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Breastfeeding Self-efficacy and Related Socio-demographic, Perinatal and Psychological Factors: a Cross-sectional Study Among Postpartum Greek Women

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ABSTRACT

Background: Studies have shown that breastfeeding self-efficacy constitutes a determinant used to forecast breastfeeding behaviours. **Objective:** The aim of this study was to examine the factors associated to breastfeeding self-efficacy and identify its predictors among Greek women in their immediate postpartum period. **Methods:** A cross-sectional study was conducted at the General Hospital of Volos, Greece. A convenience sample of 120 postpartum women who gave birth at the hospital and met all the inclusion criteria were invited to participate; 100 responded. Questionnaires on socio-demographic, perinatal and breastfeeding-related characteristics, the Edinburgh Postnatal Depression Scale, and the Breastfeeding Self-Efficiency Scale were completed. Univariate and multivariate analyses were performed with the use of the linear regression model. **Results:** Women reported a rather good level of breastfeeding self-efficacy (mean = 3.65; *SD* = 0.85) in the early postpartum period. 52% of women carried out exclusive breastfeeding in the hospital. The prevalence of postnatal depression was 25%. The best-fit regression analysis revealed four predictors (timing of the mother's decision to breastfeed, infant's feeding pattern, previous breastfeeding experience, levels of postnatal depression) explaining 44.7% of the variance in breastfeeding self-efficacy. **Conclusion:** Acknowledging the determinants which affect breastfeeding self-efficacy of women in the immediate postpartum period is a necessary condition in designing targeted intervention services.
Keywords: Breastfeeding self-efficacy, demographic factors, perinatal factors, social support, postnatal depression.

1. BACKGROUND

Breastfeeding is a major public healthcare issue. The effects and advantages of breastfeeding, when it comes to physical and mental health of the mother, the child and their relationship, have been studied at length. Research confirms that breastfeeding protects mothers from ovarian cancer (1) and breast cancer (2), reduces the probability of disease, and helps the retrogression of the uterus and reduces blood loss (3). As far as the infant is concerned, breast milk works as a shield against infections (4); it also provides all the healthy nutrients for its fast growth, and all the bioactive factors which reduce the probability of inflammation (4). Studies show that breastfeeding reduces the mortality and morbidity rates in infants (5), while breastfeeding infants show reduced frequency of gastrointestinal and respiratory infections (6).

Breastfeeding makes a considerable difference when it comes to the protection of adults against chronic diseases like obesity and type2 diabetes (7), and contributes to raising the intelligence of infants (8). Equally important is that breastfeeding leads to saving resources on a household and national level, while it also contributes in environmental protection (9). In addition, it constitutes the first significant interaction between the mother and her newborn, thus contributing to the establishment of a healthy relationship between them (10) and to the child's mental health (11).

Bandura defines self-efficacy as the "belief of the individual in his/her ability to deal with facts

which affect his/her life". The emergence and increase or decrease of self-efficacy is related to one of the following factors, or their combination: i) enactive mastery experience; ii) vicarious experience; iii) social verbal persuasion (influence); and iv) mental and physical condition (status) of the person (12). In the case of breastfeeding, enactive mastery experience is seen as a woman carrying out the act of breastfeeding, vicarious experience is seen as a woman watching other women breastfeed, the stances of the partner and the health professionals are related to social influence, while the feelings of happiness, fear and pain are connected to the mother's physical and emotional condition.

Breastfeeding self-efficacy is defined as the woman's trust in her ability to breastfeed. It has been established as a core component of breastfeeding research and is considered as a salient variable in the initiation and duration of breastfeeding (13, 14).

The issue of postnatal depression is as important one, similar to the breastfeeding self-efficacy matter, as it is the most common mental disorder connected to childbirth, afflicting a range from 4.0% to 63.9% of women worldwide (15). The relationship between postnatal depression and breastfeeding, although established, still remains unclear, as far as the direction and the precise nature of this relationship (16, 17).

2. OBJECTIVE

The aim of this study was to examine associated factors of breastfeeding self-efficacy and identify its predictors among a sample of Greek women in the immediate postpartum period.

3. MATERIAL AND METHODS

Study design and participants

A cross-sectional descriptive study among breastfeeding women who gave birth at the obstetrics clinic of the General Hospital of Volos, the capital of the Regional Unit of Magnesia, central Greece. By utilizing convenience sampling, 120 postpartum women who had given birth at the study hospital and met all the inclusion criteria were invited to participate in the study; 100 responded (response rate = 83.3%). Women were eligible to take part in the study if they were at least 18 years of age, able to understand the Greek language, willing to participate in the study, had delivered a single, living, healthy infant, and had initiated breastfeeding. The study excluded women with serious medical or obstetric conditions.

Data collection

Data were collected at the hospital during face to face interviews by the use of a questionnaire within three to four days after delivery. Prior to the interview, all participants were given explanations on the purpose of the survey and signed a form of informed consent.

Ethical considerations

After an official letter of cooperation, the study protocol was approved by the Ethics Committee and the Scientific Council of the hospital where the study was performed. The research was executed following the principles of confidentiality, anonymity and informed consent, as outlined by the Declaration of Helsinki and its subsequent revisions.

Measures

A self-reported questionnaire was used, which consisted of three sections:

a) Individual characteristics. Socio-demographic basics (maternal age, marital status, educational level, monthly income, and country of origin), perinatal (delivery mode, gestational age, birth order, weight of new-born, and days in neonatal intensive care unit) and breastfeeding-related characteristics (previous breastfeeding experience, timing of mother's decision to breastfeed, time from childbirth to initiation of breastfeeding, husband's support in breastfeeding, and infant feeding pattern) of the women were recorded. The infant feeding pattern was categorized into two groups as classified by WHO: i) exclusive breastfeeding (breast milk only with no other supplement); and ii) partial breastfeeding (other liquids also or bottle of artificial milk).

b) Edinburgh Postnatal Depression Scale (EPDS). The EPDS is a widely used screening instrument that has been validated to indicate depression symptoms among postpartum women (18). It consists of 10 statements which correspond to a 4-point Likert scale, ranging from 0 to 3 points. The total score ranges from 0 to 30, with higher scores reflecting a higher risk of postnatal depression. The Greek version of EPDS has shown acceptable psychometric properties and high internal consistency reliability with a Cronbach's alpha value of 0.90 (19). A cut off point of 11/12 on the EPDS – Greek version showed optimum Receiver Operating Characteristics (sensitivity = 90.0% and specificity = 97.2%). In the present study the Cronbach's alpha coefficient was 0.84.

c) Breastfeeding Self-Efficacy Scale – Short Form (BSES-SF). The BSES-SF is a commonly used self-report instrument, derived from the original 33-item BSES, which measures the mother's self-efficacy in her ability to breastfeed (20). The scale consists of 14 items with positive statements. All statements are preceded by the phrase "I can always ..." and rated on a 5-point Likert scale, ranging from 1 = "not at all confident" to 5 = "very confident". The total score of the scale was calculated as the mean score of all items. A higher total score is indicative of a greater level of maternal breastfeeding self-efficacy. In the original study, the reported Cronbach's alpha coefficient was 0.94, suggesting good internal consistency reliability. Similarly, in this study the Cronbach's alpha coefficient was 0.94.

Statistical analysis

Continuous variables are presented with mean, standard deviation, and range (min–max) while categorical variables are presented as absolute (n), and relative (%) frequencies. The internal consistency reliability of scales was analysed with Cronbach's alpha. The BSES-SF score was used as the outcome (dependent variable) while the socio-demographic, perinatal, breastfeeding-related characteristics along with the EPDS score as the determinants (independent variables). Univariate and multivariate linear regression analysis in a stepwise method (p-value for removal was set at 0.10 and p-value for entry was set at 0.05) was applied so as to identify the significant independent variables that could predict breastfeeding self-efficacy among the postpartum women. Regression coefficients (β) with standard errors were computed from the results of the linear regres-

Characteristics	Categories	n	%
Age (years)	≤ 19	1	1.0
	20−29	37	37.0
	30−39	57	57.0
	≥ 40	5	5.0
	Mean ± SD	31.30 ± 5.23	
Current marital status	Married	90	90.0
	Unmarried	10	10.0
Highest level of education	High school	58	58.0
	University / Technical university	37	37.0
	Postgraduate degree	5	5.0
Monthly income	< 500 Euros	9	9.0
	500−1.000 Euros	56	56.0
	1.000−1.500 Euros	24	24.0
	> 1.500 Euros	11	11.0
Country of origin	Greece	87	87.0
	Other	13	13.0
Mode of delivery	Normal vaginal delivery	55	55.0
	Cesarean delivery	45	45.0
Gestational age of newborn	Term / Post-term	76	76.0
	Preterm	24	24.0
Birth order	1	44	44.0
	2	33	33.0
	≥ 3	23	23.0
Weight of newborn (kgr)	≤ 2.49	8	8.0
	2.50−2.99	30	30.0
	3.00−3.49	42	42.0
	≥ 3.50	20	20.0
	Mean ± SD	3.14 ± 0.43	
Stay in NICU	No	88	88.0
	Yes	12	12.0

Abbreviations: SD, standard deviation; NICU, Neonatal Intensive Care Unit.

Table 1. Socio-demographic and perinatal characteristics of the participants.

sion analyses. The statistics of the data were processed with SPSS v. 22.0 software.

4. RESULTS

Mothers' characteristics and prevalence of postpartum depression

One hundred postpartum women participated in this study. Their mean age was 31.30 years (SD = 5.23). Overall, the majority of the mothers were in the age range of 30 to 39 years (57%), were lawfully married (90%), and had a high school education (58%). Regarding their pregnancies, the majority was multiparous (56%), reached full-term (76%), and gave birth via normal vaginal delivery (55%). The detailed socio-demographic and perinatal characteristics are illustrated in Table 1.

Over half of the mothers (52%) had no previous breastfeeding experience and carried out exclusive breastfeeding in the hospital. The majority of the participants made the decision

to breastfeed their infants before birth (94%). Most mothers initiated breastfeeding within twelve hours after childbirth (60%). Around two-thirds of the women (67%) reported that they were supported to breastfeed by their husband. The mean overall EPDS score was 8.06 (SD = 5.64; ranging from 0 to 24), lower than the cut-off point (11/12) of screening postnatal depression in Greek mothers. Specifically, one-fourth of the mothers (25%) were at risk of postnatal depression (Table 2).

Breastfeeding self-efficacy

Greek mothers reported a rather good level of breastfeeding self-efficacy in the immediate postpartum period; the mean overall BSES-SF score was 3.65 (SD = 0.85; ranging from 1.43 to 5.00). The three statements that had the highest mean score, suggesting a greater confidence in maternal breastfeeding, were: "satisfied with my breastfeeding experience", "keep wanting to breastfeed", and "comfortably breastfeed with my family members present". On the other hand, the lowest scored statements in the BSES-SF, indicating that mothers felt less confident, were the following: "determine that my baby is getting enough milk", "ensure that my baby is properly latched on for the whole feeding", and "manage to breastfeed even if my baby is crying" (Table 3).

Factors associated with breastfeeding self-efficacy

Fifteen mothers' characteristics as well as their postpartum depression were analysed using simple and multiple linear regression models. The results of univariate analyses showed that factors significantly associated with the level of maternal breastfeeding self-efficacy were: the mother's age, previ-

Characteristics	Categories	n	%
Previous breastfeeding experience	No	52	52.0
	Yes	48	48.0
Timing of mother's decision to breastfeed	After childbirth	6	6.0
	Before childbirth	94	94.0
Time from childbirth to initiation of breastfeeding	< 12 hours	60	60.0
	12−24 hours	31	31.0
	> 24 hours	9	9.0
Husband's support in breastfeeding	Not at all / a little supportive	33	33.0
	Very / quite supportive	67	67.0
Infant's feeding pattern	Partial breastfeeding	48	48.0
	Exclusive breastfeeding	52	52.0
EPDS score	Absence of depression (≤ 11)	75	75.0
	Presence of depression (≥ 12)	25	25.0
	Mean ± SD	8.06 ± 5.64	

Abbreviations: SD, standard deviation; EPDS, Edinburgh Postnatal Depression Scale.

Table 2. Participants' breastfeeding related characteristics and EPDS score.

Original item no.	Items of BSES-SF	Mean ± SD
9	Be satisfied with my breastfeeding experience.	4.06 ± 1.05
7	Keep wanting to breastfeed.	4.02 ± 1.06
8	Comfortably breastfeed with my family members present.	3.95 ± 1.31
12	Continue to breastfeed my baby for every feeding.	3.93 ± 1.08
10	Deal with the fact that breastfeeding can be time consuming.	3.92 ± 1.06
13	Manage to keep up with my baby's breastfeeding demands.	3.84 ± 1.14
14	Tell when my baby is finished breast-feeding.	3.74 ± 1.13
11	Finish feeding my baby on one breast before switching to the other breast.	3.56 ± 1.17
5	Manage the breastfeeding situation to my satisfaction.	3.53 ± 1.12
3	Breastfeed my baby without using artificial milk as a supplement.	3.47 ± 1.36
2	Successfully cope with breastfeeding like I have with other challenging tasks.	3.43 ± 1.12
6	Manage to breastfeed even if my baby is crying.	3.41 ± 1.15
4	Ensure that my baby is properly latched on for the whole feeding.	3.28 ± 1.12
1	Determine that my baby is getting enough milk.	2.89 ± 1.14
	Overall BSES-SF score	3.65 ± 0.85

Abbreviations: SD, standard deviation; BSES-SF, Breastfeeding Self-Efficacy Scale – Short Form.

Note: 5-point Likert scale was used (1 = "not at all confident" to 5 = "very confident").

Table 3. Ranking in descending order of the BSES-SF items based on mean score.

ous breastfeeding experience, the timing of the mother's decision to breastfeed, the husband's support in breastfeeding, the infant's feeding pattern, and the postnatal depression level (Table 4). Specifically, the mothers' age was positively associated with the BSES-SF score, which means that the higher her age, the higher her breastfeeding self-efficacy. Also, mothers with previous breastfeeding experience, who decided to breastfeed before childbirth, and carried out exclusive breastfeeding in the hospital had higher breastfeeding confidence. In addition, women with greater support from their husband reported higher levels of self-efficacy to breastfeed. Finally, the EPDS score was negatively related to BSES-SF score, which means that the lower the mother's postpartum depression, the higher her breastfeeding self-efficacy.

These variables were entered into a stepwise linear regression model. Of the six factors, four were included in the prediction model that reached four steps with none of the variables removed. As shown in Table 4, the timing of mother's decision to breastfeed (β = 1.240, p < 0.001), the infant's feeding pattern (β = 0.556, p < 0.001), previous breastfeeding experience (β = 0.449, p = 0.001), and the EPDS score (β = -0.027, p = 0.031) were identified as pre-

dictors of breastfeeding self-efficacy. The final model was statistically significant (F = 21.007, p < 0.001) and explained the 44.7% of the variance in breastfeeding self-efficacy (R^2 = 0.469; Adjusted R^2 = 0.447). The unique amount of variance that the predictors of breastfeeding self-efficacy bring to the model was demonstrated by the squared semi-partial correlation coefficient (sr^2). The timing of the mother's decision to breastfeed and the infant's feeding pattern uniquely accounted for 11.0% and 10.2% of the variance of breastfeeding self-efficacy, respectively. Moreover, previous breastfeeding experience and the EPDS score uniquely accounted for 6.9% and 2.7% of the variance of the mother's self-efficacy, respectively.

5. DISCUSSION

The BSES-SF is a tool for measuring breastfeeding self-efficacy and can be used to identify mothers at risk of prematurely discontinuing breastfeeding (20). The purpose of this study was to examine Greek mothers' breastfeeding self-efficacy and identify its predictors in the immediate postpartum period.

According to our findings, the mean overall BSES-SF score was 3.65 indicating a rather good level of breastfeeding self-efficacy. Previous studies conducted in China (21), Japan (22), Iran (23), Uganda (24), and USA (25) reported lower mean overall BSES-SF scores, while other studies in Italy (26), Croatia (27), Sweden (28), Brazil (29), and Philippines (30) reported higher mean scores of self-efficacy. The differences in mean total score of BSES-SF may be related to the use of different methodologies and early postpartum samples, such as the proportion of multiparous women or the attending antenatal breastfeeding classes, and probably due to different cultural contexts between countries.

Regarding the breastfeeding self-efficacy items, in this study mothers were most confident (mean score ≥ 4) about being satisfied with their breastfeeding experience, keep wanting to breastfeed, and breastfeeding with other family members present. Such findings were similar to other studies in Finland (31), and Philippines (30). On the other hand, Greek mothers were least confident (mean score < 3) about determining that infant is getting enough milk. This result was found in a study among Finnish primiparous and multiparous women (31).

Approximately half of the studied women had previous breastfeeding experience, which was identified as a significant predictor of breastfeeding self-efficacy. Specifically, mother's self-efficacy in her ability to breastfeed was higher in those with previous personal experience. This is an expected finding since, according to Bandura's social cognitive theory (12), self-efficacy is connected to enactive mastery experience. The positive effect of personal breastfeeding experience on confidence has been consistently observed in previous studies (20, 21, 24, 25, 27, 28, 31-33).

Another determinant of breastfeeding self-efficacy found in our study was the timing of the decision-making to breastfeed, confirming previous findings. Particularly, women who decided to breastfeed before childbirth had significantly higher levels of confidence. In the current study, the majority of mothers chose to breastfeed during pregnancy rather than after childbirth. Various studies

Independent variables	Univariate analysis		Multivariate analysis		
	β (SE)	P value	β (SE)	P value	sr2
Age (years)	0.047 (0.016)	0.004			
Current marital status					
Married	0.000a				
Unmarried	-0.264 (0.282)	0.352			
Highest level of education					
Secondary	0.000a				
Tertiary	0.029 (0.172)	0.869			
Monthly income					
< 500 Euros	0.000a				
500–1.000 Euros	0.132 (0.307)	0.670			
1.000–1.500 Euros	0.034 (0.335)	0.920			
> 1.500 Euros	0.286 (0.385)	0.458			
Country of origin					
Greece	0.000a				
Other	0.187 (0.252)	0.460			
Mode of delivery					
Normal vaginal delivery	0.000a				
Cesarean delivery	0.106 (0.171)	0.537			
Gestational age of newborn					
Term / Post-term	0.000a				
Preterm	-0.112 (0.199)	0.573			
Parity					
Primipara	0.000a				
Multipara	0.297 (0.169)	0.082			
Weight of newborn (kgr)	0.186 (0.199)	0.352			
Stay in NICU					
No	0.000a				
Yes	0.403 (0.259)	0.122			
Previous breastfeeding experience					
No	0.000a		0.000a		
Yes	0.603 (0.159)	<0.001	0.449 (0.128)	0.001	0.069
Timing of mother's decision to breastfeed					
After childbirth	0.000a		0.000a		
Before childbirth	1.687 (0.315)	<0.001	1.240 (0.280)	<0.001	0.110
Time from childbirth to initiation of breastfeeding					
< 12 hours	0.000a				
12–24 hours	0.052 (0.188)	0.783			
⊠ 24 hours	0.294 (0.304)	0.336			
Husband's support in breastfeeding					
⊠ot at all / a little supportive	0.000a				
Very / quite supportive	0.452 (0.175)	0.011			
Infant's feeding pattern					
Partial breastfeeding	0.000a		0.000a		
Exclusive breastfeeding	0.705 (0.155)	<0.001	0.556 (0.130)	<0.001	0.102
EPDS score	-0.059 (0.014)	<0.001	-0.027 (0.012)	0.031	0.027

$R^2 = 0.469$; Adjusted $R^2 = 0.447$; model fit: $F = 21.007$, $p < 0.001$.

Abbreviations: SE, standard error; NICU, Neonatal Intensive Care Unit; BSES-SF, Breastfeeding Self-Efficacy Scale – Short Form; EPDS, Edinburgh Postnatal Depression Scale.

a Indicates reference category.

Table 4. Univariate and multivariate linear regression analyses with the BSES-SF score as dependent variable.

examining the timing of mother's decision to breastfeed reported that the earlier during pregnancy the decision is made on breastfeeding, the higher the self-efficacy and the more likely to initiate and maintain breastfeeding (32, 34). Making the decision to breastfeed early allows mothers more time to obtain knowledge on breastfeeding and therefore be more effective.

We also found a significant association between actual newborn feeding patterns and breastfeeding confidence, suggesting that mothers who fully breastfed their infants had greater self-efficacy than those who partially breastfed. Such result concurred with literature that maternal self-efficacy and exclusive breastfeeding in hospital were highly correlated (21, 25, 26, 29, 31, 33). Addionaly, similar studies found higher self-efficacy in women who were exclusively breastfeeding at 1 month (27), 3 months (26), and 6 months (27) postpartum. Considering this evidence, individual and focused breastfeeding support should be provided to all mothers during their postpartum stay in hospital.

Finally, a quarter of mothers were at risk of postnatal depression. This result aligns with the worldwide statistics of postnatal depression (15). The literature has examined the relationships between postpartum depression and breastfeeding intention, initiation, duration, and dose (17). As for the relation between postnatal depression and self-efficacy in breastfeeding, the current study found that the EPDS and BSES-SF scores were inversely correlated, which means that reducing the levels of postnatal depression increases breastfeeding self-efficacy. In this line, previous studies demonstrated that mothers with a higher level of postpartum depression had lower self-efficacy in breastfeeding (20, 23, 26, 33, 35, 36). This link of depression with breastfeeding confidence could be explained by changes in neuroendocrine function. Maternal depression has been associated with lower oxytocin levels during breastfeeding, which may reduce mothers' sense of self-efficacy (37).

These results showcase how crucial the role of midwives and other healthcare professionals is in providing health care and monitoring pregnant women, new mothers, and newborns. A well-informed preparation of pregnant women is also of great importance, as the number of prenatal checkup is positively correlated with breastfeeding confidence (30). This preparation should educate pregnant women and their partners about the help needed for breastfeeding in the maternity hospital and at home, and raise their awareness about detecting depressive symptoms in time (38).

Limitations of the study
This study has several limitations. The sample size was relatively limited, it was conducted in the obstetrics clinic of only one Greek city and the conclusions cannot be generalized for the entire population of the country. In addition, since some women were aware of the positive stances the researchers hold towards breastfeeding, it might be possible that their answers were biased towards breastfeeding and their ability to breastfeed. Finally, due to the cross-sectional type of the study, the associations found cannot be interpreted as causal relationships. Nevertheless, the results of this study can be used as a first step to define the breastfeeding needs and characteristics of postpartum women, aiming towards the improvement of health care services offered to mothers and newborns.

6. CONCLUSION
The current study showed that breastfeeding self-efficacy can be modified, since it is affected by a series of factors, some of which can be altered by informative programs and the education of pregnant women and women that already breastfeed. In addition, the research showed the association between low breastfeeding self-efficacy and postnatal depression, which threatens a lot of new mothers. Therefore, aside from strategies related to the improvement of breastfeeding self-efficacy, there appears to be a necessity to apply measures for prevention and treatment of postnatal depression.

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