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ORIGINAL ARTICLE

Psychometric evaluation of breastfeeding self efficiency scale

Evaluación psicométrica de la escala de autoeficacia de la lactancia materna

Daniela Andrade R.[a,e], Claudio Bustos N.[b,f], Héctor Brito C.[c,d], Natalie Adasme D.[a,e], Bárbara López B.[a,e], Cristina Parra P.[a,g], Benjamín Vicente P.[b]

[a]M-SSR Grupo de Investigación de Matronería en Salud Sexual y Salud Reproductiva, Carrera Obstetricia y Puericultura, Universidad Autónoma de Chile, Chile.
[b]Departamento de Psiquiatría y Salud Mental, Universidad de Concepción. Concepción, Chile.
[c]I-CIRESA Unidad de Investigación en Ciencias de la Rehabilitación en Salud, Departamento de Kinesiología,Universidad Autónoma de Chile, Chile.
[d]Kinesiólogo.
[e]Matrona.
[f]Psicólogo.
[g]Interna.

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What do we know about the subject matter of this study?

Breastfeeding self-efficacy is the belief about abilities to breastfeed successfully, representing an indicator associated with the mental health of the postnatal woman and the maintenance of exclusive breastfeeding.

What does this study contribute to what is already known?

It allows an assessment adjusted to the Chilean population on the role of breastfeeding self-efficacy, in order to support the establishment and maintenance of breastfeeding, in addition to promoting mental health.

Abstract

Breastfeeding self-efficacy is one of the indicators associated with the mental health of puerperal women and the maintenance of exclusive breastfeeding. **Objective:** To evaluate the psychometric properties of an instrument to measure self-efficacy to breastfeed on the second postpartum day in the Chilean population. **Subjects and Method:** A convenience sample of 320 puerperal women who volunteered to participate in an interview on their second postpartum day was evaluated. Reliability was evaluated using the coefficient Cronbach's alpha. To assess its factorial structure, an exploratory factor analysis was performed. **Results:** The results indicate that the final instrument, which has the factors "Intrapersonal Thoughts", composed of six items and "Breastfeeding Techniques", composed of eight items, presented an internal consistency by factor and total scale of F1 = 0.90, F2 = 0.91, and Total = 0.94, respectively. **Conclusion:** The breastfeeding self-efficacy scale showed good psychometric characteristics during the second postpartum day among Chilean puerperal women.

Keywords:
Breastfeeding;
Self-Efficacy;
Puerperium;
Validation Studies

Correspondence:
Benjamín Vicente
bvicent@udec.cl

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Ana Zepeda Ortega

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Introduction

According to Bandura's Social Cognitive Theory, self-efficacy is a concept that refers to a person's set of beliefs about her/his ability to perform a particular behavior successfully[1]. Self-efficacy has been studied from two perspectives: specific self-efficacy, defined as the belief about the level of competence in particular situations, and general self-efficacy, which refers to a person's sense of overall competence that enables her/him to face new tasks and cope with a wide variety of challenging situations[1].

Breastfeeding self-efficacy is defined as the mother's perception of her abilities to be and feel capable of breastfeeding her child, coping satisfactorily with this process, and is influenced by the mother's previous experience, learning by observation, verbal persuasion, her physiological and affective state, among others[2].

During the postpartum period, the mother's self-efficacy is key in the achievement of roles, the ability to competently perform infant care, and other parental tasks that depend on her confidence in her maternal abilities[3]. At this stage, one of the recommendations to mothers is to initiate and maintain exclusive breastfeeding ideally during the first six months, which is widely documented in relation to its benefits for the child and the mother[4].

Several studies have identified that there is an association between breastfeeding self-efficacy and successful lactation, resulting in a longer duration of breastfeeding and exclusivity of up to six months, indicating that a failure in the establishment of breastfeeding is related to a higher risk of presenting mental health disorders such as depression or anxiety, compared with mothers who had successfully breastfed[2-10].

Evidence shows that the predictor variables of higher breastfeeding self-efficacy are breastfeeding intention, partner support, support from health professionals during labor and postpartum, attending breastfeeding classes during pregnancy, breastfeeding initiation (time from delivery to initiation), previous breastfeeding experience[11,12], early and successful initiation of breastfeeding, co-habitation, exclusive breastfeeding during hospital stay[13], age, perceived social support, and parity[14,15].

Regarding the impact of higher breastfeeding self-efficacy, a longitudinal study from postpartum day 2 to postpartum month 6 found that high self-efficacy at 2 days postpartum predicted positive emotional adjustment and fewer depressive symptoms at 6 weeks postpartum, as well as exclusive breastfeeding at 6 months postpartum. Among distressed mothers, concerns about breastfeeding were among the most commonly cited reasons for postpartum stress, along with lack of sleep, lack of social support, and overwhelming learning demands related to motherhood[16].

Despite the importance of breastfeeding self-efficacy on the mental health of the mother and the success of exclusive breastfeeding during the first postpartum months, impacting the health of children, there are no instruments in Chile to measure self-efficacy related to exclusive breastfeeding in women in the postpartum period.

At the international level, the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) is an abbreviated adaptation of the original scale, both created by Dr. Cindy-Lee Dennis. This abbreviated version has been translated into different languages and has been used in various countries, reporting adequate psychometric properties[17-19]. In 2011, it was translated in Spain[20] obtaining a Cronbach's alpha of 0.79. In Brazil, it was adapted to Portuguese obtaining an internal consistency of 0.88[21]. However, it has not been validated in the Chilean population.

The objective of this research was to evaluate the psychometric properties of the BSES-SF to measure breastfeeding self-efficacy on the second postpartum day in Chilean postpartum women.

Subjects and Method

A non-probabilistic sampling was carried out from June 2019 to March 2020 to 320 postpartum women on the second postpartum day at the Regional Hospital of Talca, Chile.

The inclusion criteria were age older than 19 years, signing the informed consent, women registered in family health centers from the commune of Talca, and being native Spanish speakers. Exclusion criteria were rurality, psychiatric pathology diagnosed before the study (obtained from the review of the perinatal record and the woman's diary), cognitive deficit (obtained from the review of the perinatal record and the woman's diary), and having a newborn hospitalized in the neonatology unit.

Instruments

The Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) consists of 14 self-administered items (table 1). Each item is scored using a Likert-type scale from 1 to 5, where 1 indicates "very insecure" and 5 indicates "very secure."

To collect the relevant sociodemographic and clinical information, the clinical record data were reviewed, whose information was collected by the clinical midwife on duty.

Procedure

Daily visits were made to the Regional Hospital of Talca in the Postpartum Unit to contact postpartum women between June 2019 and March 2020, identifying that they were on the second postpartum day. Recruitment was planned with the head of the postpartum unit, inviting the postpartum women to participate voluntarily, followed by informed consent. The information was collected in an interview lasting 10 to 15 minutes.

This study was reviewed and approved by the ethics committee of the *Universidad Autónoma de Chile* (CEC N° 15-19).

Statistical analysis

The general description of the sample was made by summary statistics, such as mean (Me), Standard Deviation (SD), and percentage frequency.

In the exploratory factor analysis, an iterative method was used to determine the number of initial factors that could be extracted from the original set of items. Horn's Parallel Analysis[22] was used as a procedure. Once the number of factors was determined, a solution was generated using the weighted least squares method on the correlation matrix of categorical variables, followed by a Geomin oblique rotation. Reliability analyses were carried out using Cronbach's alpha[23].

The information was coded and processed using R statistical packages version 3.

Table 1. Items Breastfeeding self-efficacy scale

N°	Items
1	Determine that my baby is getting enough milk
2	Successfully cope with breastfeeding like I have with other challenging tasks
3	Breastfeed my baby without using formula as a supplement
4	Ensure that my baby is properly latched on for the whole feeding
5	Manage the breastfeeding situation to my satisfaction
6	Manage to breastfeed even if my baby is crying
7	Keep wanting to breastfeed
8	Comfortably breastfeed with my family members present
9	Be satisfied with my breastfeeding experience
10	Deal with the fact that breastfeeding can be time-consuming
11	Finish feeding my baby on one breast before switching to the other breast
12	Continue to breastfeed my baby for every feeding
13	Manage to keep up with my baby's breastfeeding demands
14	Tell when my baby is finished breastfeeding

Results

Sample description

320 postpartum women with a mean age of 29 years (SD = 6.26), with completed high school education (41.6%), cohabiting marital status (44.7%), married (25.6%), and single (29.4%). The most frequent types of delivery were vaginal delivery (59.3%) and cesarean section (35.8%), and most did not have labor dystocia (90.6%). For most of the mothers, it was their first child (40.3%) and for the rest, it was their second child (33.1%) or third or more children (26.6%). Feeding of the newborn up to two days postpartum was mostly exclusive breastfeeding in 92.6% (n = 296).

Regarding pregnancy planning, 55.9% of the women did not plan their pregnancy. However, 100% categorized it as accepted (table 2).

Exploratory Factor Analysis

The evaluation of the data matrix using the Kaiser-Meyer-Olkin (KMO) sample adequacy index was 0.95 and Bartlett's test X^2 (91) = 2701, which is equivalent to $p < 0.001$. Both show that the correlation matrix is suitable for exploratory factor analysis.

To determine the number of factors, an analysis was performed using Horn's Parallel statistical test, which showed two factors. The two-stage least squares solution explains 65% of the variance, with all factor loadings above 0.4 (table 3).

Factor 1 comprising items 1 to 6 "intrapersonal thoughts" expresses mothers' perceptions of their intellectual abilities to carry out breastfeeding. Factor 2 comprising items 7 to 14 "breastfeeding techniques" corresponds to the perception of the achievement of motor skills necessary to start and maintain breastfeeding. A positive correlation is observed between both factors (r = 0.77), indicating that the perception of intellectual abilities is related to the achievement of breastfeeding technique.

Reliability analysis

In the reliability analysis, the internal consistency per factor showed a Cronbach's alpha for Factor 1 and Factor 2 of 0.90 and 0.9, respectively, and the total scale presented a Cronbach's alpha of 0.94.

The descriptive analysis of the scores showed for Factor 1 a Me = 3.8 (SD = 0.9) and in Factor 2 a Me = 4.1 (SD = 0.8), which indicates high scores in both factors. The distribution in both factors showed a negative asymmetry, evidencing that most of the women had a positive perception, however, there was a greater accumulation in the second factor, between scores 3 and 4 out of a total of 5. In the total scale a mean of 3.99 (SD = 0.24) was obtained, showing a positive score of self-efficacy in breastfeeding, where most

of the scores were between 3 and 4, revealing a ceiling effect, that is, a level at which a negative score is no longer distinguishable. This is reflected in the value of the asymmetry indicator (-0.37) (table 4).

In the analysis of breastfeeding self-efficacy, 69.4% of the sample reported high self-efficacy, 26.9% moderate self-efficacy, and only 3.8% reported low breastfeeding self-efficacy.

Discussion

The breastfeeding self-efficacy scale composed of 14 items has a two-dimensional structure, which explains 65% of the total variance of the instrument, showing reliability higher than 0.9 in each dimension and 0.94 in the total scale. These results suggest that the scale has adequate psychometric properties, so it can be used as a valid and reliable tool in postpartum women to evaluate their breastfeeding self-efficacy, which is confirmed by other studies in women with similar characteristics on the second postpartum day, age close to 30 years, and a higher percentage of multiparous women[17,19, 25-26].

In this study, there were high self-efficacy scores, with great relevance in clinical practice. Regarding the score obtained from the breastfeeding self-efficacy scale, despite the heterogeneity of the sample, a mean of 54.7 (SD 13.2) was observed which, according to its cut-off score, is categorized as high self-efficacy on the second postpartum day[25].

In the case of the differential sociodemographic characteristics of this population, a high percentage of complete high school education was found, and it was mostly their first and second child, unlike other populations[15,18], characteristics that may have an impact on the differentiated perception of breastfeeding self-efficacy in two dimensions.

The psychometric results of this research are very similar to those obtained in previous studies[15,18,26-28] which found a Cronbach's alpha between 0.70 to 0.93. The first scale constructed by Dennis Cindy Lee[29] had 33 items with two dimensions; however, the short version of 14 items showed only one dimension[30]. The psychometric results presented in this study maintain the author's initial factorial configuration. The identification of two dimensions coincides with the findings of other studies[31-32], in contrast to other studies that show only one dimension[17,19,24].

The self-efficacy scale with two dimensions may have a greater specificity in breastfeeding problems since its detection and support. The intrapersonal thoughts dimension places greater emphasis on the characteristics of self-perception which, as mentioned in other studies, could be associated with the risk of

Table 2. Clinical and sociodemographic characteristics

	Mean	SD
Age	27.8	6.29
Variable	n	%
Educational level		
Primary not finished	12	3.8
Primary finished	17	5.3
High school not finished	40	12.5
High school finished	133	41.6
University not finished	28	8.8
University finished	42	13.1
Technical career	8	2.5
Technical career	40	12.5
Marital status		
Single	94	29.4
Married	82	25.6
Cohabiting	143	44.7
Separated	1	0.3
Nutritional condition		
Underweight	3	0.9
Normal weight	74	23.1
Overweight	93	29.1
Obesity	150	46.9
Parity		
Vaginal	190	59.3
Cesarean	115	35.8
Forced	15	4.9
Dystocia		
YES	30	9.4
NO	290	90.6
newborn feeding		
EB*	296	92.5
Mixed	20	6.3
FF*	4	1.3
Number of children		
1st child	129	40.3
2nd child	106	33.1
3rd child	56	17.5
4th child	22	6.9
5 or more	7	2.2
Planned Pregnancy		
Yes	141	44.1
No	179	55.9
Acceptance of Pregnancy		
Yes	320	100.0

EB* Exclusive Breastfeeding; FF* Formula-feeding

Table 3. Correlation coefficient matrix -Breastfeeding Self-Efficacy Scale

N°	Item	Factores	
		1	2
1	Determine that my baby is getting enough milk	0.01	0.79
2	Successfully cope with breastfeeding like I have with other challenging tasks	0.24	0.60
3	Breastfeed my baby without using formula as a supplement	0.21	0.67
4	Ensure that my baby is properly latched on for the whole feeding	-0.13	0.96
5	Manage the breastfeeding situation to my satisfaction	0.12	0.75
6	Manage to breastfeed even if my baby is crying	0.24	0.57
7	Keep wanting to breastfeed	0.53	0.29
8	Comfortably breastfeed with my family members present	0.72	0.02
9	Be satisfied with my breastfeeding experience	0.68	0.22
10	Deal with the fact that breastfeeding can be time-consuming	0.84	-0.12
11	Finish feeding my baby on one breast before switching to the other breast	0.68	0.12
12	Continue to breastfeed my baby for every feeding	0.85	0.02
13	Manage to keep up with my baby's breastfeeding demands	0.88	0.00
14	Tell when my baby is finished breastfeeding	0.45	0.33

Table 4. Descriptions of scales by dimension and total

Scale	n*	Mean	SD	Minimum	Maximum	Asymmetry	kurtosis
Factor 1	6	3.79	0.95	1	5	-0.79	0.15
Factor 2	8	4.14	0.83	1	5	-1.69	3.43
Total	14	3.99	0.24	3.49	4.33	-0.37	-0.31

*Number of items

alterations in mental health[33], being a determining factor for the maintenance and success of breastfeeding[34].

This instrument has the advantage of being brief and can be applied to diverse populations, showing adequate psychometric characteristics, but it would be good to perform a confirmatory analysis to corroborate the need to maintain two factors or reduce them to one.

Women with low scores on the self-efficacy scale are more likely to present complications in the initiation of breastfeeding or abandonment of exclusive breastfeeding[12,28] and present an increased risk of mental health disturbances[2,3]. For this reason, breastfeeding self-efficacy should be an aspect to be considered in clinical practice in order to support the establishment and maintenance of breastfeeding, promote the mental health of mothers, and thus favor the adequate development and growth of children.

Ethical Responsibilities

Human Beings and animals protection: Disclosure the authors state that the procedures were followed according to the Declaration of Helsinki and the World Medical Association regarding human experimentation developed for the medical community.

Data confidentiality: The authors state that they have followed the protocols of their Center and Local regulations on the publication of patient data.

Rights to privacy and informed consent: The authors have obtained the informed consent of the patients and/or subjects referred to in the article. This document is in the possession of the correspondence author.

Conflicts of Interest

Authors declare no conflict of interest regarding the present study.

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