

ORIGINAL ARTICLE / ОРИГИНАЛНИ РАД

Validation of the Serbian version of the Breastfeeding self-efficacy scale-short form

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SUMMARY

Introduction/Objective Breastfeeding prevalence in Serbia remains low compared with global estimates. Breastfeeding self-efficacy scale-short form is widely recognized as a key, modifiable determinant of breastfeeding outcomes, with growing evidence that improving it is associated with higher breastfeeding rates. This study aimed to translate and culturally adapt the scale for use in Serbian language, establish its psychometric adequacy within a population of breastfeeding mothers throughout the first postpartum year, and examine differences in scores by selected sociodemographic and obstetric characteristics.

Methods A total of 70 breastfeeding mothers who delivered at the Clinic for Gynecology and Obstetrics, University Clinical Center of Vojvodina participated in this cross-sectional study. The validated Croatian version served as the basis for the adaptation process, which followed standardized cross-cultural procedures. Internal consistency was evaluated using item-total statistics and Cronbach's α . Group differences were compared using the Mann-Whitney U test.

Results The participants' mean age was 32.19 years (SD = 5.17). The instrument showed strong internal consistency (Cronbach's α = 0.81; 95% CI: 0.73–0.87). Corrected item-total correlation coefficients ranged from 0.13 to 0.73. The mean score was 54.11 ± 10.81 , indicating high breastfeeding self-efficacy. Lower scores were observed among mothers with cesarean delivery, shorter intended breastfeeding duration, early cessation, lack of early initiation, and insufficient breastfeeding support.

Conclusion The Serbian version of the scale exhibited good internal consistency and preliminary validity as an instrument for assessing breastfeeding self-efficacy.

Keywords: breast feeding; self-efficacy; surveys and questionnaires; cross-sectional studies; mothers; postpartum period

INTRODUCTION

In line with World Health Organization guidance, infants are recommended to receive only breast milk for the first six months, after which complementary foods are introduced while breastfeeding continues for up to two years [1]. A substantial body of clinical research demonstrates that breastfeeding reduces the risk of both short-term and long-term adverse health outcomes in infants. Children who were breastfed for longer durations display lower incidence of infectious illnesses and reduced mortality [2]. Breastfeeding confers numerous health benefits, including a decreased risk of type 1 diabetes, asthma, respiratory illnesses, gastrointestinal infections and celiac disease, and sudden infant death syndrome in infants [3]. The composition of human breast milk dynamically adapts to the infant's changing nutritional and developmental needs during

the early stages of life. Beyond providing essential nutrients, it also contributes to non-nutritive functions through a wide range of bioactive components, including hormones, antioxidants, secretory immunoglobulin A (IgA), lactoferrin, and numerous other protective substances. Furthermore, the protein profile of breast milk is specifically suited to the physiological immaturity of neonatal ureagenesis and renal excretory function, while its low antigenicity and high biological compatibility support the establishment and maintenance of immune tolerance in the infant [4]. Moreover, ensuring an optimal balance of essential nutrients and micronutrients in human milk is fundamental for subsequent skeletal growth and development during infancy [5]. In mothers, breastfeeding has been associated with a reduced risk of cardiometabolic disease, ovarian cancer, and type 2 diabetes [6]. Human milk is widely regarded as the optimal form of infant

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feeding, meeting both the physical and psychological needs of newborns during the early months of life [7, 8]. Despite well-established benefits and existing recommendations, breastfeeding initiation and continuation rates remain suboptimal among mothers [9]. Multiple factors are associated with early cessation of breastfeeding, such as maternal age, educational attainment, and psychosocial status. Additional influences on successful and sustained exclusive breastfeeding include maternal knowledge and attitudes, the level of support received, socioeconomic conditions, and breastfeeding self-efficacy [10]. UNICEF Belgrade data indicate that early initiation of breastfeeding occurs in only 8% of newborns in Serbia, with 6% in urban areas and 10% in non-urban areas. Exclusive breastfeeding is reported in 24% of infants aged 0–5 months nationwide [11]. Maternal breastfeeding self-efficacy is recognized as a key influencing factor of initiation, duration, and exclusiveness of breastfeeding [6]. Breastfeeding self-efficacy scale (BSES), developed by Dennis and Faux (1999), was created to measure maternal sense of competence in breastfeeding. Dennis (2003) later revised the instrument, reducing it from 33 to 14 items and renaming it the BSES-short form (BSES-SF) [12]. Self-efficacy refers to the women's perceived capability to breastfeed successfully [13, 14]. The BSES-SF allows healthcare professionals to identify women at higher risk of not initiating or sustaining breastfeeding and to pinpoint specific areas of reduced confidence, thereby facilitating the development of individualized breastfeeding promotion strategies [11]. Several factors contribute to breastfeeding self-efficacy, such as prior personal experience, exposure to breastfeeding practices, maternal well-being, and verbal support. Efforts to improve self-efficacy are important because they are associated with more favorable breastfeeding outcomes and better infant health [15]. The BSES-SF has demonstrated strong psychometric properties and has been translated into several languages, but a Serbian version is still lacking. For this reason, validating a Serbian version and using it within efforts to improve breastfeeding rates is an important step. Grounded in Bandura's social cognitive theory, the BSES-SF measures maternal confidence in breastfeeding ability. This psychometric assessment supports the reliability of the Serbian version of the BSES-SF and quantifies maternal breastfeeding self-efficacy throughout the postpartum. The absence of a clear link between mothers' demographic characteristics and overall scale score suggests that the BSES-SF captures a distinct construct, pointing to a modifiable factor that may help identify mothers at higher risk [16]. Beyond measurement, the BSES-SF can indicate which mothers may need more support during breastfeeding. Lower scores, in this context, are usually associated with a greater need for intervention. Accordingly, BSES-SF may be used as a tool to reveal specific support needs among mothers and suggest lactation support programs. Based on BSES-SF results, specific strategies to enhance maternal confidence can be implemented.

METHODS

This cross-sectional study included breastfeeding mothers who had delivered at a tertiary care hospital in Novi Sad in 2025. Women could take part if they were 18 years or older, had delivered after 37 gestational weeks, spoke Serbian, were able to give informed consent, and had reached at least six months postpartum. We included only mothers whose postpartum course did not involve intensive care, since early contact between mother and infant is considered important for establishing breastfeeding. Those with medical conditions or ongoing therapies that made breastfeeding unfeasible were not included. Participants were informed of the study objectives before enrollment, and written informed consent was then obtained. Participants then completed the study questionnaire either in person or online.

Of the 100 women invited to take part, 22 declined. Among those who responded, eight were later excluded for incomplete questionnaires, leaving a final sample of 70 participants. Sample size was estimated using general guidance for psychometric validation, which typically recommends including several participants per item. For a 14-item questionnaire, this resulted in an expected range of 70 to 140 participants. A larger sample was preferred in order to strengthen the analysis. The BSES-SF is a unidimensional instrument comprising 14 items. All items are positively worded and introduced by the phrase "I can always," and are rated on a five-point Likert-type scale covering the range from 1 ("not at all confident") to 5 ("always confident"). Total scores are based on the sum of item responses, ranging from 14 to 70, with higher scores indicating greater breastfeeding self-efficacy. In addition to the BSES-SF, data on demographic characteristics (maternal age, education level, employment, and marital status) were collected. The questionnaire also involved information about nursing practices and obstetric and neonatal characteristics, such as gestational age, parity, mode of delivery, prior breastfeeding experience, and timing of lactation initiation.

The Serbian version of the BSES-SF was developed through a standardized cross-cultural adaptation process based on the previously validated Croatian version. Permission for translation and use of the instrument was obtained from the author of the Croatian version. The translation into Serbian was carried out by two independent certified court interpreters, with the aim of maintaining conceptual equivalence with the original version. The draft was reviewed by healthcare professionals working in nursing and pediatric care to suggest changes to improve the wording and structure. It was then revised further with the original author to ensure it remained consistent with the original instrument and to resolve any remaining issues. The final version was established after repeated comparison with the original scale, with particular attention to both conceptual clarity and linguistic suitability for use in the Serbian setting.

A pilot study was conducted with 10 participants who satisfied the study eligibility criteria, to evaluate how

Table 1. Results of breastfeeding self-efficacy scale-short form according to demographics

Variable	Category	Mean $\pm$ SD	Test (statistic)	p
Parity	Primipara	53.13 $\pm$ 10.99	532.5	0.422 ^a
	Multipara	54.85 $\pm$ 10.75		
Marital status	Married	54.28 $\pm$ 11.02	225.5	0.389 ^a
	Not married	53 $\pm$ 9.80		
Education level	Primary school	58 $\pm$ 7	2.64	0.619 ^b
	Secondary school	52.22 $\pm$ 11.06		
	College	47.33 $\pm$ 21.94		
	University degree	55.96 $\pm$ 9.33		
	Master/magister/PhD	55.31 $\pm$ 10.97		

SD – standard deviation;

^aMann–Whitney U test;^bKruskal–Wallis test**Table 2.** Results of breastfeeding self-efficacy scale-short form according to obstetric characteristics

Variable	Category	Mean $\pm$ SD	Test (statistic)	p
Number of pregnancies	1	53.70 $\pm$ 10.31	4.05	0.256 ^b
	2	54.81 $\pm$ 11.45		
	3	56.92 $\pm$ 8.27		
	4	43 $\pm$ 13.04		
	> 4	59 $\pm$ 5.66		
Infant sex	Male	51.68 $\pm$ 12.47	496	0.172 ^a
	Female	56.42 $\pm$ 8.52		
Type of delivery	Cesarean section	49.35 $\pm$ 14.02	353.5	0.040 ^a
	Vaginal delivery	56.02 $\pm$ 8.68		
Breastfeeding duration	Up to six months	37.50 $\pm$ 19.60	66.5	0.040 ^a
	More than six months	55.12 $\pm$ 9.40		
Breastfeeding cessation during pregnancy	< 6 months	45.88 $\pm$ 12.28	199	< 0.001 ^a
	> 6 months	58.98 $\pm$ 5.89		
Breastfeeding initiated in maternity ward	Yes	57.81 $\pm$ 8.35	300.5	0.001 ^a
	No	48.57 $\pm$ 11.82		
Adequate breastfeeding support	Yes	57.47 $\pm$ 8.99	407	0.018 ^a
	No	51.29 $\pm$ 11.50		
Community midwife visit	Yes	53.53 $\pm$ 10.96	558	0.555 ^a
	No	54.61 $\pm$ 10.81		

SD – standard deviation;

^aMann–Whitney U test;^bKruskal–Wallis test

groups were performed using the Kruskal–Wallis test. All statistical tests were two-tailed, and a $p < 0.05$ was considered statistically significant.

Ethics: The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the University Clinical Center of Vojvodina (Decision No. 00-44/22.).

RESULTS

The mean participant age was 32.19 years ($SD = 5.17$). The instrument showed strong internal consistency and reliability ($\alpha = 0.81$; 95% CI: 0.73–0.87; $p < 0.001$). Corrected item–total correlation coefficients varied from 0.133 to 0.726 (Table 1).

The exclusion of individual items did not result in any substantial improvement in the scale's internal consistency. Overall, participants reported high levels of breastfeeding self-efficacy, reflected by a mean BSES-SF score of 54.11 ($SD = 10.81$), indicating considerable confidence in their breastfeeding abilities. No significant differences in BSES-SF scores were observed across obstetric variables (Table 2). However, significantly lower self-efficacy scores were identified among mothers who underwent cesarean delivery, intended to breastfeed for less than six months, ceased breastfeeding before six months postpartum, did not initiate breastfeeding during their maternity hospital stay, or reported insufficient breastfeeding support (Table 3, Figure 1).

clear and easy to understand the translated instrument was. Participants were asked to identify any difficulties in understanding the items; all reported that the questions were clear and easy to understand. Based on the outcomes, the final Serbian version of the BSES-SF was established.

Statistical analysis was performed using JASP, Version 0.97.1 (University of Amsterdam, Amsterdam, The Netherlands). Continuous variables were presented as mean $\pm$ standard deviation (SD), while categorical variables were expressed as frequencies and percentages. The internal consistency of the BSES-SF was assessed using Cronbach's α coefficient and corresponding 95% confidence intervals (CIs), with values greater than 0.70 considered acceptable. Corrected item–total correlations were calculated for each item, and the effect of item removal on overall reliability was evaluated. Differences between two independent groups were analyzed using the Mann–Whitney U test, while comparisons across more than two

DISCUSSION

The study evaluated psychometric characteristics of the Serbian version of BSES-SF, a globally accepted and widely used tool. So far, no such study has been conducted in Serbia. Previous studies have shown that BSES-SF is associated with relevant sociodemographic and obstetric characteristics. The scale showed strong internal consistency, with a Cronbach's α of 0.81, which falls within the range reported in earlier validation studies (0.74–0.97) [7, 9, 12, 16–19]. Mothers confirmed high level of self-efficacy, with a mean total score of 54.11 ($SD = 10.81$). Similar findings have been reported in other populations, with mean scores ranging from 34.39 to 63.31. The present result is closer to the upper range of reported values, suggesting relatively high breastfeeding confidence in this sample, while lower scores in some studies may be explained by differences in population characteristics and postpartum conditions.

Table 3. Breastfeeding self-efficacy scale-short form item-total correlations and reliability analysis

Questions	Corrected item-total correlation	Cronbach's α if item deleted
I can always determine that my baby is getting enough milk	0.325	0.808
I can always successfully cope with breastfeeding like I have with other challenging tasks	0.572	0.787
I can always breastfeed my baby without using formula as a supplement	0.360	0.807
I can always ensure that my baby is properly latched on for the whole feeding	0.528	0.791
I can always manage the breastfeeding situation to my satisfaction	0.565	0.789
I can always manage to breastfeed even if my baby is crying	0.173	0.814
I can always keep wanting to breastfeed	0.525	0.797
I can always comfortably breastfeed with my family members present	0.279	0.813
I can always be satisfied with my breastfeeding experience	0.726	0.777
I can always deal with the fact that breastfeeding can be time-consuming	0.212	0.814
I can always finish feeding my baby on one breast before switching to the other breast	0.133	0.824
I can always continue to breastfeed my baby for every feeding	0.687	0.780
I can always manage to keep up with my baby's breastfeeding demands	0.676	0.781
I can always tell when my baby is finished breastfeeding	0.506	0.794

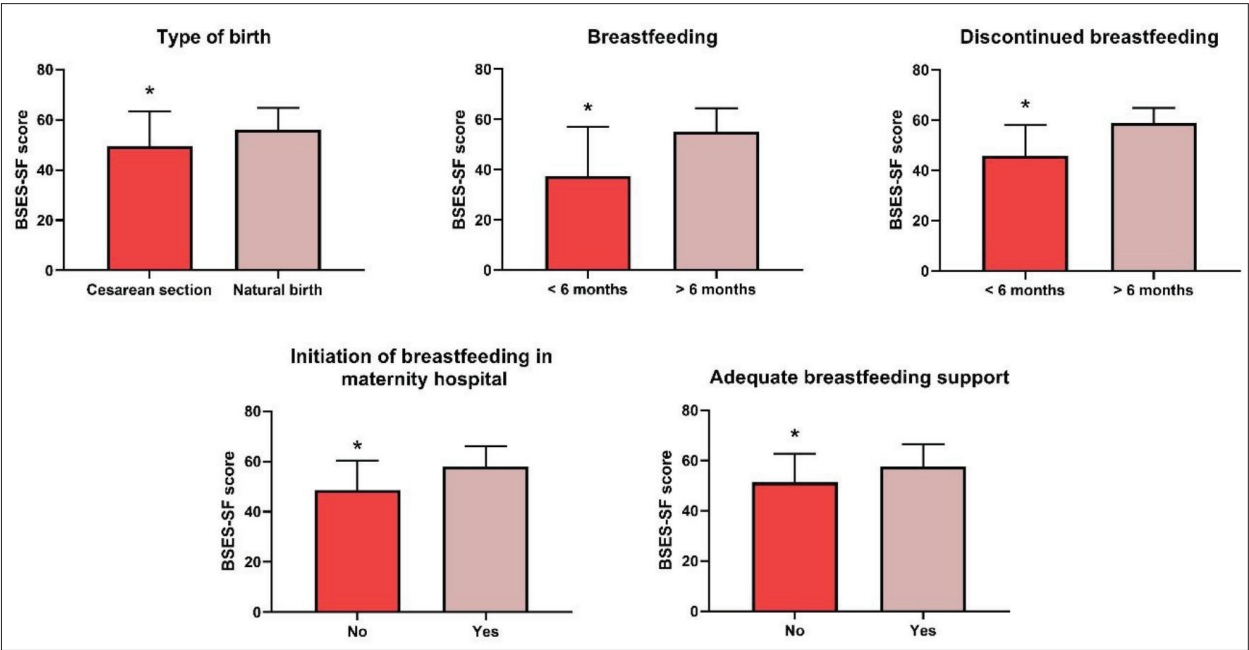


Figure 1. Breastfeeding self-efficacy scale-short form score according to obstetric characteristics

As in other studies, there were no significant associations between total score and the mother's and infant's age [20]. Respondents who completed only primary school had the highest scores. Among respondents with higher educational attainment, those with a university education scored higher than those with secondary education, which is in line with Amini et al. [20]. Similar results were found by Mazúchová et al. [12] where better scores were noted in women with lower educational attainment, in comparison with women with tertiary-level education. Rarely, in some studies there were no significant differences in relation to educational level [18, 21]. On the other hand, Gizaw et al. [22] showed better attitude for breastfeeding associated with educational level, particularly among mothers with secondary education or higher. Respondents who are married (or living with a partner) had greater success in breastfeeding compared to single mothers. The multiparous had a better score compared to the respondents with only one

child, even though the questions related to the experience with the first child [7, 12]. There are studies that show even that multiparous mothers who had previously breastfed for more than six months scored significantly better than those with shorter nursing experience [17, 18, 22]. The number of pregnancies correlated positively with the outcome of the survey, regardless of the number of live births. A total of 83% of respondents delivered vaginally and had higher scores than those who underwent cesarean section, consistent with previous findings [9, 15]. Many evidence indicates that mothers who deliver by cesarean section are less likely to intend to breastfeed, which may be related to the absence of early breastfeeding support practices such as lactation initiation in the first hour after birth and skin-to-skin contact [7]. This is in line with studies suggesting that cesarean delivery may be associated with short-term psychological effects. All respondents reported during pregnancy that they intended to breastfeed for more than

six months. Among them, 55% achieved this goal and had higher scores, suggesting that greater breastfeeding self-efficacy may be associated with both the intention to breastfeed and its successful continuation. These findings are in line with previous studies highlighting self-efficacy as an important factor in breastfeeding duration. A woman's breastfeeding perception is influenced by multiple factors including prior experience, breastfeeding intention, commitment, and emotional well-being [21]. A total of 70% of participants established lactation during their stay in the maternity ward and achieved higher scores, regardless of delivery method. About 50% of the participants believe that the support in the maternity hospital is adequate in terms of establishing lactation, they also had better score values than the respondents who were not satisfied with the support. Greater social support from spouses, family members, nurses, and midwives during breastfeeding period has been associated with higher overall scores [9, 21].

In Serbia, as part of primary health care, there is an outpatient service that automatically assigns a nurse to the mother in the first days after leaving the maternity hospital. Yet, almost 40% of women state that they hired private breastfeeding counselors to improve their breastfeeding experience. Recent studies suggest that postnatal breastfeeding support interventions appear more effective than antenatal interventions in improving breastfeeding self-efficacy, which coincides with the impressions of the mothers who participated in our study.

In recent World Health Organization and UNICEF communications, particular emphasis has been placed on the development of sustainable breastfeeding support systems, recognizing that breastfeeding success depends not only on maternal factors but also on family, community, workplace, and health-care support. These factors are also known determinants of breastfeeding self-efficacy. Also, new guidelines from the Association of Anesthetists from March 2026 are suggesting that the breastfeeding status of women scheduled for procedures requiring anesthesia or sedation should be assessed during preoperative planning. Available data suggest that most perioperative drugs are excreted into human milk in minimal concentrations, with no demonstrated clinically significant adverse effects on nursing infants. Accordingly, interruption of breastfeeding or discarding expressed milk after anesthesia is not routinely recommended. Instead, breastfeeding can usually be continued once the mother is awake and clinically stable [23].

Recent International Council for Harmonization recommendations advocate for the appropriate inclusion of pregnant and breastfeeding individuals in clinical trials in

order to generate evidence-based data on the safety and efficacy of medicinal products during pregnancy and lactation. This approach may improve clinical decision-making and reduce unnecessary interruption of breastfeeding [24].

According to a clinical report published by the American Academy of Pediatrics in January 2026, feeding with human milk is associated with improved clinical outcomes among very low birth weight infants and has been correlated with a lower risk of several major neonatal morbidities, such as necrotizing enterocolitis, late-onset sepsis, bronchopulmonary dysplasia, retinopathy of prematurity, and neurodevelopmental deficits. Therefore, healthcare professionals should ensure that parents are adequately informed about the significant role of human milk in promoting infant health and provide continuous breastfeeding support during the entire neonatal intensive care stay to help families meet their lactation goals [25].

CONCLUSION

In this study, the Serbian version of the BSES-SF demonstrated good reliability and validity for assessing breastfeeding self-efficacy among Serbian-speaking mothers. These findings are similar to those reported in earlier validation studies.

Further research is needed to examine the scale in mothers with medical conditions that may affect breastfeeding. It would also be useful to include more heterogeneous populations to confirm these findings and to better understand how breastfeeding self-efficacy can be improved.

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A preliminary version of this study was presented as a poster at the International Society of Gynecological Endocrinology World Congress held in Rome, Italy, March 4–6 2026, under a different title and with partial results. The current manuscript presents the complete analysis. An abstract was included in the Congress Book of Abstracts (Supplement 1/2026), which is not classified as a journal of national significance and does not have an Impact Factor.

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Валидација српске верзије кратке форме скале самоефикасности у дојењу

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САЖЕТАК

Увод/Циљ Преваленција дојења у Србији и даље је ниска у поређењу са глобалним проценама. Самоефикасност у дојењу представља важан и променљив фактор који утиче на исход дојења, при чему све више студија указује на то да њено унапређење доприноси квалитету и трајању дојења. Циљ ове студије био је да се кратка форма скале самоефикасности у дојењу преведе и културолошки прилагоди српском језику, да се процене њене психометријске карактеристике код дојиља до 12 месеци након порођаја, као и да се испитају разлике у скоровима у односу на релевантне социодемографске и опстетичке карактеристике.

Метод Ова студија пресека обухватила је 70 дојиља порођених на Клиници за гинекологију и акушерство Универзитетског клиничког центра Војводине. Скала је прилагођена на основу претходно валидиране хрватске верзије, уз примену стандардизованих процедура културне адаптације. Унутрашња конзистентност је процењена помоћу статистике

ставка-укупно (*item-total*) и Кронбахове α . Разлике између група анализиране су применом Ман-Витнијевог *U*-теста.

Резултати Просечна старост испитаница износила је $32,19 \pm 5,17$ година. Скала је показала добру унутрашњу конзистентност (Кронбахова $\alpha = 0,81$; 95% CI: 0,73–0,87). Кориговане корелације између ставки и укупног скорa кретале су се од 0,13 до 0,73. Просечан скор износио је $54,11 \pm 10,81$, што указује на висок ниво самоефикасности у дојењу. Нижи скорови забележени су код мајки порођених царским резом, са краћим планираним трајањем дојења, раном обуставом дојења, касним започињањем дојења и недовољном подршком за дојење.

Закључак Српска верзија скале показала је задовољавајућу унутрашњу конзистентност и прелиминарну валидност за мерење самоефикасности у дојењу.

Кључне речи: дојење; самоефикасност; упитници; студије пресека; мајке; постпартални период