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## RESEARCH ARTICLE

### Cross-cultural Adaptation and Validation of the Childbirth Fear Prior to Pregnancy Scale in Brazil

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#### Abstract:

#### Background:

The fear of childbirth can range from apprehension to intense fear (tokophobia), with serious consequences for maternal health. Therefore, a standardized scale is needed to measure the fear of childbirth before pregnancy.

#### Objective:

This study aimed to adapt the Childbirth Fear Prior to Pregnancy (CFPP) scale to the Brazilian context and analyse its validity and reliability.

#### Methods:

A cross-sectional survey was completed by 146 nursing students at two Brazilian universities. A committee of experts evaluated the cross-cultural adaptation of the CFPP scale. Construct validity was verified using item-total correlations and Exploratory Factor Analysis (EFA). The validity of divergent concurrent criteria was evaluated by associating the score obtained using the Brazilian CFPP with the Depression, Anxiety, and Stress Scale (DASS-21). Reliability was analysed using Cronbach's alpha coefficient and test-retest.

#### Results:

Correlation analysis revealed a predominance of moderate inter-item correlation and strong item-total correlation (>0.62). The EFA indicated that all items related to a single factor, with factor loadings and communalities >0.5. These results reinforced the one-dimensionality of the Brazilian CFPP. The validity of divergent concurrent criteria was confirmed *via* weak correlations with DASS-21 scores ( $r = 0.32$ ,  $p < 0.001$ ). The Cronbach's alpha (0.86) and the intra-class correlation coefficient (0.99) indicated reliability and strong temporal stability, respectively.

#### Conclusion:

The Brazilian version of the CFPP provides evidence of validity and reliability to measure fear of childbirth before pregnancy in young adults in Brazil.

**Keywords:** Childbirth fear, Scale, Surveys and questionnaires, Validation studies, Psychometrics, Transcultural studies.

#### Article History

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## 1. INTRODUCTION

Childbirth is viewed as an unpredictable event by some women and can evoke feelings of fear and anxiety. Fear of childbirth can range from apprehension to intense fear

(tokophobia), with serious consequences for maternal well-being and health [1 - 3]. Previous studies have identified high levels of fear of childbirth in 20% of women [3]. High levels of fear were more commonly reported by young, unemployed, less educated women and by those experiencing their first pregnancy [4, 5]. In addition, fear of childbirth is associated with an increased number of caesarean sections, prolonged labour, and difficulties in bonding with the baby [6, 7].

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The main causes of fear include perception of the unknown, pain, perineal trauma, lack of involvement in decision-making during labour, abandonment during labour, child's health, mother's health, and neonatal death [3, 8, 9]. In multiparous women, surgical deliveries or previous traumatic experiences were the strongest predictors of childbirth fear [10].

It is important to note that the characteristics and anxieties of healthcare professionals affect birth outcomes. For example, Yee *et al.* studied the cognitive and affective traits of 94 obstetricians (OBs) in the United States and reviewed the birth outcomes of 1,502 women who received care from these OBs [11]. OBs with high anxiety and low coping scores had a significantly lower vaginal birth after caesarean rates among patients eligible for a vaginal birth after caesarean, compared to OBs with low anxiety and proactive coping skills. Conversely, healthcare providers can help reduce fear and anxiety among childbearing women. Trust can reduce fear [12]; however, to support childbearing women who have a fear of childbirth, health professionals must be willing to analyse and acknowledge their own fears, as personal opinions and feelings can affect the manner in which care is provided [11, 12]. During childbirth care, a provider's fear of birth can result in unnecessary interventions and can cause the provider to discourage patients from having a natural birth.

Previous studies on the preferences of young women from eight countries revealed that preferences for a caesarean section without medical indication are primarily driven by fear of childbirth [13]. Some strategies to address fear include health education in schools and during the prenatal period [14, 15], debriefing or counselling to discuss previous negative experiences [16], intensive cognitive-behavioural therapy [17], and yoga [13, 18]. Partners are also affected by fear and, therefore, must be included in the diagnosis of and interventions for fear [19].

Some instruments are available to measure fear of childbirth [20 - 24]. However, there are no validated scales to evaluate pre-pregnancy fear of childbirth in women and men in Brazil.

The assessment of fear of childbirth and the early identification of modifiable factors contributing to this fear can be useful for the development of interventions directed at health professional trainees working in obstetrics and to improve the quality of care for the next generation of maternity care recipients. For these reasons, this study aimed to conduct the cross-cultural adaptation and psychometric testing of the Childbirth Fear Prior to Pregnancy (CFPP) scale for use in Brazil.

## 2. METHODS

### 2.1. Study Design

This cross-sectional study was conducted in two stages: first, the cross-cultural adaptation of the CFPP scale to the Brazilian culture, and second, the evaluation of the validity and reliability of the Brazilian CFPP scale *via* the analysis of the psychometric properties of the adapted instrument.

The process of adapting the CFPP for use in the Brazilian culture and the validation of its use was approved by the authors of the original tool, and the version adapted for Portugal was made available for conducting this study.

### 2.2. The Childbirth Fear Prior to Pregnancy (CFPP) scale

Culturally adapted and validated in Germany, Australia, Canada, the United States, England, Iceland, and Portugal, the CFPP scale assesses fear of childbirth in young people, including men and women, who plan to have children in the future [25, 26]. The items measure fear related to pain, bodily harm, and complications using a Likert-type scale, accessible language, and opportunities for rapid implementation. It is a self-administered scale containing 10 items, each with six Likert response options: (1) strongly disagree, (2) disagree, (3) partially disagree, (4) partially agree, (5) agree, and (6) strongly agree. The final score is obtained by summing the score of the 10 items, with a minimum score of 10 and a maximum of 60. The higher the score, the greater the fear of childbirth [22, 26].

### 2.3. Cross-cultural Adaptation

We followed the methodological recommendations proposed by Beaton *et al.* [27] and reviewed the Portuguese CFPP scale adapted for patients in Portugal [25]. Our analysis included the evaluation of the scale by an expert committee and a pre-test conducted with the target population.

A committee of experts including two methodologists, two linguistic specialists, two obstetric nurses, and one undergraduate nursing student analysed the cultural, conceptual, semantic, and idiomatic equivalences of the Portuguese version of the CFPP scale. We implemented the changes suggested by the experts, with items demonstrating equivalency measured by at least 80% agreement between the evaluators [28] and those resulting from the pre-test version of the CFPP scale (CFPP - BR).

The pre-test and validation stages of this study were conducted with 30 undergraduate nursing students at two universities (14 students from a public university and 16 students from a private university) in the state of São Paulo, from February, 2018 to August, 2018. We included male and female students in the first, second, third, fourth, and fifth years who were not parents and were not experiencing pregnancy at the time of data collection. The data collection instrument consisted of a form to characterise the population and the CFPP - BR. The aim of this stage was to verify the understanding and clarity of the items, as recommended by Beaton *et al.* [27]. The researchers evaluated possible difficulties in interpreting or understanding the items and inadequacies in questions and answers. At the end of this stage, the cross-cultural, adapted, Brazilian version of the CFPP scale was developed [28].

### 2.4. Validity and Reliability

The content and face validity of the Brazilian CFPP scale were verified by the expert committee and by the target population during the pre-test stage. To analyse the psychometric properties, the Brazilian version of the CFPP scale was administered to 146 nursing students, following the same inclusion criteria as the pre-test. This number was established by the proportion of 10 puerperal women for each

item of the instrument [29]. The Depression, Anxiety, and Stress Scale (DASS-21) were also used at the same time [30].

The construct validity, which assesses the instrument's dimensionality, was verified using inter-item and item-total correlations and Exploratory Factor Analysis (EFA). Corrected item-total correlation coefficients  $>0.45$  for all items were considered strong evidence of one-dimensionality [31]. The EFA was conducted considering the possibility of three factors, as described by the authors of the English version, and was obtained through a parallel analysis based on a polychoric matrix [29, 32]. Factor extraction was performed using the unweighted least squares method with promax rotation, with a minimum criterion for factor loadings and communalities  $\geq 0.40$  [29]. A Kaiser-Meyer-Olkin (KMO)  $\geq 0.70$  and a significant Bartlett sphericity test indicated the sample adequacy of this study [29]. The number of factors was indicated by the scree test with scree plot visualisation using Horn's parallel analysis [32].

Consistent with previous CFPP scale validation studies [25, 26], the validity of divergent concurrent criterion was tested by associating the scores obtained from the Brazilian version of the CFPP scale and the DASS-21 [30]. The correlations were classified as weak ( $0 < r < 0.3$ ), moderate ( $0.3 \leq r < 0.5$ ), or strong ( $r \geq 0.5$ ). Validity was confirmed when the correlational coefficients between the existing scales measuring different constructs were low or moderate [33].

Reliability was analysed using the Cronbach's alpha coefficient and temporal stability through test-retest. Cronbach's alpha values  $>0.7$  indicated the reliability of the instrument [34]. The Brazilian version of the CFPP was re-administered to 47 participants within 40 days of the original administration. Intra-class Correlation Coefficient (ICC) values  $>0.70$  indicated favourable stability [34].

The scores of the participants were divided into quartiles to establish cut-off points for the classification of scores into the following categories: absence of fear of childbirth, low fear of childbirth, moderate fear of childbirth, and high fear of childbirth. Data from the Brazilian sample were compared to those of students from an international study conducted by Stoll and colleagues from 2015 to 2016 [26]. Their study included data from 3,385 young women and men from the United States, Canada, Iceland, Germany, England, Chile, New Zealand, and Australia who had plans to become parents and completed the CFPP scale.

## 2.5. Statistical Analyses

The data were processed and analysed using the Statistical Package for the Social Sciences (SPSS) version 20.0 (SPSS v. 20.0, IBM Corp., Chicago, IL, USA). The EFA, scree plot, Horn's parallel analysis, Cronbach's alpha, and correlation results were obtained using Jeffrey's Amazing Statistics Program (JASP) version 0.12 (JASP v. 0.12, Amsterdam, The Netherlands).

## 2.6. Ethics Statements

This study was approved by the ethics committee of our institution (No. 2,428,902), and all participants provided informed consent. This study was conducted in accordance with the principles of the Declaration of Helsinki.

## 3. RESULTS

The equivalence between the original version of the CFPP scale and the version adapted to Portuguese culture was evaluated, and changes were suggested for the cross-cultural adaptation to be used in the Brazilian context. Words that are not commonly used in Brazil were replaced with more appropriate words (Table 1).

**Table 1. Modifications to the Childbirth Fear Prior to Pregnancy scale.**

S. No.	Original English version	Portugal version	Brazil version
1	I am worried that labour pain will be too intense.	Preocupa-me que a dor do parto possa ser demasiado forte.	Eu me preocupo que a dor do trabalho de parto possa ser muito forte.
2	I feel I (my partner) will not be able to handle the pain of childbirth.	Sinto que eu (minha parceira) não vou ser capaz de aguentar a dor do nascimento.	Sinto que eu/minha parceira não vou ser capaz de aguentar a dor do nascimento.
3	I am afraid that I (my partner) might panic and not know what to do during labour & birth.	Tenho medo que eu (minha parceira) possa entrar em pânico e não saber o que fazer durante o parto.	Tenho medo que eu /minha parceira possa entrar em pânico e não saiba o que fazer durante o trabalho de parto e nascimento.
4	I am fearful of birth.	Tenho medo do nascimento.	Tenho medo do nascimento.
5	I am worried that harm might come to the baby.	Tenho receio de que algo de mal possa acontecer ao bebê.	Eu me preocupo que algo de ruim possa acontecer ao bebê.
6	I am afraid that I (my partner) will be out of control during labour and birth.	Tenho medo que eu (minha parceira) possa perder o controle durante o parto.	Tenho medo que eu /minha parceira possa perder o controle durante o trabalho de parto e nascimento.
7	I fear complications during labour and birth.	Tenho receio das complicações durante o parto.	Tenho medo das complicações durante o trabalho de parto e nascimento.
8	Birth is unpredictable and risky.	O nascimento é algo imprevisível e arriscado.	O nascimento é algo imprevisível e arriscado.
9	I am afraid of what the labour and birth process will do to my (my partner's) body.	Tenho medo do que o parto e o processo de nascimento possam fazer ao meu corpo (da minha parceira).	Tenho medo do que o parto e o processo de nascimento possam fazer ao meu corpo/da minha parceira.
10	I am afraid that my (my partner's) body will never be the same again after birth.	Tenho receio que o meu corpo (da minha parceira) nunca mais seja o mesmo depois do parto.	Tenho medo que o meu corpo/da minha parceira nunca mais seja o mesmo depois do parto.

Changes made to the Portuguese version to develop the Brazilian version are shown in bold in the ‘Brazil version’ column.

The use of the term ‘parto’ was carefully considered, as for some experts, it refers specifically to the moment of childbirth. In item 1, the English version of the CFPP scale included the term ‘labour’, which refers to ‘trabalho de parto’. The use of the term ‘trabalho de parto’ instead of ‘parto’ in item 1 was approved by 90% of the experts. In items 3, 6, and 7, the word ‘parto’ was replaced with ‘trabalho de parto’ and ‘nascimento’, as the terms “labour and birth” were included in the original version. This change was also approved by 90% of the experts. All other changes were approved by 100% of the experts. The committee agreed that the items were relevant to the measurement of fear of childbirth and easy to understand, confirming the content and face validity of the Brazilian version of the CFPP scale.

No participant had difficulty completing or understanding the Brazilian version of the CFPP scale. The students found the CFPP scale easy to understand and believed that it contained items that accurately assessed fear of childbirth, with no further suggestions for changes. The mean time to complete the CFPP

– BR was five minutes.

Of the 146 nursing students participating in the psychometric analysis stage, 58.2% attended public universities, and 41.8% attended private universities. There was a predominance of female participants (86.3%, n = 126), with a mean age of 21.2 years. Most participants were without a partner (54.1%, n = 79), identified as white (67.1%, n = 98), did not have a paying job (73.9%, n = 108), did not study women’s health (69.2%, n = 101), and never assisted in a delivery (54.1%, n = 79).

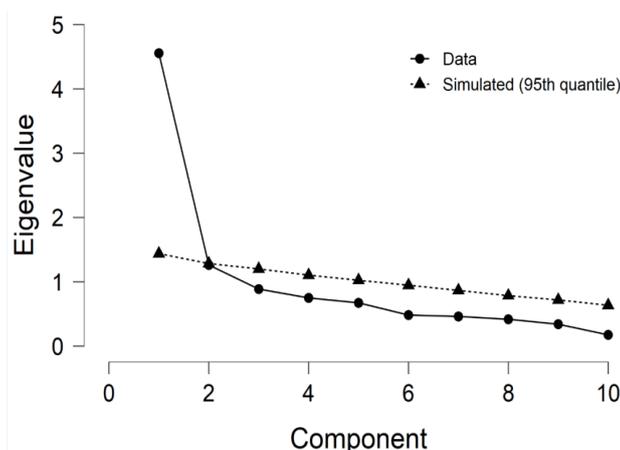
The Spearman correlation test revealed a moderate correlation between the items and a strong correlation of the sum of all items with individual items of the Brazilian CFPP scale (Table 2).

Inter-item and item-total correlations were measured using the Spearman correlation test. Values >0.45 demonstrate strong one-dimensional analyses. CFPP, Childbirth Fear - Prior to Pregnancy.

The KMO was 0.83, and Bartlett’s test revealed  $p < 0.001$ . The scree test with scree plot visualisation and Horn’s parallel analysis indicated a one-dimensional solution (Fig. 1).

**Table 2. Inter-item and item-total correlations of the Brazilian CFPP scale.**

Correlation											
Items	1	2	3	4	5	6	7	8	9	10	CFPP
1	-	-	-	-	-	-	-	-	-	-	-
2	0.51	-	-	-	-	-	-	-	-	-	-
3	0.42	0.50	-	-	-	-	-	-	-	-	-
4	0.33	0.47	0.43	-	-	-	-	-	-	-	-
5	0.52	0.39	0.54	0.31	-	-	-	-	-	-	-
6	0.31	0.46	0.50	0.42	0.41	-	-	-	-	-	-
7	0.47	0.48	0.55	0.38	0.59	0.43	-	-	-	-	-
8	0.26	0.33	0.33	0.50	0.38	0.31	0.36	-	-	-	-
9	0.29	0.34	0.36	0.35	0.34	0.37	0.30	0.49	-	-	-
10	0.32	0.33	0.33	0.36	0.29	0.31	0.25	0.42	0.81	-	-
CFPP	0.62	0.68	0.71	0.67	0.67	0.67	0.68	0.63	0.70	0.68	-



**Fig. (1).** Scree plot and Horn’s parallel analysis.

EFA indicated that all items were related to a single factor, with factor loadings and communalities >0.5 (Table 3).

Factor loading values >0.5 indicate a strong correlation of magnitude, and communality values >0.5 indicate adequate common variances between the items. CFPP, Childbirth Fear - Prior to Pregnancy.

**Table 3. Exploratory factor analysis of the Brazilian CFPP scale.**

Item	Factor Loading	Communality
1	0.56	0.69
2	0.65	0.57
3	0.70	0.51
4	0.60	0.65
5	0.67	0.55
6	0.62	0.61
7	0.65	0.58
8	0.58	0.66
9	0.64	0.59
10	0.60	0.63

The scores of the Brazilian CFPP scale were significant but had a weak correlation with the DASS-21 scores ( $r = 0.32, p < 0.001$ ).

The Cronbach’s alpha coefficient of the Brazilian CFPP scale was 0.86. When any one of the ten items was excluded, the decrease in alpha value was <0.1.

The stability of the Brazilian version of the CFPP scale was measured using the test-retest method. The scores of the two survey administrations were similar (mean score of the first administration: 35.4; mean score of the second administration: 37.3). The ICC was 0.99 ( $p = 0.000$ ).

Table 4 shows the students’ scores for fear of childbirth organised into quartiles. The proposed scores revealed moderate fear of childbirth in 50 participants (34.2%), low fear of childbirth in 39 participants (26.8%), absence of fear of childbirth in 31 participants (21.2%), and high fear of childbirth in 26 participants (17.8%).

**Table 4. Fear of childbirth classification scores (n = 146).**

Classification	Score Range	N	%
Absence of fear of childbirth	$10 \leq x < 25$	31	21.2
Low fear of childbirth	$25 \leq x < 35$	39	26.7
Moderate fear of childbirth	$35 \leq x < 45$	50	34.2
High fear of childbirth	$45 \leq x \leq 60$	26	17.9
<b>Total</b>	-	146	100

To put the Brazilian scores into context, the third author provided comparable data from an international study of childbirth fear among university students, using the same scale to assess fear of childbirth. The sample included women and men from eight countries, and the results were stratified by the field of study. The proportion of students in the moderate and high quartiles were similar between Brazilian nursing students and students from other countries. In contrast, more Brazilian students reported no fear as compared to international students (Table 5).

**Table 5. Fear of childbirth classification scores among university students (n = 3,885).**

Classification	Health professional student - Yes n (%)	Health professional student - No n (%)
Absence of fear of childbirth	214 (16.9)	319 (12.2)
Low fear of childbirth	419 (33.1)	883 (33.7)
Moderate fear of childbirth	431 (34.1)	957 (36.5)
High fear of childbirth	201 (15.9)	461 (17.6)
<b>Total</b>	1,265	2,620

The classifications were defined by the scores on the Brazilian version of the Childbirth Fear Prior to Pregnancy scale: absence of fear of childbirth =  $10 \leq x < 25$ ; low fear of childbirth =  $25 \leq x < 35$ ; moderate fear of childbirth =  $35 \leq x < 45$ ; high fear of childbirth =  $45 \leq x \leq 60$ .

**4. DISCUSSION**

The cross-cultural adaptation of the CFPP scale was conducted with methodological rigour, according to the recommendations of Beaton *et al.* [27]. We maintained the original content of the instrument and added specific characteristics related to Brazilian culture. The content and face validity of the instrument were verified *via* review by a committee of experts and nursing students.

The instrument presented good indicators of sample adequacy. Moderate inter-item and strong item-total correlations support the one-dimensionality of the Brazilian version of the CFPP scale. These results are similar to those obtained for versions of the CFPP scale adapted for other countries [25, 26]. All items were found to be highly correlated with a single factor and demonstrated high commonality, which indicated a favourable contribution of each item to evaluate the construct of fear of childbirth. These results suggest that the Brazilian version of the CFPP scale is one-dimensional, and our findings are similar to the results obtained for versions of the CFPP scale adapted for other countries [26].

The significant yet weak correlation between the scores of the Brazilian version of the CFPP scale and the DASS-21, a known scale to assess depression, anxiety, and stress, confirms the validity of divergent competitor criteria. This result also suggests that the two constructs are different. American university students showed greater correlations between the DASS-21 subscales and CFPP scale scores compared to students from other countries, indicating that fear of childbirth overlaps with other negative psychological conditions among American students. For Icelandic and German students, the correlation was lower between the two scales [26]. However, no correlation was found between the CFPP and DASS-21 scores among Portuguese university students [25].

The Brazilian version of the CFPP scale had a Cronbach’s alpha of 0.86, which indicates adequate reliability of the instrument [34]. This finding also corroborates the values described by Stoll *et al.* [26], and Ferreira and Teixeira (2020) [25] for the reliability of the English, Icelandic, German, Spanish and Portuguese versions of the CFPP scale.

Furthermore, the test-retest ICC of the Brazilian version of the CFPP scale indicated the instrument's stability.

The mean time to complete the Brazilian version of the CFPP scale was approximately five minutes, and 52% of the participants reported moderate or high fear of childbirth. These results are very similar to the results of the international sample (50% of health professional students reported moderate or high fear, and 54.1% of students studying other topics reported moderate or high fear).

The validation study of the original CFPP scale reported higher CFPP scores in English and American students, indicating more fear of childbirth in the United Kingdom and the United States. The lowest scores were obtained in German students, while students in Australia, Canada, and Iceland had scores similar to those of Brazilian students [26].

This study had some limitations. The participants were mostly women, which may have led to a bias in the results. Further research with the Brazilian version of the CFPP scale is necessary to complement the psychometric analyses. In addition, future studies on the scale administration for professionals already working in obstetrics are suggested, thereby complementing the validity studies.

## CONCLUSION

In summary, the Brazilian version of the CFPP scale is a one-dimensional scale of 10 items that is a valid and reliable measure of fear of childbirth in young adults before pregnancy in Brazil. The scale demonstrated favourable psychometric properties that can be used to identify and target modifiable factors related to the development of fear of childbirth in both women and men. Identification of fear and the factors causing it can be used to develop specific educational strategies in nursing courses. Providing education about the fear of childbirth can help decondition the fear experienced by students and possible future parents.

## LIST OF ABBREVIATIONS

<b>OBs</b>	= Obstetricians;
<b>CFPP</b>	= Childbirth Fear Prior to Pregnancy;
<b>CFPP</b>	= BR, pre-test version of the Childbirth Fear Prior to Pregnancy scale;
<b>DASS-21</b>	= Depression, Anxiety, and Stress Scale;
<b>EFA</b>	= Exploratory Factor Analysis;
<b>KMO</b>	= Kaiser-Meyer-Olkin;
<b>ICC</b>	= Correlation Coefficient;
<b>SPSS</b>	= Statistical Package for the Social Sciences;
<b>JASP</b>	= Jeffrey's Amazing Statistics Program.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Study was approved by the Research Ethics Committee of Botucatu Medical School - São Paulo State University, No. 2.428,902.

## HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 2013.

## CONSENT FOR PUBLICATION

Informed consent was obtained from all the participants.

## AVAILABILITY OF DATA AND MATERIAL

Not applicable.

## FUNDING

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## CONFLICT OF INTEREST

The authors report no conflict of interest.

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