Original Article

The Hindi Version of the Breastfeeding Self-Efficacy Scale-Short Form: Reliability and Validity Assessment

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Abstract

Background: Despite the cultural sanctity and elevation of breastfeeding practices, nearly one in two Indian women nationwide are unable to practice exclusive breastfeeding (EBF). Early identification of mothers at risk of reduced breastfeeding through a suitable instrument can enable targeted interventions for breastfeeding support. **Objectives:** We conducted this study with the objectives of translation into Hindi and to psychometrically test the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) and to ascertain the sociodemographic and other correlates of breastfeeding self-efficacy. **Methods:** The BSES-SF was translated into Hindi using a back and forth translation process to ensure linguistic validity. We enrolled a total of 210 married women who were mothers of infants at an urban primary health center in Delhi, India. **Results:** The Cronbach's alpha for the Hindi translation of the BSES-SF was 0.87 with all except one correlation coefficient <0.3. We conducted an exploratory factor analysis using principal component analysis that revealed a two-component solution, which explained 47.9% and 16.7% of the total variance, respectively. Mothers perceiving higher social support registered significantly higher mean BSES-SF scores, indicating a greater confidence in their breastfeeding abilities ($P = 0.01$). However, breastfeeding self-efficacy was unrelated to the mother's age, parity, and education. The women planning to breastfeed partially had lower BSES-SF scores compared to the woman adhering to EBF norms ($P < 0.001$). **Conclusion:** The Hindi version of the BSES-SF demonstrates good reliability and validity and can also explain previous and planned breastfeeding behavior in mothers of infants.

Keywords: Breast feeding self-efficacy, breastfeeding, Hindi version, India

Introduction

Breastfeeding is the most crucial health intervention for infants in the developing world for reducing the risk of life-threatening infections.[1] The World Health Organization recommends exclusive breastfeeding (EBF) for infants until they are 6 months of age and continued breastfeeding until the infant is at least 2 years of age.[2] Adherence to EBF by the mother reduces her infant's risk of gastrointestinal and lower respiratory tract infections and is protective against protein–energy malnutrition.[3,4] In contrast, failure to breastfeed or nonadherence to EBF, resulting in partial breastfeeding, accentuates health risks for both mothers and infants.[5]

Breastfeeding is a nearly universal cultural trait among Indian women, but changing sociocultural landscapes and erosion of traditional support networks threaten the practice.[6] The Indian National Family Health Survey 4 (2015–2016), a large scale cross-sectional study, revealed that 54.9% of mothers exclusively breastfed their infants aged below 6 months.[7]

Self-efficacy or confidence of the mother in performing breastfeeding is a significant determinant of its adequacy in infants.[8] Dennis and Faux originally developed a 33-item breastfeeding self-efficacy scale (BSES) that was reduced to a shorter 14-item instrument, the BSES-short form (BSES-SF) which is particularly useful for application in postpartum women.[9,10] The BSES-SF has been utilized in diverse cultural settings and proven to be highly useful in identifying women at risk of nonadherence to EBF, short duration of breastfeeding,

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and also as a tool for the provision of targeted breastfeeding support.[11,12] The BSES-SF can serve as a useful instrument for assessing the confidence to breastfeed in women presenting to primary care settings in low- and middle-income countries. However, it has previously not been validated in an Indian or Hindi-speaking population.

We conducted this study with the objectives of translation into Hindi and to psychometrically test the BSES-SF and to ascertain the sociodemographic and other correlates of breastfeeding self-efficacy.

Methods

Design and setting

We conducted a cross-sectional study from January to June 2019 at a primary care, public health center located in a resettlement colony of an urban slum in the North-East district of Delhi. Resident doctors from the community medicine department of a government medical college in Delhi provide outreach services at the well-baby and immunization clinic conducted at the health center.

Participants

We enrolled adult women who were mothers of an infant child (aged below 1 year) and were able to communicate in the Hindi language. We included only those mothers who had successfully initiated breastfeeding to their infants for at least 15 days since birth. The mothers who had discontinued feeding their infants on any medical recommendation, and those previously diagnosed with depression were excluded.

Sample size

A respondent-item ratio of 15:1 is considered adequate, and a sample size of 200 is considered fair when conducting factor analysis.[13] A sample size of 210 was therefore considered adequate for validating a 14-item scale in this study.

Sampling strategy

The women meeting the selection criteria and willing to participate were enrolled in the study by consecutive sampling from the health center.

Study instruments

The BSES-SF by Dennis *et al*. was applied for assessing the mother's confidence in breastfeeding their infant child. It is a previously validated 14-item scale where each item has five response choices on a Likert-type scale, ranging from "not at all confident" (1 point) to "always confident" (5 points).[10] All the items are presented positively, and their scores are summed to produce a total score ranging from 14 to 70. Higher total scores indicate higher levels of breastfeeding self-efficacy. Although the BSES-SF has been mostly used during the first 6 months of the postpartum period, we applied it throughout the 1st year of the infant's life. This is because apart from EBF, continued breastfeeding with initiation and maintenance of appropriate complementary feeding practices in older infants is also essential for preventing protein-energy malnutrition in the Indian scenario.

The English version of the BSES-SF was linguistically validated into the local language Hindi. The translation process included: (a) forward translation of the original BSES-SF into Hindi by a native speaker, (b) the back-translation into English was conducted by another native speaker, (c) this forward and back translation process was continued until the back-translated version matched with the original English version of the BSES-SF, and (d) the translated version was pretested in ten women to assess reading comprehension of the new scale.

Postpartum depression in the mothers was ascertained with the Hindi version of the original 10-item Edinburg Postnatal Depression Scale by Cox *et al*.,[14] which has been validated for use in most low- and middle-income countries.[15] Perceived social support in the mothers was assessed with the previously validated 12-item multidimensional scale of perceived social support by Zimet *et al*., which was also linguistically validated into Hindi for the present study.[16] The detailed results related to the prevalence of postnatal depression and social support among the participants have been previously reported by us.[17]

Data collection

Two resident doctors of the department of community medicine interviewed the participants. A patient interview schedule was also used to collect sociodemographic data and the mother's awareness and practices related to breastfeeding. The BSES-SF and the other survey instruments are preferably intended for self-administration. However, in this study, these questionnaires were verbally administered to nearly half (49.5%) of the participants, which included those who requested it, to improve the survey response, and aid those with limited literacy. Nevertheless, to minimize inter-observer and measurement bias, both the interviewers' read all the items of the questionnaires in sequence and using the exact wordings, as mentioned in the text. Any unnecessary probing was also strictly avoided.

The socioeconomic status of the participants was calculated based on the modified BG Prasad scale updated for 2019 income criteria.[18,19]

Statistical analysis

An exploratory factor analysis using the principal component analysis (PCA) method was run on the 14-item BSES-SF to ascertain its appropriateness in a Hindi-speaking population. The present dataset satisfied the PCA requirements regarding the linear relationship between variables and adequacy of sample size. The Cronbach's alpha was calculated to establish the reliability of the BSES-SF.

Categorical variables were expressed as frequency and proportion, whereas continuous variables were expressed as the mean and standard deviation (SD) for normal and median and interquartile range (IQR) for nonnormal distribution. The Mann–Whitney U-test was applied to assess the median of the difference between the continuous outcomes. $P < 0.05$ was considered statistically significant.

Table 1: BSE-SF short with principal components, factor loading, reliability, means, and standard deviation

Item	Original sample loading	Hindi sample loading	Corrected item-total alpha correlation	Cronbach's alpha if items deleted	Mean±SD
Determine that my baby is getting enough milk	0.76	0.74	0.61	0.86	3.96±1.30
Successfully cope with breastfeeding as I have with other challenging tasks	0.82	0.65	0.56	0.86	3.97±1.28
Breastfeed my baby without using formula as supplement	0.73	0.11	0.26	0.91	4.00±3.81
Ensure that my baby is properly latched on for feeding	0.72	0.69	0.58	0.86	4.17±1.19
Manage the breastfeeding situation to my satisfaction	0.83	0.72	0.63	0.86	3.94±1.33
Manage to breastfeed even if my baby is crying	0.72	0.55	0.55	0.86	3.78±1.49
Keep wanting to breastfeed	0.70	0.17	0.35	0.87	4.05±2.45
Comfortably breastfeed with my family members present	0.66	0.67	0.62	0.86	4.05±1.29
Be satisfied with my breastfeeding experience	0.84	0.74	0.71	0.85	3.73±1.80
Deal with the fact that breastfeeding can be time consuming	0.76	0.79	0.72	0.85	3.72±1.73
Finish feeding my baby on one breast before switching on to other breast	0.73	0.67	0.65	0.85	3.75±1.77
Continue to breastfeed my baby for every feeding	0.82	0.88	0.73	0.85	3.84±1.67
Manage to keep up with my baby's breastfeeding demands	0.81	0.88	0.75	0.85	3.83±1.78
Tell when my baby is finished breastfeeding	0.77	0.80	0.71	0.85	3.97±1.70

SD: Standard deviation BSE-SF: Breastfeeding self-efficacy scale-short form

Ethics

The study was approved by the Institutional Ethics Committee of the medical college. Written and informed consent was taken from all the participants. Women detected with a lack of confidence in breastfeeding were provided health education and support to improve their breastfeeding technique, enhance awareness, and promote sensitization toward continuing with breastfeeding their infant child. The study was registered with the Clinical Trials Registry of India as an observational trial (CTRI/2018/12/016552).

Results

Sample characteristics

We conducted a cross-sectional survey with a 100% response rate. A total of 210 women were included in the study, all of whom were married and having an infant child at the time of the interview. The mean (SD) age of the participants was 25.95 (3.74) years. High school education had been completed by 116 (55.2%) participants, but only 14 (6.6%) were employed.

Internal consistency and reliability

Cronbach's alpha for the Hindi translation of the BSES-SF was 0.87. No increase of >0.10 in the Cronbach's alpha was obtained when items were removed one by one. Inspection of the item–total correlation showed a range of 0.26–0.75 with all except one correlation coefficient (item 3) <0.3 [Table 1]. The Cronbach's alpha of the BSES-SF questionnaire was also found to be comparable in both the self-administered (0.85) and the verbally administered (0.89) groups. The mean (±SD) BSES-SF score was 54.7 (±16.1) (95% confidence interval [CI] 52.6–56.9).

Factor analysis

Inspection of the correlation matrix showed that all except one item had at least one correlation coefficient >0.3. The overall Kaiser–Meyer–Olkin (KMO) measure was 0.90, classifications of "marvellous" according to Kaiser, while the individual KMO values for all the items were >0.8, which suggested retaining all the items of the BSES-SF. Bartlett's Test of Sphericity was statistically significant (Chi-square = 2132.9, df = 91, $P < 0.0005$), indicating that the data were likely factorizable.

PCA revealed two components that had eigenvalues >1, which explained 47.9% and 16.7% of the total variance, respectively, and the Scree test confirmed the two-component structure. Strong loadings of items relating to "technique of breastfeeding" (items 9, 10, 11, 12, 13, and 14) were present in component 1, and toward "maternal intrapersonal thoughts – maternal knowledge, attitudes, and beliefs towards breastfeeding" were present in component 2 (1, 2, 4, 5, 6, 7, and 8). Item 3 (breastfeed my baby without using formula as supplement) was not significantly loaded (<0.3) in either of the components [Table 2].

Construct validity

Breast-feeding self-efficacy and correlates: The median (IQR) BSES-SF score was 59 (47–66). The median BSES-SF score was higher in multiparas (61) compared to primiparas (57), but the difference was not statistically significant ($P = 0.11$). Mothers with postpartum depression had a significantly lower median BSES-SF score (54) compared to mothers without depression (61) ($P = 0.02$). However, the mothers reporting higher social support had significantly greater median BSES-SF scores (63) compared to the women having

Table 2: Rotated Structure Matrix for principal component analysis of a two-component (BSE-SF) questionnaire*

	Component 1	Component 2
BFSES12	0.915	0.209
BFSES13	0.910	0.216
BFSES14	0.873	0.205
BFSES10	0.855	0.234
BFSES9	0.817	0.271
BFSES11	0.783	0.234
BFSES1	0.174	0.842
BFSES5	0.200	0.825
BFSES4	0.144	0.819
BFSES2	0.159	0.790
BFSES8	0.221	0.788
BFSES6	0.216	0.707
BFSES7	0.238	0.341
BFSES3	0.138	0.293

*Varimax rotation with Kaiser normalization BSE-SF: Breastfeeding self-efficacy scale-short form

medium or low social support (57) (P = 0.001). There was no association found between the ages of the women, their socioeconomic status, and their education level with their confidence in breastfeeding [Table 3].

Concurrent validity

In this study, mothers having infants below 6 months of age were asked whether they planned to adhere to EBF practices until 6 months of age. Mothers with older infants (6–11 months) were asked if they had practiced EBF until their infant was 6 months old. Mothers who had exclusively breastfed their infant for 6 months or planned to continue EBF for 6 months registered significantly higher mean BSES-SF scores compared to the mothers who reported partial EBF or expressed lack of confidence in continuing EBF until their infant was 6 months of age ($P < 0.001$).

Discussion

The present study demonstrates that the Hindi version of the BSES-SF is a reliable instrument with Cronbach's alpha comparable to the original version.[10] Higher breastfeeding confidence reflected in higher BSES-SF scores was seen amongst multiparas, on the absence of depression, and mothers perceiving higher social support. Furthermore, the women planning to breastfeed partially had lower BSES-SF scores compared to those who understood the need to adhere to EBF for the stipulated period. The evidence suggests that the Hindi BSES-SF can be a useful tool for the assessment of breastfeeding confidence and early identification of women at risk of nonadherence to EBF in similar primary care settings in India.

The study findings show that Hindi BSES-SF had two components, in variance with previous studies suggesting only a one-factor solution.[10,12] No association was found between breastfeeding confidence and maternal age or literacy in our study. A large scale national cross-sectional study in India (NFHS-4 2015–2016) also found similar findings except in Southern India, where maternal education levels influenced

Table 3: Factors associated with breastfeeding self-efficacy in mothers of infants

Variable	Total (n=210)	BSES-SF score, median (IQR)	P
Age (in years)			
18-29	170 (81)	59.5 (48-66)	0.40
≥30	40 (19)	56 (43.2-66)	
Education (in years)			
<10	94 (44.8)	60 (45.7-67)	0.56
≥10	116 (55.2)	59 (47.2-69)	
SES			
Upper/middle	163 (77.6)	60 (47-67)	0.64
Lower	47 (22.4)	59 (50-64)	
Total number of children			
1	100 (47.6)	57 (42-65)	0.11
>1	110 (52.4)	61 (48-66)	
Age of the infant child			
≤6 months	124 (59)	59 (47-66)	0.97
>6 months	86 (41)	59 (47.7-66.2)	
Postpartum depression			
Present	61 (29)	54 (46-64)	0.02
Absent	149 (79)	61 (48-67)	
Social support			
Low/medium	127 (60.5)	57 (44-64)	0.001
High	83 (39.5)	63 (52-68)	
EBF awareness			
Present	187 (89)	60 (47-66)	0.18
Absent	23 (11)	57 (47-60)	
EBF adherence/plan to adhere			
Adherent	148 (70.5)	62 (52.2-67)	<0.001
Nonadherent	62 (29.5)	47.5 (33.7-59.2)	
Breastfeeding peer			
Present	31 (14.8)	60 (46-66)	0.97
Absent	179 (85.2)	59 (48-66)	
Women in household with previous breastfeeding experience			
Present	92 (43.8)	62 (50-67)	0.010
Absent	118 (56.2)	57 (44-65)	

EBF: Exclusive breastfeeding, SES: Self-efficacy scale, IQR: Interquartile range, BSES-SF: Breastfeeding Self-Efficacy Scale-Short Form

EBF practice.[20] Another study conducted in rural Mysore, also located in Southern India, reported younger women and those educated until primary or beyond had higher odds of practicing non-EBF.[21]

Multiparas with prior breastfeeding experience usually have more breastfeeding confidence with their current infant compared to primiparas. However, in the present study, this association was not statistically significant, unlike similar studies conducted amongst Australian[22] and Spanish mothers.[11] The NFHS-4 data also suggests that higher birth order is associated with an increased likelihood of adherence to EBF by Indian mothers.[20]

It is well-established that mothers lacking support from their partner are more likely to discontinue breastfeeding their

baby compared to other mothers.[23] Similarly, in our study, high social support (either from the husband, friend or family) translated into increased confidence in breastfeeding abilities of mothers. Moreover, mothers living in households where another woman with breastfeeding experience was present, also reported higher BSES-SF scores.

Women with postpartum depression are at higher risk of early breastfeeding cessation.[24,25] Our study also found mothers having postpartum depression had significantly lower self-efficacy for breastfeeding.

Recommendations

The BSES-SF should be translated into other major Indian languages and validated among breastfeeding women in diverse health settings across India. Future studies should also ascertain the effectiveness of the application of the BSES-SF in achieving higher rates and adequacy of EBF at the individual and community level.

Limitations

The study has certain limitations. First, it was conducted in a single site in Delhi that limits the external generalizability of the study findings, especially in settings where the women differ in their social, cultural, and educational characteristics. Moreover, the results cannot be generalized to those women who do not speak or understand the Hindi language. Second, the cross-sectional design precluded the identification of causal associations. Consequently, in the absence of prospective follow-up, the change in breastfeeding practices of the mothers over time could not be ascertained. Third, the quality and content of antenatal and postnatal care received by the mothers that are known to promote good breastfeeding practices were not evaluated by us.[19] Fourth, in this study, we did not assess test-retest reliability. Finally, the verbal administration of the questionnaires to the women may have led to a response bias, especially the social desirability bias, in which the participants over-reports good behavior expecting it to be more agreeable for the interviewer.

Conclusion

The Hindi version of the BSES-SF demonstrates good reliability, validity and can also explain previous and planned breastfeeding behavior in mothers of infants.

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Conflicts of interest

There are no conflicts of interest.

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