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Psychometric properties of measures assessing paternal involvement in breastfeeding: a systematic review

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ABSTRACT

Research highlights the importance of paternal involvement in breastfeeding and its implications for these practices. This systematic review sought to identify and analyze the psychometric properties of instruments used to assess this context. To achieve this objective, searches were conducted across ten databases without restrictions regarding language or publication period, with a specific extraction method developed to evaluate the psychometric quality of the selected studies. A total of 4,542 records were identified, of which 12 met the eligibility criteria. Most of the selected studies exhibited psychometric limitations, particularly concerning the definition of the constructs measured by the instruments. Psycho-affective and cognitive aspects emerged as central to understanding paternal participation in breastfeeding, which is essential for the child's development. The findings highlight the importance of developing public policies and support programs that foster paternal involvement in the parenting context. The application of the psychometric data extraction method developed for this review proved to be a valuable tool to support the development and adaptation of psychological instruments. This review expanded the understanding of instruments that assess paternal involvement in breastfeeding, thereby enriching knowledge of the father's role in this vital process of human development.

Keywords
breast feeding, fathers, psychometrics, systematic review, child nutrition

RESUMO

Pesquisas destacam a importância da participação paterna e suas implicações para a prática do aleitamento. Esta revisão sistemática objetiva identificar e analisar as propriedades psicométricas de instrumentos que avaliam esse contexto. Para tal, foi realizada buscas em dez bases de dados, sem restrições de idioma ou período, sendo criado um método de extração para avaliar a qualidade psicométrica dos estudos selecionados. Foram encontrados 4.542 registros, dos quais 12 estudos atenderam aos critérios de elegibilidade. Foram observadas fragilidades psicométricas na maioria dos estudos selecionados, especialmente relacionadas à definição dos construtos medidos pelos instrumentos. Destacam-se o papel dos aspectos psicoafetivos e cognitivos na compreensão da participação paterna no aleitamento materno, o que é fundamental para o desenvolvimento do filho. Os achados apontam para a relevância de elaboração de políticas públicas e programas de apoio que promovam o envolvimento paterno no contexto do exercício da parentalidade. A implementação do método de extração de dados psicométricos utilizado nesta revisão mostrou-se um recurso útil para subsidiar o desenvolvimento e a adaptação de instrumentos psicológicos. Esta revisão aprofundou o conhecimento acerca de instrumentos que avaliam a participação paterna no aleitamento materno, enriquecendo o entendimento sobre o pai nesse processo vital do desenvolvimento humano.

Palavras chave
aleitamento materno, pai, psicometria, revisão sistemática, alimentação infantil

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Propriedades Psicométricas das medidas paternas sobre aleitamento materno: Revisão sistemática

Introduction

Global estimates suggest that the lack of breastfeeding (BF) results in more than 820,000 preventable deaths each year among children under five years of age (World Health Organization [WHO] & United Nations Children's Fund [UNICEF], 2018). As part of the global nutrition targets, it is projected that 70% of infants will be exclusively breastfed, a practice that promotes child health and quality of life (WHO & UNICEF, 2021), with potential positive repercussions in adulthood (Ministério da Saúde, 2018), as well as providing benefits for maternal health (WHO & UNICEF, 2018). Evidence indicates that paternal involvement plays a crucial role in promoting BF (Ministério da Saúde, 2012; Gebremariam et al., 2021), contributing to increased BF rates (Baldwin et al., 2021).

Traditionally, the father's role was emphasized as that of the family provider (Barbeta-Viñas & Cano, 2017). In contemporary contexts, however, this view has shifted toward paternal involvement in daily caregiving tasks, such as bathing, dressing, and comforting the infant, highlighting the importance of this engagement in providing emotional support to both the infant and the mother (Atkinson et al., 2021). Studies on parenthood reinforce that the roles of fathers and mothers differ in childcare, yet complement each other. Fathers have a unique perspective on the BF experience (Canton et al., 2022) and on their interactions with their children (Bueno et al., 2015), which may develop during pregnancy or after birth.

Studies suggest that the paternal presence is essential for maintaining BF, as it offers emotional and social support to the woman (Dessen & Braz, 2000; Ouyang & Nasrin, 2021). Paternal involvement appears to facilitate both the initiation and continuation of BF in the immediate postpartum period (Ogbo et al., 2020). The recent qualitative meta-synthesis review by Alvarenga et al. (2025) indicates that the father's approach to BF may influence the decision-making process regarding its continuation or discontinuation. This process encompasses the psychological, emotional, and sociocultural dimensions of the relationship between father, mother, and infant during the BF period. Therefore, the father plays a relevant role in determining the choice of infant feeding (Shaker et al., 2004).

Considering that the literature identifies the father as a key figure in BF and that instruments for assessing this participation already exist, this systematic review aims to identify these instruments and evaluate their psychometric properties. The development and adaptation of such instruments comprise three main stages: the theoretical phase, which supports the operationalization of the construct into measurable items; the empirical phase, which involves the creation of a pilot instrument and data collection to evaluate its psychometric quality; and the analytical phase, which seeks evidence of validity (Pasquali, 2010). These guidelines informed the creation of a method for extracting and analyzing evidence of validity and reliability in articles published in national and international journals.

This literature review provides two principal contributions to the field: (i) identifying significant gaps in scientific production concerning paternal involvement in the BF process; and (ii) developing an analytical method that can assist in the design and cross-cultural adaptation of psychological instruments with appropriate methodological rigor, thereby improving the quality of quantitative research reports. Furthermore, the findings of this review may encourage the development of new studies on this topic, deepening understanding and expanding scientific production in this area.

Method

To guide the writing process, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist was followed (Page et al., 2021).

Protocol and registration

This review was registered in the International Prospective Register of Systematic Reviews (Prospero, CRD42021278403). The guiding question of this research was: What are the measures that assess paternal participation in the context of BF and their psychometric properties? Based on the findings, the strengths and limitations of these instruments were identified and discussed.

Eligibility and exclusion criteria

Publications with free and virtual access that reported the use of psychometric measures in the BF context involving fathers were included. Considering the objective of this review, studies that included couples but did not present separate outcomes for

mothers and fathers were excluded. Additionally, studies that focused exclusively on pregnant women or mothers were excluded, as this review specifically addressed the assessment of paternal participation in the BF process. Literature reviews, studies using only qualitative methods, duplicate records across databases, and errata were also excluded.

Information sources and search strategies

Ten databases were consulted, eight of which are health-related and multidisciplinary: Embase, CINAHL, PsycINFO, PubMed (NIH), Scopus, Virtual Health Library (VHL), Web of Science/Clarivate Analytics, and Open Access and Scholarly Information System (OASIS.BR). Two were considered sources of gray literature: the Brazilian Digital Library of Theses and Dissertations (BDTD) and the Networked Digital Library of Theses and Dissertations (NDLTD). The search was conducted between July 12 and 27, 2023, through the Capes Journal Portal, accessed via institutional login.

Health Sciences Descriptors and Medical Subject Headings were consulted, and the keywords were defined in English and Portuguese: (surveys, scale, questionnaires, BF, "breast feeding", adaptation, validation, psychometric) and (*inventario, escala, questionário, amamentação, "aleitamento materno", adaptação, validação, psicometria*), using the Boolean operators AND and OR. The search in English yielded a higher number of results, except in OASIS.BR, where the results were in Portuguese. No language or time filters were applied. The descriptor "father" (pai) produced an insufficient number of records and was therefore not included.

Study selection and analysis

Two independent reviewers performed the selection and screening of the studies. Disagreements were examined and resolved by consensus. The analysis included the following information: author, year of publication, measures, methods, psychometric properties, and sample characteristics.

For full-text studies written in a language different from the scientific lingua franca, translation into English-Portuguese and back-translation into the original language were performed to minimize translation errors. Manual inclusions were also considered through reference lists of the eligible studies and recommended articles in the databases to identify potentially overlooked studies.

Data extraction

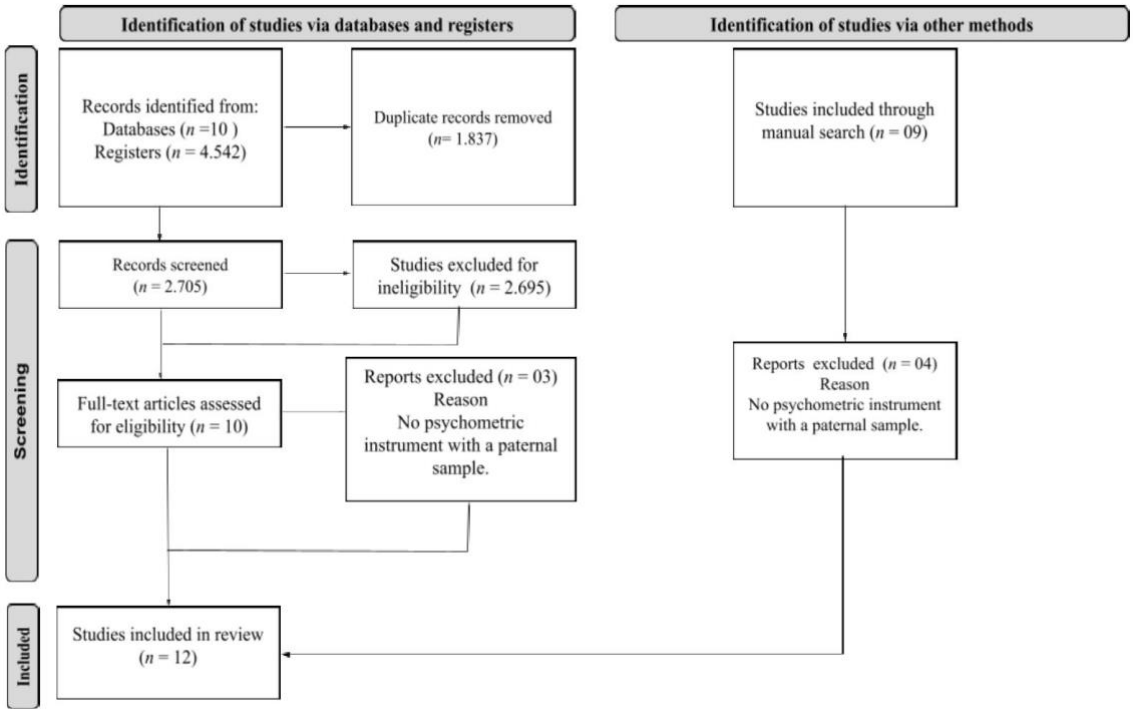
The extraction of validity evidence followed the criteria established by the American Educational Research Association et al. (2014), the International Test Commission (ITC, 2017), and Pasquali (2010). Among the five sources of evidence described by the American Educational Research Association et al. (2014) and the ITC (2017), evidence related to test content and internal structure was included.

Results

The search across the ten databases yielded a total of 4,542 records. Of these, 1,837 duplicates identified across databases were removed. During the screening phase, 2,695 publications were excluded for not meeting the eligibility criteria, as detailed in Figure 1. Ten studies were identified through database searches, while manual inclusion added nine additional records. The abstracts and full texts of the 19 studies were then analyzed according to the established eligibility criteria. Ultimately, 12 studies were deemed eligible for inclusion (Table 2).

Figure 1

Selection, screening, and eligibility process of the articles



Source: PRISMA Flowchart (Moher et al., 2009; 2015)

Table 1

Characteristics of the eligible studies (*n* = 12)

Author	Measures	Methods (data collection)
Abu-Abbas et al. (2016)	Construction: Fathers' attitudes regarding breastfeeding; Fathers' involvement in the breastfeeding process	Quantitative, cross-sectional; hospital; Jordan.
Atkinson et al. (2021)	Replication: Iowa Infant Feeding Attitude Scale (IIFAS)	Mixed, longitudinal, convenience sampling; social media; postpartum; England, United States of America, and others.
Crippa et al. (2021)	Construction: Fathers' Knowledge and Attitudes Toward Breastfeeding Questionnaire	Quantitative, cross-sectional, convenience sampling; Baby-Friendly Hospital Initiative (BFHI), postpartum; Italy, Europe, and others.
Chipojola et al. (2022)	Adaptation: Paternal Breastfeeding Self-Efficacy Scale – Short Form (PBSES-SF)	Quantitative, cross-sectional, convenience sampling; BFHI, postpartum; Africa.
Dennis et al. (2018)	Construction: PBSES-SF	Experimental, randomized controlled trial; hospital, postpartum; Canada.
Escribano et al. (2023)	Adaptation: Spanish IIFAS	Quantitative, cross-sectional, convenience sampling; BFHI, postpartum; Spain.
Franco & Gonçalves (2014a, 2014b)	Construction: Fathers' Knowledge About Breastfeeding Scale (ECPA); Fathers' Need for Knowledge About Breastfeeding Scale (ENCPA); Fathers' Importance of Participation in Breastfeeding Scale (EIPPA)	Quantitative, cross-sectional, convenience sampling; hospital, postpartum; Portugal.
Freed, Fraley et al. (1992)	Construction: Attitudinal Questions	Quantitative, cross-sectional, convenience sampling; hospital, prenatal; United States.
Kucukoglu et al. (2023)	Adaptation: PBSES-SF	Quantitative, cross-sectional, convenience sampling; hospital, postpartum; Turkey.
Panahi et al. (2022)	Construction: Fathers' Support for Breastfeeding	Experimental, randomized controlled trial; health center, postpartum; Iran.
Taşpinar et al. (2013)	Construction: Paternal Knowledge About and Attitude Toward Breastfeeding and Lactation	Quantitative, cross-sectional, convenience sampling; BFHI, postpartum; Turkey.

Analysis of the studies

The studies included in this review originated from several continents: North America, Africa, Asia, and Europe. The majority employed quantitative methods with convenience and cross-sectional sampling (Table 1).

Regarding the sociodemographic characteristics of the twelve selected studies, the following aspects are highlighted: a) the samples predominantly consisted of married participants aged 18 years or over. It is worth noting that the study by Kucukoglu et al. (2023) did not provide information about marital status (Table 2); b) eight studies

addressed paternal parity, including first-time fathers, fathers with previous children, and fathers to be (Atkinson et al., 2021; Escribano et al., 2023; Franco & Gonçalves, 2014a, 2014b; Freed, Fraley et al., 1992; Kucukoglu et al., 2023; Taşpinar et al., 2013); c) Dennis et al. (2018) specifically reported that their sample of first-time fathers was drawn from the study by Abbass-Dick et al. (2015); d) although focused exclusively on fathers, two studies also considered the mother's previous BF experience (Crippa et al., 2021; Kucukoglu et al., 2023), and three described maternal parity (Crippa et al., 2021; Chipojola et al., 2022; Panahi et al., 2022); and e) regarding the age of the children, the studies included infants aged between zero and 52 weeks, who were being fed either through Exclusive Breastfeeding (EBF) or non-exclusive breastfeeding, with EBF being predominant in the early developmental period.

Concerning breastfeeding characteristics, the variable "type of breastfeeding" was the most frequently reported in the selected studies. With respect to the type of delivery, vaginal birth predominated. Concerning gestational age and type of pregnancy, most cases involved full-term pregnancies (> 37 weeks) with single gestation (Table 2).

The Paternal Breastfeeding Self-Efficacy Scale – Short Form (PBSES-SF; Dennis et al., 2018) was used in three studies (Table 1). The Breastfeeding Self-Efficacy Scale was initially developed for maternal samples (Dennis & Faux, 1999), and a short version was later created (Dennis, 2003). In 2018, Dennis et al. adapted the items for paternal samples based on the maternal version of the Breastfeeding Self-Efficacy Scale – Short Form (Dennis, 2003). In this adaptation study, the authors reported that the sample was derived from a randomized controlled trial conducted by Abbass-Dick et al. (2015). Data from the paternal sample (n = 214) were analyzed, and the measure was reapplied six weeks postpartum with a sample of 173 participants.

The Iowa Infant Feeding Attitude Scale (IIFAS; Mora et al., 1999), originally developed for lactating women in a hospital context, was used in two studies. Atkinson et al. (2021) applied it to a paternal sample, considering the validity evidence presented in the study by Mitchell-Box et al. (2013), which involved couples during the prenatal period, where men were not necessarily the infant's fathers. Escribano et al. (2023) adapted the reduced version of the Spanish IIFAS (Tomás-Almarcha et al., 2016) for use with a paternal sample, as shown in Table 1.

Table 2

Sample characteristics and assessment of psychometric properties

Studies (*n* = 12)							
Authors (ano)	**Samples**				**Internal structure**		
	Paternal		**Infant**		**Analysis**	**Nº Factor (F), Dimension**	**Coefficient Reliability**
	***n* (age)**	**Relation (%)**	**Pregnancy; Births (%)**	**Age; BF (%)**			
Abu-Abbas et al. (2016)	190 (*)	*	*	*	*	*	α =.73
Atkinson et al. (2021)	212(>20)	Married (73.1)	single (97.6), multiple (1.9); *	< 52 w; AME (51.4) AMM (15) EAF (34)	*	*	α = .78
Crippa et al. (2021)	200 (M=37.2 SD= 5)	Married (60)	single (100); spontaneous (56), CB (44)	*; EBF (76.5) MBF (17.5) Bottle (6)	*	*	α = .70
Chipojola et al.(2022)	180(>20)	Married (95)	single (100); VB(81.7), CB(18.3)	< 5 d EBF (95)	CFA	Unidimensional	α = .90**; ICC = .93 (2 w PP)
Dennis et al. (2018)	214(>17)	Married (90)	single (100); VB(72), CB(28)	< 6 w; MBF (*)			α = .91**; α = .92 (6 w PP)
Escribano et al. (2023)	639(>22)	Married or civil union (67.3)	single (100); *	< 27 w; EBF (48) MBF (35.2) EFF (16.7)			.76
Franco e Gonçalves (2014a, 2014b)	150(>19)	Married (69.3)	*	> 48 hours; * (*)	PCA	2, Functions: breastfeeding; anatomo-physiology	ECPA: α = .85 and α = .90; ENCPA: α = .84 and α = .92 (F 1 and 2)
						3, Participation Physical, affective, domestic	α = .92; .88 and .80 (F 1, 2 and 3)
Freed, Fraley et al. (1992)	268 (*)	Married (97)	*	*	*	*	*
Kucukoglu et al. (2023)	221(>19)	*	*;NB(96), CS(126)	2 to 6 w; *	EFA CFA	Unidimensional	α = .93; *r* =1 (T1). *r* =.96 (T2) (*p*<.001)
Panahi et al. (2022)	76 (M=29.31 [CG] a 29.36 [IG])	*	Single (100); *	3 to 5 d; EBF (*), MBF (*)	*	*	α= .93
Taşpinar et al. (2013)	203 (>25)	*	*;VS(36.9) CS(3.1)	< 5 d, *	*	*	*

Note: *Data not presented in the studies. M = Mean. SD = Standard Deviation. IG = Intervention Group. CG = Control Group. EAF = Exclusively Formula-Fed. PCA = Principal Component Analysis. EFA = Exploratory Factor Analysis. CFA = Confirmatory Factor Analysis. ** Hospital (Immediate postpartum). EBF = Exclusive Breastfeeding. MBF = Mixed Breastfeeding. EFF = Exclusively Formula-Fed. T = Time. PP = Postpartum. w = weeks. d = days. CS = Cesarean Section. NB = Normal Birth. VB = Vaginal Birth.

Methodological evaluation of the selected studies

Different variables were identified to characterize the paternal and infant samples. Table 2 presents the results of the variables most frequently reported in the studies. The creation of categories to report data related to pregnancy, birth, and breastfeeding enabled the characterization of the contexts in which the measures were applied. Regarding education, employability, and income, levels varied according to the socioeconomic profile of each country. The results indicated that most participants belonged to medium to high socioeconomic strata (Atkinson et al., 2021; Crippa et al., 2021; Dennis et al., 2018; Escribano et al., 2023; Freed, Fraley et al., 1992; Panahi et al., 2022; Kucukoglu et al., 2023). Abu-Abbas et al. (2016) and Franco and Gonçalves (2014a, 2014b) did not report these data.

Compared with the other studies, Abu-Abbas et al. (2016) reported limited information on participant characterization. They did not describe the participant recruitment process, which precluded identification of the sampling procedure. Franco and Gonçalves (2014a, 2014b) applied identical data-collection procedures (Table 1) and the same data-analysis methods (Table 2). Panahi et al. (2022) and Taşpınar et al. (2013) did not report the type of feeding (Table 2).

Conceptual imprecisions were identified in Crippa et al. (2021) and Kucukoglu et al. (2023), which described deliveries as spontaneous and normal, respectively (Table 2), contrary to Robson's Classification (WHO, 2017). Such misclassification may lead to erroneous inferences regarding BF practices in the immediate postpartum period. To summarize the procedures used for instrument construction, adaptation, and replication (Table 1), and to synthesize the validity evidence reported in the studies (Table 2), we developed a three-phase method: (1) search for theoretical constructs; (2) procedures for item construction and adaptation; and (3) statistical procedures to obtain validity evidence based on internal structure.

Phase 1. Crippa et al. (2021) stated that they used the "Ten Steps to Successful Breastfeeding" strategy (WHO & UNICEF, 2018) as a guideline for item construction; however, they did not discuss the theoretical basis adopted to conceptualize the fathers' knowledge and general attitude toward BF. This absence of theoretical grounding was also observed in Abu-Abbas et al. (2016), Freed, Fraley et al. (1992), Panahi et al. (2022), and Taşpinar et al. (2013). Other studies exhibited conceptual limitations (Atkinson et al., 2021; Crippa et al., 2021; Escribano et al., 2023; Franco & Gonçalves, 2014a, 2014b).

Franco and Gonçalves (2014a, 2014b) adapted definitions from a Portuguese language dictionary to conceptualize the variables measured. The PBSES-SF was grounded in Bandura's Social Learning Theory (Chipojola et al., 2022; Dennis et al., 2018; Kucukoglu et al., 2023). Crippa et al. (2021), Dennis et al. (2018), and Franco and Gonçalves (2014b) defined BF according to the World Health Organization.

Phase 2. Abu-Abbas et al. (2016) did not present results from the expert-review stage (n = 3) and did not report which items belonged to each dimension or the type of response scale employed. They performed a pilot test with fathers (n = 22). In Crippa et al. (2021), items were evaluated by a team of healthcare professionals, with items showing less than 50% agreement being excluded; fathers (n = 50) also reviewed the items, and no changes were made. Franco and Gonçalves (2014a, 2014b) conducted a literature review and semi-structured interviews with fathers, mothers, and nurses to derive the items. Franco and Gonçalves (2014b) reported the involvement of a panel of judges for item analysis but did not describe the analytical procedures used.

Regarding the PBSES-SF, the authors reported the item modifications required to adapt the maternal version for fathers; however, they did not describe the item-analysis procedures (Dennis et al., 2018). Chipojola et al. (2022) and Kucukoglu et al. (2023) followed specific cross-cultural adaptation guidelines. Chipojola et al. (2022) included clinical experts (n = 3) but did not present the experts' evaluations. A pilot test was applied with the sample (n = 20), which produced no modifications. Kucukoglu et al. (2023) included BF experts (n = 10) and used Kendall's W concordance coefficient to analyze the scores of the experts (χ^2 = 15.662, W = .120, p = .268). Fathers (n = 20) reviewed the items and demonstrated comprehension of the scale.

Regarding the other measures, Taşpinar et al. (2013) performed a literature review to construct the questionnaire and conducted a pilot with fathers (n = 11); Freed, Fraley et al. (1992) did not report item-construction procedures; and Panahi et al. (2022) engaged experts (n = 10) in reproductive health and calculated the Content Validity Index (S-CVI = .76; S-CVR = .79). Escribano et al. (2023) did not report the content-validity procedures for the Spanish IIFAS reduced version.

Phase 3. Statistical analyses were reported in six studies. Cronbach's Alpha (α) was the principal index used to evaluate reliability (Table 2). No tests of measurement invariance between groups were performed.

The ECPA and ENCPA share nine items and two dimensions, with α = .92 and α = .91, respectively. The retention of two factors explained 71.85% and 72.15% of the total

variance, respectively (Franco & Gonçalves, 2014a). The EIPPA showed internal consistency (α = .93), and the three retained components accounted for 66.07% of the total variance (Franco & Gonçalves, 2014b). Pearson correlations between each item and the total scale score were $r > .30$ (Franco & Gonçalves, 2014a, 2014b). Table 2 reports the Alpha coefficients for these measures' factors.

The Kaiser–Meyer–Olkin (KMO) criterion and Bartlett's test of sphericity were applied in Franco and Gonçalves (2014a, 2014b) and Kucukoglu et al. (2023). The VARIMAX rotation method was used in these studies.

For validation of the construct of the PBSES-SF, Chipojola et al. (2022) and Dennis et al. (2018) applied Confirmatory Factor Analysis (CFA) using the Maximum Likelihood extraction method. The original study (Dennis et al., 2018) conducted CFA in the hospital period (RMSEA = .10; CFI = .87; TFI = .84; SRMR = .06) and at six weeks postpartum (RMSEA = .06; CFI = .95; TFI = .94; SRMR = .05). Chipojola et al. (2022) reported CFA results for the hospital period (χ^2/df = 1.59; RMR = .08; TLI = .95; CFI = .97). Kucukoglu et al. (2023) performed Exploratory Factor Analysis (EFA; factor loadings .42–.76) and CFA (χ^2/df = 2.295; RMSEA = .077; CFI = .946; AGFI = .861; NFI = .909) for the period after hospital discharge, but did not report the extraction method. Kucukoglu et al. (2023) also mentioned Principal Component Analysis (PCA) without presenting results.

Concerning the PBSES-SF adaptations, Chipojola et al. (2022) assessed reliability with α in the hospital and test-retest stability using the intraclass correlation coefficient (ICC) two weeks postpartum. Kucukoglu et al. (2023) reported α and test-retest reliability assessed during routine check-ups at 15 and 40 days postpartum using Pearson's product-moment correlation (Table 2).

Panahi et al. (2022) reported internal consistency (Table 2) and stability via a test-retest procedure with fathers (n = 15) over a two-week interval, yielding Pearson's correlation $r = .86$; $p < .05$. To evaluate attitudes of expectant fathers, Freed, Fraley et al. (1992) cited validity evidence from a prior study by Freed, Jones et al. (1992) with a sample of pregnant women.

The Spanish IIFAS (Escribano et al., 2023) obtained CFA results {χ^2 = 1461.78 (df = 36; $p < .001$); TLI = .96; CFI = .97; RMSEA = .05 (90% CI [.04–.06])} using the Weighted Least Squares Means and Variance estimator. The internal-consistency estimate was obtained from a nonlinear reliability estimator based on Structural Equation Modeling (Table 2).

Discussion

This review identified paternal measures related to BF and analyzed their psychometric properties. The authors developed a three-phase extraction and analysis method to group and summarize the results of the 12 selected studies. Notably, four studies mentioned healthcare institutions certified by the Baby-Friendly Hospital Initiative (BFHI) (Table 1), which aims to promote the implementation of the "Ten Steps to Successful Breastfeeding" in maternity services. An institution receives BFHI certification upon meeting several criteria, including compliance with the "Ten Steps" (WHO & UNICEF, 2018). Therefore, the practice of EBF within the first hour of life is expected in these studies.

Most studies were conducted in hospital settings, contextualizing the environment in which paternal involvement occurred. Within this context, social desirability bias may have influenced participants' responses, potentially introducing selection bias (Karande & Perkar, 2012). Consequently, the interpretation of results must be approached with caution, considering the specific procedures and routines characteristic of these settings.

Analysis of sociodemographic data revealed a predominance of married or cohabiting participants, suggesting the relevance of relationship type and paternal cohabitation with the mother for BF practice. In this regard, Chipojola et al. (2022) emphasized that the meaning of marriage within a cultural context may affect BF behavior, corroborating Minagawa et al. (2005). Concerning parity and paternal age, most studies provided age range information, although paternal parity was frequently omitted. Regarding sample characterization, findings suggest that most measures assessed paternal perceptions of EBF during the puerperal period following a single pregnancy, primarily in hospital contexts (Tables 1 and 2).

Regarding psychometric properties, the analytical method proposed by the authors comprised three phases, described below. In Phase 1, only Chipojola et al. (2022), Dennis et al. (2018), and Kucukoglu et al. (2023) presented a more comprehensive theoretical model to assess paternal BF self-efficacy. Although Crippa et al. (2021) did not define paternal BF knowledge, in their discussion, they implied it referred to the father's informational repertoire, consistent with Franco and Gonçalves (2014a). It is also relevant that Atkinson et al. (2021) and Escribano et al. (2023), who investigated positive and negative paternal attitudes toward BF, did not specify the theoretical construct (attitude) or its valence (positive or negative) underpinning the construction of the IIFAS.

Furthermore, it is worth noting that BF has terminologies with different meanings (Ministério da Saúde, 2017). It was also verified that although the studies considered the type of BF (Table 2), most did not present the corresponding definitions.

The Phase 1 results, based on the principles of the American Educational Research Association et al. (2014), revealed theoretical weaknesses in the analyzed measures, as most studies lacked a conceptual framework or presented only partial definitions of the constructs. Since theory forms the foundation of instrument development and adaptation, theoretical absence or insufficiency may compromise item operationalization and the validity of subsequent inferences. There also appears to be a lack of theoretical models addressing the father's role in BF. Future research should therefore include fathers as primary informants in studies on early childcare.

In Phase 2, expert evaluation of items is recommended to assess item adequacy to the construct (American Educational Research Association et al., 2014; ITC, 2017) and to describe procedures for calculating the Content Validity Index (CVI). Polit and Beck (2006) suggest involving three to ten experts. Among the selected studies, only four reported the number of experts (Abu-Abbas et al., 2016; Chipojola et al., 2022; Kucukoglu et al., 2023; Panahi et al., 2022), all within the recommended range.

The cross-cultural adaptations of the PBSES-SF followed established methodological guidelines, consistent with ITC (2017). Only Kucukoglu et al. (2023) described the procedures for calculating and interpreting content validity results, demonstrating a high level of expert agreement.

Regarding item construction, Crippa et al. (2021), Franco and Gonçalves (2014a, 2014b), and Taşpınar et al. (2013) adhered to Pasquali (2010). Panahi et al. (2022) presented quantitative results from the expert panel but did not detail the CVI calculation or interpretation method. Based on Polit and Beck (2006), it can be inferred that the CVI value reached the minimum threshold. Crippa et al. (2021) adopted an expert agreement cutoff below the recommended value without citing a technical reference for this decision. However, the percentage was below the recommended level, according to Hernández-Nieto (2002).

Following expert review, Pasquali (2010) recommends a semantic analysis phase with a small group of participants. Among the 12 studies, four reported performing this phase (Crippa et al., 2021; Chipojola et al., 2022; Taşpınar et al., 2013; Kucukoglu et al., 2023).

In test development, initial reliability and validity evidence should be obtained through a pilot study (ITC, 2017). Regarding this procedure, Abu-Abbas et al. (2016), Chipojola et al. (2022), and Taşpınar et al. (2013) conducted pilot studies but did not present statistical analyses. The ITC (2017) recommends a minimum sample size of n = 100 for item analysis; therefore, these studies fall below the acceptable threshold.

The deficiencies of the studies in relation to expert evaluations (Dennis et al., 2018; Escribano et al., 2023; Freed, Fraley et al., 1992; Franco & Gonçalves, 2014a; Taşpınar et al., 2013), the description of the results of this evaluation (Abu-Abbas et al., 2016; Crippa et al., 2021; Franco & Gonçalves, 2014b; Panahi et al., 2022), and the absence of statistical analyses of pilot data, reinforce the importance of adopting a standardized and systematic method in research to improve the quality of the evaluated measures, as suggested by Alexandre and Coluci (2011). The absence of methodological standardization in reporting instrument development leads to inconsistencies that hinder the evaluation of evidence quality and cross-cultural adaptation.

In Phase 3, according to the American Educational Research Association et al. (2014), validity concerns the extent to which evidence and theory support the intended interpretation of instrument results. Factor analyses must rely on valid conceptual assumptions related to the sample and variables. As there is no consensus on minimum sample size, insufficient sample size may compromise results, requiring careful interpretation (Hair et al., 2019). Miot (2011) emphasizes that various techniques exist for sample size calculation, and appropriate methods should be selected based on study design. Fontelles et al. (2010) recommend presenting well-defined criteria to ensure that statistical inference is valid for a given population.

From this understanding, it was observed that: (a) most of the studies selected in this review did not report the criterion adopted for sample size calculation, except Escribano et al. (2023), Kucukoglu et al. (2023), and Panahi et al. (2022); (b) Dennis et al. (2018), Crippa et al. (2021), Freed, Fraley et al. (1992), Kucukoglu et al. (2023), and Taşpınar et al. (2013) met the minimum sample recommendations (ITC, 2017); and (c) only Panahi et al. (2022) presented the formula used to calculate the sample size for comparing two groups, which justified the number of participants in the study.

Regarding statistical analyses, Chipojola et al. (2022), Dennis et al. (2018), Escribano et al. (2023), and Kucukoglu et al. (2023) performed CFA, an appropriate technique for validating psychological instruments, which supports the use of these studies (Silva et al., 2015). Franco and Gonçalves (2014a, 2014b) and Kucukoglu et al.

(2023) reported using VARIMAX rotation, the KMO criterion, and Bartlett's sphericity test, considered to be the preliminary steps in EFA. This rotation is orthogonal and assumes that the retained factors are uncorrelated (Damásio, 2012), maximizing the strongest correlations (Dancey & Reidy, 2019), and is rarely used in the fields of human and health sciences (Damásio, 2012).

Franco and Gonçalves (2014a, 2014b) employed PCA rather than EFA, although PCA extracts components without distinguishing between common and specific variance, while EFA extracts factors based solely on common variance (Damásio, 2012). Therefore, both EFA and CFA are recommended.

Reliability estimates (α and test–retest) (Hair et al., 2019) were reported in some studies. The scales developed by Franco and Gonçalves (2014a, 2014b) demonstrated good internal consistency, $\alpha > .70$ (Hair et al., 2019). The PBSES-SF adaptations (Chipojola et al., 2022; Kucukoglu et al., 2023) showed reliability results consistent with the original (Dennis et al., 2018), exceeding $\alpha > .70$ (Hair et al., 2019). According to the literature, the measure appears to be reliable, exceeding the reference value of $\alpha > .70$ (Hair et al., 2019), showing excellent temporal stability with ICC > .90 (Koo & Li, 2016), and a significant test-retest correlation of $r > .70$ (Mukaka, 2012). These findings corroborate the original unidimensional structure, though further research should verify the PBSES-SF stability across cultures.

Panahi et al. (2022) assessed reliability using test-retest with Pearson's correlation, indicating a strong correlation between two administrations (Dancey & Reidy, 2019), as also observed by Kucukoglu et al. (2023). According to Polit (2014), although this method is widely used, ICC provides a more accurate estimate of temporal stability, as demonstrated by Chipojola et al. (2022).

The procedures adopted for the construction of the measures by Freed, Fraley et al. (1992) showed psychometric weakness, from the theoretical aspects to the analysis of internal structure, due to the replication of data from the study by Freed, Jones et al. (1992), whose sample consisted of pregnant women.

Although the IIFAS (Atkinson et al., 2021) and Spanish IIFAS (Escribano et al., 2023) were applied in the postnatal period, the Spanish IIFAS results are consistent with those of Tomás-Almarcha et al. (2016), who found a unidimensional structure in a sample of pregnant women. Despite Mitchell-Box et al. (2013) claiming that the IIFAS can be applied to both genders without item modification, Atkinson et al. (2021) suggest that the

findings remain inconclusive regarding the internal structure of these measures in paternal samples.

The instruments analyzed assessed paternal attitude, involvement, knowledge, self-efficacy, and participation in the BF context, suggesting that psychoaffective and cognitive aspects are involved in paternal understanding in this setting. The existence of theoretical models in the field of parenthood, especially those considering the father's role during BF, highlights the importance of a multidimensional approach to evaluate paternal involvement, which is crucial for the infant's healthy development and for maternal support. Such an approach requires clear conceptual definitions to support the construction of psychometrically sound measures.

The psychometric fragility observed in most available measures may compromise the validity of interpretations by overlooking the social, economic, and cultural specificities of the populations studied. Moreover, these limitations may hinder the cross-cultural adaptation of instruments and negatively affect the development and implementation of public policies based on empirical data (Noronha & Bonfá-Araujo, 2024).

Among the included studies, the use of samples differing from the original measures suggests that generalizations should be avoided. Therefore, new studies should examine validity evidence with paternal samples during the prenatal and postnatal periods across different cultural contexts. The predominance of data collection in hospital settings suggests that fathers' access to this environment is promising.

Additionally, the reviewed studies indicated that cohabitation between father and mother favors BF promotion. This finding suggests that BF is not solely the mother's responsibility but rather a relational dynamic involving the father and the mother-infant dyad. This is an important consideration for promoting more inclusive practices among healthcare professionals, encouraging and supporting fathers' active participation in this process. However, the homogeneity of the samples regarding marital status limits the generalization of results to other family structures.

Most studies employed a cross-sectional design, which prevents follow-up of the BF process and understanding of the paternal role over time. Longitudinal studies are therefore recommended to identify relevant variables in the BF context and the impacts associated with paternal involvement during this period.

It is worth noting that most measures were applied only in the postpartum period. Only the study by Freed, Fraley et al. (1992) included paternal participation during the

prenatal phase. This finding points to the need to expand research on fathers' involvement from pregnancy onward—a crucial stage for bond formation and BF promotion. As emphasized by Hosking et al. (2025), including fathers during this period through BF promotion programs is essential to improve exclusive BF rates.

This review focused on analyzing validity evidence based on the content and internal structure of psychological measures. However, it did not include validity evidence based on relationships with external variables, as explored in studies by Dennis et al. (2018), Chipojola et al. (2021), and Atkinson et al. (2021).

Despite the use of controlled vocabulary and Boolean operators, few measures were retrieved. It is possible that other studies were not captured due to non-indexed keywords. Furthermore, paternal inclusion in BF research remains incipient. One of the findings of this review was the identification of measures applied to couples. Future studies should seek validity evidence considering between-group variance. Furthermore, the results indicate that quantitative studies addressing the paternal figure in BF remain scarce. Therefore, the development and adaptation of instruments across different countries, particularly in Brazil, which was not represented among the identified studies, are strongly recommended.

The creation and adaptation of instruments that position fathers as key figures in early parenthood during the BF phase should incorporate constructs addressing the multidimensional aspects of paternal participation. Such instruments can support health organizations and society at large in promoting male involvement in parenting and maternal-infant health care. In addition, they can inform discussions on public policies aimed at promoting gender equity in childcare.

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