

ORIGINAL PAPER
ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ

Psychometric properties of the Greek version of the Breastfeeding Self-Efficacy Scale and correlation with depressive symptomatology

OBJECTIVE To conduct psychometric evaluation of the Greek version of the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) and assess correlation between the scores on BSES-SF and the Edinburgh Postnatal Depression Scale (EPDS). **METHOD** The study was conducted at the largest maternity hospital in Athens, Greece, where 173 eligible pregnant women completed the BSES-SF and the EPDS during their visit to the antenatal outpatient department and 3 days after delivery. The infant feeding method was determined 6 months postpartum. Exploratory factor analysis (EFA) was carried out to evaluate the construct validity of the BSES-EF scale and the internal consistency was analyzed with Cronbach's α . The predictive validity was assessed by comparison of the BSES-SF total score, using Student's t-test, between the women who reported exclusive breastfeeding 6 months postpartum and those that did not. Stepwise multiple linear regression analyses was performed to identify variables independently associated with the BSES-SF total score. P values reported were two-tailed, with statistical significance set at 0.05. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS), version 22.0. **RESULTS** The mean BSES-SF score before birth was 44.2 ± 11.1 and 3 days after birth it had increased significantly to 47.7 ± 12.1 ($p < 0.001$). Internal consistency reliability for the BSES-SF was acceptable, with Cronbach's α 0.93. Exploratory factor analysis indicated a one-factor structure, with the extracted factors explaining 52.7% of the total variance. The predictive validity of BSES-SF was significant for breastfeeding at 6 months. The BSES-SF score was significantly negatively correlated with the EPDS score before birth ($r = -0.23$, $p = 0.002$) and 3 days after the birth ($r = -0.22$, $p = 0.008$). Higher BSES-SF scores were recorded by women with higher educational level and those who had received breastfeeding support from the obstetrician. **CONCLUSIONS** The Greek version of the BSES-SF demonstrated satisfactory reliability and validity for measuring the breastfeeding self-efficacy of women. The international applicability of the BSES-SF is further evidenced by the results of this study.

According to World Health Organization (WHO) recommendations, by 2025 at least 50% of infants should exclusively breastfeed at 6 months.^{1,2} Although breastfeeding has undeniable benefits,³⁻⁵ breastfeeding rates in Greece are far lower than those recommended. As stated by the most recent National Survey of Prevalence and Determinants of Maternal Breastfeeding, the initiation rates of exclusive breastfeeding are 66% and follow a remarkable decline to 25% at the end of the 4th month, and to 0.7% at the end of the 6th month.⁶

A significant modifiable psychometric factor associated with increased breastfeeding, is breastfeeding self-efficacy (BSE).⁷⁻¹⁰ The concept of BSE is based on the self-efficacy theory developed by Bandura and is associated with a mother's perceived ability to breastfeed her baby, and expresses in advance the possible choice of the mother to breastfeed, how much effort she is going to make, the pattern of thoughts she is going to have, and her emotional status while facing problems with breastfeeding.^{7,8} The Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF)⁷

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2020, 37(5):656-662

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Ψυχομετρικές ιδιότητες
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αυτοαποτελεσματικότητας
στον μητρικό θηλασμό και
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συμπτωματολογία

Περίληψη στο τέλος του άρθρου

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was developed to measure a mother's confidence in her ability to breastfeed her new infant. This scale is considered a unique tool for identifying mothers likely to discontinue breastfeeding prematurely¹¹ and an effective measure for informing clinical practice.¹²

Depressive symptomatology is associated with decreased breastfeeding self-efficacy, and consequently with lower rates of breastfeeding.^{13,14} The assessment of depression is important, as antenatal depression is a significant risk factor for early breastfeeding cessation.¹⁵ The Edinburgh Postnatal Depression Scale (EPDS) is a reliable instrument for screening antenatal depression.¹⁶

As the BSE had not yet been studied among women in Greece, where the breastfeeding rates are declining, it was considered important to provide a validated Greek version of the BSES-SF, in order to identify, while in the maternity hospital, those women with low BSE, who are therefore at high risk of early breastfeeding cessation, in order to offer them intensive support.

The aim of the current study was to conduct psychometric testing of the Greek version of BSES-SF. A further target was to evaluate correlation between the scores on BSES-SF and EPDS, and other characteristics.

MATERIAL AND METHOD

This study was carried out in the Outpatient Maternity Department of a large tertiary maternity hospital in Athens, Greece. The participants were pregnant women who received routine care at the outpatient maternity department of the hospital, between May 2016 and December 2016. Women were included in the sample if they: (a) had a good understanding of the Greek language, (b) were aged above 18 years old, (c) were more than 32 weeks pregnant, and (d) were nulliparous. During the recruitment period, 220 eligible pregnant women were invited to participate and 173 finally agreed, providing informed consent (response rate 78.6%). The study was approved by the Research and Ethics Committee of the Greek Hospital (6/20-04-2016) and was conducted according to the Declaration of Helsinki.

A member of the research team contacted the eligible women, informed them about the aim and the protocol of the study and gave them an envelope containing the informed consent form, a baseline questionnaire that included sociodemographic questions, the BSES-SF and the EPDS. The participants first signed the informed consent form, then completed the questionnaires and returned them to the researcher. The follow-up questionnaires were administered to the participants 3 days after their delivery. The participants were also asked about the provision of support by health professionals while in hospital. The infant feeding method was determined at 6 months postpartum by telephone or via

a web-based survey platform. The definition of breastfeeding methods was that of Labbok and Krasovec.¹⁷

Instruments

Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF). The BSES-SF is an easy to use 14-item self-report instrument, each item scored on a 5-point Likert scale.¹² The reliability estimates of the BSES-SF, including Cronbach's α coefficient, inter-item correlations, and corrected item-total correlations, present high internal consistency.¹² The scale has been translated and psychometrically tested among women from diverse culture populations.^{11,12,18-26} BSES-SF has primarily been used with mothers in the immediate postpartum period, with some studies²⁶⁻²⁹ demonstrating the predictive validity of the scale in pregnancy.

Edinburgh Postnatal Depression Scale (EPDS). The EPDS is a 10-item self-report scale covering the common symptoms of depression antenatally and postnatally. The 10 symptoms of depression included are: inability to laugh and look forward to things with enjoyment, blaming oneself unnecessarily, being anxious or worried, being scared or panicky, inability to cope, difficulty in sleeping, feeling sad or miserable, crying, and having thoughts of harming oneself. Each item is scored on a 4-point scale (0 to 3), the total score ranging from 0 to 30, with higher scores indicating higher depressive symptoms.¹⁶

Translation procedure

Permission to use the BSES-SF was obtained from its developer, and a translated version of the questionnaire into Greek was provided to her. The translated and validated Greek version of EPDS was used.³⁰

Statistical analysis

Continuous variables are presented as mean and standard deviation (SD), mean \pm SD. Qualitative variables are presented with absolute and relative frequencies. Exploratory factor analysis (EFA) was carried out to evaluate construct validity and to disclose the underlying structures of the study questionnaire. Principal component analysis (PCA) was chosen as the extraction method using Varimax rotation. The cut-off point for factor loadings was 0.40 and for eigenvalues 1.00. The internal consistency was analyzed with Cronbach's α . Reliability of equal to or greater than 0.70 was considered acceptable. Predictive validity was assessed by comparison of the BSES-SF total score using Student's t-test between women who were breastfeeding exclusively at 6 months postpartum and those who were not. The BSES-SF total score at 3 days after delivery was compared with the initial score using paired t-tests. Multiple stepwise linear regression analysis was performed to identify variables independently associated with the BSES-SF total score (p for removal was set at 0.1 and p for entry was set at 0.05). Regression coefficients and standard error were computed from the results of the regression analyses. P values reported are

two-tailed, with the level of statistical significance set at 0.05. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS), version 22.0.

RESULTS

The study sample consisted of 173 women with a mean age of 32.6 ± 4.6 years. The demographic characteristics of the sample are presented in table 1. Most of the women in the sample were Greek (94.8%), and 91.3% were married or lived with partner. The educational level was high; 43.4% of the participants had a university degree and 26% had a postgraduate degree. The mean gestational week at completion of the first set of questionnaires was 35.8 ± 3.3 . Other information given was that 42.2% of the women had experienced problems during pregnancy and 35.9% smoked before pregnancy.

The descriptive statistics for the BSES-SF items, corrected item-total correlations and Cronbach's α if an item was deleted, are presented in table 2. Higher mean values

Table 1. Demographic and clinical characteristics of the study population of nulliparous pregnant women (n=173).

	n (%)
<i>Age, mean (SD)</i>	32.6 (4.6)
<i>BMI (before pregnancy), mean (SD)</i>	22.6 (4.1)
<i>Nationality</i>	
Greek	164 (94.8)
Other	9 (5.2)
<i>Educational level</i>	
Primary/middle/high school	53 (30.6)
University	75 (43.4)
Postgraduate studies	45 (26.0)
<i>Monthly family income (€)</i>	
<800	33 (22.9)
800–1500	60 (41.7)
>1500	51 (35.4)
<i>Family status</i>	
Married/living with partner	158 (91.3)
Single/divorced	15 (8.7)
<i>Relationship with partner/husband</i>	
Very bad/bad/moderate	12 (7.1)
Good	13 (7.7)
Very good	143 (85.1)
<i>Gestational week, mean (SD)</i>	35.8 (3.3)
<i>Medical problems during pregnancy</i>	65 (42.2)
<i>Smoking before pregnancy</i>	61 (35.9)

SD: Standard deviation, BMI: Body mass index

were found for the items 9 and 10. Internal consistency reliability for the BSES-SF was acceptable, with Cronbach's α 0.93. Exploratory factor analysis with principal component method and varimax rotation was conducted. Using the latent root criterion of retaining factors with eigenvalues greater than 1.0, a one-factor structure was identified, with the extracted factors explaining 52.7% of the total variance. All factor loadings were greater more than 0.40 (tab. 3).

Table 2. Inter-item correlation coefficients and internal consistency reliability of the Breast-feeding Self-Efficacy Scale-Short Form (BSES-SF) questionnaire.

Item	Mean	SD	Item-total correlation	Cronbach's α , if item deleted
1	2.6	1.0	0.64	0.92
2	3.2	1.1	0.71	0.92
3	3.2	1.2	0.69	0.92
4	3.0	1.0	0.76	0.92
5	3.2	1.0	0.82	0.92
6	2.7	1.1	0.70	0.92
7	3.4	1.1	0.67	0.92
8	3.1	1.3	0.48	0.93
9	3.6	1.2	0.67	0.92
10	3.6	1.1	0.58	0.92
11	2.9	1.1	0.57	0.92
12	3.3	1.1	0.75	0.92
13	3.3	1.1	0.82	0.92
14	3.2	1.0	0.49	0.93

SD: Standard deviation

Table 3. Results from exploratory factor analysis for Breast-feeding Self-Efficacy Scale-Short Form (BSES-SF).

	Factor loading
Item 1	0.70
Item 2	0.77
Item 3	0.74
Item 4	0.80
Item 5	0.85
Item 6	0.75
Item 7	0.72
Item 8	0.54
Item 9	0.71
Item 10	0.62
Item 11	0.63
Item 12	0.81
Item 13	0.86
Item 14	0.56

The mean BSES-SF score before birth was 44.2 ± 11.1 and 3 days after birth it had increased significantly to 47.7 ± 12.1 ($p < 0.001$) (fig. 1). Also, predictive validity of BSES-SF was significant for breastfeeding at six months. The mean score at 3 days after birth was significantly greater ($p < 0.001$) for women that had exclusive breastfeeding at six months (109/173, 63%) [mean (SD): 50.1 (11.9)] compared to those who had not [mean (SD): 39.5 (10.9)] (fig. 2).

Correlation with EPDS and other characteristics

BSES-SF was significantly negatively correlated with EPDS before birth ($r = -0.23$, $p = 0.002$) and 3 days after the

birth ($r = -0.22$, $p = 0.008$), indicating that higher levels of depression are associated with lower levels of self-efficacy.

Before birth, the only factor found in a regression model to be associated with BSES-SF was the EPDS score. Step-wise multiple regression analysis showed that 3 days after birth, the educational level, breastfeeding support by the obstetrician and the EPDS score were independently associated with the BSES-SF score. Specifically, higher scores were recorded by women of higher educational level and those who had been given breastfeeding support by the obstetrician. The score on BSES-SF was found to decrease as the score on the EPDS increases (tab. 4).

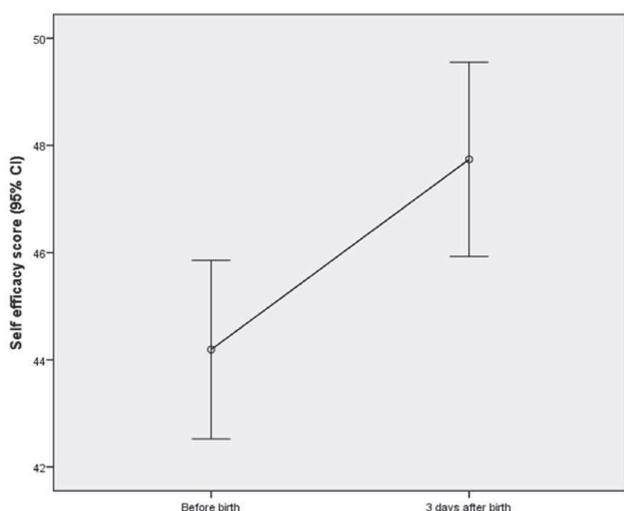


Figure 1. Change in the score on Breast-feeding Self-Efficacy Scale-Short Form (BSES-SF) of nulliparous pregnant women from before birth to 3 days after birth (n=173).

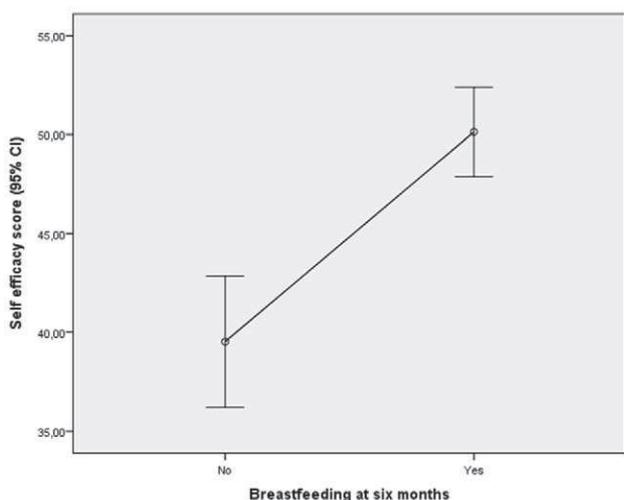


Figure 2. Mean self-efficacy score for women that had exclusive breastfeeding at six months and those who had not.

DISCUSSION

Questionnaires used in epidemiological studies must have high validity and reliability.³⁷ The Greek version of the BSES-SF assessed here showed sound psychometric properties when administered during the third trimester of pregnancy. The internal consistency of the Greek version of the scale was acceptable, with a Cronbach’s α of 0.93, similar to the 0.94 reported in the original version¹² and comparable with that reported by other international studies.^{11,18–22,24–26} The results also provided evidence of construct and predictive validity. The relationship found here between breastfeeding self-efficacy and breastfeeding outcomes is comparable to that reported by the developer of the tool⁸ and is encouraging for clinical practice suggesting that the Greek version of BSES is a valid instrument for identifying high-risk Greek mothers.

Our findings demonstrated, in addition, that pregnant women with depressive symptomatology record lower

Table 4. Factors associated with Breast-feeding Self-Efficacy Scale-Short Form (BSES-SF) score 3 days post-partum (n=173).

	b	SE	p
<i>Educational level</i>			
Primary/middle/high school	Reference		
University/postgraduate studies	5.79	2.10	0.007
<i>Did you have breastfeeding support by your obstetrician during your hospital stay?</i>			
No	Reference		
Yes	5.82	1.81	0.007
<i>Depression score</i>	-0.51	0.19	0.011

Multiple linear regression with dependent variable the BSES-SF score 3 days after the birth
b: Regression coefficient, SE: Standard error

scores for breast-feeding self-efficacy between the 3rd and 4th day post-partum, as found in previous studies.^{12,20,25,26,32} The only demographic characteristic showing significant correlation with lower BSEF-SF scores was the low educational level, differing from the findings of a previous study.²⁶

The support provided by healthcare professionals is also important for breast-feeding.³³ A new finding in this study is the relationship found between breast-feeding support by the obstetrician and higher breast-feeding self-efficacy levels. Breast-feeding self-efficacy expectancy is reported to be influenced by verbal persuasion (e.g., encouragement from influential others such as health professionals), among other main sources of information (e.g., performance accomplishments, vicarious experiences, physiological responses).⁷

Our study was not without limitations; the participants were recruited in only one public maternity hospital in

the city of Athens, thus limiting the generalization of the findings. This hospital, however serves pregnant women not only from the area of Athens but also from rural areas of Greece, with diverse cultural background and economic status, thus increasing the representativeness of the population.

In conclusion, the Greek version of BSES-SF is a valid and reliable instrument for the identification of Greek mothers with low breast-feeding self-efficacy. It should be included in routine maternal care in order to increase breast-feeding rates. The international applicability of the BSES-SF is further evidenced by the results of the present study.

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ΠΕΡΙΛΗΨΗ

Ψυχομετρικές ιδιότητες της ελληνικής κλίμακας αυτοαποτελεσματικότητας στον μητρικό θηλασμό και συσχέτισή της με καταθλιπτική συμπτωματολογία

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ΣΚΟΠΟΣ Η διερεύνηση των ψυχομετρικών ιδιοτήτων της ελληνικής κλίμακας αυτοαποτελεσματικότητας στον μητρικό θηλασμό (BSES-SF). Επί πλέον, η αξιολόγηση οποιασδήποτε συσχέτισης μεταξύ της BSES-SF και της Edinburgh Postnatal Depression Scale (EPDS) καθώς και άλλων παραγόντων. **ΥΛΙΚΟ-ΜΕΘΟΔΟΣ** Η παρούσα μελέτη εκπονήθηκε στο μεγαλύτερο μαιευτικό νοσοκομείο της Αθήνας. Κατά τη διάρκεια συλλογής των δεδομένων, 173 έγκυες που πληρούσαν τα κριτήρια εισδοχής στη μελέτη συμπλήρωσαν τις κλίμακες BSES-SF και EPDS κατά τη διάρκεια της παρακολούθησής τους στα εξωτερικά μαιευτικά ιατρεία του νοσοκομείου και 3 ημέρες μετά τον τοκετό τους. Επίσης, προσδιορίστηκε τηλεφωνικά ο τρόπος σίτισης του βρέφους στους 6 μήνες μετά τον τοκετό. Διεξήχθη διερευνητική παραγοντική ανάλυση προκειμένου να αξιολογηθεί η δομική εγκυρότητα του ερωτηματολογίου. Η εσωτερική συνοχή ελέγχθηκε με τη χρήση του συντελεστή Cronbach's α. Η προγνωστική ικανότητα αξιολογήθηκε με τη συσχέτιση της συνολικής βαθμολογίας της κλίμακας BSES-SF, χρησιμοποιώντας το Student's t-test, μεταξύ των μητέρων που θήλασαν αποκλειστικά για 6 μήνες και εκείνων που δεν θήλασαν αποκλειστικά για 6 μήνες. Η ανάλυση γραμμικής παλινδρόμησης με τη διαδικασία διαδοχικής ένταξης/αφαίρεσης εφαρμόστηκε για την εύρεση ανεξάρτητων παραγόντων που σχετίζονται με τη συνολική βαθμολογία της κλίμακας BSES-SF. Τα επίπεδα σημαντικότητας ήταν αμφίπλευρα και η στατιστική σημαντικότητα τέθηκε στο 0,05. Για την ανάλυση χρησιμοποιήθηκε το στατιστικό πρόγραμμα Statistical Package for Social Sciences (SPSS), έκδοση 22.0. **ΑΠΟΤΕΛΕΣΜΑΤΑ** Η μέση βαθμολογία BSES-SF πριν από τη γέννηση ήταν 44,2 (SD=11,1) και 3 ημέρες μετά τη γέννηση αυξήθηκε σημαντικά ($p < 0,001$) και ανήλθε στο 47,7 (SD=12,1). Ο συντελεστής αξιοπιστίας α του Cronbach ήταν 0,93, άρα υπήρξε αποδεκτή αξιοπιστία. Η διερευνητική παραγοντική ανάλυση έδειξε δομή ενός παράγοντα, με τους συντελεστές εξαγωγής να εξηγούν το 52,7% της συνολικής διακύμανσης. Επίσης, η προγνωστική ικανότητα του BSES-SF ήταν σημαντική για τον θηλασμό στους 6 μήνες. Το BSES-SF συσχέτιστηκε σημαντικά και αρνητικά με το EPDS πριν από τη γέννηση ($r = -0,23$, $p = 0,002$) και τρεις ημέρες μετά τη γέννηση ($r = -0,22$, $p = 0,008$). Επιπρόσθετα, παρατηρήθηκαν μεγαλύτερες βαθμολογίες BSES-SF σε γυναί-

κες με υψηλότερο μορφωτικό επίπεδο και σε εκείνες στις οποίες είχε δοθεί υποστήριξη για τον θηλασμό από τον μαιευτήρα. **ΣΥΜΠΕΡΑΣΜΑΤΑ** Η ελληνική έκδοση του BSES-SF έδειξε ικανοποιητική αξιοπιστία και εγκυρότητα για τη μέτρηση της αυτοαποτελεσματικότητας των γυναικών στον μητρικό θηλασμό. Επίσης, η διεθνής εφαρμογή του BSES-SF επιβεβαιώνεται περαιτέρω από τα αποτελέσματα της παρούσας μελέτης.

Λέξεις ευρητηρίου: Αυτοαποτελεσματικότητα, Ελλάδα, Μητρικός θηλασμός, Ψυχομετρικές ιδιότητες

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