition to favoring the bond between the mother/baby binomial[5,6].

It is estimated that the expansion of breastfeeding per year can prevent about 823,000 deaths of children and 20,000 deaths of women from breast cancer. Nevertheless, despite the recommendations, in low- and middle-income countries, only 37% of children up to six months of age are exclusively breastfed. It is worth underlining that, in developed and developing countries, the duration of breastfeeding is even shorter, where one of the main reasons is the early introduction of nutritional supplements[1,4].

In Brazil, although there was an increase in the prevalence of EBF, mainly between 1986 and 2006, rising from 4.7% to 37.1%[7], this number is still low, according, for example, to the global nutrition goals for 2025 established during the 56th World Health Assembly, held in 2012, among which, the goal is to increase the

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rate of breastfeeding by at least 50% in the first six months of life worldwide[8].

Several factors interfere with the success of exclusive breastfeeding, since there are not only biological, but also social, cultural, economic and emotional challenges, with emphasis on the lack of guidance from health professionals to pregnant women in the pregnancy-puerperal period, weaknesses in family support network, low levels of schooling, primiparity, pain and discomfort in the breasts, work in the puerperium, close family members who did not breastfeed their children or introduced other foods early, decreased milk production, use of artificial teats, among others[9,10]. However, public policies with actions aimed at promoting this practice, especially during prenatal care, contribute to overcoming many of these challenges[9,11].

In this context, one of the most significant intervening factors is the maternal intention to breastfeed. Research indicates that there is a relationship among the knowledge of the benefits, the individual beliefs obtained in the life trajectories of women and the motivation to breastfeed[12,13]. Therefore, the act of assessing this intention and the factors that contribute to this decision-making by mothers is essential for the establishment of health education programs, interventions and policies, in order to reduce early weaning and promote breastfeeding for longer periods[14,15].

In light of the foregoing, there is a clear need to use measuring instruments that assess the maternal intention to breastfeed both in health care practice and in scientific research. To this end, the Infant Feeding Intentions Scale (IFI), developed in English and Spanish in 2009, in the United States of America (USA), measures, in a simplified, reliable and quantitative way, mothers' intentions to exclusively breastfeed their babies up to one, three, or six months of age, or to use formula[16].

It is worth emphasizing that the original IFI was developed from other instruments, based on theories of behavior, such as the Transtheoretical Model and the Theory of Reasoned Action. However, this scale advanced in relation to these instruments, covering both the duration and the strength of the intentions to

exclusively breastfeed until six months of age, thus incorporating the two-dimensional nature of the intention to breastfeed[16].

The IFI was used in several international surveys that validated the scale and/or measured the construct in different countries such as Lebanon[14], Syria[15], Australia[17], Jordan[3], Indonesia[18], Puerto Rico[12], Turkey[4] and in the USA[12,19-21]. In Brazil, in 2019, researchers carried out the translation and cultural adaptation of the scale. Thus, the Brazilian version of the IFI was considered representative and clear[22], but it was still necessary to assess the psychometric properties in the Brazilian reality, which justifies the accomplishment of the present study.

Given the above, the following research question was established: is the Brazilian version of the IFI internally consistent and reliable to assess the maternal intention to exclusively breastfeed until the infant is six months old in the Brazilian context? Accordingly, the objective of this study was to assess the psychometric properties of the Brazilian version of the Infant Feeding Intentions Scale.

METHODS

This is a methodological study, with a quantitative approach, conducted in three Family Health Strategy units in the city of Macaé, Rio de Janeiro, Brazil, between July 2019 and March 2020.

As an assumption, in order to hold a factor analysis, for simpler structural models, a 10:1 ratio, that is, ten participants for each item of a measuring instrument to be validated, is considered adequate[23]. Therefore, given the one-dimensional nature of the IFI, consisting of five items, a minimum sample size of 50 pregnant women was estimated for the assessment of the psychometric properties of the scale.

The following inclusion criteria were considered: pregnant women, over 18 years old and who underwent prenatal care in one of the three Family Health Strategy units. Exclusion criteria were: having less than 30 or more than 37 weeks of gestation, suffering from psychiatric and/or neurological disorders and/or

hearing loss, in addition to pregnant women who had clinical complications on the day or at the time of data collection.

Data collection took place through individual face-to-face approaches with pregnant women, through the interview technique, in the waiting room of the units, while they were waiting for prenatal care.

Firstly, an instrument of sociodemographic and gestational information was applied, namely: age, ethnicity, gestational age, if they lived with a partner or spouse, marital status, how many people lived in the same house, schooling, if they worked outside the home, if they had health insurance plan, family income, if they smoked and consumed alcoholic beverages, in addition to questions about the acceptability of pregnancy (planned pregnancy; happiness about the pregnancy; intention to abort).

Finally, the instrument of the Brazilian version of the Infant Feeding Intentions Scale (IFI) was used, consisting of five items with five answer options each, based on a Likert-type scale, individually scored from 0 to 4, where the total final score was obtained by calculating the mean score of the first two items, added to items 3, 4 and 5. The score of maternal intention to breastfeed ranges from 0 to 16, with 0 representing a very strong intention not to breastfeed and 16 representing a very strong intention to exclusively breastfeed for the first six months of age[14,16,19,22].

Data were initially tabulated, by means of double typing, in Microsoft Excel® 2016 software. In order to characterize the participants, descriptive statistics with measures of central tendency (mean, minimum, maximum) and dispersion (standard deviation) were used. IBM® SPSS v.20 software was adopted to make statistical analyses, while the Analysis of Moment Structures module (IBM® SPSS AMOS) was used to accomplish the Confirmatory Factor Analysis (CFA).

When confirming the instrument's factor structure, through the CFA, the following adjustment indicators were considered: Comparative Fit Index (CFI) $\geq$ 0.95; Tucker-Lewis Index (TLI) $\geq$ 0.90; Godness-of-Fit Index (GFI) $\geq$ 0.90; Root-Mean-Square Error of Approximation (RMSEA) < 0.10; and Root Mean Square Residual (RMSR) $\leq$ 0.08[23].

In order to assess the reliability of the scale in question, the analysis of internal consistency measured by Cronbach's alpha was used, that is, the degree to which the answers are consistent in the items of the measuring instrument. To this end, the following parameters were considered: values around 0.90 are "excellent"; values around 0.80 are "very good"; and values around 0.70 are "adequate"[23].

The research is associated with the multicenter project "Exclusive breastfeeding: sociocultural determinants in Brazil", approved by the Research Ethics Committee (Opinion nº. 2.507.525), in accordance with the recommendations of Resolution 466/2012 of the National Health Council. The creator of the original instrument granted authorization for cultural adaptation and validation of the scale. All participants signed the Free and Informed Consent Form (FICF).

RESULTS

The study was attended by 59 (100.0%) pregnant women with a mean age of 24.9 years (SD=5.6), minimum 18 and maximum 40 years. With regard to gestational age, the mean was 33.1 weeks of gestation (SD=2.8), a minimum of 30 and a maximum of 37 weeks. Among the participants, the majority, 33 (55.9%), declared themselves brown. As for marital status, more than two thirds lived with a partner, 47 (79.7%). The level of schooling of pregnant women with high school (39; 66.1%) showed the highest proportion, followed by elementary school (17; 28.8%) and higher education (3; 5.1%).

Of the total number of participants, 43 (72.9%) do not work and 41 (69.5%) consider their income to be sufficient to meet the basic needs of their family nucleus. With regard to pregnancy, considering the valid percentages, excluding absent records, the largest portion was unplanned (29; 67.4%); however, the pregnant women reported being happy about the pregnancy (31; 72.1%), as can be seen in Table 1.

Table 1. Characterization of pregnant women according to sociodemographic and gestational variables (n=59). Rio das Ostras, RJ, Brazil. 2021

Variables	n	%
Race/color		
White	7	11.9
Black	17	28.8
Yellow	2	3.4
Brown	33	55.9
Living with a partner		
Yes	47	79.7
No	12	20.3
Schooling		
Elementary school	17	28.8
High school	39	66.1
Higher education	3	5.1
Working		
Yes	16	27.1
No	43	72.9
Income sufficiency		
Less than basic needs	12	20.3
Only basic needs	41	69.5
More than basic needs	6	10.2
Planned pregnancy*		
Yes	14	32.6
No	29	67.4
Happiness about the pregnancy *		
Yes	31	72.1
No	12	27.9
Intention to abort*		
Yes	6	14.0
No	37	86.0

*The item showed missing

In order to confirm the factor structure of the Brazilian version of the IFI, the CFA was carried out, considering the same structure of the original version. The adjustments obtained were: CFI=0.953; TLI=0.905; GFI=0.958; RMSEA=0.088 (LO 90=0.000; HI 90=0.217); and, RMSR=0.077. Therefore, all adjustments were assessed as satisfactory, that is, the Brazilian version of the IFI has the same factor structure as the original version, being a unidimensional model consisted of five items for the assessment of maternal intention to breastfeed (Figure 1)

INFANT FEEDING INTENTIONS SCALE

The sentences below are about feeding your baby. Please choose the answer that comes closest to your opinion, considering your plans for feeding your baby as well as the likelihood of putting these plans into practice.

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
1. I have plans to only feed my baby with formula (I will not breastfeed).	0	1	2	3	4
2. I have plans to at least try to breastfeed.	4	3	2	1	0
3. When my baby is one month old, I will only breastfeed him/her without using any other formula.	4	3	2	1	0
4. When my baby is three months old, I will only breastfeed him/her without using any other formula.	4	3	2	1	0
5. When my baby is six months old, I will only breastfeed him/her without using any other formula.	4	3	2	1	0

Numbers within the grid represent the point value for each answer. Total score = (mean of items 1 and 2) + (sum of items 3, 4 and 5). Accordingly, the total score ranges from 0 (very strong intention not to breastfeed) to 16 (very strong intention to breastfeed exclusively during the first 6 months).

Figure 1. Infant Feeding Intentions Scale. Rio das Ostras, RJ, Brazil. 2021.

Subsequently, a Cronbach's alpha of 0.70 was obtained for the total of five items. According to Table 2, the Cronbach's alpha, if the item is excluded, ranged from 0.55 for item 4 (breastfeeding only without using any other artificial milk [formula] when the baby is three months old) to 0.71 for item 2 (plans to at least try to breastfeed), as can be seen in Table 2.

Table 2. Correlation between total item and Cronbach's alpha if the item is excluded (n=59). Rio das Ostras, RJ, Brazil. 2021

Items	Cronbach's alpha if the item is excluded
1. I have plans to only feed my baby with formula (I will not breastfeed).	0.66
2. I have plans to at least try to breastfeed.	0.71
3. When my baby is one month old, I will only breastfeed him/her without using any other formula.	0.66
4. When my baby is three months old, I will only breastfeed him/her without using any other formula.	0.55
5. When my baby is six months old, I will only breastfeed him/her without using any other formula.	0.63

The overall mean score of the scale was 12.0 (SD=3.86), ranging from 2.5 to 16.0; with the lowest mean value among white pregnant women (mean = 9.9) and the highest among those who declared that their monthly income is less than their basic needs (mean = 14.0), as can be seen in Table 3.

Table 3. Comparison of mean scores of maternal intention to breastfeed (n=59). Rio das Ostras, RJ, Brazil. 2020

Variables	Scale Mean	Standard deviation
Race/color		
White	9.9	5.1
Black	13.4	2.4
Yellow	13.3	1.8
Brown	11.7	4.1
Living with a partner		
Yes	11.8	3.9
No	12.8	3.9
Schooling		
Elementary school	11.4	3.6
High school	12.3	3.9
Higher education	12.5	6.1
Working		
Yes	11.5	4.1
No	12.2	3.8
Income sufficiency		
Less than basic needs	14.0	2.2
Only basic needs	11.3	3.9
More than basic needs	13.3	4.8
Planned pregnancy*		
Yes	12.4	3.9
No	12.5	3.8
Happiness about the pregnancy*		
Yes	12.8	3.6
No	11.7	4.4
Intention to abort*		
Yes	10.3	5.1
No	12.8	3.5

*The item showed missing.

Our attention is drawn to the fact that the intention to exclusively breastfeed up to six months was directly proportional to the mother's level of schooling, that is, the higher the level of education/schooling, the higher the intention to breastfeed. Conversely, there was a lower intention to breastfeed among pregnant women who work outside the home.

DISCUSSION

The research aimed to assess the psychometric properties of the Brazilian version of the Infant Feeding Intentions Scale (IFI), showing satisfactory results from a sample of a group of Brazilian pregnant women. These participants were mostly women who declared to be brown, young adults and who lived with their spouses. A significant portion had completed the regular cycle of compulsory education, had no work outside the home and stated that their family income met only the family's basic needs. The overall mean score of the scale found represented a trend toward a strong maternal intention to breastfeed among the pregnant women who attended the study.

With regard to factor analysis, it was found that the Brazilian version of the IFI has the same factor structure as the original, as in the study that detected the validity of the Turkish translated version[4], and also in the Arabic validation study of the scale, where, in this analysis, the instrument was also considered unidimensional[14].

Concerning the assessment of reliability through the analysis of internal consistency, the Cronbach's alpha score obtained was satisfactory, close to the studies that followed the same directive, such as the research with Lebanese women, which obtained an acceptable internal consistency value, with a Cronbach's alpha of 0.82[14], a Turkish study, where the coefficient alpha was 0.86[4], and a study with different ethnic groups, where it obtained 0.70 in the analysis of the English-speaking participants and 0.75 in the Spanish-speaking ones[19].

As for the mean score of the scale, lower values were found among white pregnant women and higher among those who reported monthly income lower than their basic needs. Therefore, with respect to the socioeconomic level of these families, the maternal intention to breastfeed was inversely proportional, because the lower the mothers' purchasing power, the higher was their mean in the scale, a finding that is in contrast to an Arabic study, where the highest intention to breastfeed came from women with higher incomes[14].

Concerning the level of schooling, the highest IFI scale mean was found among women with higher education, which corroborates the findings of two studies with Lebanese and Syrian women, which also showed a positive association between the general score of the scale and maternal levels of schooling[14,15], and a Brazilian study, which identified a higher level of education as a protective factor for the duration of exclusive breastfeeding[24].

Moreover, it is possible to perceive rates consistent with the literature regarding a lower intention to breastfeed among pregnant women who work outside the home, as in Arabic studies[14,15] with Lebanese and Syrian women, a Jordanian study[3] and a Indonesian study[18], which reported that employed mothers find it difficult to maintain breastfeeding due to time constraints, making formula feeding more convenient, since the period of maternity leave, although varying among countries, is mostly insufficient to ensure exclusive breastfeeding until six months[14].

In other studies that followed up mothers before and after the birth of their children, it was identified that the factors that most influenced early weaning were the return to work and the insufficient production of milk, which is a misconception that can be explained by the lack of knowledge, insecurity and difficulties with breastfeeding, such as, for example, thinking that the milk is weak or insufficient to satisfy the baby[15,20].

Early weaning is a serious public health problem, which reinforces the need for qualified and targeted care from health professionals, especially nurses, to recognize the factors that influence breastfeeding, thus promoting the necessary support and guidance to minimize the difficulties faced[25]. Accordingly, the importance of health education strategies with pregnant and postpartum women and their family members, aiming to ensure greater autonomy and security, should be highlighted. Therefore, it is worth emphasizing the need to use scales, such as the IFI, that quantitatively measure maternal intentions to breastfeed and predict exclusive breastfeeding, besides serving as the principle for the investigation of these factors.

The present study had limitations, especially the Coronavirus Disease 2019 pandemic (COVID-19), since data collection was interrupted two months earlier than planned. Therefore, more pregnant women could have

been captured for the survey, which would increase its internal and external validity. Nevertheless, in this initial study, the minimum sample size was respected and the findings were satisfactory, with the research objective duly achieved, which does not prevent the Brazilian version of the IFI from being tested again with a larger number of pregnant women with different characteristics, and consequently it may be used in various settings.

CONCLUSION

The study findings indicated that the Brazilian version of the IFI is internally consistent and reliable to assess the maternal intention to exclusively breastfeed the infant up to six months of life in the Brazilian context.

Its application is also suggested to assess its construct in different settings and with pregnant women with different characteristics, aiming at the development of health education strategies that contribute to the reduction of early weaning, thus promoting exclusive breastfeeding in the recommended period. Its use in future investigations will complement the psychometric analyses.

PROPRIEDADES PSICOMÉTRICAS DA VERSÃO BRASILEIRA DA INFANT FEEDING INTENTIONS SCALE

RESUMO

Objetivo: avaliar as propriedades psicométricas da versão brasileira da *Infant Feeding Intentions Scale*. **Métodos:** estudo metodológico, realizado em três unidades de Estratégia da Saúde da Família do município de Macaé, Rio de Janeiro, Brasil, entre julho de 2019 e março de 2020, em que participaram gestantes, maiores de 18 anos, que realizavam o pré-natal em um dos cenários. Para confirmar a estrutura fatorial, adotou-se a análise fatorial confirmatória; e, para avaliar a fidedignidade da escala, utilizou-se a análise da consistência interna, mensurada pelo alfa de Cronbach. **Resultados:** participaram 59 (100,0%) gestantes com média de idade de 24,9 anos e de 33,1 semanas de gestação. Os ajustes obtidos na análise fatorial foram satisfatórios, ou seja, a versão brasileira da escala possui a mesma estrutura fatorial que a versão original, sendo um modelo unidimensional composto por cinco itens. O Alfa de Cronbach foi de 0,70 para o total de cinco itens. **Conclusão:** a versão brasileira da escala é internamente consistente e fidedigna para avaliar a intenção materna de amamentar exclusivamente até os seis meses de vida do lactente no contexto brasileiro.

Palavras-chave: Intenção. Gestantes. Nutrição do lactente. Estudos de validação. Aleitamento materno.

PROPIEDADES PSICOMÉTRICAS DE LA VERSIÓN BRASILEÑA DE LA *INFANT FEEDING INTENTIONS SCALE*

RESUMEN

Objetivo: evaluar las propriedades psicométricas de la versión brasileña de la *Infant Feeding Intentions Scale*. **Métodos:** estudio metodológico, realizado en tres unidades de Estrategia Salud de la Familia del municipio de Macaé, Rio de Janeiro, Brasil, entre julio de 2019 y marzo de 2020, en el que participaron mujeres embarazadas, mayores de 18 años, que realizaban el prenatal en una de las tres unidades. Para confirmar la estructura factorial, se adoptó el análisis factorial confirmatorio; y, para evaluar la fiabilidad de la escala, se utilizó el análisis de la consistencia interna, medida por el Alfa de Cronbach. **Resultados:** participaron 59 (100,0%) embarazadas con promedio de edad de 24,9 años y de 33,1 semanas de embarazo. Los ajustes obtenidos en el análisis factorial fueron satisfactorios, o sea, la versión brasileña de la escala posee la misma estructura factorial que la versión original, siendo un modelo unidimensional compuesto por cinco ítems. El Alfa de Cronbach fue de 0,70 para el total de cinco ítems. **Conclusión:** la versión brasileña de la escala es internamente consistente y fiable para evaluar la intención materna de amamantar exclusivamente hasta los seis meses de vida del lactante en el contexto brasileño.

Palabras clave: Intención. Mujeres embarazadas. Nutrición del lactante. Estudio de validación. Lactancia materna.

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