

# Breastfeeding assessment instruments and their use in clinical practice

*Instrumentos de avaliação do aleitamento materno e seu uso na prática clínica*  
*Instrumentos de evaluación de la lactancia materna y su uso en la práctica clínica*



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#### ABSTRACT

**Objectives:** To identify breastfeeding assessment tools, their application in clinical practice, and their validation and cross-cultural adaptation.

**Method:** This is an integrative review of literature obtained from six databases and an online library, conducted from August 2014 to December 2015, without a temporal delimitation.

**Results:** We identified 19 assessment tools, of which 12 were validated and five were cross-culturally adapted. In terms of adaptation, the tools were used to assess the risk of early weaning (BAPT) and the perception/behaviour of mothers during nursing (BSES-SF and IIFAS).

**Conclusions:** The identification of the available instruments and their indications for breastfeeding assessments can help health workers choose the ideal instrument, and qualify maternal and child care.

**Keywords:** Breast feeding. Evolution. Postpartum period.

#### RESUMO

**Objetivos:** Identificar instrumentos de avaliação da amamentação e sua aplicação na prática clínica, validação e adaptação transcultural.

**Método:** Revisão integrativa, realizada em seis bases de dados e em uma biblioteca eletrônica, entre agosto/2014-dezembro/2015, sem limitação temporal.

**Resultados:** Foram identificados 19 instrumentos de avaliação do AM. Destes, 12 foram validados e cinco foram adaptados transculturalmente. Quanto à aplicação, destacam-se seu uso para a avaliação do risco de desmame (BAPT) e a percepção/comportamento da mulher em amamentar (BSES-SF e IIFAS).

**Conclusão:** A identificação dos instrumentos disponíveis e de suas indicações para a avaliação do AM pode auxiliar profissionais na escolha pelo instrumento a ser utilizado, qualificando a assistência materno-infantil.

**Palavras-chave:** Aleitamento materno. Avaliação. Período pós-parto.

#### RESUMEN

**Objetivo:** Identificar los instrumentos de evaluación de amamantamiento, la aplicación en la práctica clínica, validación y adaptación cultural.

**Método:** Revisión integradora, realizado en seis bases de datos y una biblioteca electrónica a partir de agosto/2014 a diciembre/2015 sin limitación temporal.

**Resultados:** Identificado 19 instrumentos de evaluación y, de estos, 12 fueron validados y cinco fueron adaptados culturalmente. La aplicación destaca su uso para evaluar el riesgo de destete (BAPT) y la percepción/comportamiento de las mujeres en enfermería (BSES-SF y IIFAS).

**Conclusiones:** La identificación de los instrumentos disponibles y sus indicaciones para la evaluación de la lactancia materna puede ayudar a los profesionales en la elección del instrumento que se utiliza, calificativo del cuidado materno-infantil.

**Palabras clave:** Lactancia materna. Evaluación. Periodo posparto.

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## ■ INTRODUCTION

Breastfeeding is recommended exclusively for the first 6 months of the child's life to promote health<sup>(1)</sup> since, according to evidence, it brings numerous benefits<sup>(2-3)</sup>. Breastfeeding is expected to reduce child mortality from preventable diseases by 13% reduction, especially in children under five<sup>(3)</sup>. This reduction is one of the Sustainable Development Goals to be attained between 2016 and 2030<sup>(4)</sup>.

Despite global efforts and the consequent implementation of programmes and public policies to encourage breastfeeding, the rates of early initiation, duration, and exclusivity have not yet reached desirable levels<sup>(5)</sup>. Some of the causes of early weaning are associated with socio-cultural factors, aspects that are intrinsic to women, anatomic-physiological features and, above all, difficulties in dealing with the process of breastfeeding<sup>(6-7)</sup>.

In light of the numerous factors that interfere with breastfeeding and the recommendations of this practice, observing sucking and feeding is a fundamental strategy to identify possible problems and suggest clinical or educational interventions. A breastfeeding assessment tool serves as a guide for healthcare workers and indicator of quality for healthcare institutions because it systematises and records their activities, monitors the individual behaviours of mothers and their infants, qualifies written communication between professionals for the continuity of interventions, and increases the self-confidence of mothers regarding their ability to breastfeed and deal with the needs of their babies<sup>(8)</sup>.

Thus, the aims of this paper were to identify breastfeeding assessment tools, their application in clinical practice, and their validation and cross-cultural adaptation.

## ■ METHOD

This is an integrative literature review that consists of the following steps: selection of the research question; sample selection and data collection based on criteria for inclusion and exclusion; definition of the information to be extracted from the selected studies; assessment of studies included in the selection; interpretation of results; and presentation of conclusion<sup>(9)</sup>. The questions formulated to respond to the objectives were: Which breastfeeding assessment tools exist in scientific literature? What are the assessment methods and indications for each of these tools? Which tools are validated and cross-culturally adapted?

The following criteria were adopted for the inclusion of scientific papers: research involving humans that addresses the construction, comparison, validation, and cross-cultur-

al adaptation of instruments used to assess breastfeeding, applied in the postpartum period, involving term newborn, published in Portuguese, English and/or Spanish, without temporal delimitation. The exclusion criteria were: unavailability of the original work and literature reviews.

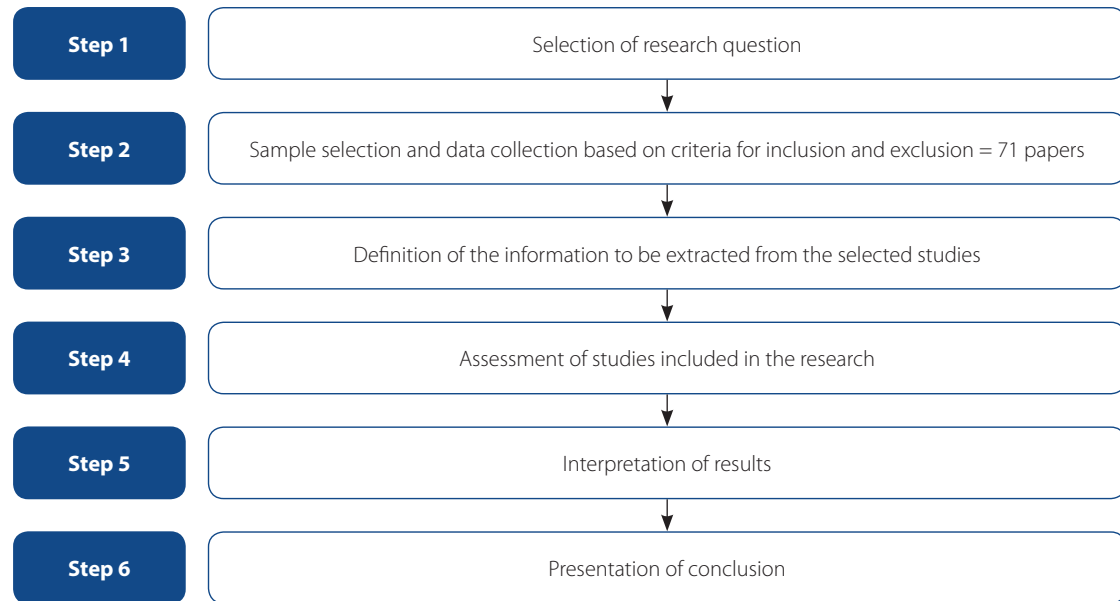
The search for papers occurred from August 2014 to December 2015 using the following health sciences descriptors (DeCS), in Portuguese, English, and Spanish: *Aleitamento materno, Avaliação de resultados (Cuidados de Saúde), Avaliação, Mamilos/lesões* and *Comportamento de sucção*. The keywords indexed in the Medical Subject Headings (MeSH): Breast Feeding, Nursing Assessment; Observation, Outcome Assessment (Health Care) and Nipples/injuries. We also used the following words in Portuguese, English and Spanish: Evaluation Instruments, Breastfeeding Observation, Observation Protocol, Nursing Assessment, and Observation, to expand the search in literature. Indirectly related terms, such as nipples and sucking behaviour, were also included in the search since they are commonly used to assess mothers and infants during breastfeeding.

The following databases were consulted: *Literatura Latino-Americana e do Caribe em Ciências da Saúde* (LILACS), Medical Literature Analysis and Retrieval System Online (PubMed/MEDLINE), *Base de Dados de Enfermagem* (BDENF), *Fundación Index* (CUIDEN), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and SciVerse Scopus (Scopus); and Scientific Electronic Library Online (*SciELO*). The descriptors and words were combined using the Boolean operator AND with all possible cross references and in all the consulted databases and electronic libraries. The search resulted in 79 papers. Of these papers, 48 were duplicated in the consulted databases, 10 did not respond to the object of the study, and 4 were reviews. The final number of papers was 17.

To exhaust the existing publications in current literature, a new search was conducted based on the titles of the instruments identified in 17 of the previously selected papers. This search resulted in 211 papers, of which 60 were excluded because they were duplicates, and 51 were selected for the review.

After the selection of the 68 papers, we conducted a reverse search to exhaust the publications based on the analysis of references of the previously included papers. In this analysis, we read all the references listed in the selected articles to date, resulting in the inclusion of another 3 papers, totalling 71 publications (Figure 1).

The selected papers were managed and organised on a spreadsheet prepared by the authors with the following variables of interest: characterisation of publications (year and country); grade of recommendation and level



**Figure 1** – Flow chart of integrative review

Source: Research data, 2016.

of evidence of the studies; title, purpose and method of application/score of the breastfeeding assessment instruments; and indications for the classification of studies in relation to the level of recommendation and level of evidence, based on the criteria adopted by the Oxford Centre for Evidence-based Medicine, which are: 1<sup>st</sup>: systematic review (with homogeneity) of randomised controlled clinical trials; 1B: randomised controlled trial with narrow confidence interval (with homogeneity); 1C: therapeutic results of type “all or nothing”; 2<sup>nd</sup>: systematic review of cohort studies; 2B: cohort study (including randomised clinical trial of lesser quality); 2C: observation of therapeutic results, ecological study; 3<sup>rd</sup>: systematic review (with homogeneity) of case-control study; 3B: case-control study; 4<sup>th</sup>: case reports (including cohort and case-control of lesser quality); and 5<sup>th</sup>: opinion devoid of critical appraisal, or based on basic materials<sup>(10)</sup>.

All the identified publications of the previously mentioned selection were considered in this study, regardless of whether they were approved by the research ethics committees, due to the year in which they were published and the method used by the authors of the respective papers. The validation studies and other studies with reliability tests and Cronbach’s alpha of the instrument were classified as validated. The studies with reports of the adaptation of the instrument to another language other than the original language of the author were classified being cross-cultural adaptation. As regards ethical issues, the present study was

not submitted to the research ethics committee since it is based on data that do not directly come from humans, as specified in Resolution CNS 466/2012.

## ■ RESULTS

Of the 71 papers that were analysed, we identified 21 breastfeeding assessment instruments with different goals that permeated the subject matter, published between 1988 and 2015, 20 countries, especially the United States of America (24), followed by Brazil (8 studies), Canada and China (5 studies each), and Turkey and Spain (4 studies each).

Two instruments were not analysed, Infant Feeding Assessment Tool (FeedCat Tool)<sup>(11)</sup> because it assesses the type of breastfeeding, and Gender-Role Attitudes toward Breastfeeding Scale (GRABS)<sup>(12)</sup> because there was no information available for analysis. Therefore, 19 breastfeeding instruments were included in the result of this study.

The degree of recommendation and level of evidence of the studies, according to the Oxford Centre for Evidence-based Medicine, were found respectively: 90.1% grade B (56 level 2B and 8 level 2C studies), 8.5% grade D level 5 (6 studies), and 1.4% grade A level 1B (1 study).

With regard to the goals listed in the analysed studies, the proposals of the authors were highly diverse. To facilitate the presentation, the instruments were classified into 4 categories: Risk assessment of early weaning<sup>(13-20)</sup>; Assess-

Instrument/Author/Year	Objective
<b>Category 1 – Risk assessment of early weaning</b>	
Breastfeeding Attrition Prediction Tool <b>(BAPT)</b> /Janke, 1991 <sup>(13-18)</sup>	Identify women who have a tendency toward early weaning.
Breastfeeding Assessment Score <b>(BAS)</b> /Hall et al., 2002 <sup>(19-20)</sup>	Identify women who have a higher risk of weaning in the first ten days of the child's life.
<b>Category 2 – Assessment of the perception and behaviour of nursing women</b>	
Breastfeeding Personal Efficacy Beliefs Inventory <b>(BPEBI)</b> /Cleveland and McCrone, 2005 (21)	Measure the confidence of women regarding their ability to manage their thoughts, emotions, motivation, action and environment to successfully breastfeed for one year.
Breastfeeding Self-Efficacy Scale <b>(BSES)</b> /Dennis and Faux, 1999 <sup>(22-28)</sup>	Assess maternal behaviour in relation to breastfeeding from the perspective of self-efficacy.
Breastfeeding Self-Efficacy Scale – Short Form <b>(BSES-SF)</b> /Dennis, 2003 <sup>(29-46)</sup>	
H & H Lactation Scale <b>(HHLS)</b> /Hill and Humenick, 1996 <sup>(47-48)</sup>	Measure maternal perception of insufficient milk production.
Iowa Infant Feeding Attitudes Scale <b>(IIFAS)</b> /De la Mora et al., 1999 <sup>(40, 49-60)</sup>	Measure maternal attitudes towards lactation and identify factors that influence decisions related to infant feeding methods.
Maternal Breastfeeding Evaluation Scale <b>(MBFES)</b> /Leff, Jefferis and Gagne, 1994 <sup>(61-64)</sup>	Evaluate maternal perception of success in breastfeeding.
<b>Category 3 – Assessment of maternal behaviour/attitude and infant sucking skills in breastfeeding</b>	
B-R-E-A-S-T-FEED Observation Form <b>(BREAST)</b> /Armstrong, 1992 <sup>(8)</sup>	Guide the observation and assessment of mother and child behaviour during breastfeeding.
Lactation Assessment Tool <b>(LAT™)</b> /Cadwell et al., 2004/Blair et al., 1999 <sup>(65-66)</sup>	Document breastfeeding, suggest corrective interventions to optimise holding and positioning for lactating women with pain associated with nipple trauma.
LATCH Scoring System <b>(LATCH)</b> /Jensen, Wallace and Kelsay, 1994 <sup>(63, 67-73)</sup>	Systematically document the assessment of breastfeeding during individual sessions.
Mother-Baby Assessment Tool Scoring System <b>(MBA)</b> /Mulford, 1992 <sup>(67-68, 73)</sup>	Evaluate the learning process in breastfeeding (mother and child).
Mother-Infant Breastfeeding Progress Tool <b>(MIBPT)</b> /Johnson, Mulder and Strube, 2007 <sup>(75)</sup>	Guide the continued support and education for the mother-baby dyad.
<b>Category 4 – Assessment of the infant's sucking skills in breastfeeding</b>	
<i>Avaliação da Sucção do RN na Alimentação no Seio Materno</i> /Mosele et al., 2014 <sup>(76)</sup>	Evaluate the sucking of newborns during breastfeeding.
Bristol Breastfeeding Assessment Tool <b>(BAAT)</b> /Ingram et al., 2015 <sup>(77)</sup>	Evaluate breastfeeding as a measure of proficiency and allow the before/after comparison of a procedure such as frenotomy.
Breastfeeding Evaluation and Education Tool <b>(BEET)</b> /Tobin, 1996 <sup>(78)</sup>	Evaluate the adequacy of breastfeeding the baby.
Infant Breastfeeding Assessment Tool <b>(IBFAT)</b> /Matthews, 1988 <sup>(63, 67, 73, 79)</sup>	Evaluate and measure the competence of the breastfeeding infant.
Neonatal Oral-motor Assessment Scale <b>(NOMAS)</b> /Palmer, Crawley and Blanco, 1993 / Braun and Palmer, 1990 <sup>(80)</sup>	Identify and quantify oral-motor patterns in premature and term neonates during the non-nutritive and nutritive sucking.
Systematic Assessment of the Infant at Breast <b>(SAIB)</b> /Shrago and Bocar, 1990 <sup>(81)</sup>	Identify criteria that can be used to assess the infant's contribution during breastfeeding.

**Chart 1** – Breastfeeding assessment instruments according to the author who proposed the instrument, year of first publication and goals, according to the established category

Source: Research data, 2016.

Instrument	Scoring method	Application method
<b>Category 1 – Risk assessment of early weaning</b>		
BAPT	Likert method with 66 items (1 to 6 points each)	Self-applied
BAS	5 items (0 – 2 each) and 3 items (-2 each) = -6 to 10 points	Self-applied
<b>Category 2 – Assessment of the perception and behaviour of nursing women</b>		
BPEBI	7 items of 0% to 100% (100 mm outline)	Self-applied
BSES	Likert method with 33 items (1 to 5 points each)	Self-applied
BSES-SF	Likert method with 14 items (1 to 5 points each)	Self-applied
HHLS	Likert method with 20 items (1 to 7 points each)	Self-applied
IIFAS	Likert method with 17 items (1 to 5 points each)	Self-applied
MBFES	Likert method with 30 items (concordance and discordance with 5 variations)	Self-applied
<b>Category 3 – Assessment of maternal behaviour/attitude and infant sucking skills in breastfeeding</b>		
BREAST	6 subcategories with 2 to 7 items each/No score	Health workers
LAT™	9 items with related intervention/No score	Health workers
LATCH	Score by item (0 – 2), totalling 10 points	Self-applied
MBA	Score by item (0 – 2), totalling 10 points	Health workers
MIBPT	8 items (1 point each) = totalling 8 points	Health workers
<b>Category 4 – Assessment of the infant's sucking skills in breastfeeding</b>		
Suction of the newborn during breastfeeding	Score by item (0 – 2), totalling 8 points	Health workers
BBAT	Score by item (0 – 2), totalling 8 points	Health workers
BEET	None	Health workers
IBFAT	Score by item (0 – 3), totalling 12 points	Self-applied
NOMAS	None	Qualified health workers
SAIB	None	Health workers

**Chart 2** – Breastfeeding assessment tools, scoring methods, and application

Source: Research data, 2016.

ment of the perception and behaviour of nursing women<sup>(21-64)</sup>; Assessment of maternal attitude/behaviour and infant sucking skills in breastfeeding<sup>(8, 63, 65-75)</sup>; and Assessment of infant's sucking skills in breastfeeding<sup>(63, 67, 73, 76-81)</sup> (Chart 1).

As for the scoring method and application of the instruments, we found various methods for instruments of the same category, and the possibility of self-application of the mother, especially in categories 1 and 2, where the instruments have a higher number of assessment items (Chart 2).

As regards validation and cross-cultural adaptation, it was found that five instruments were validated in the country of origin and all the instruments of categories 3 and 4 were adapted to other cultures although researched in different countries than the language of origin. BSES,

BSES-SF and IIFAS had a higher volume of publications, ranging from 6 to 10 different countries, and all the studies contained cross-cultural adaptations.

Of the existing instruments, only BSES, BSES-SF, BREAST, and the *Avaliação da Sucção do Recém-Nascido* were researched in Brazil and the first two were adapted and validated in the country (Chart 3).

## ■ DISCUSSION

The results of this study revealed the availability of a wide range of instruments to monitor mother and child during breastfeeding; however, in the clinical practice, there is a lack of standardisation of these instruments to guide and record the care provided by health professionals<sup>(8)</sup>.

Instrument	Country/Language of publication	Instrument validated in the country of the author	Information about cross-cultural adaptation
<b>Category 1 – Risk assessment of early weaning</b>			
BAPT	USA/English <sup>(13-17)</sup>	Yes <sup>(13-15, 17)</sup> /No <sup>(16)</sup>	Yes <sup>(13-15, 17)</sup> /No <sup>(16)</sup>
	Turkey/Turkish <sup>(18)</sup>	Yes <sup>(18)</sup>	Yes <sup>(18)</sup>
BAS	USA/English <sup>(19)</sup> , Spanish <sup>(20)</sup>	Yes <sup>(19-20)</sup>	No <sup>(19-20)</sup>
<b>Category 2 – Assessment of the perception and behaviour of nursing women</b>			
BPEBI	USA/English <sup>(21)</sup>	Yes <sup>(21)</sup>	No <sup>(21)</sup>
BSES	Canada/English <sup>(22)</sup>	Yes <sup>(22)</sup>	No <sup>(22)</sup>
	China/Chinese <sup>(23)</sup>	Yes <sup>(23)</sup>	Yes <sup>(23)</sup>
	Porto Rico/Spanish <sup>(24)</sup>	Yes <sup>(24)</sup>	Yes <sup>(24)</sup>
	Australia/English <sup>(25)</sup>	Yes <sup>(25)</sup>	Yes <sup>(25)</sup>
	Brazil/Portuguese <sup>(26-27)</sup>	Yes <sup>(26-27)</sup>	Yes <sup>(26-27)</sup>
	Turkey/Turkish <sup>(28)</sup>	Yes <sup>(28)</sup>	Yes <sup>(28)</sup>
BSES-SF	Canada/English <sup>(29-31)</sup>	Yes <sup>(29-31)</sup>	Yes <sup>(29-31)</sup>
	Poland/Polish <sup>(32)</sup>	Yes <sup>(32)</sup>	Yes <sup>(32)</sup>
	UK/English <sup>(33)</sup>	Yes <sup>(33)</sup>	Yes <sup>(33)</sup>
	Turkey/Turkish <sup>(34)</sup>	Yes <sup>(34)</sup>	Yes <sup>(34)</sup>
	Brazil/Portuguese <sup>(35-38)</sup>	Yes <sup>(35-37)</sup> /No <sup>(38)</sup>	Yes <sup>(35-37)</sup> /No <sup>(36, 38)</sup>
	USA/English <sup>(39-40)</sup>	Yes <sup>(39-40)</sup>	No <sup>(39)</sup> /Yes <sup>(40)</sup>
	Spain/Spanish <sup>(41-43)</sup>	Yes <sup>(41-43)</sup>	Yes <sup>(41-42)</sup> /No <sup>(43)</sup>
	Croatia/Croatian <sup>(44)</sup>	Yes <sup>(44)</sup>	Yes <sup>(44)</sup>
	China/Chinese <sup>(45)</sup>	Yes <sup>(45)</sup>	Yes <sup>(45)</sup>
	Sweden/Swedish <sup>(46)</sup>	Yes <sup>(46)</sup>	Yes <sup>(46)</sup>
HHLS	USA/English <sup>(47)</sup>	Yes <sup>(47)</sup>	No <sup>(47)</sup>
	Thailand/Unspecified <sup>(48)</sup>	No <sup>(48)</sup>	No <sup>(48)</sup>
IIFAS	USA/English <sup>(40,49-50)</sup>	Yes <sup>(40, 49)</sup> /No <sup>(50)</sup>	Yes <sup>(40, 49)</sup> /No <sup>(50)</sup>
	Romania/Romanian <sup>(51)</sup>	Yes <sup>(51)</sup>	Yes <sup>(51)</sup>
	Scotland/English <sup>(52)</sup>	Yes <sup>(52)</sup>	No <sup>(52)</sup>
	China/Chinese <sup>(53-54)</sup>	Yes <sup>(53-54)</sup>	Yes <sup>(53-54)</sup>
	UK/English <sup>(55)</sup>	No <sup>(55)</sup>	No <sup>(55)</sup>
	Japan/Japanese <sup>(56-57)</sup>	Yes <sup>(56-57)</sup>	Yes <sup>(56-57)</sup>
	China-Australia/ Chinese <sup>(58)</sup>	Yes <sup>(58)</sup>	Yes <sup>(58)</sup>
	Hawaii/English <sup>(59)</sup>	Yes <sup>(59)</sup>	Yes <sup>(59)</sup>
	Saudi Arabia/Arabic <sup>(60)</sup>	Yes <sup>(60)</sup>	Yes <sup>(60)</sup>
MBFES	USA/English <sup>(61-63)</sup>	Yes <sup>(61-62)</sup> /No <sup>(63)</sup>	Yes <sup>(61-62)</sup> /No <sup>(63)</sup>
	Japan/Japanese <sup>(64)</sup>	Yes <sup>(64)</sup>	Yes <sup>(64)</sup>
<b>Category 3 – Assessment of maternal behaviour/attitude and infant sucking skills in breastfeeding</b>			
BREAST	Brazil/Portuguese <sup>(8)</sup>	No <sup>(8)</sup>	No <sup>(8)</sup>
LAT <sup>TM</sup>	Latvia/Unspecified <sup>(65-66)</sup>	No <sup>(65-66)</sup>	No <sup>(65-66)</sup>

**Chart 3** – Breastfeeding assessment instruments according to validation and cross-cultural adaptation (continue)

Instrument	Country/Language of publication	Instrument validated in the country of the author	Information about cross-cultural adaptation
LATCH	USA/English <sup>(63, 67-70)</sup>	No <sup>(63,67-68)</sup> /Yes <sup>(69-70)</sup>	No <sup>(63,67-70)</sup>
LATCH	Spain/Spanish <sup>(71)</sup>	Yes <sup>(71)</sup>	No <sup>(71)</sup>
	Italy/Unspecified <sup>(72)</sup>	Yes <sup>(72)</sup>	No <sup>(72)</sup>
	Turkey/English <sup>(73)</sup>	Yes <sup>(73)</sup>	No <sup>(73)</sup>
MBA	USA/English <sup>(67-68)</sup>	No <sup>(67-68)</sup>	No <sup>(67-68)</sup>
	Turkey/English <sup>(74)</sup>	Yes <sup>(74)</sup>	No <sup>(74)</sup>
MIBPT	USA/English <sup>(75)</sup>	No <sup>(75)</sup>	No <sup>(75)</sup>
<b>Category 4 – Assessment of the infant's sucking skills in breastfeeding</b>			
Avaliação da Sucção do Recém-Nascido na Alimentação no Seio Materno	Brazil/Portuguese <sup>(76)</sup>	No <sup>(76)</sup>	No <sup>(76)</sup>
BBAT	UK/English <sup>(77)</sup>	Yes <sup>(77)</sup>	No <sup>(77)</sup>
BEET	USA/English <sup>(78)</sup>	No <sup>(78)</sup>	No <sup>(78)</sup>
IBFAT	Canada/English <sup>(79)</sup>	Yes <sup>(79)</sup>	No <sup>(79)</sup>
	USA/English <sup>(63, 67)</sup>	No <sup>(63,67)</sup>	No <sup>(63,67)</sup>
	Turkey/Turkish <sup>(73)</sup>	Yes <sup>(73)</sup>	No <sup>(73)</sup>
NOMAS	Unspecified/English <sup>(80)</sup>	No <sup>(80)</sup>	No <sup>(80)</sup>
SAIB	USA/English <sup>(81)</sup>	No <sup>(81)</sup>	No <sup>(81)</sup>

**Chart 3** – Breastfeeding assessment instruments according to validation and cross-cultural adaptation (conclusion)

Source: Research data, 2016.

As regards the **Assessment of the risk of early weaning**, the tools BAS<sup>(19-20)</sup> and BAPT<sup>(13-18)</sup> target the identification of this risk because they require the surveying of infant formula use and a description of the situations related to its indication.

According to the WHO<sup>(1)</sup>, the reduced supply of breast milk and the introduction of liquids or solids in the child's diet before 6 months of age characterise the beginning of early weaning. Other factors found in breastfeeding, such as pain/breast problem, previous negative experience, and other mentioned in literature, are also related to higher risk of early weaning<sup>(7-8)</sup>.

Regarding the application of these assessments in the clinical practice, literature is limited for both instruments. Although they have the same goal, the BAS is easy to apply and precisely detects the risk of early weaning<sup>(19-20)</sup>, similar to the Apgar score used to evaluate the conditions of child birth. The BAPT, however, covers more of the causes, but it was considered infeasible by most of the researchers<sup>(15-18)</sup> because of the excessive number of evaluative items.

The author of the BAPT<sup>(13)</sup> recommended the reduction of the instrument to improve its applicability in practice. In 2004, the structure was modified, but after application

in pregnant women and recent mothers, the results did not validate its use<sup>(15)</sup>. In 2006, it was reviewed again and reduced to 20 items<sup>(16)</sup>, and renamed "Breast-Feeding Attitude Scale (BrAS)". After this modification, use of the instrument was validated. Soon after, in 2007, a second proposal of the original was presented by other authors, this time with the reduction of the instrument to 35 items and Likert score to three points<sup>(17)</sup>, which was also considered valid. In 2011, it was cross-culturally adapted and validated by other authors<sup>(18)</sup>, who maintained the original structure of the items and simply changed the scoring method, with the reduction to five points on the Likert scale.

Although the BAS is more practical, it was only found in one study in Spanish, in addition to the original English, without the cross-cultural adaptation for the country of the translated language<sup>(20)</sup>.

The use of an instrument to identify the risk of early weaning can effectively reduce this event and allow the provision of differentiated and qualified professional care; however, both instruments proved fragile according to the accounts found in literature. There are no usage records of the BAS and BAPT instruments in Brazil.

The second category, defined as **Assessment of the perception and behaviour of nursing women**, refers to the central idea of the self-confidence of women when breastfeeding their infants. It is known that the mother's self-efficacy is strongly related to the success of prolonged breastfeeding, and, consequently, to the reduction of early weaning rates<sup>(22, 29)</sup>. The six instruments mentioned in this group – BSES, BSES-SF IIFAS, MBFES, HHLS, and BPEBI –, seem to cover the emotional aspects and maternal knowledge related to breastfeeding. The most widely used instruments with records in literature were the BSES/BSES-SF and IIFAS, used in 12 and 9 countries, respectively.

The BSES was built in 1999<sup>(22)</sup> and, due to the extensive repertoire of items it contains, the author later presented it in "Short Form" (BSES-SF), in 2003<sup>(29)</sup>. In Brazil, BSES/BSES-SF were the only instruments that were validated<sup>(26-27, 35-37)</sup> and cross-cultural adapted for use in the country<sup>(26-27, 35, 37)</sup>. The full version (BSES) was studied in 2009<sup>(26)</sup> for the first time, and subsequently translated and validated in Brazil<sup>(27)</sup>. The reduced version (BSES-SF), published in 2010<sup>(35-36)</sup>, 2012<sup>(37)</sup>, and 2014<sup>(38)</sup>, showed that the instrument is reliable and valid to assess the self-efficacy of recent mothers in Brazil while breastfeeding and that it can be successfully used for individualised interventions<sup>(35-38)</sup>.

As regards the IIFAS, we found that the instrument is also used in various regions, and validated in 10 different countries, most of which<sup>(40, 49, 51, 53 -54, 56-60)</sup> included a cross-cultural adaptation. The instrument was considered useful and provided a reliable assessment of maternal attitudes in relation to breastfeeding, except in a study conducted in the United Kingdom<sup>(55)</sup>.

The BPEBI instrument was only published for its author, who validated its use in the USA<sup>(21)</sup>. The HHLS instrument was found in two publications, although it was only validated in one study<sup>(47)</sup>, and we did not find reports of its cross-cultural adaptation<sup>(47-48)</sup>. For the MBFES instrument, we found 4 publications, three of which presented its validation for application and cross-cultural adaptations in the USA<sup>(61-63)</sup> and in Japan<sup>(64)</sup>.

Unlike the first category, the six instruments presented below proposed the assessment of breastfeeding through the mother's self-confidence, considering the idea of capacity, know-how/recognition, having the attitude and eagerness to breastfeed in various everyday situations, and the infant's behaviour in relation to satiety while breastfeeding. This perspective broadens the scope of assessment and enables the consideration of subjective issues that hinder breastfeeding. In this way, these instruments allow a dialogue between the health workers and the nursing moth-

ers regarding their expectations and limitations to breastfeeding and their satisfaction and desire to breastfeed, thus proposing a welcoming, comprehensive care that is suitable for every situation.

The third category, **Assessment of maternal behaviour/attitude and infant sucking skills in breastfeeding**, addresses the parameters of women and their infants in breastfeeding. It includes five instruments (BREAST, LAT<sup>TM</sup>, LATCH, MBA, and MIBPT) that analyse maternal behaviour, positioning of the mother and child during breastfeeding, infant behaviour, rooting, effective breastfeeding, breast health, infant health, and number/interval between feedings<sup>(8, 13, 66, 74 -75)</sup>.

As to the application of these instruments according to the analysed literature, it was noted that the instrument BREAST is easy to fill and its use is widely divulged among health professionals. It is also recommended in training promoted by the United Nations Foundation for Early Childhood (UNICEF). Although widely used in practice, only one Brazilian study<sup>(8)</sup> reported its use as protocol to assess difficulties in the initiation of breastfeeding, and we did not find published validation studies.

In relation to the MBA, we found three studies, but only one of these studies validated the instrument<sup>(74)</sup> and none of them cross-culturally adapted the instrument<sup>(67-68, 74)</sup>.

For the MIBPT instrument, we only found one study without cross-cultural adaptation and validation<sup>(75)</sup>. The same occurred with the LAT<sup>TM</sup> instrument, although its use was reported in two studies<sup>(65-66)</sup>. The instrument LATCH had the highest number of publications in this category, with records in the USA<sup>(63, 67 -70)</sup>, Spain<sup>(71)</sup>, Italy<sup>(72)</sup>, and Turkey<sup>(73)</sup>, but without descriptions of cross-cultural adaptation. There are no records of studies in Brazil with these instruments, with the exception of the BREAST.

These instruments proved practical and objective for the clinical assessment of breastfeeding. Moreover, they provide a punctual assessment that complements the instruments of the previous category.

Given the low number of publications and limitations regarding the use of these instruments in this category, we suggest further investigations that explore the items and verify whether these items objectively cover the key items that should be addressed in a breastfeeding assessment. Of these instruments, the most researched were the LATCH, probably due to its presentation, and the BAS, in the Apgar score format, which makes it easier to apply in practice, although it must be cross-culturally adapted to the countries that suggest its use.

The fourth category, **Assessment of the competencies of the breastfeeding infant**, includes the following



instruments: *Avaliação da Sucção do Recém-Nascido na Alimentação no Seio Materno*, BBAT, BEET, IBFAT, NOMAS and LEARN. In this section, we only considered aspects related to the infant during breastfeeding, namely behaviour, rooting, effective sucking, infant health number/interval between feedings, among others<sup>(8, 13, 66, 74-75)</sup>.

In relation to cross-cultural adaptation and validation, the instruments *Avaliação da Sucção do Recém-Nascido na Alimentação no Seio Materno*<sup>(76)</sup>, BEET<sup>(79)</sup>, NOMAS<sup>(80)</sup>, SAIB<sup>(81)</sup>, and IBFAT<sup>(63, 67, 73, 79)</sup> were not validated in the country of origin or adapted in other countries, and only one publication was found for each instrument, with the exception of the IBFAT that was identified in two studies<sup>(73, 79)</sup>. That BBAT was validated in the United Kingdom<sup>(77)</sup>, and its use was only reported in one publication.

It should be noted that the publications of the *Avaliação da Sucção do Recém-Nascido na Alimentação no Seio Materno*<sup>(76)</sup> and the BBAT<sup>(77)</sup> are dated 2014 and 2015, respectively, which means they are recent and little explored to date. Most of the instruments in this category, with the exception of the national instrument<sup>(76)</sup>, were not explored in Brazilian studies.

Thus, the instruments in this category are relevant in that they can help to further assess breastfeeding, especially to identify the oral disorders of children. Similarly, some of the instruments mentioned here can also be complemented, although studies are required to validate these instruments.

It is interesting to note that, despite the large number of existing instruments, they have different objectives for the same purpose and allow the use of more than one instrument for a single mother-child during breastfeeding since they complement one another in relation to breadth and specificity for assessment of breastfeeding.

## ■ CONCLUSION

We identified 19 breastfeeding assessment instruments, of which 12 were validated by the authors of the publications according to the objective (BAS, BAPT, BBAT, BPEBI, BSES, BSES-SF HHLS, IIFAS, MBA, MBFES, IBFAT, and LATCH) and only five were adapted cross-culturally (BAPT, BSES, BSES-SF IIFAS, and MBFES).

The large number of breastfeeding assessment instruments, the wide range of objectives, the different scoring methods, and the application hindered any detailed comparison, and therefore constitutes the limitation of this study. The detection of available instruments and their indications to assess breastfeeding, however, can help health workers select the ideal instrument and consequently improve mother and child care.

In this study, it was not possible to select a single instrument that met the overall needs of the mother-child dyad given the variety of objectives of each instrument. However, we highlight the BAPT instrument for assessing the risk of early weaning, and the BSES-SF and IIFAS to assess the perception and behaviour of breastfeeding women.

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