Translation and validation of the Breast-feeding Self-efficacy Scale into Turkish

Aysun Basgun Eksioglu, MSc (Research Fellow)*, Esin Ceber, PhD, RN (Associate Professor)

Midwifery Department, Atatürk School of Health, Ege University, 35100 Bornova, Izmir, Turkey

A B S T R A C T

Background: recent research indicates that most mothers give up breast feeding their infants early in the postpartum period due to difficulties with breast feeding and the belief that they are inefficient at breast feeding. Using self-efficacy theory as a conceptual framework to measure breast-feeding confidence, a Turkish version of the Breast-feeding Self-Efficacy Scale (BSES) was developed and psychometrically tested among Turkish mothers.
Objective: to translate the BSES into Turkish and assess its psychometric properties among breast-feeding mothers.
Design: a methodological study to assess the reliability, validity and predictive value of the BSES.
Setting: women were recruited from two mother and child health-care units in the Altındağ district in Izmir, Turkey between 2006 and 2007, and followed up two months post partum.
Participants: 165 Turkish-speaking women.
Methods: following back-translation, questionnaires were completed in hospital and at home by postnatal women. The BSES was administrated at one, four and eight weeks post partum to determine the method of infant feeding. The interviews and home visits were conducted in mothers' own homes at a mutually convenient time.
Findings: the psychometric assessment method used to validate the original BSES (English version) was replicated with the translated Turkish version. The well-concordance coefficient of Kendall's W scale was 0.227, $p < 0.01$ and the test–retest reliability coefficient was 0.45. The consistency of the scale in terms of temporal process was efficient ($p = 0.00$). Cronbach's alpha coefficient was 0.91 and 0.92 at one and four weeks post partum, respectively, and the reliability of the scale was found to be high ($0.80 \leq \alpha < 1.00$).
Key conclusions and implications for practice: the Turkish version of the BSES can be used to determine which mothers are at risk of giving up breast feeding early in the postpartum period, and the subjects they need to learn about breast feeding.

Introduction

Breast milk is the most appropriate source of nutrition during infancy; its contents change according to the needs of a newborn infant, it provides protection against infections, it meets the infant's physiological and psychosocial needs in the first four to six months of life, and it is economical (Vinther and Helsing, 1997; Tunçel et al., 2005; Aidam et al., 2006; Groleau et al., 2006).

The value of providing infants with human milk has long been understood. Numerous studies have provided robust evidence that breast feeding reduces morbidity and mortality during the first year of life (Torres et al., 2003).

The Innocenti Declaration on the protection, promotion and support of breast feeding was produced and used by participants at the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) Policy Makers Meeting on 'Breast feeding in the early 1990s: a global initiative' in Italy in 1990. Since the adoption of the original Innocenti Declaration, remarkable progress has been made in improving infant and young child feeding practices worldwide (World Health Organization and United Nations Children's Fund, 1999; Üstüner and Bodur, 2009).

Nevertheless, inappropriate feeding practices, suboptimal or no breast feeding and inadequate complementary feeding remain the greatest threat to child health and survival globally. Improved breast feeding alone could save the lives of more than 3500 children every day; more than any other preventive intervention (World Health Organization and United Nations Children's Fund, 1999).

WHO has also published breast-feeding recommendations which indicate that all infants should be exclusively breast fed for the first six months post partum, with continued breast feeding until one year of age or more (Dennis, 2002; Lawrence, 2002; Dai and Dennis, 2003; Aluş et al., 2008). It is also suggested that breast feeding should be continued with supplementary foods from six months until two years of age (Özmert, 2005; Aidam et al., 2006).

* Corresponding author.
E-mail address: aysun.basgun@ege.edu.tr (A.B. Eksioglu).

According to UNICEF, while breast-feeding initiation rates are no longer declining at the global level, only 38% of children under six months of age in the developing world are exclusively breast fed, and only 39% of children aged 20–23 months benefit from the practice of continued breast feeding. Additional recent evidence also indicates that approximately 50% of children are exclusively breast fed in just 28 countries worldwide (United Nations Children's Fund, 2007, 2009).

In Turkey, almost all infants are breast fed in the first months of the postpartum period, but this rate decreases to 66% by the end of the first year. Most mothers in Turkey initiate breast feeding and continue to breast feed until six months post partum, but the majority of infants are not breast fed exclusively. The percentage of infants who are breast fed exclusively is 27.3% up to three months of age, and this decreases to 7.6% for infants aged four to six months (Turkish Demographic and Health Survey, 2003).

Data from the Turkish Demographic and Health Survey indicate that breast feeding in Turkey commences relatively late after birth. Only 39% of breast-fed infants received their first breast feed in the first hour post partum, and 27% did not receive their first breast feed in the first 24 hours post partum (Turkish Demographic and Health Survey, 2008). These percentages are lower than those from the 2003 survey, showing that Turkish mothers are still rejecting the practice of early breast feeding (Turkish Demographic and Health Survey, 2003, 2008).

The rates for continued breast feeding are insufficient worldwide (Yenal and Okumuş, 2003). As a consequence, the breast-feeding status of mothers should be evaluated soon after childbirth, and mothers should be given special training and support to prevent breast-feeding problems by helping them to gain self-efficacy and increase breast-feeding success. Successful breast feeding can be achieved through the support and education of mothers (Lawrence, 2002; Ingram et al., 2004; Moore and Coty, 2006). As such, there is a need for objective diagnostic tools that can be applied quickly (Yenal and Okumuş, 2003).

Researchers have shown that maternal confidence is an important factor in the continuation of breast feeding. The reliability of the Breast-feeding Self-efficacy Scale (BSES) has been evaluated by considering the need for a scale which provides a standard and objective evaluation in terms of breast-feeding criteria among health-care personnel, directs educational planning, and is suitable for use in Turkey. The purpose of this methodological study was to develop and conduct a preliminary psychometric assessment of an instrument to measure confidence in new breast-feeding mothers.

It is thought that the BSES will contribute greatly to the determination of mothers' self-efficacy status, which is one of the most important factors affecting breast-feeding status, and to the gaining functionality of the consultation period which will enable the development of self-efficacy.

The BSES was developed and psychometrically tested to measure breast-feeding confidence (Dennis and Faux, 1999). Replicating this original research, further methodological studies have been conducted in Canada (Dennis, 2003), Australia (Blyth et al., 2002; Creedy et al., 2003), China (Dai and Dennis, 2003) and Puerto Rico (Molina Torres et al., 2003).

Breast-feeding confidence

Breast-feeding confidence describes a woman's belief or expectation that she possesses the knowledge and skills to successfully breast feed her infant (Chezem et al., 2003).

Women who are confident in their ability to breast feed are typically successful. In a study conducted by O'Campo et al. (1992), women who described themselves as 'somewhat confident' in the prenatal period had three times the risk of weaning during the first six months compared with women who described themselves as 'very confident' (O'Campo et al., 1992; Chezem et al., 2003).

These expectations are based on information gained from prior breast-feeding experience, observation of other women breast feeding, support and encouragement from individuals whose opinions are respected, and the physiological reaction to the prospect or act of breast feeding (Dennis and Faux, 1999).

Breast-feeding confidence has also been associated with maternal perceptions of insufficient milk supply; a leading cause of artificial milk supplementation and decrease in breast-feeding level (Hill and Humenick, 1996; Dai and Dennis, 2003). If health professionals are to effectively improve low breast-feeding duration rates, they need to identify high-risk women and the predisposing factors that are amenable to intervention (Blyth et al., 2002; Dennis, 2003). One possible modifiable variable is breast-feeding confidence (Loughlin et al., 1985; Buxton et al., 1991; O'Campo et al., 1992; Hill and Humenick, 1996; Ertem et al., 2001). To provide a theoretical perspective of breast-feeding confidence and guide the development and evaluation of confidence-enhancing interventions, the breast-feeding self-efficacy theory was developed by Dennis (1999) through the application of Bandura's (1994) social cognitive theory (Blyth et al., 2002).

Self-confidence has been shown as an important predictor for breast-feeding duration. It is known that the majority of mothers give up breast feeding in the early postpartum period in many countries: 'Buxton et al. reported that 27 percent of women with low maternal confidence in the prenatal period discontinued breast feeding within the first postpartum week compared with only 5 percent of highly confident women' (Dai and Dennis, 2003).

Similarly, Papinczak and Turner (2000) found that mothers who were unable to establish lactation reported significantly lower levels of breast-feeding confidence than mothers who breast fed for more than six months. In a longitudinal study of 64 low-income mothers, Ertem et al. (2001) reported that breast-feeding confidence rather than perceived problems was associated with the early termination of breast feeding.

The most common reasons for the early termination of breast feeding are that mothers do not believe they are efficient at breast feeding, they have difficulties with breast feeding and they have trouble coping with mental health problems, especially in the postpartum period (Dennis, 2003; Thome et al., 2004; Wojnar, 2004; Akşit, 2005). Factors such as personality traits, mother's age, socio-economic status, ethnic profile, self-confidence and prenatal knowledge, attitude towards breast feeding, use of supplementary food a few days after birth, insufficiency of family support and experience of breast feeding are known to play a part (Blyth et al., 2002; Dennis, 2002; Kaya et al., 2004). The breast-feeding self-efficacy theory was developed (Dennis, 1999) to conceptualise breast-feeding confidence, based on Bandura's (1994) social learning theory. Bandura advocated a behaviour-specific approach to the study of self-efficacy, arguing that a measure of general self-efficacy in overall ability would be inadequate for tapping an individual's efficacy for managing tasks associated with a specific behaviour. Thus, to measure breast-feeding self-efficacy, an instrument specific to tasks associated with breast feeding must be used (Blyth et al., 2002).

Breast-feeding self-efficacy theory

Self-efficacy is commonly defined as the belief in one's capabilities to achieve a goal or an outcome. According to Bandura (1994), self-efficacy is a dynamic cognitive process in which an individual evaluates his or her ability towards the performance of a given task and an important health-related behaviour predictor (Bandura, 1994; Akkoyunlu et al., 2005). According to Dennis and Faux (1999), breast-feeding self-efficacy refers to a mother's perceived ability to

breast feed her new infant and is a salient variable in breast-feeding duration. Bandura's (1994) social cognitive theory and self-efficacy concept may be used to promote the conceptual development of breast-feeding confidence. Bandura defines 'individuals' judgments concerning how well they can realise the actions to tackle with potential circumstances' as self-efficacy perception. Self-efficacy is not about how competent an individual is in his/her skills. It is about the individual's belief in his/her own skills.

Breast-feeding self-efficacy depends on whether or not the mother chooses to breast feed and knows how to breast feed, how long she will breast feed, and how she will respond to the emotional difficulties of breast feeding. It is important for mothers to believe in themselves and have self-confidence in order to transfer their theoretical knowledge about breast feeding into real behaviour (Blyth et al., 2002).

A number of studies have found maternal breast-feeding confidence to be associated with breast-feeding outcomes. Blyth et al. (2002) found that mothers with high breast-feeding self-efficacy were significantly more likely to breast feed at the time self-efficacy was assessed, and to do so exclusively one week and four months later.

Dennis and Faux (1999) further operationalised self-efficacy theory applied to breast feeding to produce a psychometrically sound instrument to measure breast-feeding confidence, the BSES. This scale is an instrument which can characterise the beliefs and ideas of mothers about breast feeding, special required principles of successful breast feeding and breast-feeding skills (Dai and Dennis, 2003). Among 130 postpartum Canadian women, BSES scores in the immediate postpartum period were significantly related to infant feeding outcomes. In particular, the higher the BSES score, the more likely the mother was to be breast feeding exclusively; the lower the mother's BSES score, the more likely she was to be feeding her infant with artificial milk (Dennis, 1999).

Determining the efficacy of breast feeding using a valid and reliable measuring instrument is significant for breast-feeding training. Validity and reliability studies on the BSES have been undertaken in different countries. Replicating the original research, further methodological studies have been conducted in Canada (Blyth et al., 2002; Creedy et al., 2003; Dai and Dennis, 2003; Torres et al., 2003). In these studies, BSES scores in the early postpartum period have consistently predicted breast-feeding duration at one, four and eight weeks post partum. In addition, a significant relationship has been demonstrated between BSES scores and exclusive breast feeding (Blyth et al., 2002; Creedy et al., 2003; Dai and Dennis, 2003; Torres et al., 2003). These studies provide preliminary evidence that the BSES may be an internationally applicable, reliable and valid measure to assist health professionals in caring for breast-feeding women. However, this practice disregards possible changes in psychometric properties due to translation bias, and it ignores the impact that culture may have on the meaning of scale items. The purpose of this study was to translate Dennis's BSES into Turkish and to retest the psychometric properties among Turkish mothers.

Methods

Setting and study participants

The research took place over an eight-month period in the mother and child health-care units in Altındağ district, Izmir, Turkey. The interviews were conducted by the first author (AE) in the mothers' own homes at a mutually convenient time. All mothers who said that they had breast fed were asked to participate in the study.

This methodological study translated and then examined the reliability and validity of the BSES. Participants who met the eligibility criteria were recruited from two mother and child health-care units between September 2006 and February 2007.

Eligible participants were all breast feeding at hospital discharge and had been at least 37 weeks of gestation when they gave birth. Mothers were excluded if they had a factor that could significantly interfere with breast feeding, such as multiple births, high-risk pregnancy (i.e. serious medical condition or known birth defect) or the infant was not discharged home with the mother. After initial screening, 171 potentially eligible women were approached, and 165 mothers agreed to participate in the study.

Instruments

The BSES is a 33-item, self-report instrument developed to measure breast-feeding confidence. The measure contains two subscales: the technique subscale, where the items depict maternal skills and recognition of specific principles required for successful breast feeding; and the intrapersonal thoughts subscale, where the items are related to maternal attitudes and beliefs about breast feeding. All the items are preceded by the phrase 'I can always' and are anchored with a five-point Likert scale, where 1=not at all confident and 5=always confident. As recommended by Bandura (Dai and Dennis, 2003), all the items are presented positively, and scores are summed to produce a range from 33 to 165; higher scores indicate higher levels of breast-feeding self-efficacy.

The content validity of the BSES was based on a literature review, interviews with breast-feeding mothers, and expert judgement using a method recommended by Lynn (Lynn, 1986). Following a pilot test, an initial psychometric assessment was conducted with a convenience sample of 130 Canadian breast-feeding women; questionnaires were completed during the postpartum hospitalisation and again at six weeks post partum. Cronbach's alpha coefficient for the scale was 0.96, with 73% of all corrected item-total correlations ranging from 0.30 to 0.70. Responses were subjected to principal components analysis with a varimax rotation, yielding the theorised subscales. Support for predictive validity was demonstrated through positive correlations between the BSES scores and infant feeding method at six weeks post partum. In the present study, the BSES was administrated at one, four and eight weeks post partum.

Translation process

To translate the BSES into Turkish, diverse methods were used to ensure content, semantic and technical equivalence.

In order to make the BSES applicable to Turkish women, language equivalence was studied to define validity and reliability.

First, the scale was translated into Turkish by the researcher. Later, it was translated from English into Turkish by five health-care professionals who know both languages. After the most appropriate expressions were chosen in consequence of these translations, the translation of the scale's Turkish version (back-translation) was undertaken by a linguist. The back-translation was compared with the original BSES and the scale was finalised by making required corrections to the 33 items.

In this study, the opinions of 10 professionals were used for content validity. The ideas of the specialists about the language validity of the scale are those of academics working on breast feeding and health-care personnel (breast-feeding consultant midwife, nurse and paediatrician) working in state hospitals. The professionals analysed the scale items in terms of being 'distinguishing, comprehensible, relevant and culturally appropriate'. When evaluating each scale item, the professionals considered

whether or not the item was clear, short and comprehensible, if it had content related to successful breast feeding, and if it was appropriate to Turkey's standards. Each item was rated on a 100-point scale by the professionals for the content validity of the Turkish version of the scale. While the professionals were assessing the items, they suggested that some sentences should be corrected because low-rated items could be misunderstood by the mothers. Accordingly, the item 'I can always keep feeling that I really want to breast feed my baby for at least six weeks' was changed to 'I can always keep feeling that I really want to breast feed my baby for at least six months'; the item 'I can always refrain from bottle feeding for the first four weeks' was changed to 'I can always refrain from bottle feeding my baby'; and the item 'I can always feed my baby every two to three hours' was changed to 'I can always breast feed my baby day and night whenever it wants'. The pilot study, based on 25 breast-feeding mothers, found that the edited version of the BSES was comprehensible and clear.

Ethical considerations

Permission to conduct the study was received from the Ege University Izmir Ataturk School of Health Ethics Commission and Izmir Country Health Directorate Ethic Committee who reviewed and accepted the proposal.

Dr. Cindy-Lee-Dennis from Toronto University provided written permission for the BSES to be translated into Turkish. The midwives in the area supported the research in terms of identifying mothers to participate in the study. Mothers were given verbal and written information about the study, and given the opportunity to ask any questions concerning participation. All of the participants were informed that their participation in the study was voluntary and that their names would remain confidential.

In this study, the BSES and sociodemographic question form, home visit and interview method were applied to women who had just had an infant in Altındağ district, Izmir. The BSES was applied three times in total; once in the first week of the postpartum period, once in the fourth week, and once in the eighth week.

Data analysis

For validity orientation, while the professionals' opinions were being evaluated, the scores obtained from the evaluation through the scale were averaged and the result was calculated using Kendall's coefficient of concordance (W).

For reliability orientation, the constancy of the scale against time (test–retest reliability) was determined using Pearson moments correlation. Cronbach's alpha method and corrected item-total correlation were used to evaluate the self-consistency and homogeneity of the BSES.

Sociodemographic data and baseline information about the mothers are given as numbers and percentages. For data regarding mothers' breast-feeding status, analysis of variance in repeated measurements was undertaken using Student's t-test. Finally, Bonferroni's multiple comparisons test was used to define the differences between groups.

Findings

Sample characteristics

The mean age of the sample was 27.32 years [standard deviation (SD) 5.18], ranging from 20 to 39 years. Forty-six percent ($n=76$) of mothers had a primary school education, 10.3% ($n=17$) had a secondary education, 26.1% had completed high school and 13.3% ($n=22$) had a university education. In relation to employment status,

27.3% ($n=45$) of participants worked outside the home and 72.7% ($n=120$) were stay-at-home mothers. 55% ($n=84$) of mothers were primiparous, 46.7% ($n=77$) of participants had a caesarean childbirth and 53.3% ($n=88$) had a vaginal childbirth.

Reliability

Internal consistency

In order to test the constancy of the scale against time, the results from one and four weeks post partum were analysed within the context of test–retest reliability using Pearson moments correlation. The test–retest reliability of the scale was found to be significant at $p < 0.01$. High-level Cronbach's alpha and correlation reliability coefficients were obtained for the BSES scores at one and four weeks post partum. Cronbach's alpha coefficient of the Turkish version of the BSES was 0.92, and when any of the items were excluded, the increase was not much more than 0.10. One item fell below the 0.20 criterion. Specifically, the item 'I can always comfortably breast feed in public places' had a corrected item-total correlation of 0.16. The BSES mean score was 131.8 (SD: 22.07), with an item mean of 4.58 ranging from 2.31 to 4.94. The mean inter-item correlation was 0.54, ranging from 0.16 to 0.79.

Construct validity

Factor analysis

Principal components analysis is the most widely applied and recommended first step in factor analysis (Dennis and Faux, 1999). An explanatory factor analysis was undertaken in order to summarise the features of the relationships between the items and to define the reasonable basic structure of the translated BSES. The basic components technique was chosen to do the similar ones of original methods used by Dennis (Dai and Dennis, 2003). This specific analysis yielded a seven-factor solution with eigenvalues greater than 1 in the unrotated matrix. However, principal components analysis was repeated with the varimax rotation method in order to elicit the concordance of the original scale, and this led to two factors. In the scale, five items were found below 0.30: 'I can always monitor breast milk by keeping track of my baby's urine and bowel movements', I can always comfortably breast feed in public places', 'I can always count on my friends to support my decision to breast feed', 'I can always keep wanting to breast feed' and 'I can always count on my family to support my decision to breast feed'.

The two factors obtained from the scale explain 42.49% of the total variance. Factor I had an eigenvalue of 10.39, which explained 31.47% of the variance and consisted of 17 items. Factor II had an eigenvalue of 3.63, which explained 11.02% of the variance and consisted of 16 items. Total test correlations regarding the 33 items in the scale, the factor structure of the scale and the reliability coefficient are shown in Tables 1 and 2.

Factor I was congruent with the theorised intrapersonal thoughts subscale, and depicted maternal attitudes and beliefs towards breast feeding. Factor II was similar to the theorised breast-feeding technique subscale, and included items representing maternal skills and recognition of specific tasks and principles required for successful breast feeding.

The item 'I can always successfully cope with breast feeding like I have with other challenging tasks' was seen to have a relatively high load value in both of the factors. All of the factors were protected by their adjusted item-total correlations and their high factor loads.

Predictive validity

Predictive validity was determined by examination of the breast-feeding status of the participants, their average scores on

Table 1
Factor loads of Breast-feeding Self-Efficacy Scale items.

Items	Factor I	Factor II	Item-total correlations
Factor 1. Technique			
I can always ensure that my baby is properly latched for the whole feed	0.865	0.084	0.54
I can always hold my baby comfortably during breast feeding	0.843	0.105	0.57
I can always recognise the signs of a good latch	0.836	0.060	0.58
I can always position my baby correctly at my breast	0.829	0.064	0.54
I can always feel if my baby is sucking properly at my breast	0.788	0.218	0.52
I can always keep my baby awake at my breast during a feed	0.751	0.213	0.41
I can always finish feeding my baby on one breast before switching to the other breast	0.674	0.107	0.42
I can always determine that my baby is getting enough milk	0.656	0.207	0.63
I can always recognise when my baby has finished breast feeding	0.615	0.011	0.59
I can always deal with the fact that breast feeding may temporarily limit my freedom	0.598	0.219	0.53
I can always accept the fact that breast feeding can be time consuming	0.585	0.205	0.57
I can always monitor breast milk by keeping track of my baby's urine and bowel movements	0.506	0.165	0.25
I can always succesfully cope with breast feeding like I have with other challenging tasks	0.475	0.472	0.79
I can always take my baby off the breast without pain to myself	0.463	0.062	0.58
I can always manage to breast feed even if my baby is crying	0.343	0.142	0.63
I can always comfortably breast feed in public places	0.212	0.079	0.16
I can always count on my friends to support my decision to breast feed	0.041	0.035	0.25
Factor 2. Interpersonal thoughts			
I can always feed my baby exclusively with breast milk	0.136	0.826	0.75
I can always manage to keep up with my baby's breast-feeding demands	0.170	0.824	0.79
I can always continue to breast feed my baby for every feed	0.106	0.701	0.51
I can always maintain my milk supply by using the 'supply and demand' rule	0.288	0.699	0.75
I can always keep feeling that I really want to breast feed my baby for at least six months	0.163	0.698	0.69
I can always breast feed my baby without using artificial milk as a supplement	0.265	0.697	0.69
I can always motivate myself to breast feed succesfully	0.241	0.682	0.49
I can always refrain from bottle feeding my baby	0.251	0.646	0.71
I can always breast feed my baby day and night whenever it wants	0.461	0.545	0.76
I can always focus on getting through one feed at a time	0.379	0.530	0.75
I can always be satisfied with my breast-feeding experience	−0.007	0.514	0.34
I can always manage the breast-feeding situation to my satisfaction	0.327	0.498	0.58
I can always stay motivated to breast feed my baby	0.091	0.462	0.54
I can always keep wanting to breast feed	0.086	0.452	0.24
I can always count on my family to support my decision to breast feed	−0.003	0.222	0.27
I can always comfortably breast feed with my family members present	0.003	0.193	0.32

Table 2
Distribution of the average scores of the Breast-feeding Self-Efficacy Scale (BSES).

BSES	$\overline{X}$	SS
Week one	151.22	12.39
Week four	154.99	11.51
Week eight	155.52	11.35

the BSES, and the findings related to the variants which were thought to influence these.

The BSES scores were 151.22 ± 12.39, 154.99 ± 11.51 and 155.52 ± 11.35 at one, four and eight weeks post partum, respectively.

A significant relationship was found between the average BSES scores of the mothers and the time to first breast feed. A significant difference was found between the BSES scores in the first and fourth week and the time to first breast feed (one week, $t = 1.75$, $p < 0.05$; four weeks, $t = 2.13$, $p < 0.05$). The difference was not statistically significant for BSES at eight weeks ($t = 1.01$, $p > 0.05$).

Eighty percent of mothers stated that they fed their infants exclusively with breast milk, and 20% of mothers stated that they fed their infants with supplementary food along with breast milk. Significant differences were found between the mothers who breast fed their infants exclusively (one week, mean 154.2, SD: 8.54; four weeks, mean 156.5, SD: 10.0; eight weeks, mean 157.0, SD: 9.32) and the mothers who fed their infants with supplementary food along with breast milk [one week, mean 139.3, SD: 17.49 ($t = 7.01$, $p < 0.01$); four weeks, mean 148.8, SD: 14.8 ($t = 3.57$, $p < 0.01$); eight weeks,

mean 150.0, SD: 16.92 ($t = 3.19$, $p < 0.05$)]. When the mothers in the study were asked why they fed their infants with other types of food, 10.3% stated that they did not have enough breast milk, 1.2% stated that their infants did not want to suck, 3.6% said that they wanted to prevent the growth of canker, 3.0% said that the infants needed water, and 1.8% said that they fed their infants with other types of food as well as breast milk on the advice of family members. The average BSES scores of the mothers who exclusively breast fed their infants were higher than those of the mothers who fed their infants using other methods ($t = 25.25$, $p < 0.01$).

Breast-feeding self-efficacy and demographic factors

The differences between the average BSES scores of the mothers at one, four and eight weeks post partum and age (one week, $F = 0.817$, $p > 0.05$; four weeks, $F = 0.485$, $p > 0.05$, eight weeks, $F = 0.323$, $p > 0.05$) and educational level (one week, $F = 1.62$, $p > 0.05$, four weeks $F = 0.070$, $p > 0.05$; eight weeks, $F = 0.154$, $p > 0.05$) were not significant. In total, 68.5% of the mothers who participated in the study stated that they breast fed their infants in the first hour post partum, and 31.5% said that they breast fed their infants after the first hour post partum. A significant relationship was found between the BSES scores of the mothers at one, four and eight weeks post partum and the time to first breast feed. A significant difference was found between the BSES scores at one and four weeks post partum and the time to first breast feed (one week, $t = 1.75$, $p < 0.05$; four weeks, $t = 2.13$, $p < 0.05$). The difference was not significant for the BSES scores at eight weeks post partum ($t = 1.01$, $p > 0.05$). When analysing the findings

related to the multiple comparison test, which shows where the difference stems from, a significant difference in BSES scores was found between the mothers who breast fed their infants in the first hour post partum and the mothers who breast fed their infants for the first time after hospital discharge ($F = 10.60$, $p < 0.01$). Accordingly, the lowest BSES scores were found in mothers who breast fed their infants after hospital discharge (one week, mean 117.0; four weeks, mean 131.3; eight weeks, mean 136.5).

Discussion

The BSES is an instrument that measures a mother's confidence in her ability to breast feed her new infant (Creedy et al., 2003). The results from this study indicate that the BSES is a reliable and valid tool for measuring breast-feeding self-efficacy in Turkish women.

The findings from the validity and reliability studies of the BSES developed by Dennis (Dennis and Faux, 1999) in order to determine breast-feeding self-efficacy show that the 33-item version of the scale can be used in a valid and reliable way among Turkish mothers.

For language validity, the scale was translated from English into Turkish by five professionals who know both languages. Choosing a translator, translation technique and back-translation should be given much attention during the translation process for the adaptation of an intercultural scale (Aksayan et al., 2002; Gözüm and Aksayan, 2002). The back-translation of the scale (the re-translation of the latest Turkish version into English) was done by a linguist after the translation from English to Turkish was completed. When creating a Spanish version of the BSES, Torres et al. stated that back-translation should be done by somebody who did not know the original scale (Torres et al., 2003). The back-translation was compared with the BSES and the scale was formed by making all the necessary corrections for each of the 33 items. The translation process was rigorously conducted to ensure that equivalence was established.

It is important to note that all of the translators strived to achieve as much similarity as possible to the original BSES in grammatical structure, concepts, word complexity, meaning and wording (Torres et al., 2003).

The fact that there is a 'consensus' among specialists is important in terms of showing that the scale as a whole and its items have reflected the part to be measured, and the content validity has been maintained (Aksayan et al., 2002; Gözüm and Aksayan, 2002; Çatal and Dicle, 2008). The scale has been restructured in line with the suggestions and criticisms of the specialists and tried to be made suitable for the Turkish setting.

The surface validity of the latest version of the BSES, as in the study of Dai and Dennis (2003), was evaluated using a pilot study. This was applied to 25 breast-feeding mothers, who stated that the expressions were comprehensible and clear.

The factor structure of the scale was analysed out of 33 items, and the items were placed into the factors where they have the highest value. As a consequence of the factor analysis, it was determined that the scale is made up of two factors, as in the original scale. At the end of the factor analysis, the eigenvalue of Factor I was 10.39 and this explained 31.47% of the variance; it was composed of 17 items, the loads of which changed from 0.86 to 0.041. Cronbach's alpha coefficient was 0.89. Factor I was in accordance with the theorised subscale of the breast-feeding technique. Factor II had an eigenvalue of 3.63 which explained 11.02% of the variance. The 16 items loaded to this factor changed between 0.82 and 0.19. Cronbach's alpha coefficient was 0.82. Cronbach alpha coefficients for all subscales ranged from 0.82 to 0.89, indicating good levels of internal consistency.

The content validity of the instrument, which was reviewed by an expert panel, seems to be sufficiently high. The BSES items, technique and intrapersonal thoughts subscales were examined for construct validity.

All these items met the loading criterion and loaded separately on each factor. In this study, items in the confidence subscale loaded on two factors and the mean scale scores were very similar to previous studies (Dennis and Faux, 1999; Dai and Dennis, 2003; Torres et al., 2003).

A factor load value of 0.45 or more is a good measurement for the adoption of item, but this limit may be reduced to 0.30 for a few items in the application (Creedy et al., 2003; Çatal and Dicle, 2008; Büyüköztürk, 2006). In the direction of this criterion, four items in the scale were found to be below 0.30, yet these items were not excluded from the scale because the exclusion of these items could result in constriction of the questions connected to the measured feature, and when the item was excluded, the difference in Cronbach's alpha was not significant.

According to reliability studies of the BSES, item-total-test correlation coefficients were 0.16–0.79 and the internal consistency coefficient for the whole scale was 0.91. The fact that the internal consistency coefficients were high shows that there was enough internal consistency, and the findings are consistent with the study of Dennis and Faux (1999). The level of reliability for all of the sub-dimensions of the scale is enough if the level of reliability for the measurement instruments used in the studies is 0.70 (Tezbaşaran, 1996). Cronbach's alpha for the BSES adapted for Chinese mothers was 0.96 (Dai and Dennis, 2003). The Cronbach's alpha reliability coefficient of the BSES in Spanish was 0.96 (Torres et al., 2003).

Moreover, the score constancy of the scale was analysed using the test–retest method, and the correlation coefficient obtained was 0.45; this result was statistically significant ($r = 0.45$, $p < 0.01$). When it is taken into consideration to comment on the item-total correlation that the items which were 0.30 or over distinguished (Tavşancıl, 2002) the individuals in terms of the measured feature, it can be seen that the item-total correlations are adequate.

The results acquired refer to the reliability of the measurement instrument which was adapted beforehand. Along with the lack of a definite standard about the reliability of the item-total-score correlation coefficient's being inadequate below which criterion it is, the reliability of the items which have coefficients below 0.50 is evaluated as low; this coefficient needs to be over 0.30. When it comes to application, many researchers use 0.20 as the low level (Akkoyunlu et al., 2005).

The item-total-score reliability coefficients differ between items, and that for Item 29 (I can breast feed my baby in places which are open to the public) was $r = 0.16$. However, this item was applied without being excluded from the scale in view of the cultural sensitivity of Turkish women about protecting their privacy.

The item-total correlations in Dai and Dennis's study aimed at creating a Chinese version of the BSES were over 0.30 (Dai and Dennis, 2003). The item-total correlations of the BSES applied to 130 Puerto Rican mothers by Torres et al. (2003) ranged between 0.30 and 0.70; only one item (I can always rely on my family to support my decision to breast feed) was below 0.30 (0.19).

The mother's breast-feeding self-efficacy depends on her choice to breast feed, her knowledge of breast-feeding methods, how long she will breast feed, and how she will react to the difficulties of breast feeding. It is important for mothers to believe in themselves in transforming their knowledge of breast feeding into real behaviour and to have self-confidence (Blyth et al., 2002). Analysis of the BSES scores showed that the score was 151.22 ± 12.39 at one week post partum, increasing to 154.99 ± 11.51 at four weeks post partum and 155.52 ± 11.35 at eight weeks post partum.

A significant relationship was found between the average self-efficacy scores at one, four and eight weeks post partum and the time of first breast feeding. The average breast-feeding self-efficacy score of the mothers who breast fed their infants in the first hour post partum was higher than that of the mothers who breast fed their infants more than one hour post partum, particularly if the first breast feed occurred after hospital discharge. Mothers should be informed about the benefits of breast milk and breast-feeding methods before they are discharged from the hospital, and health-care personnel should help mothers to start breast feeding in the first hour post partum by evaluating the mother both physically and socioculturally.

Breast feeding an infant in the first hour post partum can be delayed for many reasons, but the frequency of breast feeding depends on the mother's knowledge of and enthusiasm for breast feeding (Tunçel et al., 2005).

Eighty percent of mothers stated that they fed their infants exclusively with breast milk, and 20% stated that they fed their infants with supplementary food along with breast milk. This study found a significant difference between the average BSES scores of mothers who breast fed their infants exclusively and mothers who fed their infants with liquid food or supplementary food along with breast milk. The average BSES scores of the mothers who fed their infants exclusively with breast milk were much higher than those of the mothers who fed their infants with different methods.

According to the Turkish Demographic and Health Survey in 2008, 44.0% of infants are fed with liquid food along with breast milk. This percentage is significantly higher than that found in the Turkish Demographic and Health Survey in 2003 (31.8%).

This study found that reasons for feeding infants with foods other than breast milk included: traditional habits, parental guidance, the idea that breast feeding the infant is insufficient and the infant may need water, and trying to prevent canker growth. This situation could change if mothers are sufficiently supported and informed about breast feeding and infant feeding in the prenatal period by specialists, especially midwives.

The BSES is a valid and reliable instrument for the identification of Turkish mothers with low breast-feeding self-efficacy.

Conclusion

Overall, this study found that the validity and reliability of the Turkish version of the BSES are adequate for field application, but there is a need to repeat the validity studies of the scale in different fields. The consistency of the BSES is adequate. Repetition of the fundamental validity and reliability studies will be necessary at every use of the scale in terms of being scientific of the acquired data by taking the changes due to technological, social and cultural developments into consideration. The BSES, the Turkish validity and reliability studies of which were done; can be used in various field surveys to identify mothers at risk of giving up breast feeding early in the postpartum period, and to identify areas of breast feeding in which mothers need education. Moreover, it is thought that health-care personnel and professionals can help mothers to cope with their ideational or technical problems, and to be more successful in the breast-feeding process by undertaking studies to increase mothers' breast-feeding self-efficacy. In conclusion, performing the studies in which this scale is to be used will make a major contribution to the measuring competency of the scale.

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