PSYCHOSOCIAL FACTORS ASSOCIATED WITH BREASTFEEDING PRACTICE AMONG SAUDI ARABIAN MOTHERS

By

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ABSTRACT

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Background/Significance: Breastfeeding has been identified as the most complete form of infant nutrition in the first six months of infant life. The World Health Organization (WHO) recommends exclusive breastfeeding throughout the first six months. Adherence to the WHO recommendation of breastfeeding is important to lay a healthy foundation for infant growth and development. However, there has been a noticeable decline in the rate of exclusive breastfeeding in the Kingdom of Saudi Arabia (KSA). There is a lack of literature that examines theory-based factors associated with breastfeeding practice among Saudi Arabian mothers; thus, the causes that underlie the low rate of breastfeeding have not yet been established.

Framework: The conceptual framework for this study was guided by the breastfeeding self-efficacy theory.

Aims: The aims of the study were to examine: 1) the associations between perceived stress and the practice of breastfeeding among first-time Saudi Arabian mothers, 2) the association between social support and the practice of breastfeeding among first-time Saudi Arabian mothers, and 3) the association between breastfeeding self-efficacy and the practice of breastfeeding among first-time Saudi Arabian mothers at six to twelve months after birth.

Methods: This study used a cross-sectional, correlational design. A non-random convenience sample of 160 first-time mothers was recruited from four primary care centers in Jeddah, KSA. Multinomial logistic regression model was employed to examine the three aims. The associations between the demographic variables in this study and the three breastfeeding categories

(exclusive, partial and discontinued breastfeeding) were examined using One-way analysis-of-variance (ANOVA), Pearson's chi-square test, and Fisher's exact test.

Results: The mean age of participants was 27.21 years. The proportions of exclusive, partial, and discontinued breastfeeding in the study sample were 27.5%, 30.00%, and 42.5%, respectively. Mothers who had higher levels of perceived stress were significantly more likely to discontinue breastfeeding before the recommended six months. Mothers with higher levels of social support were significantly more likely to continue breastfeeding throughout the first six months after birth. Likewise, mothers with higher levels of breastfeeding self-efficacy were more likely to continue exclusive or partial breastfeeding throughout the first six months. There were significant associations between breastfeeding practice, maternal employment status, household income, and educational level.

Implications: This study indicated that mothers with lower levels of perceived stress, higher levels of social support, and higher levels of breastfeeding self-efficacy were more likely to continue breastfeeding until at least six months postpartum. Clinicians should empower mothers with psychosocial resources to promote the practice of breastfeeding. Moreover, there is a need for policy that mandates assessment of psychosocial factors during prenatal and postnatal care. Findings from this study lay the foundation for future intervention research through identifying the theory-based factors that are associated with breastfeeding.

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Infant feeding is critical in order to lay a healthy foundation for growth and development. Breastfeeding has been identified as the most complete form of nutrition in the first six months of infant life (James & Lessen, 2009; The World Health Organization [WHO], 2016). Research has shown that exclusive breastfeeding in the first six months of an infant's life has numerous advantages to both the infant and the mother (Ip et al., 2007; The United Nations Children's Fund [UNICEF], 2015; Victora et al., 2016). The WHO reviewed the scientific evidence regarding the potential benefits of the optimal duration of exclusive breastfeeding. Accordingly, in 2001, the WHO revised the global breastfeeding recommendations on the duration of breastfeeding to recommend exclusive breastfeeding throughout the first six months versus the first four to six months after birth (Kramer & Kakuma, 2002).

The current recommendations by the WHO are consistent with the American Academy of Pediatrics (AAP) that infants should be exclusively breastfed for the first six months of infant life, and breastfeeding should be continued until two years of age accompanied by age-appropriate food (Gartner et al., 2005; WHO, 2016). Adherence to the WHO and the AAP recommendations of breastfeeding is important in order to achieve optimal health benefits for both infants and mothers (Khan, Vesel, Bahl, & Martines, 2015; Victora et al., 2016). Unfortunately, this recommendation is not always being followed; worldwide, fewer than 40% of infants are exclusively breastfed during the first six months of their life (WHO, 2015). The low rate of breastfeeding has been identified as a global health issue that needs to be addressed (Bevan & Brown, 2014).

Exclusive breastfeeding rates within the first six months have improved gradually over the last decade in different countries around the world (Cai, Wardlaw, & Brown, 2012). Despite

the fact that rates of exclusive breastfeeding have improved in the United States of America (USA), Sub-Saharan Africa, and East/South Asia, there has been a noticeable decline in the rate of exclusive breastfeeding in the Kingdom of Saudi Arabia (KSA; Ogbeide, Siddiqui, Al Khalifa, & Karim, 2004; UNICEF, 2013). Studies in the KSA has highlighted the issue of decreased breastfeeding rates and the need for more research that addresses barriers to breastfeeding (Al-Jassir, El-Bashir, Moizuddin, & Abu-Nayan, 2006; Al Juaid, Binns, & Giglia, 2014). Therefore, this study focused on examining the breastfeeding practice in the KSA.

It has been consistently reported that the rates of exclusive breastfeeding in developed and developing countries decline as infant age advances (Abusaad & El-Gilany, 2011; Alemayehu, Haidar, & Habte, 2009). The most commonly reported reason for the early termination of breastfeeding among Saudi Arabian mothers is the perception of insufficient breast milk (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; Al Juaid et al., 2014). According to McCarter-Spaulding & Kearney (2001), the perception of "insufficient milk supply" is defined as the mother's belief that her breast milk is deficient in quantity or quality to meet her infant's nutritional needs. Perceived insufficient milk supply may relate to the lack of confidence in a mother's ability to successfully breastfeed (Dennis, 2002; Otsuka, Dennis, Tatsuoka, & Jimba, 2008), known as breastfeeding self-efficacy (Dennis & Faux, 1999).

Repetitive reporting of "insufficient breast milk" as a reason for early breastfeeding discontinuation can also be explained by infrequent breastfeeding that results from formula supplementation (Wasser et al., 2011), which eventually leads to diminished breast milk (Al Juaid et al., 2014; Neville & Morton, 2001). Other important psychosocial factors, such as perceived stress and social support, can also impact the ability of mothers to continue breastfeeding (Bandura, 1977a, 1977b; Dennis, 1999).

Psychosocial factors are important determinants of breastfeeding that can influence a mother's decision and ability to breastfeed (Hauff, Leonard, & Rasmussen, 2014; Meedya, 2010). The influences of such factors are yet unknown in the KSA, a country that has a low breastfeeding rate (Al Juaid et al., 2014). In order to improve the current rate of breastfeeding in the KSA, psychosocial factors that can be modified with appropriate intervention strategies need to be identified.

An Overview of Births and Health Centers in the KSA

Saudi Arabia, one of the largest developing countries in the Middle East, is located in the southwest corner of Asia. Total population of the KSA as of 2016 census was approximately 31,7 million people, including about 20,1 million Saudi, and 11,7 million non-Saudi (Saudi Arabian General Authority for statistics, 2016). The total number of Saudi females was 9,850,218 including 4,622,041 who were of childbearing age between 19-45 years (Saudi Arabian General Authority for statistics, 2016). Jeddah city, the second largest city, is located in the western region of the KSA. The city of Jeddah has five governmental hospitals and other 33 private hospitals (Ministry of Health in the KSA, 2016).

According to the Ministry of Health Statistics (2015), the total number of births in the government hospitals was 262,792 births in 2015. Of the total births, there were 10,126 deliveries in Jeddah's government hospitals including 8,825 vaginal deliveries, 1,301 cesarean deliveries and others assisted deliveries (Ministry of Health in the KSA, 2016). There are 45 primary care centers (PCCs) in the city of Jeddah that provide preventative and regular health services for community members. The PCCs are available for the public in every geographic sector and serve under the rules and regulations of the Ministry of Health. There are well-baby

clinics in each primary care center. In Jeddah, the total well-baby visits per the recent yearly statistics were 187,301 Saudi and 107,318 non Saudi (Ministry of Health in the KSA, 2016).

Prevalence of Breastfeeding in the KSA

The global exclusive breastfeeding rate of infants younger than six months has not exceeded 39% over the past decade (UNICEF, 2015). There are no recent data on national breastfeeding rates in the KSA since 2014, which may hinder the accurate monitoring of progress and change over time of breastfeeding patterns (Al Juaid et al., 2014). Almost all Saudi Arabian mothers initiate breastfeeding after the birth of their infants. The documented breastfeeding initiation rates have been consistently over 90%, ranging from 91.6% to 95% (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; El Mouzan , Al Omar, Al Salloum, Al Herbish, & Qurachi, 2009). However, this high rate of breastfeeding drops following the first weeks after birth. National surveys' findings reported that fewer than 24% of infants were breastfed (either exclusively or accompanied with formula) throughout the first six months of life (Al-Jassir et al., 2006; El Mouzan et al., 2009).

A study in the KSA revealed a declining trend of exclusively breastfed infants, from 76.1% at birth to only 19.2%, and 12.2%, at four and six months of infant age, respectively (Amin, Hablas, & Al Qader, 2011). Similarly, another regional survey in the KSA reported a sharp decline of breastfeeding rates from 98.9% at the first week after birth to only 0.8% at six months (Al-Jassir, El-Bashir, & Moizuddin, 2004; El-Gilany et al., 2011). This decline in breastfeeding rates over the first six-months is consistent with the findings from other countries where exclusive breastfeeding rates decline as infant age advances (Abusaad & El-Gilany, 2011; Alemayehu, Haidar, & Habte, 2009; CDC 2012). There are numerous possible reasons for the

declining trends of breastfeeding over the first six months after birth including early introduction of solids and formula (Wasser et al., 2011).

In Riyadh, the central largest city of the KSA, the percentage of exclusive breastfeeding through the first six months is less than 2%, much lower than in many developed countries (Al-Hreashy et al., 2008; Al-Jassir et al., 2004). The causes that underlie the early discontinuation of breastfeeding among Saudi Arabian mothers before the recommended six months are not yet established. The current breastfeeding rates cannot be improved, unless the factors related to the early discontinuation of breastfeeding are identified.

History of Breastfeeding in the KSA

The KSA is governed by Islamic rules and regulations based on the Quran and tradition of Prophet Muhammad. The Holy Quran explicitly recommended breastfeeding more than 1000 years ago: "Mothers shall give suck to their offspring for two whole years for those who desire to complete the term" (Quran, 2:233). These Islamic principles strongly shape the mother-infant relationship and feeding decision in the KSA. Historically, breastfeeding among Saudi mothers was a common practice until recently, when alternatives, such as formula feeding, became more accessible and affordable for most Saudi mothers (Murshid, 2006). The recent significant changes in the education and employment opportunities for females might account for declining breastfeeding rates in the KSA (The World Breastfeeding Trends Initiative [WBTi], 2012). Moreover, the country's rapid socio-economic growth might also contribute to the current pattern of infant feeding (Al-Madani, Vydelingum, & Lawrence, 2010; Twum-Danso & Ame, 2012).

Concurrent sub-optimal infant feeding practices that may result in negative health outcomes are common among Saudi mothers within the first six month including the early

introduction of water, herbal tea (Al-Hreashy et al., 2008), and formula (Murshid, 2006). Maternal dissatisfaction with breastfeeding might lead to the introductions of different type of nutritional supplements. A recent study examined maternal concerns about breastfeeding among Saudi Arabian and Egyptian mothers, and revealed that only 14% of Saudi mothers were satisfied with their exclusive breastfeeding experience compared to 65% of Egyptian mothers (Nafee Elsayed & Al-Dossary, 2016). Different reasons might explain breastfeeding dissatisfaction among Saudi Arabian mothers including embarrassment from breastfeeding in public places, and unsuitability of breastfeeding with working mothers (Nafee Elsayed & Al-Dossary, 2016). This high rate of breastfeeding dissatisfaction among Saudi mothers indicates the critical needs for addressing concerns and barriers to breastfeeding.

Globally, the practice of breastfeeding has been accepted and acknowledged as the gold standard for infant nutrition (WHO, 2015). Strategies that support breastfeeding, such as the Baby-Friendly Hospital Initiative (BFHI) and lactation consultants, have been implemented in different developed countries around the world to ensure the best possible health outcomes and improve mothers' confidence in breastfeeding (WHO & UNICEF, 2009). Breastfeeding supporting strategies have shown to be effective in helping mothers to overcome potential barriers that nursing mothers may encounter, and to improve breastfeeding outcomes (James & Lessen, 2009; Patel & Patel, 2015). Yet, such supportive measures and policies are lacking in the KSA, hindering the improvement of current breastfeeding rates. So far, no successful strategy has been found that guarantees that mothers, who initiate breastfeeding, will continue to do so throughout the recommended six months.

Despite the consistent agreement on the steps of BFHI among Saudi mothers, a recent study revealed that the BFHI steps are not being followed by health professionals and policy

makers in the KSA (Salem & Al Madani, 2015). Among the strategies used to promote breastfeeding was a social media campaign that was initiated in the KSA, which showed a slightly positive effect on breastfeeding rates (Bahkali et al., 2015). Nevertheless, there is a lack of intervention programs that support breastfeeding and address mothers' concerns. Thus, understanding individual psychosocial factors that might influence the practice of breastfeeding in the KSA is important in order to effectively support breastfeeding mothers.

Factors Contributing to Early Discontinuation of Breastfeeding

Despite religious instructions and the well-documented evidence on the benefits of breastfeeding, about half of breastfeeding mothers in the KSA discontinue breastfeeding before the recommended period of six months (Al-Hreashy et al., 2008). In the KSA, several studies have cited the perception of insufficient breast milk that could result from lack of breastfeeding knowledge as the most frequent reason for early breastfeeding discontinuation (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; Al Juaid et al., 2014). Another study carried out in western Saudi Arabia, city of Jeddah, revealed that 50% of a sample of 128 mothers identified insufficient breast milk as the cause of inability to sustain breastfeeding, followed by return to work (Fida & Al-Aama, 2003). McCarter-Spaulding and Kearney (2001) defined the expression of perceived insufficient milk as the mother's belief about her breast milk being insufficient in amount or quality to meet the needs of her infant.

Lack of self-efficacy. After birth, it is unlikely for mothers to have inadequate breast milk supply due to physiologic or primary reasons. Literature that supports the associations between the perception of insufficient milk and the primary physical issues is lacking. Nevertheless, research has found a negative association between the perception of insufficient milk and breastfeeding confidence, known as breastfeeding self-efficacy (Dennis & Faux, 1999).

Two studies conducted in the USA and Japan revealed a significant correlation between breastfeeding self-efficacy and the perception of insufficient milk (McCarter-Spaulding & Kearney, 2001; Otsuka et al., 2008). Therefore, breastfeeding self-efficacy could be a very important factor to address in order to understand its correlation with the practice of breastfeeding among Saudi Arabian mothers.

Perceived high levels of stress. Some of the psychosocial influences affecting breastfeeding exclusivity and duration among Saudi mothers are related to Saudi mothers' unique sociocultural contexts (Al Juaid et al., 2014). The common practice of newly married Saudi women moving from rural to urban areas (migration), often around the time of their first baby, can cause stress and social isolation (Aldosari, Bello, & Alhidary, 2015; Salam, 2013).

Saudi Arabian mothers are expected to serve as the primary caregivers for their infants, and coordinate household tasks with the lack of their husbands' support (Aldosari & Pufpaff, 2014). Within this unique social-cultural context, Saudi Arabian mothers could experience high levels of stress. Stress has been identified as a significant predictor of postpartum depression, another factor strongly associated with the early cessation of breastfeeding (Brown, Rance, & Bennett, 2016; Henderson, Evans, Straton, Priest, & Hagan, 2003; Miller, 2002). Thus, addressing perceived stress among Saudi mothers is crucial in order to promote the healthy outcomes of breastfeeding.

Lack of social support. The social barriers of breastfeeding cessation are evident in the KSA, where there is a lack of established policy to support breastfeeding in the workplace or in public (Al-Binali, 2012). While they are a minority, employed mothers are at high risk for the early discontinuation of breastfeeding due to experiencing high levels of stress and a lack of support (WBTi, 2012). For instance, in developed country, mothers who had breastfed for six

months or longer reported a drop in their earnings that resulted from reduced working hours and a loss of promotions (Rippeyoung & Noonan, 2012).

Several social barriers have been documented in the KSA, including the common norm that it is unacceptable to breastfeed in public places (WBTi, 2012), a lack of private nursing rooms, and embarrassment regarding breastfeeding in public (Nafee Elsayed & Al-Dossary, 2016). In addition, employed Saudi mothers are granted a short maternity leave (about five weeks), which may prevent them from continuing breastfeeding throughout the recommended six months (WBTi, 2012). The possible loss of income associated with prolonged maternity leave, sleep disturbances with newborn responsibilities, and a lack of support pose a high risk of psychological stress among breastfeeding mothers, and can lead to the early cessation of breastfeeding (Gardazi, Mobeen, & Syeda Ahsan Ali, 2016).

Significance

Significance of breastfeeding to society. Supporting appropriate feeding choices is essential for optimizing infant health outcomes. Research has shown unquestionable long-term benefits of exclusive breastfeeding for infants and mothers (Khan et al., 2015; Sankar et al., 2015; Victora et al., 2016). For infants, breastfeeding is associated with improved brain development and cognitive performance (Victora et al., 2016), increased protection and immunity against several pathogens (Stuebe & Schwarz, 2010), a decreased risk of infant mortality (Khan et al., 2015; Sankar et al., 2015; Victora et al., 2016), and a reduced risk of obesity and asthma (Krenz-Niedbala et al., 2015; Victora et al., 2016). In addition, the odds of sudden infant death syndrome (SIDS) are approximately three times lower in breastfeeding infants than in formula-fed infants (Hauck, Thompson, Tanabe, Moon, & Vennemann, 2011). The potential protective effects of breastfeeding against SIDS can be explained by the survival

mechanism in reducing the arousal thresholds during infant sleep (Horne, Parslow, Ferens, Watts, & Adamson, 2004).

Breastfeeding not only benefits infant health outcomes, but also benefits their mothers. Mothers, who breastfed their infants, had a significantly decreased maternal risk of breast and ovarian cancers compared to those who never breastfed (Victora et al., 2016). Moreover, breastfeeding releases the oxytocin hormone, which reduces the risk of postpartum bleeding (Chen & Rogan, 2004). In addition, regular breastfeeding can help in natural birth spacing (Victora et al., 2016).

The previous advantages become more evident with exclusive breastfeeding. Nevertheless, a recent study has revealed that even partial breastfeeding can provide some protective effects for infants against certain diseases compared to exclusive formula feeding (Sankar et al., 2015). It is important to note that the previously cited health benefits of breastfeeding were based on correlational and observational studies; thus, careful interpretation of the results is advised. In addition, causal inferences cannot be assumed due to the lack of evidence about ruling out all potential confounding factors that could account for the correlations between the health benefits and the practice of breastfeeding.

Establishing an emotional bond through breastfeeding is vital for a healthy mother-infant relationship. Breastfeeding is a natural way to continue the mother-infant attachment that usually begins during pregnancy (Yu, 2011). Breastfeeding not only strengthens the quality of mother-infant relationship, but it also releases hormones that encourage mothering behaviors (Yu, 2011). For example, the hormone oxytocin, which is released when mothers breastfeed, has been linked to changes in maternal brain activity in response to infants' cues (Peltola et al., 2014). Furthermore, mother-infant bonding via breastfeeding can reduce the risk of child maltreatment

and enhance the long-term mother-infant relationship (Strathearn, Mamun, Najman, & O'Callaghan, 2009).

Breastfeeding is also environmentally-friendly because it does not require the disposal of formula or cans (Gartner et al., 2005). It saves the use of natural resources and raw materials that can take decades to break down after disposal, such as plastic bottles. Moreover, breastfeeding saves time and money because it eliminates the cost of artificial milk, bottles, heating, and storage.

Despite the health benefits and environmental advantages of breastfeeding, there are other psychological, physiological, economical, and social factors that influence the ability of mothers to breastfeed. Thus, these factors need to be specified to further promote breastfeeding by taking into account variations in sociocultural norms and backgrounds (Al Juaid et al., 2014).

Significance to healthcare. The risks of the early cessation of breastfeeding include increasing infants' susceptibility for contracting infectious diseases, such as diarrhea and pneumonia, which are most often associated with infant mortality (Black, Morris, & Bryce, 2003). Infants, who were never breastfed, face elevated risks of diabetes, SIDS, and leukemia (Ip et al., 2007). Other infectious diseases, such as otitis media, gastroenteritis, and atopic dermatitis, are also more common among non-breastfed infants due to their underdeveloped immune systems (Black et al., 2003; Stuebe & Schwarz, 2010).

Breastfeeding significantly impacts healthcare and its associated costs. Breastfeeding is not only associated with decreased mortality and morbidity (Stuebe & Schwarz, 2010), but it also has the potential for decreased annual healthcare costs (Bartick & Reinhold, 2010; Weimer, 2001). It has been estimated that a minimum of $10 billion could be saved yearly in the USA if the prevalence of exclusive breastfeeding was improved to 80% at six months (Bartick &

Reinhold, 2010; Weimer, 2001). The cost savings associated with exclusive breastfeeding can be direct, via the reduction of formula costs, infant's sick clinic visits, and diagnostic procedure fees that may be requested for a sick infant, and indirect, such as through the reduction of parental absenteeism that occurs when parents must accompany a sick infant (Rippeyoung & Noonan, 2012; Weimer, 2001).

Mothers' feeding behavior plays a major role in regulating the ongoing process of weight gain during infancy (Koupil & Toivanen, 2008). In the USA, approximately 17% of the children are obese (Ogden et al., 2016). In the KSA, there is very limited information on the prevalence of early childhood obesity. However, research has found that obesity is evident in all age groups and affects all regions of the KSA (Al-Othaimeen, 2007). Studies conducted in the Middle East have found that children and adolescents are likely to experience a great weight gain as they age and grow (Al-Hourani, Henry, & Lightowler, 2003; Al-Isa, 2004). The current epidemic of childhood obesity cannot be attributed to the alterations in genes that are linked to adult obesity alone (Gittner, Ludington-Hoe, & Haller, 2014); however, it might, in part, be the result of mothers' suboptimal feeding behaviors. Childhood obesity can lead to comorbidities and lifelong weight struggles (Gittner et al., 2014). The risk of early childhood obesity can be reduced, in part, through exclusive breastfeeding (Krenz-Niedbala et al., 2015; Victora et al., 2016).

Obesity and its associated diseases place a huge financial cost on individuals and healthcare systems. Treating childhood obesity and its associated medical conditions is expected to cost $48 to $60 billion in the USA, per year by 2030 (Finkelstein, Fiebelkorn, & Wang, 2003; Wang, McPherson, Marsh, Gortmaker, & Brown, 2011). Exclusive and longer-duration breastfeeding can protect against the development of childhood obesity (Reynolds, Hennessy, &

Polek, 2014). Therefore, efforts need to be taken by healthcare systems to encourage mothers to follow the current recommendations for breastfeeding.

Breastfeeding support has become a global health goal to ensure maximum health benefits with reduced costs. The WHO and UNICEF introduced the BFHI in 1991, which included the *Ten Steps to Successful Breastfeeding*. The *Ten Steps to Successful Breastfeeding* were developed by global experts for healthcare providers to adopt in order to increase the initiation, duration, and exclusivity of breastfeeding. There are vast differences between the breastfeeding promotion strategies implemented by healthcare facilities in developed versus developing countries.

Additionally, the assessment of maternal psychosocial factors that may influence the practice of breastfeeding is often not included in prenatal and postnatal care in the KSA (Habib, Hanafi, & El-Sagheer, 2011). Thus, it is important to address maternal psychosocial factors, and, by doing so, breastfeeding recommendations could be incorporated into the healthcare system (Gartner et al., 2005; Glassman, McKearney, Saslaw, & Sirota, 2014).

Significance to the discipline of nursing. Addressing breastfeeding and its associated factors is imperative for the discipline of nursing to achieve adherence to the current breastfeeding recommendations, particularly in developing countries where the rates of breastfeeding are relatively low (Murshid, 2006). It has not been established that a physical or hormonal factor alone causes insufficient milk production (Neifert, 2001), which was the most cited reason for early breastfeeding discontinuation (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; Al Juaid et al., 2014). Thus, there must be other factors that also influence early breastfeeding discontinuation, such as psychosocial factors including self-efficacy (McCarter-Spaulding & Kearney, 2001; Otsuka et al., 2008), perceived stress (Doulouger, Panagopoulou, &

Montgomery, 2013), and social support (Dashti, Scott, Edwards, & Al-Sughayer, 2010; Nassar et al., 2014). Such psychosocial factors need to be addressed to equip nurses with the knowledge and skills needed to effectively encourage breastfeeding throughout the first six months of infant's life.

Understanding psychosocial factors enables nurses to integrate the assessment of such factors into their daily practice. Given the fact that the majority of Saudi Arabian mothers initiate breastfeeding (Al-Hreashy et al., 2008; Al-Jassir et al., 2006), efforts are needed to identify the main factors that contribute to the discontinuation of breastfeeding. Factors influencing breastfeeding initiation are different than factors that influence the exclusivity of breastfeeding at six months postpartum (Jones, Kogan, Singh, Dee, & Grummer-Strawn, 2011). Thus, exploring psychosocial factors at six months postpartum is needed to identify the possible determinants of breastfeeding exclusivity and enhance evidence-based practice. Maternal psychosocial factors are important components of the basic nursing metaparadigm: health, person, environment, and nursing (Fawcett & Desanto-Madeya, 2013). Clarifying the psychosocial determinants of breastfeeding assists nurses in educating and assisting mothers who may be at risk of early termination of breastfeeding.

Integrating conceptual knowledge into nursing practice is essential to provide holistic care that could improve the health outcomes of mothers and infants via breastfeeding. Furthermore, nurses need to be well-informed about the psychosocial factors associated with the exclusivity and duration of breastfeeding so they can identify at risk mothers for early breastfeeding discontinuation and develop individualized plans to assist all breastfeeding mothers. It is imperative to integrate the assessment of psychosocial factors into practice through supportive breastfeeding policy in healthcare systems.

Gaps in Knowledge

Numerous antecedents of the early breastfeeding cessation are psychosocial factors (Balogun, Dagvadorj, Anigo, Ota, & Sasaki, 2015; McCarter-Spaulding & Kearney, 2001; Meedya, 2010; Otsuka et al., 2008). Research that examines the relationships between psychosocial factors and breastfeeding practice is lacking in the KSA; hence, the associations between such factors are not well-known. Existing literature from different countries has revealed inconsistent findings related to the association between psychosocial factors and the practice of breastfeeding (Aubuchon-Endsley, Kennedy, Gilchrist, Thomas, & Grant, 2015; McQueen, Dennis, Stremler, & Norman, 2011; Souza & Fernandes, 2014), suggesting the need for more research in this area.

While some studies have reported a positive association between stress levels and the practice of breastfeeding (Dimitraki et al., 2016; Doulouger et al., 2013; Dozier, Nelson, & Brownell, 2012), other studies did not support this positive relationship (Groer, 2005; Groer, Davis, & Hemphill, 2002). Research has also not established whether breastfeeding self-efficacy is a cause or a consequence of breastfeeding behavior. The lack of knowledge related to the psychosocial factors of breastfeeding could impede the ability of researchers and professionals to improve breastfeeding practice.

Several studies in the KSA that examined the maternal characteristics associated with breastfeeding focused on the first weeks of postpartum period (Al-Jassir et al., 2006; Al-Yousif, Sabra, Sebiany, & Hafez, 2011; Shawky & Abalkhail, 2003); thus, the reasons behind the discontinuation of breastfeeding before the recommended six months period are still not well understood. Studies conducted in the KSA have identified factors associated with breastfeeding exclusivity and duration, including increased maternal age, low income, rural residence, and low

educational levels (Al-Jassir et al., 2006; Al-Madani et al., 2010; Amin et al., 2011; Shawky & Abalkhail, 2003). However, these demographic factors are not amenable to change in the short term, though they are important to consider for intervening.

Furthermore, research has not examined how the three modifiable factors of stress, social support, and breastfeeding self-efficacy can affect the breastfeeding practices of mothers in the KSA, which makes it difficult to develop health promotion programs and monitor progress of breastfeeding parameters. Thus, these factors need to be addressed within a Saudi population, who has different cultural norms and social backgrounds than populations in developed countries (Al-Binali, 2012; Al Juaid et al., 2014; Habib et al., 2011).

This study was innovative in the following ways: 1) It involved the assessment of the associations that have not been empirically well-established between modifiable psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy as primary exposures, while other studies focused on breastfeeding self-efficacy as an ultimate outcome (Dozier et al., 2012); 2) It involved examining the maternal psychosocial factors associated with a longer duration of exclusive breastfeeding at six months of infant age, while several other studies have focused on breastfeeding primarily during the early postpartum period; and 3) It targeted first-time Saudi Arabian mothers who have low rates of exclusive breastfeeding (Murshid, 2006).

Study Purpose

The purpose of the study was to examine associations between three modifiable maternal psychosocial factors (perceived stress, social support, and breastfeeding self-efficacy) and breastfeeding practices in a sample of primiparous mothers who initiated breastfeeding in the KSA. As part of the overall pursuit of knowledge that can be used to promote healthy breastfeeding practices worldwide, this study has provided an original contribution to nursing

science by exploring the associations between modifiable psychosocial factors and breastfeeding practice within a population of Saudi Arabian women.

Definitions of Key Concepts

Breastfeeding initiation. Breastfeeding initiation**,** one of the main indicators of breastfeeding outcomes, is related to the time of the first breastfeeding session after the birth of an infant (Jana, 2006). Breastfeeding initiation can be determined based on the provision of breast milk for the newborn within the first 24 hours after birth (Dennis, Gagnon, Van Hulst, Dougherty, & Wahoush, 2013). The WHO defined "early breastfeeding initiation" as providing mothers' breast milk to infants within the first hour of their birth (WHO, 2016). In this study, early breastfeeding initiation was subjectively determined according to the provision of breast milk for the newborn within the first 24 hours after birth.

Breastfeeding practice. Breastfeeding practice can be described by three categories: exclusive, partial, and discontinued. Breastfeeding exclusivity is an important parameter of global breastfeeding outcomes. The specifications and definitions of breastfeeding categories are widely varied across the studies. The following definitions are the most consistent with the current WHO classifications. *Exclusive breastfeeding* was defined as an infant who is fed only breast milk for the first six months of life with no additional supplementation of any kind of food or drink, not even water, except syrups, vitamins, and minerals (WHO, 2016). *Partial breastfeeding* was defined as infants who were fed some combination of breast milk and any other food or liquid, including supplemental formula and water for the first six months (WHO, 2016). *Discontinued breastfeeding* was defined as infants who were breastfed (either exclusively or partially) for a period of time but breastfeeding was completely stopped before the

recommended first six months, and the infants were fed any food or liquid other than breast milk, including non-human milk.

Duration of breastfeeding. Duration of breastfeeding was defined as the period of any breastfeeding in days or months from the time of breastfeeding initiation to the time of breastfeeding cessation.

Perceived stress. Perceived stress was defined as a mother's perception of a situation as overwhelming and exceeding her available resources (Goodnite, 2014; Lazarus, 2006). It has been identified as a potential risk factor for the early cessation of breastfeeding (Doulouger et al., 2013).

Social support. Social support was defined as any form of social resources or helping relationships that are provided or perceived as available (Cohen, Brittney, Gottlieb, & Fetzer, 2000). Social support has been associated with high breastfeeding self-efficacy and longer-duration breastfeeding (Dashti et al., 2010; Nassar et al., 2014; Zhu, Tian, Chen, & Christensson, 2014).

Breastfeeding self-efficacy. The concept of breastfeeding self-efficacy emerged in 1999 as an important correlate of breastfeeding practice (Dennis, 1999). It refers to a mother's confidence in her ability to successfully breastfeed (Dennis, 2002; Otsuka et al., 2008). In developed countries, breastfeeding self-efficacy has been reported as a significant variable for predicting exclusive and longer-duration breastfeeding (de Jager, Skouteris, Broadbent, Amir, & Mellor, 2013; Dennis, 2006; Meedya, 2010).

Overarching Research Question

How do perceived stress, social support, and breastfeeding self-efficacy influence the practice of breastfeeding among Saudi Arabian mothers?

Aims and Hypotheses

Aim 1: To determine to what extent perceived stress is associated with the practice of breastfeeding at six to twelve months after birth among first-time Saudi Arabian mothers.

H1: Mothers who have lower levels of stress will tend to exclusively breastfeed through the first six months after birth compared to mothers who have higher levels of stress.

Aim 2: To determine to what extent social support is associated with the practice of breastfeeding at six to twelve months after birth among first-time Saudi Arabian mothers.

H2: Mothers who have higher levels of social support will continue to exclusively breastfeed their infants through the first six months after birth compared to mothers with lower levels of social support.

Aim 3: To determine to what extent breastfeeding self-efficacy is associated with the practice of breastfeeding at six to twelve months after birth among first-time Saudi Arabian mothers.

H3: Mothers who have higher levels of breastfeeding self-efficacy will continue to exclusively breastfeed their infants through the first six months compared to mothers who have lower levels of breastfeeding self-efficacy.

Summary

This study addressed the associations among the selected modifiable psychosocial variables (perceived stress, social support, and breastfeeding self-efficacy) and breastfeeding exclusivity and duration. Understanding the associations between perceived stress, social support, breastfeeding self-efficacy, and the practice of breastfeeding is important to effectively

improve breastfeeding practice. Findings from this study can be incorporated into clinical practice to improve mother and infant health outcomes in the KSA. The following is discussed in sequence: Chapter Two- conceptual framework for the study, Chapter Three- literature review on the study variables, Chapter Four- study design, methods of data collection and analysis, Chapter Five- results of the study, and Chapter Six- discussion of the findings and conclusions.

Chapter 2: Conceptual Framework

Human behavior reflects a complex interaction of physical, mental, emotional, and social actions. Different personal, psychosocial, and cultural factors influence individual behavior (Bandura, 1986). Breastfeeding is one of the natural maternal behaviors that support infant healthy growth and development (Victora et al., 2016). Breastfeeding behavior can be facilitated or impeded through personal and social contexts. A conceptual framework is important to clarify the complex interactions among an array of different factors that influence breastfeeding.

This chapter provides an overview of the conceptual framework that was used to guide the proposed study. The chapter starts with a brief description of the social cognitive theory from which the breastfeeding self-efficacy theory was derived. A detailed description of the most commonly used theory, breastfeeding self-efficacy, is provided, followed by an explanation of the concepts and propositions within that theory that relate to the study's concepts of perceived stress, social support, and breastfeeding self-efficacy and their associations with breastfeeding exclusivity and duration. The analysis of the breastfeeding self-efficacy theory elucidates the strengths, weaknesses, and gaps in the related literature. This chapter aims to clarify the conceptual associations between breastfeeding practice and the selected theory-based psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy.

Theories Used to Explain the Practice of Breastfeeding

Social Cognitive Theory (SCT). The SCT was developed by Bandura in 1977 to explain how people perform and maintain behaviors (Bandura, 1977a, 1977b). The SCT suggests that human behavior can be described through the triadic reciprocal causation in which behavioral, personal, and social factors mutually influence each other (Bandura, 1986). Bandura re-named social learning theory to social cognitive theory, to reflect the role of cognitive process

involved in the performance of behavior. The SCT is a fundamental theory that explains human behavior as the product of dynamic interplay between personal, behavioral, and environmental influences (Glanz, Rimer, & Viswanath, 2008). The SCT provides a framework for breastfeeding behavior by enhancing breastfeeding knowledge (personal factors), equipping mothers with skills to overcome breastfeeding barriers (behavioral factors), and providing breastfeeding support (environmental factors). In the SCT framework, behavioral, personal and environmental factors cannot function independently; rather they interact, regulate, and determine each other (Bandura, 1977b).

The SCT framework has been applied widely in nursing research. A study aimed to identify factors that may influence mothers' comfort level with breastfeeding in public, using SCT, concluded that past breastfeeding experience and knowledge were significant personal factors (Patenaude, Knol, & Turner, 2015). Significant environmental factors related to higher comfort with breastfeeding in public were supportive grandmother(s) and not working outside the home, while father's support and media campaigns were not significant in influencing mothers' public breastfeeding comfort (Patenaude et al., 2015). Another study guided by the SCT identified self-efficacy as an important predictor of breastfeeding initiation and duration among African-American mother (Eastin & Sharma, 2015). Thus, the foundation was laid for the breastfeeding self-efficacy theory.

Breastfeeding Self-Efficacy Theory (BSE). The BSE theory was derived from Bandura's social cognitive theory (Bandura, 1977a, 1977b; Dennis, 1999). The basic tenets of BSE theory were based on Bandura's theory of self-efficacy (Bandura, 1977a). Self-efficacy is a thought process about an individual's confidence in his/her perceived ability of performing a specific behavior (Bandura, 1986). Within this context, the BSE theory proposed that

breastfeeding self-efficacy is crucial in determining the exclusivity and duration of breastfeeding (Dennis & Faux, 1999). In different countries around the world, such as Canada, Australia, China, Brazil, and England, the concept of self-efficacy has been identified as an important determinant of breastfeeding behavior, as with other health behaviors (Babakazo, Donnen, Akilimali, Ali, & Okitolonda, 2015; McCarter-Spaulding & Gore, 2009; McQueen, Sieswerda, Montelpare, & Dennis, 2015; Wu, Hu, McCoy, & Efird, 2014). Studies from developed countries supported a strong positive association between breastfeeding self-efficacy and exclusive breastfeeding duration (de Jager et al., 2013; Dennis, 2006; Meedya, 2010).

Main Constructs in the BSE Theory

The BSE theory presents a systematic view for elucidating the behavior of breastfeeding. (Dennis, 1999). Self-efficacy is a central concept in the theoretical framework that reflects an individual's perceived ability about performing a behavior (Dennis & Faux, 1999). In the nursing literature, the concepts "self-efficacy" and "confidence" are used interchangeably. In the last decade, the concept of breastfeeding self-efficacy has been widely used in the literature reflecting the underlying theory of breastfeeding self-efficacy (Dennis, 1999). Breastfeeding self-efficacy (confidence) is one of the psychological factors that can be improved and modified through education and support (Dennis, 2003; Nichols, Schutte, Brown, Dennis, & Price, 2009; Wu et al., 2014). According to Dennis (1999), breastfeeding self-efficacy is affected by four sources of information based on Bandura's self-efficacy theory, known as antecedents, including performance accomplishments (e.g., previous breastfeeding experiences), vicarious experiences (e.g., watching other mothers practice breastfeeding), physiological states (e.g., stress, fatigue), and verbal persuasion (e.g., encouragement, social support).

The following four main sources of information that influence breastfeeding self-efficacy differ from person to person; thus, self-efficacy levels can be situation-specific (Dennis, 1999). First, performance accomplishments relate to previous personal experience in performing certain behavior. Research has supported this assumption by finding higher breastfeeding self-efficacy scores among mothers with previous breastfeeding experiences than in primiparous women (Blyth et al., 2002; Nichols et al., 2009). Moreover, it has been found in various longitudinal studies that the pattern of mothers' breastfeeding self-efficacy scores increased with the progression of time, when repeatedly measured on different occasions in a single study (McCarter-Spaulding & Gore, 2009; McQueen et al., 2011; Otsuka et al., 2014). Second, vicarious experiences involve observational learning about skills needed through live, recorded, or printed demonstrations (Dennis, 1999). An example of vicarious experience is watching other mothers while they breastfeed their infants, which can be influential. Third, verbal persuasion involves any form of social support, appraisals, or encouragement, which in turns influences the level of self-efficacy. Fourth, physiological states may involve positive interpretation of behavior (e.g., satisfaction) or negative interpretations (e.g., stress, fatigue, and pain). Health professionals can enhance mothers' BSE by modifying these sources of information (Dennis, 2006).

Self-efficacy directly influences individual response to behavior, which is known as consequences of self-efficacy. According to Dennis (1999), breastfeeding self-efficacy influences thoughts and actions via different ways: the choice of behavior (breastfeeding vs bottle feeding), the amount of effort and perseverance, thoughts patterns about the expectations of successful breastfeeding, and emotional reactions accompanied the success and failure of the breastfeeding behavior. The BSE theory predicts the following: initiation, performance as it relates to the ability to overcome obstacles, and the duration of breastfeeding (Dennis, 1999).

Self-efficacy is an important factor that can predict certain behaviors via beliefs and thought processes; however, it does not necessarily reflect the ability or skills needed to perform the actual behavior (Bandura, 1977b). Perceived stress, social support, past experience, and observing others performing the behavior can have a direct relationship with the practice of breastfeeding or an indirect relationship via the influence of BSE (Bandura, 1977a, 1977b; Dennis, 1999). The original BSE framework is displayed in Figure 1.

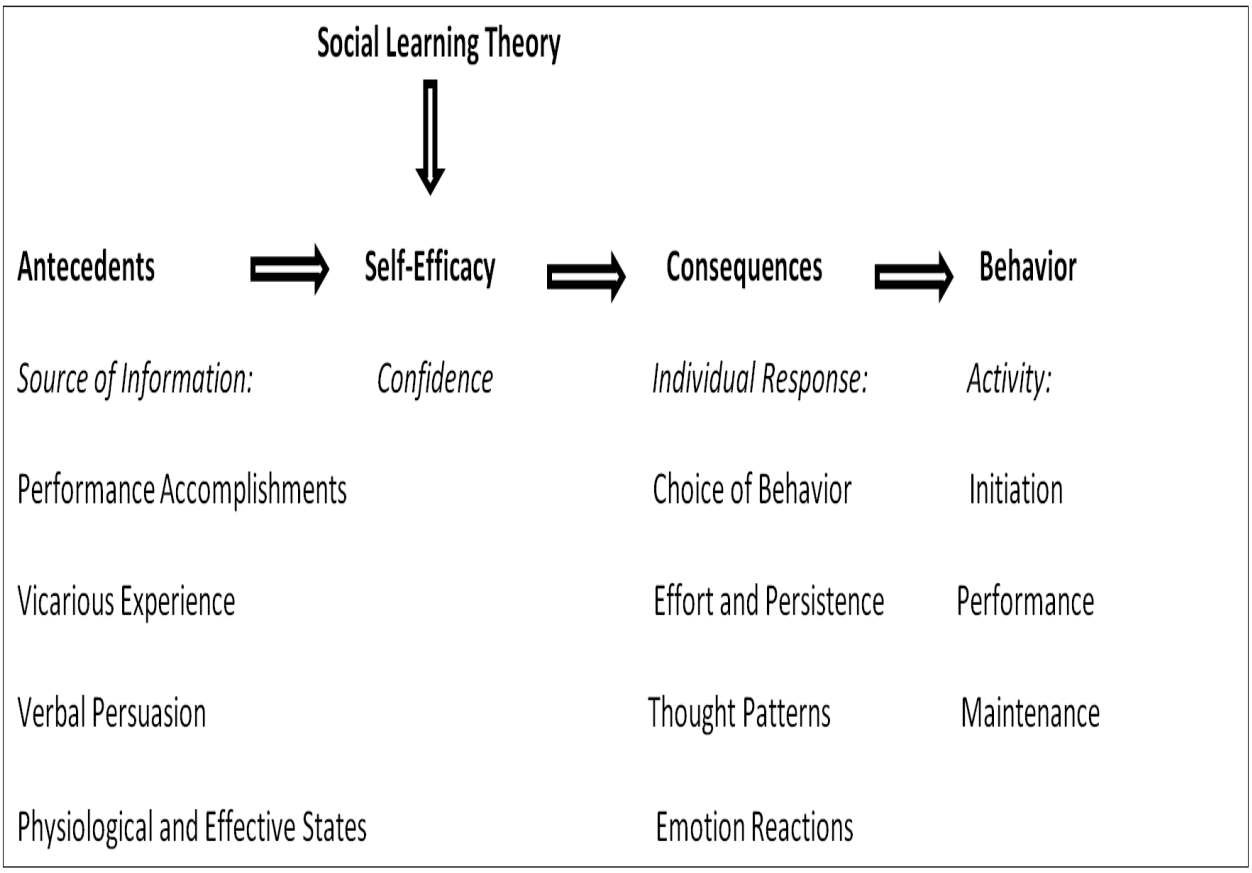

Figure 1. Self-efficacy framework.

Source: Dennis, C. (1999). Theoretical underpinnings of breastfeeding confidence: A self-efficacy framework. *Journal of Human Lactation*, 15(3), 195-201. Used with permission (Appendix A).

Theoretical Framework of the Study

Self-efficacy is a constantly evolving process that enhances over time with practice (Bandura, 1977b). Mothers' breastfeeding self-efficacy scores were found to increase over time, when they were evaluated multiple times throughout a single study (McQueen et al., 2011; Otsuka et al., 2014). Furthermore, the ability of breastfeeding self-efficacy to significantly predict breastfeeding duration varied from one week to six months postpartum (Blyth et al., 2004; de Jager et al., 2015; Henshaw, Fried, Siskind, Newhouse, & Cooper, 2015). For example, findings from a recent study showed that breastfeeding self-efficacy was a significant predictor for breastfeeding practices at six months postpartum, but not at six weeks postpartum (Henshaw et al., 2015). To control for the influence of past breastfeeding experience on breastfeeding self-efficacy, the sample of this study included only first-time mothers with their infants aged from six to 12 months.

The application of the core concepts of breastfeeding self-efficacy theory in research has been lacking. For example, breastfeeding self-efficacy has been commonly examined as an ultimate outcome of the four identified sources of information (predictors) including performance accomplishments, vicarious experiences, physiological states, and verbal persuasion. A major issue with the application of the BSE theory is its lack of consideration of the breastfeeding outcome in terms of exclusivity and duration (Resnick, 2013). Thus, the theoretical framework for the study conceptualized the associations between the selected maternal psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy as primary exposures, and the practice of breastfeeding as the outcome (see Figure 2).

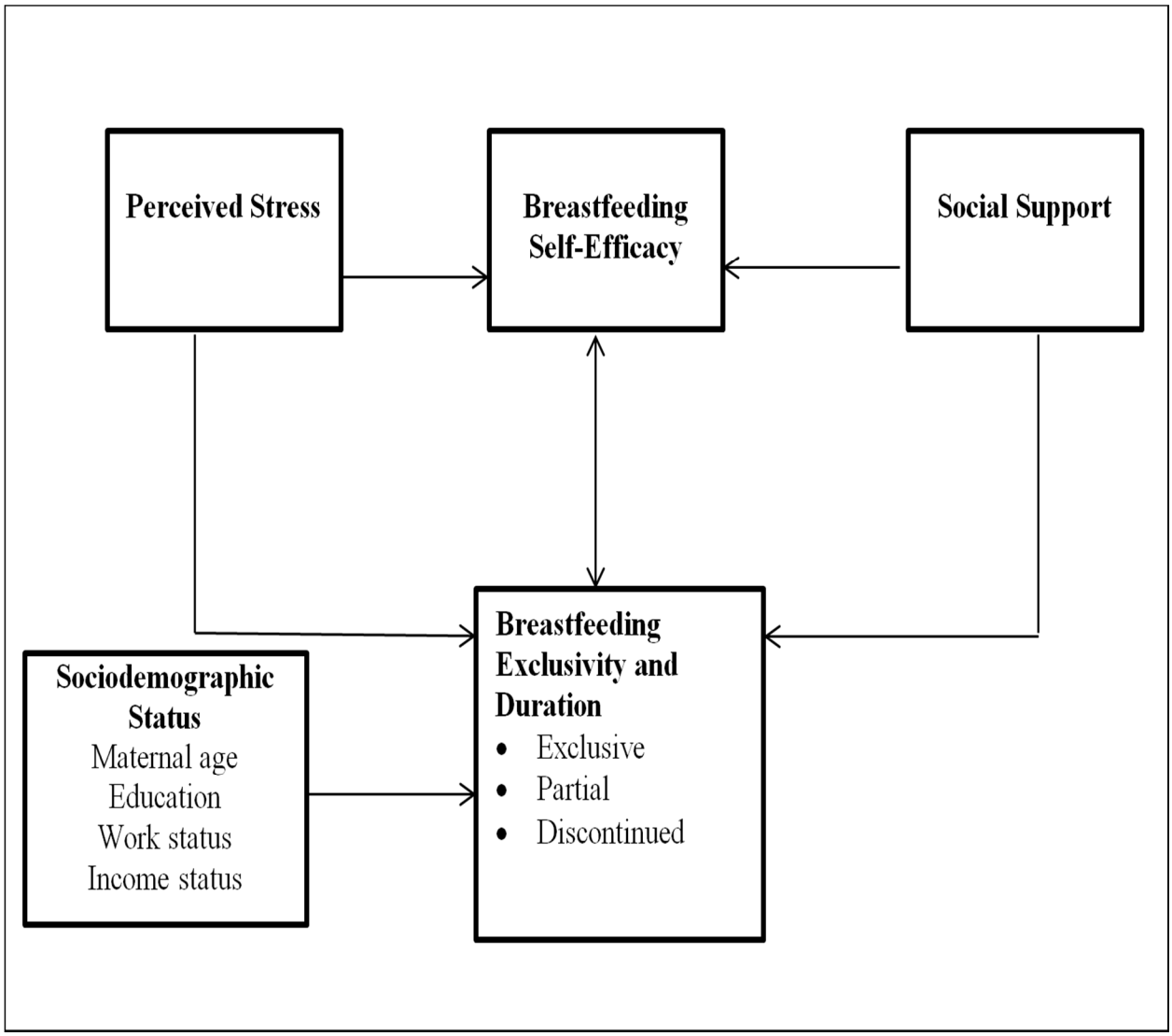

Figure 2. The conceptual framework of factors associated with breastfeeding practice.

The conceptual framework in Figure 2 has been developed based on the breastfeeding self-efficacy theory (Dennis, 1999). The conceptual framework of this study proposes that perceived stress that may occur with transition to the motherhood role among primiparous mothers can have a direct influence on the exclusivity and duration of breastfeeding (Bandura, 1977a, 1977b). Perceived stress can also indirectly impact the breastfeeding practice in terms of exclusivity and duration through the influence of breastfeeding self-efficacy (Dennis, 1999).

Breastfeeding self-efficacy can also be affected by the influence of perceived stress and social support, as both conceptualized in the BSE model as antecedents of breastfeeding self-efficacy (Bandura, 1977a, 1977b; Dennis, 1999). Social support was conceptualized in the framework of this study based on the concept of "verbal persuasion" in the original BSE model (Figure 1). Social support can indirectly influence the breastfeeding practice through influencing breastfeeding self-efficacy, and/or it can have direct influence on breastfeeding exclusivity and duration (Bandura, 1977a, 1977b; Dennis, 1999).

Modifiable variables conceptualized in the model differ from person to person and from context to context. Mothers' sociodemographic factors are important characteristics that may influence the practice of breastfeeding (Al Juaid et al., 2014; Amin et al., 2011). Maternal sociodemographic factors included in the study conceptual framework were the ages of mothers and their infants, education, work status, and income status.

Application of the BSE Theory

Dennis (2006) conducted the first study to test the assumptions in the BSE theory and assess the associations between breastfeeding self-efficacy and the outcomes of breastfeeding in the early postpartum period among Canadian breastfeeding mothers ($N = 522$). Dennis concluded that mothers who were exclusively breastfeeding had significantly higher levels of breastfeeding self-efficacy than mothers who were partially breastfeeding (2006). Dennis suggested through extensive research on breastfeeding that the BSE theory can be used to identify mothers at risk for early breastfeeding termination based on modifiable factors, including stress, social support, and breastfeeding self-efficacy (Dennis et al., 2013; Dennis, 2006; Dennis, 1999; Dennis, Heaman, & Mossman, 2011).

During the postpartum period, breastfeeding self-efficacy was a significant predictor of breastfeeding initiation and exclusivity in studies that were guided by the BSE (Blyth et al., 2002; McQueen et al., 2011; Wu et al., 2014). The postpartum period starts from the first hour after the delivery of a newborn to six weeks later (WHO, 2010). The postpartum period includes the immediate postpartum period (first 24 hours), early postpartum period (first week), and late postpartum period that extends up to 42 days (WHO, 2010).

Recently, the BSE framework was used to guide several observational and interventional studies that aimed to improve the practice of breastfeeding. For example, "self-efficacy enhancing sessions" was an intervention strategy that was developed for first-time mothers based on the BSE theory (McQueen et al., 2011; Wu et al., 2014). These "enhancing sessions" included: 1) initial assessment of breastfeeding self-efficacy, the breastfeeding goals, perception, physiologic state, and psychologic state; 2) individualized strategies to increase breastfeeding self-efficacy based on the previously listed four antecedents of breastfeeding self-efficacy; and 3) re-evaluation of the breastfeeding self-efficacy (McQueen et al., 2011; Wu et al., 2014). Another intervention was also based on the BSE theory's "self-efficacy workbooks," and it was developed to be given to pregnant women in their third trimester (Nichols et al., 2009). A majority of these theory-based interventions have been effective in improving breastfeeding self-efficacy, exclusivity, and duration.

Rationale for Choosing the BSE Theory

The rationale for using the BSE theory was that the BSE's constructs were specific to breastfeeding practice. For example, the outcomes of breastfeeding initiation, performance, and maintenance were explicitly conceptualized in the BSE theory as an outcome behavior for breastfeeding self-efficacy (Babakazo et al., 2015; Blyth et al., 2002). The BSE theory addressed

the basic propositions of self-efficacy theory in relation to breastfeeding practice, such as past breastfeeding experience and physiologic status.

The BSE theory allows constructs associated with breastfeeding to be operationalized and measured; thus, the model can be tested in different contexts with various populations. For example, the BSE theory has been used to design intervention studies that aim to promote breastfeeding among pregnant women (Blyth et al., 2004; Nichols et al., 2009) and first-time mothers (McQueen et al., 2011; Wu et al., 2014). The BSE theory has the potential to enhance breastfeeding self-efficacy and practice through the modification of the main sources of information "antecedents" identified in Figure 1. Overall, the BSE theory provides a holistic approach to variables that are amenable to change in order to enhance and promote breastfeeding exclusivity and duration.

Addressing the theory-based psychosocial factors of maternal perceived stress, social support, and breastfeeding self-efficacy has the potential to lay the foundation for innovative intervention designs and research in the KSA. Furthermore, hypotheses for future research that aim to promote exclusive and longer-duration breastfeeding cannot be generated without knowledge gained from examining psychosocial factors associated with breastfeeding at six months of infant age.

Evaluation of the BSE Theory

The description of the main concepts and constructs in the BSE theory are clearly defined. Moreover, the relationships between the concepts are explained in sequential process starting from the antecedents of the self-efficacy, and ending with the behavior of breastfeeding. The relationships between the concepts in the conceptual model of BSE remain consistent throughout the explanation and application of the theory. The theory addressed the four core

concepts of the nursing profession: nurse, health, person, and environment (Peterson & Bredow, 2017). Thus, the BSE is useful to predict human behavior in both practice and research. It can also be used to test or generate hypotheses to advance nursing science.

An important limitation of the BSE theory was that high self-efficacy may not be sufficient to execute the behavior, particularly in situations where support and resources are lacking (Bandura, 1977b). Moreover, low self-efficacy may lead to unpredictable and undesirable consequences that have not been explained in the model, such as depression (Bandura, 1977a, 1977b). Other than these limitations, the theory presents a dynamic and comprehensive view of breastfeeding behavior that can guide future studies that aim to improve the practice of breastfeeding.

Synthesis of Conceptual and Theoretical Knowledge

The BSE theory identified confidence in the ability to perform breastfeeding, known as breastfeeding self-efficacy, as a basic component of determining breastfeeding behavior (Bandura, 1977a; Dennis, 1999). Likewise, Ajzen (1991) added perceived control over performance in situations where one may not have control over the behavior as an additional construct to the theory of reasoned action. The concept of perceived behavioral control resembles the concept of self-efficacy in the BSE theory, as both concepts can be measured with the same items that determine one's belief in his/her ability to perform a certain behavior under different circumstances (Montano & Kasprzyk, 2008). In addition, the BSE assumes that human behavior is determined by intrinsic factors, which include individual's beliefs, and extrinsic factors, which include environmental influences.

Breastfeeding self-efficacy was identified as an important correlate with breastfeeding practice (Blyth et al., 2002; McQueen et al., 2011; Wu et al., 2014). High breastfeeding self-

efficacy scores have been correlated with high social support scores and low maternal perceived stress (Dennis, 2006). The BSE theory can be applied to guide future research that aims to identify mothers at high risk of early breastfeeding cessation in the first six months after birth and to develop effective interventions.

Gaps in Breastfeeding Self-efficacy Theory

The BSE theory provides insight into the nature of breastfeeding behavior. The BSE theory precisely addresses maternal psychosocial factors that predict breastfeeding self-efficacy and breastfeeding behavior. However, the majority of studies have focused on breastfeeding self-efficacy as an ultimate outcome (Dennis, 2006; Dozier et al., 2012). To close this gap, the focus of this study was on the assessment of the modifiable psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy as primary exposures.

Antecedents of the breastfeeding practice in the BSE conceptual framework (e.g., verbal persuasion, vicarious experience) have limited research implications due to unclear operational definitions. Furthermore, the linear relationships between the antecedents and the breastfeeding outcomes in the BSE theoretical model require a complex longitudinal prospective design in order for the relationships to be established. Additionally, the causal relationships between psychosocial factors (e.g., stress) and breastfeeding practices have not been established in the literature. For instance, studies have found that breastfeeding women had lower stress than women who were not breastfeeding, while other studies reported no differences between the stress levels of women who were breastfeeding versus those who were formula feeding (Dozier et al., 2012; Groer, 2005; Groer et al., 2002).

It has been well-documented that the rates of breastfeeding decline as infants advance in age. However, BSE does not address the time frame between constructs, considering the changes

in the practices of breastfeeding over time. Numerous studies have focused on breastfeeding during the early postpartum period in the application of the BSE theoretical framework (Glassman et al., 2014; McQueen et al., 2015; Souza & Fernandes, 2014). Therefore, this study aimed to close this gap by examining the maternal psychosocial factors associated with exclusive and longer-duration breastfeeding at six months of infant age. Moreover, the proposed conceptual framework in this study is the first to examine the associations between the selected psychosocial factors and breastfeeding practice among first-time Saudi Arabian mothers who initiated breastfeeding.

Summary

Theoretical frameworks are important in understanding human behavior. The breastfeeding self-efficacy theory has been used widely in nursing research. However, gaps in the theoretical knowledge exist with unclear propositions about the influence of self-efficacy as the primary exposure on the practice of breastfeeding at six months of infant age. Thus, the conceptual framework of this study was adapted based on the breastfeeding self-efficacy theory to examine to what extent the psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy were associated with breastfeeding exclusivity and duration at six months of infant age.

Several conceptual frameworks in the literature have focused on breastfeeding primarily during the early postpartum period. However, this conceptual framework further tested the assumptions with longer duration of exclusive breastfeeding, specifically at six months of infant age. The findings from this study can be incorporated into practice to identify women at risk for early breastfeeding cessation. Moreover, findings can be used to develop and test interventions

that aim to improve Saudi Arabian mothers' ability to overcome barriers and continue breastfeeding through the recommended period.

Chapter 3: Review of the Literature

Breastfeeding is a complex process affected by psychological, physiological, and social dynamics (Thulier & Mercer, 2009). The purpose of this study was to examine the associations between the breastfeeding practice and three maternal psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy in a sample of primparous mothers in the KSA. This chapter provides a review and critique of the empirical literature concerning selected study variables based on the study's theoretical framework discussed in Chapter 2. A comprehensive literature search of electronic databases was conducted to find studies that addressed the relationships between maternal psychosocial factors and breastfeeding practice, particularly exclusivity and duration. Databases included the Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, and PsychInfo. Additional relevant articles were included in the review through a manual search in the databases and Google Scholar.

The main global indicators of breastfeeding outcomes include: the percentage of mothers who ever breastfed; the percentage of mother who breastfed at 6 months, and the percentage of mothers who exclusively breastfed at 3 and 6 months (Healthy People, 2016). The main outcome of this study was the breastfeeding practice (exclusivity and duration) at six months of infant's age. There were three categories of breastfeeding practice in this study: exclusive breastfeeding which refers to mothers, who exclusively breastfed through the first six months with no additional supplement; partially breastfeeding, which refers to mothers who breastfed and supplemented with formula through the first six months postpartum; and discontinued breastfeeding, which refers to mothers who initiated breastfeeding but completely stopped prior to six months postpartum.

The review of the literature begins with the discussion of breastfeeding practices in the KSA concerning initiation, exclusivity, and duration. A review of independent maternal factors related to breastfeeding includes selected demographics, perceived stress, social support, and breastfeeding self-efficacy is also addressed. In addition, the current state of the science about the study variables, their relationships with the breastfeeding practice, and gaps in the literature are discussed. At the end of this chapter, an overall summary on the literature review is provided.

Breastfeeding Practice

An overview of breastfeeding practice in the KSA. Breastfeeding was a common practice among Saudi Arabian mothers based on their culture and Islamic instructions. The current rates of exclusive breastfeeding at six months of infant's age in the KSA are less than 24% (Al-Jassir et al., 2004; El-Gilany, Shady, & Helal, 2011). There have been significant changes in the education levels of Saudi Arabian women; subsequently, more employment opportunities are available for Saudi Arabian females (WBTi, 2012). Based on the latest labor force statistics, approximately 10% of Saudi Arabian females are engaged in the labor force (General Authority for Statistics, 2016). Given the lack of supportive breastfeeding policy in the workplace, employment could be one possible factor for the decline in the breastfeeding rates in the KSA.

The roles of Saudi Arabian mothers have evolved from being housewives in the late nineteenth century to mothers working outside the home. Additionally, the country's rapid socio-economic growth could also contribute to the lower rates of breastfeeding (Al-Madani et al., 2010; Twum-Danso & Ame, 2012). Marketing of formula feeding has been successful in displacing breastfeeding with artificial formula through unchecked advertisement and samples (Batterjee, 2010). Recently, breastfeeding alternatives (e.g., formula feeding) have become more accessible and affordable for most Saudi Arabian mothers (Murshid, 2006). According to the

changes in socio-economic status and the role of Saudi Arabian mothers in society, breastfeeding is no longer a norm among Saudi Arabian mothers (WBTi, 2012).

Despite the compelling evidence on the advantages of breastfeeding (Ip, 2007; UNICEF, 2015; Victora et al., 2016) and Islamic encouragement in the Holy Qur'an, it has been consistently stated that the breastfeeding practice in the KSA falls far short of the WHO recommendation of exclusive breastfeeding (providing breastmilk only with no additional supplement) for the first six months of infant life (Alwelaie et al., 2010; Amin et al., 2011; El Mouzan et al., 2009). The exact rates of exclusive breastfeeding in the KSA are not able to be determined due to the lack of recent national surveys and standard breastfeeding definitions (Al Juaid et al., 2014).

Initiation of breastfeeding in the KSA. Breastfeeding initiation is related to mothers who initiate breastfeeding their infants within the first hour after birth (WHO, 2016), or within the first 24 hours after birth (Debes, Kohli, Walker, Edmond, & Mullany, 2013). According to two national surveys, the rate of breastfeeding initiation in the KSA is 92% (Al-Jassir et al., 2006; El Mouzan et al., 2009). The initiation of breastfeeding after birth is the common practice in the KSA; however, the sharp decline afterwards in the breastfeeding rates as an infant advances in age is a prominent issue (El Mouzan et al., 2009).

High initiation rates of over 90% have also been consistently reported in almost all other geographic regions across the KSA including Riyadh (Al-Hreashy et al., 2008; Al-Jassir et al., 2004), Jeddah (Fida & Al-Aama, 2003; Shawky & Abalkhail, 2003), Al-Hassa (Amin et al., 2011). The high rates of breastfeeding initiation among Saudi Arabian mothers indicate their readiness to breastfeed their infants after birth. Yet, no successful strategy has been found that

induces mothers, who initiate breastfeeding, to continue with breastfeeding throughout the recommended six months.

Exclusive breastfeeding in the KSA. Exclusive breastfeeding is defined as an infant who is fed only breast milk for the first six months of life with no additional supplementation of any kind of food or drink, not even water, except syrups, vitamins, and minerals (WHO, 2016). Exclusive breastfeeding is recommended by the WHO as the most complete nutrition for six months after birth (WHO, 2016).

In the studies that classified "exclusive breastfeeding" according to the WHO definitions, the rates of exclusive breastfeeding at six months of infant's age in the KSA ranged from 0.8% to 24% (Al-Jassir et al., 2004; El-Gilany et al., 2011). Other regional studies revealed low rates of exclusive breastfeeding at six months after birth with 1.7 % in Riyadh (Al-Hreashy et al., 2008), and 12% in Al-Hassa (Amin et al., 2011).

The variations in the rates of the exclusive breastfeeding in the KSA could be attributed to the inconsistent definitions and classifications of describing the term of exclusive breastfeeding. The practice of exclusive breastfeeding has been described as predominant breastfeeding that includes liquid supplements (Al-Jassir et al., 2006; Shawky & Abalkhail, 2003), while other researchers referred to the practice of exclusive breastfeeding as giving baby only breast milk without any other supplements (Amin et al., 2011; Eldeek, Tayeb, & Habiballah, 2012).

Partial breastfeeding in the KSA. Partial breastfeeding is defined as infants who are fed some combination of breast milk and any other food or liquid, including supplemental formula (WHO, 2016). Partial breastfeeding has been very common in the KSA (Al-Jassir, Moizuddin, & Al-Bashir, 2003; Al-Jassir et al., 2006). According to national surveys, the rates of partial

breastfeeding at six months ranged from 42% to 76% in the KSA (Al-Jassir et al., 2006; Murshid, 2006). Another regional study that was conducted in the eastern region of the KSA revealed that 52% of mothers were partially breastfeeding their infants at four months postpartum (Al-Madani et al., 2010).

Early introduction of formula is likely a result of a decreased milk supply with infrequent breastfeeding (El Mouzan et al., 2009). Partial breastfeeding practice poses risks to infant health by increasing the likelihood of diarrhea, electrolyte imbalance, malnutrition, and other infectious disease (UNICEF, 2015; WHO, 2016). The majority of Saudi Arabian mothers who engage in the "partial feeding" practice tend to introduce water to their infant during the first six months due to the hot climate in the KSA (Al-Hreashy et al., 2008). Introducing water for infants prior to six months can result in breastfeeding refusal due to fullness of the infant's stomach. Consequently, breast milk supply will be reduced due to infrequent breastfeeding, and it can eventually lead to breastfeeding cessation. It is important to mention that providing water to infants prior to six months of age is not recommended by the WHO and the AAP even in a hot climate (Eidelman & Schanler, 2012; WHO, 2016). Indeed, breast milk contains 80% of water (WHO, 2016); thus, it is a complete source of nutrition and hydration for optimal infant growth and development.

Breastfeeding cessation in the KSA. Discontinued breastfeeding is defined as initiation of breastfeeding followed by a complete stopping of breastfeeding after a period of time and prior to six months postpartum, when the infant is fed only foods or liquids other than breast milk, including non-human milk. A survey conducted in Riyadh with 548 mothers showed that half of the mothers who initiated breastfeeding completely stopped at six months after birth (Al-Hreashy et al., 2008). There is a lack of recent national data on the proportion of breastfeeding

discontinuation in the KSA. However, reasons for early breastfeeding cessation have been partially identified in the literature (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; Al Juaid et al., 2014; El Mouzan et al., 2009; Fida & Al-Aama, 2003).

There are several psychological, social, and biological explanations given for breastfeeding cessation. The most commonly reported explanation for the early termination of breastfeeding among Saudi Arabian mothers is the perception of insufficient breast milk (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; Al Juaid et al., 2014; El Mouzan et al., 2009; Fida & Al-Aama, 2003), followed by sickness of infant or mother (Al-Jassir et al., 2006; El Mouzan et al., 2009; Fida & Al-Aama, 2003), becoming pregnant (Al-Jassir et al., 2006; Fida & Al-Aama, 2003), returning to work (Al-Hreashy et al., 2008; Al-Madani et al., 2010), and the usage of oral contraceptives (Shawky & Abalkhail, 2003). According to Neifert (2001), only 5% of mothers who reported insufficient breastmilk have true primary lactation problems that prevent milk production. Thus, it is unlikely that a physical or hormonal factor causes insufficient milk production (Neifert, 2001). However, a significant negative relationship between the perception of insufficient milk and breastfeeding confidence, known as breastfeeding self-efficacy, has been identified (McCarter-Spaulding & Kearney, 2001; McCarter□Spaulding & Kearney, 2001; Otsuka et al., 2008).

Duration of breastfeeding in the KSA. According to the WHO (2016), exclusive breastfeeding should last until six months after birth. Following the first six months, breastfeeding should be continued with solid food until two years of age (WHO, 2016). Unfortunately, this recommendation is not being followed in the KSA. While high rates of breastfeeding initiation are consistently reported, the rates of breastfeeding duration have sharply declined over the past 25 years in the KSA (Al Juaid et al., 2014). A national survey in 1987

showed a high breastfeeding duration mean of 13.4 months (al-Mazrou, Aziz, & Khalil, 1994). A more recent national survey revealed a drop in the mean duration of any breastfeeding from 13.4 months in 1987 to 6.57 months in 2009 (El Mouzan et al., 2009). Available data on breastfeeding rates in the KSA vary widely due to variations in study design, sample sizes, length of the recall, and locations (Al Juaid et al., 2014). There are no recent national data on the breastfeeding rates and duration, which makes it difficult to monitor progress over time.

There are several maternal characteristics that influence the breastfeeding practice including demographic characteristics and psychosocial factors. Studies conducted in the KSA have identified demographic factors associated with breastfeeding exclusivity and duration, such as increased maternal age, low income, and rural residence (Al-Jassir et al., 2006; Al-Madani et al., 2010; Amin et al., 2011; Shawky & Abalkhail, 2003). However, such factors are not amenable to be improved or altered over a short period of time to improve the breastfeeding practice.

To date, there is no current information available regarding the association of modifiable factors of perceived stress, social support, and breastfeeding self-efficacy with exclusive breastfeeding among Saudi Arabian mothers. Thus, it is difficult to work effectively towards improving the current suboptimal breastfeeding practices in the KSA without addressing the possible modifiable factors. In the following section, selected demographic and psychosocial factors related to breastfeeding are discussed including maternal age, education, work status, income status, perceived stress, social support, and breastfeeding self-efficacy. The interdisciplinary nature of the literature review offers theoretical and empirical evidence on the selected psychosocial factors in relation to breastfeeding.

Demographic factors associated with breastfeeding

Maternal age. Several studies have examined the relationships between maternal age and breastfeeding practice among Saudi Arabian mothers. There is a consistent pattern of the association between maternal age and the breastfeeding practice. The vast majority of the studies in the KSA revealed that older maternal age was significantly associated with longer duration of breastfeeding (Al-Jassir et al., 2006; Al-Madani et al., 2010; al-Mazrou et al., 1994; Amin et al., 2011). Likewise, a systematic review that included studies from different countries around the world revealed that older maternal age was a consistent predictor of longer breastfeeding duration (Thulier & Mercer, 2009).

Education and work status. Higher levels of education among Saudi Arabian mothers were not common until the late nineteenth century (Alsuwaida, 2016). Historically, a large number of Saudi mothers included in breastfeeding studies were illiterate and non-employed (al-Nasser, Bamgboye, & Alburno, 1991). Recently, the levels of education have increased among Saudi Arabian mothers with advancement in social and economic circumstances. According to the General Authority for Statistics in the KSA (2016), approximately 749,375 females compared to 778,394 males were enrolled in higher education at college level or above. Consequently, more work opportunities have become available for educated women in the KSA. Currently, the proportion of women engaged in the labor force in the KSA is 16.8% of the total population including 10.1% Saudi and 6.7% non-Saudi (General Authority for Statistics, 2016). The majority of females who are engaged in the labor force are working in the city of Jeddah, where various work opportunities are available.

While western studies revealed positive associations between the level of education and breastfeeding practice (Dennis, 2006; McQueen et al., 2015), the majority of studies conducted

in the KSA revealed negative associations between such factors (Al-Jassir et al., 2004; Amin et al., 2011; El-Gilany et al., 2011). A national survey in the KSA included a random sample of mothers with children aged less than two years ($N = 912$) revealed that a higher levels of maternal education was among the most significant factors negativelly influencing breastfeeing exclusivity and duration in the KSA (Murshid, 2006). In the eastern-province of the KSA, a longitudinal study with a sample of pregnant Saudi Arabian women ($N = 160$) revealed significant associations between educational levels and breastfeeding intention (Al-Madani et al., 2010). All illiterate women included in the study (7%) along with 84% of women who had a high educational level intended to breastfeed their infants (Al-Madani et al., 2010).

On the other hand, other studies in the KSA revealed that employed mothers tended to breastfeed less frequently and for shorter duration than non-employed mothers (Al-Hreashy et al., 2008; Amin et al., 2011; El-Gilany et al., 2011; Murshid, 2006). In summary, it is consistently noted in the literature that employment status and education level are negatively and significantly associated with breastfeeding exclusivity and duration.

Income status. Household income is an important factor that may influence the practice of breastfeeding. In the USA, the rate of breastfeeding is low among low-income, particularly among those who enrolled in The Special Supplemental Nutrition Program for Women, Infants, and Children (Silk et al., 2010). In the KSA, formula feeding has become accessible and affordable for most Saudi mothers (Murshid, 2006). Studies that have examined the association between income status and breastfeeding in the KSA revealed inconsistent findings. While it has been shown that exclusive breastfeeding was more prevalent among low-income Saudi Arabian mothers (al-Ayed & Qureshi, 1998; Amin et al., 2011), another study with 128 mothers in the KSA found that the association between income and breastfeeding were not statistically

significant (Fida & Al-Aama, 2003). However, the sample size in the later study, that found no significant association, might not be adequate to detect significant associations. In addition, 70% of the participants in the later study had a low household income of less than $1,300 (Fida & Al-Aama, 2003).

Perceived Stress

Stress has been identified as an important concept in health research which links to different diseases and health outcomes. Among a sample from Greece, maternal stress has been inversely associated with early breastfeeding initiation and duration (Doulouger et al., 2013). Research has examined stress through evaluating one's ability to respond or cope with overwhelming situations that occur in the environment, known as perceived stress (Goodnite, 2014; Lazarus, 2006). An individual's stress level can have an impact on the individual's physiological and psychological status including the risk of illness, the ability to execute certain behavior, and the belief of self-efficacy (Cohen, Janicki-Deverts, & Miller, 2007; Dennis, 1999). Stressors often emerge from task demands and workload that exceed one's capabilities (Bandura, Cioffi, Taylor, & Brouillard, 1988). The transition to motherhood can be very stressful for many women, particularly, first-time mothers.

The role of first-time mothers in caring and fulfilling their infants' needs is challenging and stressful as it requires time, knowledge, and skills (Liu, Chen, Yeh, & Hsieh, 2012). A poor transition to motherhood can result in a high level of stress, which in turn can negatively impact the mother-infant interaction (Coyl, Roggman, & Newland, 2002). Furthermore, persistent maternal stress could result in long-term physiologic and psychological disorders and health issues, such as the suppression of immune system (Cohen et al., 2007; Segerstrom & Miller, 2004), and postpartum depression (Doulouger et al., 2013; Hammen, 2005; Miller, 2002).

There are several sources of maternal stress in the first year after birth, such as traumatic (physical) stress, financial stress, emotional stress, and partner-associated stress (Dozier et al., 2012). Other causes for maternal stress after childbirth are sleep disturbances (Gardazi et al., 2016), and physical changes to the mother's body (Rallis, Skouteris, McCabe, & Milgrom, 2014). An additional source of stress among Saudi mothers relates to their individual sociocultural context (Al Juaid et al., 2014). This refers to the common rural-urban migration of Saudi women after getting married and around the time of the first baby; this can result in stress and social isolation (Aldosari et al., 2015; Salam, 2013). After migration, mothers may have difficulties forming social relationships in the new community with no one to discuss breastfeeding concerns that may arise.

Employed mothers are at high risk for the early discontinuation of breastfeeding due to experiencing high levels of stress (Hibel, Mercado, & Trumbell, 2012). Employed Saudi mothers are granted a short maternity leave (about five weeks), which may influence breastfeeding, and prevent exclusive breastfeeding throughout the recommended six months period (WBTi, 2012). In addition, mothers who have breastfed for six months or longer reported a drop in their earnings that resulted from reduced working hours and a loss of promotions (Rippeyoung & Noonan, 2012). The possible loss of income, sleep disturbances with newborn responsibilities, and a lack of support pose a high risk of psychological stress among breastfeeding mothers that can lead to the early cessation of breastfeeding. Therefore, managing stress in the first year after birth is important to improve maternal and infant health outcomes.

Stress in the first months after birth can lead to anxiety and depression (Cutrona & Troutman, 1986; Venkatesh, Phipps, Triche, & Zlotnick, 2014). The literature identified a correlation between postpartum depression and the practice of breastfeeding (Hamdan & Tamim,

2012; Henderson et al., 2003). Furthermore, several studies identified stress as a risk factor for postpartum depression (Doulouger et al., 2013; Hammen, 2005; Miller, 2002). Hence, mothers with high levels of stress need to be identified and managed early during the postpartum period to promote milk production and a healthy mother-child relationship. Unfortunately, the vast majority of the literature is focused on the relationship between breastfeeding and postpartum depression, the outcome of maternal stress (Rallis et al., 2014). However, little is known about the relationships between maternal stress as a primary exposure and breastfeeding exclusivity and duration. This was the first study that examined the associations between perceived stress and the practice of breastfeeding among first-time Saudi Arabian mothers who initiated breastfeeding.

Maternal psychological stress can lead to impaired milk production by reducing the release of breastfeeding hormones, such as oxytocin (Dewey, 2001). Maternal stress not only impacts the process of milk production, but could also lead to behavioral and cognitive issues among infants, such as attention deficit (Weinstock, 2005). Maternal responses and reactivity to postpartum stressors differ in lactating mothers from a mother who is not breastfeeding (Groer et al., 2002). Breastfeeding mothers tend to have more positive mood and perceive less stress than non-breastfeeding mothers (Groer, 2005). Maternal stress levels measured objectively (e.g., plasma cortisol levels) and subjectively (e.g., self-reported questionnaires) were also significantly associated with lower milk volume and less frequent breastfeeding (Doulouger et al., 2013). However, the literature has not presented any causal sequence between maternal perceived stress and the practice of breastfeeding.

A recent empirical study was conducted in Greece to examine the relationship between stress level and lactogenesis in a sample of 100 pregnant women, of which 61 were multiparous

and 34 nulliparous (Dimitraki et al., 2016). Stress levels were assessed using the positive and negative affectivity scale, posttraumatic stress disorders scale, and were also measured from mother's serum and cord blood after normal delivery. Breast milk volume was assessed through 24 hours breast milk collection, breastfeeding frequency, and mother's feeling of fullness in the breasts. The results revealed that mothers who experienced stressful events during labor had delayed onset of lactation and decreased milk volume (Dimitraki et al., 2016). However, the generalizability of the findings may be limited due to small sample size, and the uncontrolled differences between multiparous and nulliparous women.

Two other quantitative studies with a sample of 95 mothers from Greece and 499 mothers from the USA mothers have examined the association between maternal stress and breastfeeding practice using self-administered surveys and plasma cortisol levels (Doulouger et al., 2013; Dozier et al., 2012). The findings from these two studies showed that maternal stress was associated with delayed initiation of breastfeeding, lower milk volume, less frequent feeding, and shorter duration of breastfeeding (Doulouger et al., 2013; Dozier et al., 2012). However, the generalizability of these findings may be limited due to the following reasons: suitability to recall bias, and inability to rule out the influence of other confounding factors that can greatly impact breastfeeding, such as social support.

The relationship between breastfeeding and maternal stress has emerged in qualitative studies as well. A qualitative study of 127 postpartum American mothers aged from 18 to 45 years was conducted using written responses to the open-ended question about describing the stressful event or feeling (Jevitt, Groer, Crist, Gonzalez, & Wagner, 2012). The content analysis of responses was performed as a secondary analysis of a large study funded by the National Institutes of Health. The majority of women in this qualitative analysis were white, married, and

from low-income households. The results of the content analysis identified breastfeeding problems as one of the stressful events arising within the maternal–newborn dyad (Jevitt et al., 2012). The large number of participants and the rigor of the independent investigators strengthen this qualitative study. However, the generalizability of this content analysis results are limited by a lack of diversity given that the sample was predominantly white and low-income.

Another qualitative study was conducted in Switzerland to identify events perceived as stressful among primiparous mothers (N = 60) via semi-structured interview (Razurel, Bruchon-Schweitzer, Dupanloup, Irion, & Epiney, 2011). The participants in this qualitative study described breastfeeding as a major stressful event during early postpartum period due to associated difficulties and unbearable pain (Razurel et al., 2011). Despite an adequate number of participants (n = 60) in this qualitative study, the generalization of the findings is limited because the sample was limited to urban European women. To alleviate stress during the postpartum period, it was found that support from family members, friends, health professionals, and society was identified as a coping strategy and as one means to promote breastfeeding exclusivity and duration.

In summary, the previously mentioned studies revealed that mothers who had low levels of perceived stress were more likely to breastfeed. However, there have been a very limited number of studies examining the association between maternal perceived stress and breastfeeding practice at six months postpartum. Maternal perceived stress was measured differently across the studies using objective and subjective measures. Thus, the causal inference and the direction of the association between perceived maternal stress and breastfeeding practice have not been established among Saudi Arabian mothers. More research is warranted to understand how maternal stress influences the breastfeeding practice.

Social Support

Several studies have addressed the importance of social support for breastfeeding exclusivity and duration (Dashti et al., 2010; Nassar et al., 2014). Two major types of support have been identified in the literature: perceived support and received support (Cutrona & Troutman, 1986). Perceived support refers to one's belief or judgment on the support as effective and helpful, while received support refers to one's judgment about support provided as not helpful (Gottlieb & Bergen, 2010). In this study, the variable of interest was the perceived social support. The most commonly identified sources of breastfeeding support included family members (Dashti et al., 2010; Nassar et al., 2014), health professionals (Britton, McCormick, Renfrew, Wade, & King, 2007), and peers (Dennis, 2006; Dennis, 2002).

With a lack of social support, the practice of breastfeeding can be a frustrating experience for first-time mothers. Moreover, breastfeeding can be stressful and challenging for the mother if her breastfeeding concerns have not been addressed (O'Brien, Buikstra, Fallon, & Hegney, 2009; Razurel et al., 2011). Social support can buffer against depression and stress by improving a mother's ability to cope with postpartum stress (Schwarzer & Knoll, 2007).

Social influences affecting breastfeeding exclusivity and duration among Saudi mothers are related to Saudi mothers' unique sociocultural contexts (Al Juaid et al., 2014). Social barriers that have been documented in the KSA include the norm that it is unacceptable to breastfeed in public places (WBTi, 2012), a lack of private nursing rooms, and embarrassment regarding breastfeeding in public places (Nafee Elsayed & Al-Dossary, 2016).

Additionally, Saudi mothers are expected to serve as the primary caregivers for their infants, and coordinate household tasks, often without their husbands' support (Aldosari & Pufpaff, 2014). All of these circumstances could cause Saudi mothers to experience stress and a

lack of social support, which have been identified as significant predictors of postpartum depression, another factor strongly associated with the early cessation of breastfeeding (Henderson et al., 2003; Miller, 2002). Thus, addressing perceived stress and social support among Saudi mothers is crucial in order to promote the positive health outcomes of breastfeeding.

Social support, including support from the husband or other family members, has been associated with early breastfeeding initiation and duration among mothers in Kuwait (Dashti et al., 2010; Nassar et al., 2014). A study in the KSA with a sample of 704 mothers aged on average 30 years, who had at least one child, revealed that advice and encouragement regarding breastfeeding were significantly and positively associated with the practice of exclusive breastfeeding (Ogbeide et al., 2004). However, in the study by Ogbeide and colleagues (2004), social support was measured subjectively with only one "Yes" or "No" closed-ended question. Further research with psychometrically robust scales is needed to confirm the association between social support and breastfeeding exclusivity among Arabian mothers.

The Cochrane systematic review and meta-analysis conducted by Britton and colleagues (2007) included 34 trials with a total number of 29,385 mother-infant pairs from different countries to assess the effectiveness of support services on breastfeeding duration and exclusivity. The results of the review revealed that professional support had a positive impact on breastfeeding. Furthermore, all other forms of support, such as professional and lay support had a larger impact on the duration of exclusive breastfeeding than on any other categories of breastfeeding; whereas using telephone contact as a supportive intervention showed no significant impact on breastfeeding continuation (Britton et al., 2007). Using Social Provisions Scale (24-item) and Perceived Social Support Scale (12-item), additional two studies from

different countries indicated that maternal perceived social support was positively correlated with breastfeeding self-efficacy and longer-duration breastfeeding (Dennis, 2006; Zhu, Chan, Zhou, Ye, & He, 2014).

Nabulsi (2011) conducted a qualitative study through three focus group discussions and series of in-depth interviews to identify barriers and facilitators of breastfeeding among Lebanese postpartum mothers (N = 36) of at least one healthy newborn. Lebanese women who continued breastfeeding for longer than six months reported that they were relying mostly on family support for encouragement and assistance during breastfeeding practice (Nabulsi, 2011). However, findings from this study may not be generalized to other populations, giving the fact that mothers in this study were recruited from high-income urban settings only.

The existing literature has revealed insufficient evidence to conclusively support the association between social support and breastfeeding practice. The association between social support and the practice of breastfeeding is not well established for several reasons. First, the types of support as well as the sources of support have been inconsistently described across studies. Second, the instruments that have been used to measure social supports are varied and rely on different operationalization of the social support concept. Third, the description of the breastfeeding as an outcome varied widely leading to inconclusive findings. Fourth, there is a lack of a valid and reliable instrument that measured social support. In summary, there is a need to rigorously examine possible associations between social support and breastfeeding exclusivity and duration at six months among the Saudi Arabian mothers using a valid and reliable multidimensional instrument.

Breastfeeding Self-efficacy

The association between breastfeeding self-efficacy and breastfeeding practice has been examined by a variety of quantitative and qualitative studies. A comprehensive literature search of electronic databases was conducted to find studies that addressed the association between breastfeeding self-efficacy and breastfeeding practice, particularly exclusivity and duration. A total of 17 studies (15 quantitative and two qualitative) were identified and included in the literature review. All the included studies were from different countries around the world since no studies were found from the KSA. The mean ages were not consistently reported across the studies and varied from 24–30 years. The majority of the participants in the studies (n = 10) were postpartum, primiparous mothers, who had given birth to a single, healthy, full-term infant, and who were planning on breastfeeding (Babakazo et al., 2015; Henshaw et al., 2015; Kronborg & Væth, 2004; Loke & Chan, 2013; McQueen et al., 2015; McQueen et al., 2011; Semenic, Loiselle, & Gottlieb, 2008; Souza & Fernandes, 2014; Wu et al., 2014). The sample sizes ranged from 57 (Bailey, Clark, & Shepherd, 2008) to 781 (Otsuka et al., 2014), with a total sample size of 3,257. The most consistently used scale to assess breastfeeding self-efficacy across all the included studies is the breastfeeding self-efficacy scale (Dennis, 2003).

Findings regarding the association between breastfeeding self-efficacy and the practice of breastfeeding are consistent across the vast majority of the studies. Of the 15 quantitative studies, 13 studies consistently found breastfeeding self-efficacy to be significantly and positively associated with exclusive breastfeeding duration (Babakazo et al., 2015; Bailey et al., 2008; Blyth et al., 2002; Blyth et al., 2004; de Jager et al., 2015; Henshaw et al., 2015; Kronborg & Væth, 2004; Loke & Chan, 2013; McQueen et al., 2015; Nichols et al., 2009; Otsuka et al., 2014; Semenic et al., 2008; Wu et al., 2014).

Across the studies, the association between breastfeeding self-efficacy and breastfeeding duration was examined at different time frames during the postpartum period. Breastfeeding self-efficacy was found to be a significant predictor for breastfeeding duration at one week postpartum (Blyth et al., 2002; Blyth et al., 2004), four weeks postpartum (Nichols et al., 2009; Wu et al., 2014), six weeks postpartum (Loke & Chan, 2013), two months postpartum (de Jager et al., 2015), four months postpartum (Blyth et al., 2002; Blyth et al., 2004; Kronborg & Væth, 2004), and six months postpartum (de Jager et al., 2015; Henshaw et al., 2015).

Among the 15 included quantitative studies, only two studies showed no statistically significant difference in the comparison of mean duration of exclusive and non-exclusive breastfeeding with the scores of breastfeeding self-efficacy (McQueen et al., 2011; Souza & Fernandes, 2014). However, both studies had small sample sizes which ranged from 100-150 mothers, which may have resulted in inadequate statistical power to detect significant differences (McQueen et al., 2011). Second, Souza and Fernandes (2014) used the translated Brazilian version of the breastfeeding self-efficacy scale with un-reported psychometric properties (Souza & Fernandes, 2014). Further research with adequate sample sizes is warranted to better understand the association between breastfeeding self-efficacy and breastfeeding practice among Saudi Arabian mothers.

Qualitative studies also support the association between breastfeeding self-efficacy and the practice of breastfeeding (Avery, Zimmermann, Underwood, & Magnus, 2009; O'Brien et al., 2009). A thematic analysis of interviews with three groups of Australian mothers (n = 17), who planned to breastfeed for at least 6 months, and clinicians (n = 14) identified mother's confidence in breastfeeding as an essential psychological factor for breastfeeding duration (O'Brien et al., 2009). Another qualitative study was conducted to identify the process that contributed to

successful breastfeeding, using the grounded theory approach (Avery et al., 2009). The sample of this qualitative study included 24 focus groups of Caucasian and African American women who were either pregnant, formula feeding, or breastfeeding. The findings revealed that mothers who had confidence in their ability to breastfeed were committed to breastfeeding, and their confidence led to successful sustainment of breastfeeding (Avery et al., 2009).

The literature review revealed a major limitation across the study findings. The outcomes of the breastfeeding practices of exclusivity and duration have been defined and measured inconsistently across the studies. The practice of breastfeeding was classified inconsistently; for example, the term "breastfeeding" can be interpreted as exclusive (only breast milk), predominant breastfeeding (breast milk with other liquid supplements), or mixed feeding (Haroon, Das, Salam, Imdad, & Bhutta, 2013). Hence, the practice of breastfeeding needs to be based on the WHO definition of breastfeeding categories to eliminate the ambiguity and ensure usefulness of findings.

In reviewing the literature on the association between breastfeeding self-efficacy and breastfeeding practice, the following gaps have been identified. The samples included in some studies were small and ranged from 90-143 mothers (Henshaw et al., 2015; Nichols et al., 2009). Furthermore, contamination between the treatment "self-efficacy intervention" group and control groups of mothers recruited from the same private service can jeopardize the internal validity (Otsuka et al., 2014).

Another gap in the research approaches is the inconsistency in the follow-up periods across the studies, which varied from two days to six months. This variation may influence the findings because the practice of breastfeeding is susceptible to change over time. It was unclear whether the follow-up durations were adequate or not; thus, follow-up periods need to be

justified in future longitudinal studies. Another limitation in the state of knowledge on breastfeeding self-efficacy is that the existing findings were based on studies conducted in developed countries. Thus, findings from these studies cannot be generalized to Saudi mothers with different cultural norms and social backgrounds.

Summary

The review of the literature indicates that numerous demographic and psychosocial factors are important for breastfeeding exclusivity and duration, including perceived stress, social support, and breastfeeding self-efficacy. The literature provides support for the aims of this study. It is crucial to assess such factors in the first few months after women have given birth to identify women at high risk for early breastfeeding cessation. However, there is a dearth of the literature that examines the direct associations between the selected psychosocial factors and the practice of breastfeeding at six months after birth, particularly, among Arabic mothers. Further research is needed to better understand the associations between psychosocial factors and the practice of breastfeeding. This study aimed to close the existing gaps in the state of knowledge through examining the associations between maternal psychosocial factors and the practice of breastfeeding at six months of infant age. The following chapter describes the study methods including detailed information on design, sample, recruitment procedure, data collection, instruments, and data analysis.

Chapter 4: Methods

The purpose of this study was to examine the associations between three modifiable maternal psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy and breastfeeding practice among primiparous mothers who initiated breastfeeding and had infants aged six to 12 months in Jeddah, KSA. This chapter discusses the methods of this inquiry with details on design, settings, sample, instruments, data collection procedure, and data analysis. Ethical protection for study participants is also addressed.

Study Design

A cross-sectional correlational design was used to examine the associations among the study variables. The cross-sectional correlational design is well-suited for the aims of this study, which focused on establishing associations between the theory-based psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy, and breastfeeding practice among Saudi Arabian mothers of infants.

Sample

The population of interest in this study was first-time Saudi Arabian mothers who initiated breastfeeding and had infants 6 to 12 months of age. A non-random convenience sample of 160 mothers was recruited for the purpose of this study. Mothers were recruited from immunization clinics, well-child clinics, and physicians' offices at four public primary care centers (PCCs) in Jeddah, KSA.

Recruited mothers were stratified into three groups according to their breastfeeding practices determined at six months after childbirth: exclusive breastfeeding for six months, partial breastfeeding for six months, and discontinued breastfeeding that occurred at any point prior to six months. The exclusive breastfeeding stratum included mothers who provided only breast milk for the first six months of life with no additional supplementation of any kind of food

or drink, except syrups, vitamins, and minerals. The partial breastfeeding stratum included mothers who offered some combination of breast milk and any other food or liquid, including supplemental formula and water throughout the first six months. The discontinued breastfeeding stratum included mothers who breastfed for a period of time but stopped completely before the infant became six months old, at which time the infant was fed any food or liquid other than breast milk. Each stratum included approximately 53 mothers. To ensure about equal cases in each stratum, the principle investigator (PI) tracked the number of enrolled mothers in each group on a regular basis during the data collection period.

Power Analysis and Sample Size

A power analysis was performed using G*Power 3.1 for the Analysis of Variance (ANOVA) to determine the required sample size (Faul, Erdfelder, Buchner, & Lang, 2009). A *priori* analysis was performed to compute the sample size for ANOVA. The number of groups entered was three to account for the three groups of breastfeeding: exclusive, partial, and discontinued. Based on an alpha of 0.05, a power of 0.80, and a medium effect size of 0.25, the recommended sample size was 160.

Inclusion and Exclusion Criteria

The study's inclusion criteria were: 1) first-time Saudi mothers, 2) over 18 years of age, 3) initiated breastfeeding at birth, and 4) having a healthy infant between 6 and 12 months of age. Given the high initiation rates of breastfeeding in the KSA, mothers who had never breastfed were not included in this study. However, the indicators of breastfeeding exclusivity and duration were the major criterion outcome variables. Limiting the sample to mothers with six to12-month-old infants allowed the categories of breastfeeding to be determined based on the WHO recommendation of exclusive breastfeeding. Exclusion criteria for participation in this

study were mothers who have had a previous live birth, multiple births, low-birth weight infants (≤2500 grams), mothers who did not initiate breastfeeding, as well as mothers or infants with any health issues or medical diagnoses that interfered with breastfeeding.

Setting

Four PCCs in Jeddah, a major city in western KSA were selected for recruitment and data collection. These PCCs provide preventative and regular health services for community members including routine check-ups and childhood vaccinations. There are approximately 45 PCCs affiliated with the Ministry of Health in the city of Jeddah and distributed in five different geographical regions in Jeddah (Ministry of Health, 2016). All 45 PCCs received the approval letter from the Ministry of Health along with another facilitating letter that requested the Director of each PCC to cooperate and provide the researcher access to participants.

Four convenient public PCCs were selected from different geographical regions of Jeddah: Al-Sulimaniyah, Al-Hamadaniyah, Al-Balad, and Al-Marwah. The selected four convenient PCCs are located in the urban area (the city of Jeddah), and available to all people in the community. Women with low to medium household income are more likely to visit the PCCs. Each of these PCCs had vaccination and well-baby clinics that provide equal health care services. None of the PCCs offered patients free formula or formula samples. The four designated PCCs provide equal access and care for all community members (Habib et al., 2011).

Procedures

Procedure for human subject protection. The PI obtained the Institutional Review Board (IRB) approvals from Michigan State University (MSU) and the Ministry of Health in the KSA (Appendices B and C). Potential participants were approached during their visit in the selected PCCs by the PI or a research assistant (RA) through a recruitment script. Participation in

this study was completely voluntary. Participants were assured that refusal or withdrawal involved no penalty or loss of any health benefits to which they were entitled. There were no anticipated potential risks of participating in this study. The participants were not placed in any physical or financial risk by their participation. Participant confidentiality was maintained throughout the procedures of data collection and management. Participants were identified through identification numbers instead of names on all related forms. Surveys were coded with an identification number, and no names were used on them.

Training procedures. The PI obtained the internal permission from the Director of the selected PCCs prior to approaching the mothers. A Saudi full time staff nurse from each of the four selected PCC was hired by the PI as a RA to assist with recruitment, enrollment, and data collection. Each RA successfully completed the IRB training.

The PI provided extensive individual training to the RAs according to the protocol for recruitment and enrollment of participants into the study. This protocol included a screening questionnaire that determined mothers' eligibility before enrolling into the study (Appendix D). The PI demonstrated the recruitment procedures for the RA in each site. The PI ensured that the research assistants understood the process of the study, and that they were able to follow the recruitment and enrollment protocol. The data were collected by the PI and four trained RAs.

Recruitment and data collection procedures. Participants were recruited during immunization and well-baby visits. The PI or the research assistants approached mothers in the waiting room, explained the study and invited mothers to participate. The eligibility of the mothers who agreed to participate was assessed through the screening questionnaire (Appendix D). Mothers who met the eligibility criteria were given a written informed consent to read, sign and receive a copy of the consent form to keep (Appendix E). Participants were assured that their

participation in the study was completely voluntary and that they had the right to withdraw from the study at any time without consequences to their care at the center. Participants completed the survey in a private area to maintain confidentiality.

Participants used Qualtrics, a web-based survey software tool, to complete the survey using the provided iPad. Four iPads were available in each PCC. Participants were asked to complete the survey using an iPad or paper and pencil survey, depending on the participant's comfort level. Participants were asked by the PI or RA to submit the completed web-based survey on-site using the provided iPad. A paper-based survey was available, if a participant felt uncomfortable with completing the survey on line, or requested to fill-out a paper survey instead of an electronic survey. The PI and/or the RAs were present at each site to answer any questions the participants may have had.

Those who chose to fill out the electronic survey were given access to the survey through the installed Qualtrics "offline surveys" on the available iPad. Those who chose to fill out the paper survey were given a packet containing the questionnaire, pencil, and unsealed envelope. Once the survey was completed by the participant, it was placed in a sealed questionnaire packet and, then placed in a labeled locked box, which was located at the nurses' station. All data in the paper surveys ($N = 9$) were manually entered into Qualtrics by the RA and verified by the PI, using double data entry. The participants spent approximately an average of 15 - 17 minutes to complete the paper or electronic survey, and received a cash incentive (40 SAR) upon the completion of survey.

Data management. The consent forms were separated from other documents and stored in a secure locked box, which was available in each selected PCC. Participants could choose not to answer some questions or stop participation at any time. All information provided by

participants was kept confidential, and only the PI had access to the completed surveys. The completed surveys and data were not shared with other individuals except the PI and her dissertation committee members. Electronic data were stored on a password-protected personal computer. After the end of the data collection period, the PI physically transferred the paper-based surveys, consent forms, and the personal computer from the KSA to MSU in a secure locked bag that was kept with the PI inside the airplane. After the completion of the study, all collected data were stored on a password-protected computer and a locked cabinet in MSU for a minimum of three years.

Instrumentation

Demographic factors. Maternal demographic characteristics including age, education, family income, marital status, type of birth, and work status were measured by a self-administered questionnaire (Appendix F). Maternal age was measured in years while infant age was measured in months. Family income was assessed based on monthly household income. Participants were asked to circle their selected response or fill in the blank for other responses.

The Perceived Stress Scale (PSS). The PSS was used to measure perceived stress in this study. The PSS was developed by Cohen and colleagues in 1983 to measure the degree to which situations are identified as stressful (Cohen, Kamarck, & Mermelstein, 1983). It is the most commonly used tool to measure the level of perceived stress that can lead to the early cessation of breastfeeding and impaired milk production via reducing the release of oxytocin (Dewey, 2001; Doulouger et al., 2013).

Researchers recommend the use of 10-item PSS over the original 14-item scale for future research due to its improved psychometric characteristics (Cohen & Williamson, 1988). The PSS-10 is a 10-item, five-point Likert-type scale ranging from zero (never) to four (very often),

producing total scores that range from 0 to 40 (Cohen et al., 1983). There are four positively stated items (4, 5, 7, and 8). The total score was obtained by summing all the ten scale items with reverse scoring responses: 1, 2, 3, 4-Reverse, 5-Reverse, 6, 7-Reverse, 8-Reverse, 9, and 10. Higher scores indicated higher levels of perceived stress.

The internal reliability of the PSS-10 in a national probability sample was acceptable with an alpha coefficient of 0.78 (Cohen & Williamson, 1988). The PSS-10 demonstrated a high reliability of 0.90 with postpartum Canadian mothers (Dennis, 2006). It showed acceptable test-retest reliability between two days and four weeks (Cohen et al., 1983). The scale is strongly correlated with negative life events and depressive symptoms representing convergent validity (Cohen et al., 1983). The factorial validity and unidimensionality of the scale have not been established with the 10 items of the PSS (Lee, 2012).

The PSS has been translated into Arabic and the psychometric proprieties were evaluated in postpartum Arabic women. The Arabic version demonstrated acceptable internal consistency, with a Cronbach's alpha of 0.74 among Arabic postpartum women (Chaaya, Osman, Naassan, & Mahfoud, 2010), and a Cronbach's alpha of 0.85 among a large sample (N = 1099) of Moroccan Arabic population (Ben Loubir, Serhier, Battas, Agoub, & Bennani Othmani, 2014). The Arabic version of the PSS-10 in this study demonstrated an excellent reliability with a Cronbach's alpha of .90, which was consistent with the reliability of the PSS-10 with postpartum Canadian mothers (Dennis, 2006).

Convergent validity of the Arabic version was also demonstrated by a significant correlation with the Edinburgh Postpartum Depression Scale (Chaaya et al., 2010). Test-retest reliability was not satisfactory over six weeks, which may indicate reliability problems (inconsistency over time), or the need for frequent re-assessment of mother's perceived stress

levels that may have changed over a period of six weeks (Lee, 2012). However, the test-retest reliability of the Arabic version was acceptable with a correlation coefficient of 0.74 over varied intervals, which ranged from one to three weeks (Chaaya et al., 2010). The English version of the PSS-10 is publicly available on the internet for free use. Permission to use the validated Arabic version of PSS-10 scale was obtained from the first author, Dr. Chaaya (Appendix G).

Social Provisions Scale (SPS). Social support was measured using the 10-item short version of the SPS (Cutrona & Russell, 1987). The SPS is recommended to use for the comprehensive assessment of perceived support regardless of the sources (Gottlieb & Bergen, 2010). Items are rated on the SPS using a four-point Likert-type scale, ranging from one (strongly disagree) to four (strongly agree). There are five negatively worded statements (2, 3, 5, 6, and 9). The scores are obtained by calculating the total sum of all item responses after reverse coding the negatively worded items; higher scores indicate higher perceived support (Cutrona & Russell, 1987).

The SPS has been used with postpartum women with reporting of high reliability of 0.86 (Dennis, 2006). The SPS-10 scale has demonstrated acceptable reliability with a Cronbach's alpha of 0.83 among community adults (Gottlieb & Bergen, 2010). The SPS-10 has also been psychometrically examined with a large sample of over 600 African American adults, and showed a high reliability of 0.81 and test-retest reliability of 0.48 over two years (Gottlieb & Bergen, 2010). In the current study, the Arabic version of SPS-10 had an excellent reliability with a Cronbach's alpha of .90. Convergent validity was demonstrated by the significant correlation between the SPS and relationship quality and stability (Gottlieb & Bergen, 2010). Permission for use and translation of the SPS was obtained from the author (Appendix H).

Breastfeeding Self-Efficacy Scale (BSES). It is a 33-item, self-report instrument developed by Dennis and Faux in 1999 based on the BSE theory. In 2003, Dennis developed the BSES-short form (SF), which contains 14 items with five-point Likert-type response scales. All items are positively worded. Higher summed scores indicate higher levels of breastfeeding self-efficacy; there are no cut-off scores. The BSES-SF has been a commonly used tool for the following research purposes: measuring breastfeeding self-efficacy, predicting the practice of breastfeeding, identifying at-risk mothers for early breastfeeding termination, developing individualized plans, and evaluating the effectiveness of a breastfeeding intervention (de Jager et al., 2013; Dennis, 2003; McCarter-Spaulding & Gore, 2009).

Dennis (2003) examined the psychometric characteristics of the BSES-SF and found good inter-item correlations ranging from 0.41 to 0.73, and high single factor loading of over 0.66 of all the 14 items. The scale also has excellent reliability, with a Cronbach's alpha of 0.97 (Dennis, 2003). Moreover, it has demonstrated excellent consistent test-retest reliability of (r= 0.99) over eight weeks postpartum (Dennis, 2003). The most commonly used tool for assessing breastfeeding self-efficacy across studies was the BSES-SF (Dennis, 2003). In the current study, the Arabic version of the BFSE -14 demonstrated a similar high internal consistency coefficient of 0.95.

Content validity of the scale was constructed based on the literature, mothers' interviews, and experts' judgments (Dennis, 2003). Construct validity was assessed with factor analysis showing adequate positive correlations ($r>0.30$) among all variables, and all items loaded highly on one factor, demonstrating that the BSES-SF items are appropriate measures of breastfeeding self-efficacy (Dennis, 2003). The BSES-SF correlated positively with the Rosenberg Self-Esteem Scale, which represents convergent validity, and it negatively correlated with the Edinburgh

Postnatal Depression Scale, which supports divergent validity (Dennis, 2003). Predictive validity was supported by the significant association between high BFSE-SF scores and breastfeeding at four and eight weeks postpartum (Dennis, 2003). The BFSE-SF has been used to predict the discontinuation of breastfeeding before six months (Babakazo et al., 2015). Studies have found that high levels of maternal self-efficacy predict exclusive and longer-duration breastfeeding (Dennis, 2006; McCarter-Spaulding et al., 2009; Wu et al., 2014). For the previously mentioned adequate psychometric properties, the BFSE-SF scale was selected to examine the association between breastfeeding self-efficacy and the practice of breastfeeding at six months of infant age. Permission for use and translation of the scale was obtained from the original author (Appendix I).

Breastfeeding Practice Questionnaire. The author developed the Breastfeeding Practice Questionnaire as a self-administered questionnaire to elicit information about the following: the categories of breastfeeding (e.g., exclusive, partial, discontinued), the duration of breastfeeding, breastfeeding support, sources of breastfeeding support, type of supplements if introduced prior to six months of infant age, and reasons for breastfeeding cessation. Participants were asked to fill in the blank or circle their selected response. Duration of breastfeeding was measured using the periods of breastfeeding in months from the time of breastfeeding initiation to the time of breastfeeding cessation

Translation and Back Translation of Instruments

All surveys were translated from English to Arabic by a bilingual translator through Certified Translation Center in the KSA. All translated Arabic surveys were translated back to English through another Certified Translation Center in the KSA. Prior to data collection, the translated versions of the questionnaire were pilot-tested with five Saudi mothers to assess the

clarity of the items and applicability to Saudi mothers. Five Arabic-speaking mothers were asked to fill out the questionnaire and provide comments on the clarity of items. These five mothers were not included in the analysis. The five mothers provided a few minor comments on the wording of some items. Accordingly, a few items were revised according to the mothers' suggestions to enhance the clarity of items. There were no suggestions to delete or add any additional survey items.

For the demographic questionnaire, it was suggested to reorder the infant's date of birth blanks starting with day, month, and year. For the marital status it was suggested to remove one option "separated" as it is considered very similar to "divorced". For work status, it was suggested to delete the option of "student" as it can be confused with other options of "working" and "not working". For the social provisions scale, one of the mothers suggested to revise item 4 for more clarity. There were no other suggestions on the rest of the surveys. The revised Arabic versions of the scales were judged by other five Arabic-speaking experts in breastfeeding and maternal health to evaluate their content validity. There were consistent comments on the BSES item number five suggesting re-wording of the statement with deleting extra words to enhance clarity.

Content Validity Evaluation

To assess content validity of the translated versions of SPS and BSES, a 10-point ordinal rating relevance scale ranging from 1 (not relevant) to 10 (very relevant) was developed (Appendix J). Five Arabic-speaker experts in the field of maternity and neonatal care, including three professors and two master-prepared nurses, evaluated the relevance of the items to the construct. Two of the experts consistently rated several items in the SPS as (not relevant). Three experts added suggestions and comments to improve clarity of the items. The scales were revised

according to the suggestions. The PI discussed the scales' rating with the experts and asked them if there were any suggestions for improvement of the low rating items. The two experts who rated the SPS scale as (not relevant) had misunderstood the negatively worded statements; thus, they rated them as non-relevant in the validity scoring sheets (Appendix J). The PI clarified with the experts that the SPS contained some negatively worded statements, and asked them to re-rate the SPS's items.

The content validity index (CVI) is defined as the extent to which a scale has appropriate sample of items for a given construct (Polit & Beck, 2006). Both BSES and SPS demonstrated excellent item content validity index (I-CVI) of 0.97 and 1, respectively. The interrater agreement refers to the proportion of agreement among raters for the same scale construct (Polit & Beck, 2006). Interrater agreement for BSES and SPS were 93% and 100%, respectively, which is acceptable. Another indicator for scale content validity is the average congruency percentage (ACP), which refers to the average of the I-CVIs for all items on the scale (Polit & Beck, 2006). The ACP for BSES and SPS is acceptable of 97% and 100%, respectively.

Data Analysis

The data were analyzed using Stata statistical software, version 14.0 (StataCorp, 2015). The data were exported from Qualtrics software to Stata14 statistical software. Prior to the data analysis, all data were reviewed twice against the original surveys by the PI to ensure the accuracy of data entry. The entire data file was checked for errors, and outliers, and missing responses. All Arabic responses on open-ended items including Arabic numbers and letters were translated into English. The data were coded, and the codebook for the entire data set was generated.

The likelihood of missing data for the scale variables in this study was eliminated using two strategies. First, the settings in Qualtrics enabled "force response" option for all scale items, which required the completeness of responses before progressing to the next page of the survey. If any item of the scale was left blank, the participant would see an instant reminder message. Second, the RAs reviewed the submitted paper surveys and ensured the completeness of the responses.

Summary tables and graphic diagrams were used to examine the data and identify any out of range values. Descriptive statistics, including means (standard deviations) and frequencies (percentages), were employed for preliminary analysis to describe continuous and categorical variables, respectively. Descriptive statistics were computed for each study variable and demographic variables. After describing the study variables, inferential analyses were performed for each of the research aims.

All scale items were evaluated for reliability using item total correlations. Principal component analysis was performed for each scale to confirm the dimensionality of the scale. The criteria used to determine the number of factors were eigenvalues >1 and the scree plot. Internal consistency of each instrument in the study was also calculated using Cronbach's alpha. Pearson's product moment correlation was used to examine the interrelationships among the three psychosocial variables of perceived stress, social support, and breastfeeding self-efficacy. Summary statistics were applied to examine scale means across the categories of breastfeeding practice.

The associations between the demographic variables in this study and the three breastfeeding categories (exclusive, partial and discontinued breastfeeding) were examined using one-way analysis-of-variance (ANOVA), Pearson's chi-square test, and Fisher's exact test.

Kruskal-Wallis H tests were performed to examine the associations between psychosocial variables and the selected demographic variables of household income, maternal employment status, and maternal educational levels. The associations between the reported "insufficient breast milk" and demographic and psychosocial variables were examined using Fisher's exact tests and *t*-tests, respectively. Responses obtained from open-ended questions were analyzed as well.

Data analysis for the main research aims. The aims of this study were to examine the associations between breastfeeding practice and three modifiable maternal psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy. Multinomial logistic regression models were employed to examine the relative risks of engaging in different breastfeeding practices (exclusive, partial, or discontinued breastfeeding) after adjusting for demographic covariates. For each aim, two multinomial logistic regression models were performed using different breastfeeding categories as a reference group. A p-value of 0.05 or less was considered to be statistically significant.

Additional multiple multinomial logistic regression models were utilized to examine the relative risks of engaging in different breastfeeding practices based on the scores of all three psychosocial variables, using the same demographic control variables including maternal age, employment status, household income, and educational level. The likelihood-ratio test was used to compare the model fit among different models with the three psychosocial variables.

Summary

This study aimed to examine the associations between selected maternal psychosocial factors and the practice of breastfeeding, using a cross-sectional, correlational design. A detailed description of the sample, setting, and data collection procedure was presented, followed by

description of human subject protection and analysis plan. An overview of the selected three measures of PSS, SPS, and BSES was provided along with detailed description of the psychometric properties. The results of the data analysis will be presented in the following Chapter.

Chapter 5: Results

This study examined the associations between breastfeeding practices and selected psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy among Saudi Arabian mothers. This study included a sample of first-time Saudi Arabian mothers who had an infant aged from six to 12-months old. The data collection was completed over the period of December 2016 to February 2017. A total of 160 Saudi mothers were recruited from Al-Sulimaniyah (n = 38, 23.8%), Al-Hamadaniyah (n = 41, 25.6%), Al-Balad (n = 41, 25.6%), and Al-Marwah (n = 40, 25.0%). All the included 160 mothers had completed the surveys.

This chapter presents the results of the study in a sequence. First, information pertaining to the factor structures and reliabilities of the Perceived Stress Scale-10, Social Provisions Scale-10, and Breastfeeding Self-Efficacy Scale-14 are provided. Then, the demographic background characteristics of the study participants are described, including their associations with the pattern of breastfeeding practices. Finally, multinomial logistic regression models are presented that shed light on the associations between the psychosocial factors and the breastfeeding practice in accordance with the study aims and hypotheses.

Psychometric Properties of Psychosocial Scales

Perceived stress. Perceived stress was measured using the translated Arabic version of the Perceived Stress Scale (PSS; Chaaya et al., 2010; Cohen et al., 1983). The PSS was a 10-item, five-point Likert-type scale ranging from zero (never) to four (very often), producing total scores that ranged from 0 to 40. The average score was obtained by summing all the ten scale items with reverse scoring of the four positively worded items (4, 5, 7, and 8). Higher total scores indicated higher levels of perceived stress.

Factor structure. The exploratory factor analysis of the Arabic PSS-10 in this study was performed using principal component analysis and oblique rotation. The criteria used to determine the number of factors were eigenvalues >1 and the scree plot. The eigenvalues and scree plot indicated that scale items loaded on two factor structures (see Table 1, and Figure 3). The first factor, "perceived stress" had an eigenvalue of 5.29 explaining 52.9% of the variance. The second factor "coping" had an eigenvalue of 1.12 accounting for 11.8%. The same factor structures were identified in studies conducted with the Arabic translated version of PSS-10 (Ben Loubir et al., 2014; Chaaya et al., 2010). However, the two subscales are measuring one construct, perceived stress, by using two related concepts of negative reaction and positive coping with stressful events (Hewitt, Flett, & Mosher, 1992). In addition, when the scale items were forced to load on one factor structure, the correlation coefficients were over 0.62 among all the scale items. Thus, the total overall score of 10-item was used to measure "perceived stress" in this study.

Reliability. The reliability analysis revealed a high Cronbach's alpha of .90, indicating a strong internal consistency of the scale items. The item-rest correlations ranged from 0.56 to 0.76 with corresponding Cronbach's alpha coefficients suggesting no deletion of any item. The mean scores for each item are presented in Table 1.

Social support. Social support was measured using the Arabic version of the Social Provisions Scale (SPS)-10 item (Cutrona & Russell, 1987). Items were rated on the SPS using a four-point scale, ranging from one (strongly disagree) to four (strongly agree). There were five negatively worded statements (2, 3, 5, 6, and 9). The scores were obtained by calculating the total sum of all item responses after reverse coding the negatively worded items (2, 3, 5, 6, and 9); higher scores indicated higher perceived support (Cutrona & Russell, 1987).

Table 1

Means, Standard Deviations, Factor Loadings, and Reliability of Items for the Perceived Stress Scale

Items	*M*	*SD*	Item-rest Correlation	Cronbach's alpha if item deleted	Factor 1 Loading	Factor 2 Loading
1. How often have/had you been upset because of something that happened unexpectedly?	1.98	1.08	0.69	0.89	**0.91**	-0.09
2. How often have/had you felt that you were unable to control the important things in your life?	1.91	1.05	0.72	0.89	**0.90**	-0.05
3. How often have/had you felt nervous and "stressed"?	2.19	0.97	0.66	0.89	**0.89**	-0.10
4. When you are/were breastfeeding, how often have you felt confident about your ability to handle your personal problems?	1.75	1.04	0.60	0.89	-0.03	**0.86**
5. How often have/had you felt that things were going your way?	1.73	1.01	0.54	0.90	-0.08	**0.83**
6. How often have/had you found that you could not cope with all the things that you had to do?	2.06	1.08	0.60	0.89	**0.58**	0.17
7. How often have/had you been able to control irritations in your life?	1.65	0.99	0.56	0.90	0.13	**0.63**
8. How often have /had you felt that you were on top of things?	1.86	1.01	0.63	0.89	0.12	**0.72**
9. How often have/had you been angered because of things that were outside of your control?	2.14	1.04	0.76	0.88	**0.66**	0.26
10. How often have/had you felt difficulties were piling up so high that you could not overcome them?	2.13	1.13	0.73	0.89	**0.61**	0.28

Note. Extraction method: principal component analysis. Rotation method: Oblique with Kaiser normalization. The one factor solution explained 52.9% of the overall variance. Cronbach's alpha = .90 for all 10 items.

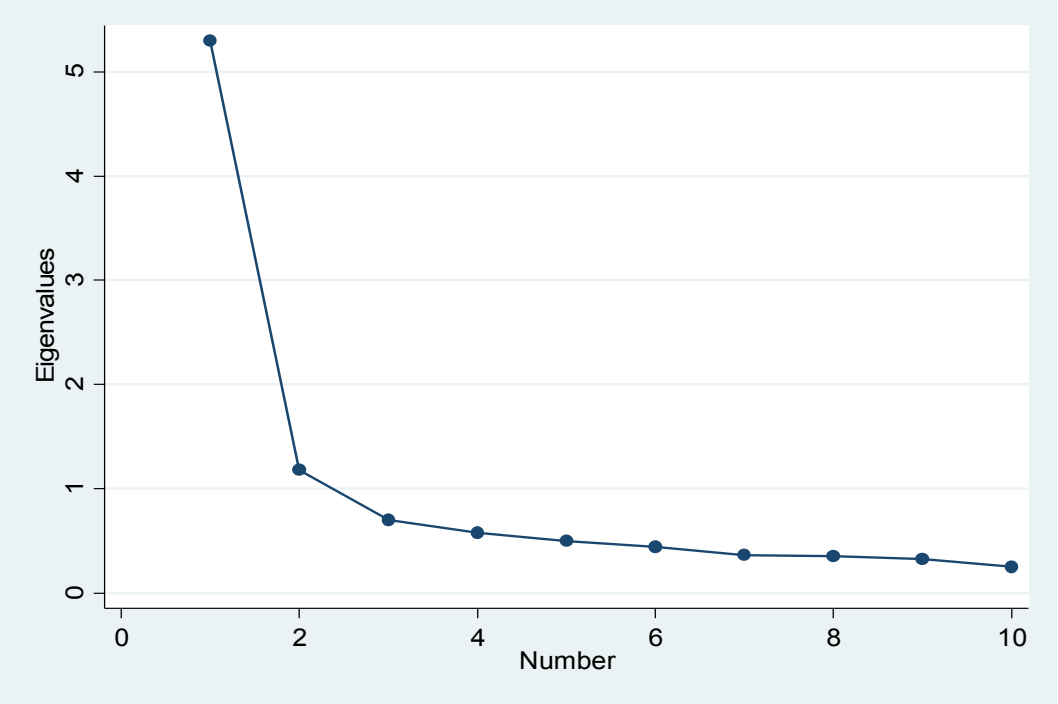

Figure3. Scree plot of eigenvalues for the Perceived Stress Scale after principal component analysis.

Factor structure. The exploratory factor analysis of the translated SPS-10 in this study was performed to inspect factor structure. The principal component analysis indicated that all scale items were highly loaded on a single factor structure. The criteria used to determine the number of factors retained were eigenvalues >1 and the scree plot. The results of factor analysis suggested a one-factor structure with an eigenvalue of 5.38 and accounted for 53.8% of overall variance. The second factor was associated with an eigenvalue of 0.93 and accounted for 9% of overall variance.

Reliability. The 10-item scale had a Cronbach's alpha of .90 with item-rest correlation coefficient of .51-.76. As shown in Table 2, all 10 items were retained since deleting any item did not result in increasing the overall internal consistency coefficient.

Table 2

Means, Standard Deviations, Factor Loadings and Reliability of Items for the Social Provision Scale

Items	*M*	*SD*	Item-rest Correlation	Cronbach's alpha if item deleted	Factor Loading
1. There are/were people I can depend on to help me if I really need it.	2.74	0.84	0.76	0.89	0.82
2. I feel/felt that I do not have close personal relationships with other people.	2.73	0.85	0.66	0.89	0.74
3. There is/was no one I can turn to for guidance in times of stress.	2.67	0.86	0.64	0.89	0.71
4. There are/were people who enjoy the same social activities that I do.	2.62	0.84	0.52	0.90	0.60
5. I do/did not think other people respect my skills and abilities.	2.75	0.87	0.62	0.89	0.69
6. If something went wrong, no one would come to my assistance.	2.76	0.86	0.61	0.89	0.68
7. I have/had close relationships that provide me with a sense of emotional security and well-being.	2.93	0.75	0.69	0.89	0.77
8. I have/had relationships where my competence and skills are recognized.	2.92	0.80	0.68	0.89	0.76
9. There is/was no one who shares my interests and concerns.	2.67	0.86	0.71	0.89	0.77
10. There is/was a trustworthy person I could turn to for advice if I were having problems.	2.97	0.91	0.68	0.89	0.76

Note. Extraction method: principal component analysis. Rotation method: unrotated. The one factor solution explained 53.8% of the overall variance in the items. Cronbach's alpha = .90 for all 10 items.

Breastfeeding Self-Efficacy. Breastfeeding self-efficacy was measured using the short form of the Breastfeeding Self-Efficacy Scale (BSES), which contains 14 items (Dennis, 2003). Items were rated using a five-point Likert-type, ranging from one (Not at all confident) to five (Very confident). All items were positively worded. Higher summed scores indicated higher levels of breastfeeding self-efficacy; there were no cut-off scores. As shown in Table 3, the mean scores of participant indicated moderate to high breastfeeding self-efficacy (*M*= 44.95, *SD* = 13.62).

Table 3

Descriptive Statistics for All Scale Variables

Scales	*M*	*SD*	Ranges Min-Max	Cronbach's alpha
Perceived Stress scale	19.41	7.56	0-37	0.90
Social Support scale	27.76	6.19	10-40	0.90
Breastfeeding Self-Efficacy scale	44.59	13.62	14-70	0.95

Factor structure. The exploratory factor analysis of the translated BFSE-14 was performed to inspect factor structure. The criteria used to determine the number of factors were eigenvalues >1, and the scree plot. The principal component analysis indicated that all scale items were highly loaded on a single factor structure. The unidimensionality in factor analysis was suggested through scree plot and eigenvalue of 8.72 that explained 62% of variance in the items, followed by an eigenvalue of 0.70 that explained 5% of variance.

Reliability. The BFSE -14 had an excellent internal consistency coefficient of 0.95. The item-rest correlation ranged from 0.72 to 0.82. Accordingly, no item has been deleted and all 14 items were retained (see Table 4).

Table 4

Means, Standard Deviations, Factor Loadings, and Reliability of Items for Breastfeeding Self-Efficacy Scale

Items	*M*	*SD*	Item-rest Correlation	Cronbach's alpha if item deleted	Factor Loading
1. I can/could always determine that my baby is/was getting enough milk	3.13	1.16	0.77	0.95	0.81
2. I can/could always successfully cope with breastfeeding like I have with other challenging tasks	3.18	1.10	0.81	0.95	0.84
3. I can/could always breastfeed my baby without using formula as a supplement	2.88	1.34	0.63	0.95	0.67
4. I can/could always ensure that my baby is properly latched on for the entire feeding	3.3	1.17	0.78	0.95	0.81
5. I can/could always manage the breastfeeding situation to my satisfaction	3.03	1.21	0.75	0.95	0.79
6. I can/could always manage to breastfeed even if my baby is crying	2.95	1.33	0.72	0.95	0.78
7. I can/could always keep wanting to breastfeed	3.47	1.24	0.74	0.95	0.76
8. I can/could always comfortably breastfeed with my family members present	3.09	1.30	0.75	0.95	0.78
9. I can/could always be satisfied with my breastfeeding experience	3.23	1.24	0.72	0.95	0.79
10. I can/could always deal with the fact that breastfeeding can be time consuming	3.41	1.19	0.76	0.95	0.77
11. I can/could always finish feeding my baby on one breast before switching to the other breast	3.26	1.20	0.76	0.95	0.79
12. I can/could always continue to breastfeed my baby for every feeding	3.22	1.31	0.73	0.95	0.80
13. I can/could always manage to keep up with my baby's breastfeeding demands	3.2	1.24	0.82	0.95	0.85
14. I can/could always tell when my baby is finished breastfeeding	3.25	1.27	0.75	0.95	0.79

Note. Extraction method: principal component analysis. Rotation method: unrotated.

Sample Characteristics

Maternal age. The ages of the women who participated in this study varied from 20 to 38 years. The mean maternal age was 27.21 years (*SD* = 4.02). The largest percentage of mothers were between 25 and 26 years of age (*n* = 30, 18.8%). There were no missing responses on maternal age.

Infant age and sex. Infant age was calculated in months from birth to the time of data collection through a fixed choice question. The ages of infants ranged from six to 12-months. The mean infant age was 8.90 months (*SD* = 2.04). The frequencies and percentages for each month of infant age are displayed in Table 5.

Table 5

Infant Age and Sex (*N* = 160)

Demographic variable	Frequency *n*	Percentage %
Infant age (Months)		
Six months	25	15.6
Seven months	19	11.9
Eight months	30	18.8
Nine months	31	19.4
Ten months	14	8.8
Eleven months	10	6.2
Twelve months	31	19.4
Infant sex		
Males	79	49.4
Females	81	50.6

Relationship status. The majority of mothers in this study were married (*n* = 154, 96. 3%). Only 6 mothers (3.8%) were divorced.

Maternal employment status. Three-fourths of the mothers were *not* working (n = 120, 75.0%) at the time of data collection. As displayed in Table 6, one fourth were working either part time (n = 17, 10.6%), or full time (n = 23, 14.4%).

Household size. The mothers were asked about the number of people who lived in their household including themselves. On average, the participants in this study lived in households with 3 members (M = 3, SD = 0.98). Table 6 shows the frequency distribution for household members. It is important to note that mothers included in this sample were all first time mothers. Thus, household sizes may not be accurate given that some married women (n = 22) reported total household members ≤ 2. This inaccuracy of reporting household sizes could be related to misinterpretation of the survey question.

Table 6

Frequencies and Percentages of Categorical Demographic Variables (N = 160)

Demographic variable	Frequency *n*	Percent %
Mother's marital status		
Married	154	96.3
Divorce	6	3.8
Mother's employment status		
Full Time (at least 35 hours/week)	23	14.4
Part-time	17	10.6
Not Working	120	75.0
Living with extended family members		
Yes	34	21.3
No	126	78.8
Household members [a]		
1	11	6.9
2	13	8.2

Table 6 (Cont'd)

Demographic variable	Frequency *n*	Percent %
3	115	72.3
4	14	8.8
5	1	0.6
6	3	1.9
7	1	0.6
9	1	0.6
Household monthly income (SAR) [b]		
3000 or Less	8	5.0
4000- 6000	67	41.9
7000- 12000	55	34.4
13000 or more	20	12.5
Don't know	8	5.0
Choose not to answer	2	1.3
Maternal education level		
Less than high school	9	5.6
High school	81	50.6
Bachelor's degree	59	36.9
Master or higher degree	11	6.9
Mode of delivery		
Vaginal Delivery	133	83.1
Caesarean section	27	16.9

Note. [a] Household sizes may not be accurate given that all mothers included in this sample were first time mothers. This inaccuracy of reporting household could be related to misunderstanding of the question. [b] household income is represented in Saudi Arabia Riyal (SAR) which approximately equal to 3.75 United States dollars.

Household income. Household income was measured based on monthly household incomes through fixed responses in Saudi Riyals (SAR). The choices ranged from less or equal to 3000 (approximately 800 USD) to 13000 SAR (approximately 3,467 USD) or more. The largest proportion of participants (*n* = 67, 41.9%) reported a low to medium household income of

4000-6000 SAR (approximately 1066 -1600 USD). Using Fisher's exact test analyses, household income was positively associated with the maternal employment status ($p < .05$), and maternal educational levels ($p < .01$).

Level of education. Maternal education level ranged from less than high school to masters or higher degrees. As shown in Table 6, the highest level of education for about half of the mothers was high school education ($n = 81$, 50.6%). Using Fisher's exact test analyses, there was a significant positive association between maternal level of education and employment status ($p < .01$).

Mode of delivery. As shown in Table 6, the majority of the births were vaginal delivery ($n = 133$, 83.1%).

Family history of breastfeeding. The majority of the participants ($n = 112$, 70%) reported that their mothers practiced breastfeeding. Of those, more than half ($n = 66$, 58.9%) reported that their mothers practiced exclusive breastfeeding.

Inter-relationships among Selected Psychosocial Factors

The results of interrelationships among the three psychosocial variables of perceived stress, social support, and breastfeeding self-efficacy were examined using a Pearson's product moment correlation. The results revealed that perceived stress was negatively associated with breastfeeding self-efficacy ($r = -.70$, $p < .001$). Conversely, social support had a strong positive association with breastfeeding self-efficacy ($r = .63$, $p < .001$). In addition, social support and perceived stress had a strong negative association ($r = -.76$, $p < .001$).

Description of Breastfeeding Practice

Breastfeeding initiation. According to the inclusion criteria for this study, all participants had initiated breastfeeding after childbirth. The majority of the mothers included in the study (n = 112, 70%) initiated breastfeeding within the first 24 hours after delivery.

The provision of free formula. Two-thirds of the sample (n = 106, 66.3%) received free infant formula from a hospital, clinic, or other agency. Of those who received free infant formula, only 31 (29.3%) did not use any of the received free formula.

Breastfeeding education during pregnancy. Less than half of the participants (n = 63, 39.4%) reported receiving education on breastfeeding during pregnancy.

Breastfeeding education and support after delivery. More than half of the participants (n = 94, 58.8%) had received help, education or support for breastfeeding and ensuring good latching after childbirth from different sources identified below.

Sources of breastfeeding support after childbirth. Of those who lived with extended families, about three-fifths of mothers (n = 21, 61.8%) reported that an extended family member did support or encourage breastfeeding. As shown in Table 7, the largest percentage of participants who received breastfeeding support and education after childbirth identified their mothers as the primary source of breastfeeding support, followed by the nurses, and physicians/doctors.

On average, each participant had 1.4 persons who supported them and 1.2 persons providing education to them. There were significant positive correlations between social support and breastfeeding support (r = .33, p < .001), as well as between social support and education received on breastfeeding (r = .39, p < .001).

Table 7

Sources of Breastfeeding Support and Education

Sources	Support for breastfeeding (n = 94)	Education on breastfeeding (n = 82)
	n (%)	n (%)
Nurse	47 (50.0)	33 (40.2)
Doctor	32 (34.0)	32 (39.0)
Lactation consultant	19 (20.2)	12 (14.6)
Mothers	64 (68.1)	58 (70.1)
Grandmother	13 (13.4)	11 (13.4)
Sister	17 (18.1)	14 (17.1)
Husband	13 (13.8)	10 (12.2)
Friend	10 (10.6)	10 (12.2)
Other (internet, relatives)	4 (4.3)	4 (4.9)

Breastfeeding duration. Slightly more than one-third of the mothers breastfed their infants for more than six months (n = 59, 36.9%). Table 8 shows the frequencies of breastfeeding duration by months.

Breastfeeding exclusivity. Of those who breastfed for six months or more (n = 92), almost half (n = 44, 47.8%) breastfed their infants for the first six months of infant age. Table 8 displays the categories of breastfeeding.

Table 8

Breastfeeding Duration and Categories (*N* = 160)

Variable	*n*	%
Duration of breastfeeding		
Less than a month.	9	5.6
1 month	17	10.6
2 months	16	10.0
3 months	13	8.1
4 months	8	5.0
5 months	5	3.1
6 months	33	20.6
More than 6 months	59	36.9
Breastfeeding categories		
Exclusive breastfeeding at 6 months	44	27.5
Partial breastfeeding at 6 months	48	30.0
Discontinued breastfeeding before 6 months	68	42.5

Reasons for breastfeeding cessation or supplementation. As shown in Table 9, a little more than three-fifths of the participants (*n* = 76, 65.5%) reported insufficient milk as the primary reason for early cessation of breastfeeding, followed by one fourth (*n* = 30, 25.9%) reported returning to work, and about one fifth (*n* = 26, 22.4%) reported sickness of baby or mother as the reasons for early breastfeeding cessation. When mothers were asked about the

most important reasons, the top three reasons identified for early breastfeeding cessation were insufficient milk (47.4%), returning to work (15.5%), and introduction of formula in the first day of baby's life (13.8%).

Table 9

Reasons for Early Breastfeeding Cessation and/or Formula Supplementation (N = 116)

Reasons for breastfeeding cessation	All reasons *n* (%)	Most important reason *n* (%)
Insufficient milk	76 (65.5)	55 (47.4)
Return to work	30 (25.9)	18 (15.5)
New pregnancy	1 (0.9)	0 (0)
Sickness of baby or mother	21 (18.1)	10 (8.6)
Introduction of the formula in the first day of life	26 (22.4)	16 (13.8)
Not applicable/ did not stop breastfeeding	3 (2.6)	2 (1.7)
Other	26 (22.4)	15 (12.9)
Refusal of infant	2	4
Use of contraceptive pills	6	4
Unspecific pain	3	2

The associations between the reported "insufficient breast milk" and other selected variables. The associations between the reported "insufficient breast milk" and the three psychosocial variables of perceived stress, social support, and breastfeeding self-efficacy were examined using *t*-tests. As shown in Table 10, the associations between the reported "insufficient breast milk" and the three psychosocial variables of perceived stress, social support, and breastfeeding self-efficacy were non-significant ($P > 0.05$).

Table 10

Descriptive Statistics for Psychosocial Variables by the Perceived Insufficient Breast Milk

Perceived insufficient breast milk	Yes (n = 55)		No (n = 105)			
	M	*SD*	*M*	*SD*	*t*	*p*
Perceived stress	19.9	5.7	19.2	8.4	0.55	0.58
Social support	27.8	4.9	27.8	6.8	0.01	0.99
Breastfeeding self-efficacy	42.7	11.3	45.6	14.7	-1.26	0.21

The associations between the reported "insufficient breast milk" and the selected demographic variables were examined using Fisher's exact tests. The results of the analysis showed no significant associations between the reported "insufficient breast milk" and the any of the selected demographic variables of household income (p = 0.29), maternal employment status (p = 0.52), and maternal educational levels (p = 0.90).

Formula and solid introduction. Close to one-third of breastfeeding mothers (n = 35, 30%) introduced formula when their infants were younger than one month, and introduced solids at six months of infant age. Table 11 shows the ages of infants when formula and solids were first introduced.

Liquid supplementation. Prior to six months, water was the most commonly introduced liquid supplement (n = 75, 64.7%), followed by herbal liquids (n = 34, 29.3%), and juices (n = 14, 12.1%).

Table 11

Formula and Solid Food Introduction According to Infant Age (N = 116)

Infant Age	Formula Introduction *n* (%)	Solid Food Introduction *n* (%)
Younger than a month	35 (30.2)	2 (1.7)
1 month	19 (16.4)	0 (0)
2 months	27 (23.3)	2 (1.7)
3 months	15 (12.9)	0 (0)
4 months	13 (11.2)	15 (12.9)
5 months	2 (1.7)	25 (21.6)
6 months	3 (2.6)	35 (30.2)
Older than 6 months	-	12 (10.3)
Not yet started	2 (1.7)	25 (21.6)

Demographic Variables by Breastfeeding Category

One-way analysis-of-variance (ANOVA), Pearson's chi-square test, and Fisher's exact test analyses were conducted to examine the associations between the demographic variables in this study and the three breastfeeding categories: exclusive, partial, and discontinued breastfeeding before six months.

One-way ANOVA was performed to test the differences in the mean ages of mothers and infants across the breastfeeding categories. The results revealed that there were no significant differences in the mean ages of mothers and infants across the breastfeeding categories (see Table 12). Using Pearson's chi-square test, there were no significant associations between the

breastfeeding categories and infant's gender ($p > 0.05$). Moreover, using Fisher's exact test, the results indicated that there were no significant associations of the breastfeeding categories with mothers' marital status, childbirth type, and family history of breastfeeding ($p > 0.05$).

However, there was a significant association between mothers' employment status and the category of breastfeeding chosen by the mothers ($p = .01$). Among participants who worked full time, there was a greater percentage of participants who discontinued breastfeeding ($n = 16$, 69.6%), compared to those who breastfed partially ($n = 5$, 21.7%) and exclusively ($n = 2$, 8.7%). Among participants who worked part time, there was a greater percentage of them who engaged in partial breastfeeding ($n = 8$, 47.1%), compared to those who discontinued breastfeeding ($n = 7$, 41.2%) and those who exclusively breastfed ($n = 2$, 11.8%). Lastly, the greater percentage of the participants who were not working outside the home continued breastfeeding throughout the first six months after birth ($n = 75$, 62.5%), compared to participants who discontinued breastfeeding ($n = 45$, 37.5%).

In addition, there was a significant association between household income and breastfeeding exclusivity ($p < .01$). Among those participants who were in the 3000 SAR or less income category, over half of them breastfed exclusively ($n = 5$, 62.5%), compared to those who partially breastfed ($n = 2$, 25.0%) and those who discontinued breastfeeding ($n = 1$, 12.5%). Of those participants who were in the 4000 to 6000 SAR range, there was a greater percentage who breastfed exclusively ($n = 25$, 37.31%), closely followed by the partial strata ($n = 23$, 34.3%), with a smaller proportion of women who discontinued breastfeeding ($n = 19$, 28.4%). Of the participants in the 7000 to 12000 SAR range, a little over half were in the discontinued category ($n = 29$, 52.7%), compared to the partial ($n = 15$, 27.3%) and exclusive ($n = 11$, 20.0%) breastfeeding categories. Of the 13000 SAR or more income category, a greater percentage of

women discontinued breastfeeding (n = 15, 75.0%), compared to women in the partial (n = 3, 15.0%) and exclusive (n = 2, 10.0%) breastfeeding categories.

Table 12

Demographic Variables by Breastfeeding Category

Variable	Exclusive BF		Partial BF		Discontinued BF			
	n	%	*n*	%	*n*	%		
							F	*p*
Mother's age							0.12	.89
20 to 23 years	9	26.5	15	44.1	10	29.4		
24 to 27 years	14	26.4	12	22.6	27	50.9		
28 to 31 years	13	29.6	11	25.0	20	45.5		
32 to 38 years	8	27.6	10	34.5	11	37.9		
							F	*p*
Infant's age							0.86	.42
6 months	5	20.0	7	28.0	13	52.0		
7 months	4	21.1	8	42.1	7	36.8		
8 months	9	30.0	11	36.7	10	33.3		
9 months	7	22.6	9	29.0	15	48.4		
10 months	7	50.0	3	21.4	4	28.6		
11 months	2	20.0	2	20.0	6	60.0		
12 months	10	32.3	8	25.8	13	41.9		
							χ^2	*p*
Infant's gender							3.14	.20
Male	20	25.3	20	25.37	39	49.4		
Female	24	29.6	28	34.6	29	35.8		
							Fisher's exact *	*p*
Relationship status								.33
Married	44	28.6	46	29.9	64	41.6		
Divorced	0	0	2	33.3	4	66.7		
Employment status								.01
Working full-time	2	8.7	5	21.7	16	69.6		
Working part-time	2	11.8	8	47.1	7	41.2		
Not working	40	33.3	35	29.2	45	37.5		

Table 12 (Cont'd)

Variable	Exclusive BF		Partial BF		Discontinued BF			
	n	%	*n*	%	*n*	%	Fisher's exact *	*p*
Household monthly income SAR								.00
3000 or less	5	62.5	2	25.0	1	12.5		
4000-6000	25	37.3	23	34.3	19	28.4		
7000-12000	11	20.0	15	27.3	29	52.7		
13000 or more	2	10.0	3	15.0	15	75.0		
Educational level								.01
Less than high school	2	22.2	4	44.4	3	33.3		
High school	28	34.6	30	37.0	23	28.4		
Bachelor's degree	12	20.3	13	22.0	34	57.6		
Master's degree or higher	2	18.2	1	9.1	8	72.7		
Birth Type								.20
Vaginal delivery	40	30.1	37	27.8	56	42.1		
Caesarean section	4	14.8	11	40.7	12	44.4		
Did your mother ever breastfeed?								.22
Yes	35	31.3	32	28.6	45	40.2		
No	3	33.3	1	11.1	5	55.6		

Note. F denotes the F test statistic based on one-way ANOVA. χ^2 denotes the Pearson's Chi-square of association statistic. *p* is the p-value. BF denotes breastfeeding. * Fisher's exact test has no statistics other than the *p* values.

Lastly, there was a significant relationship between educational level and breastfeeding categories ($p = .01$). Of the participants with less than a high school education, there was a greater proportion in the partial breastfeeding category ($n = 4$, 44.4%) compared to the exclusive ($n = 2$, 22.2%) and discontinued categories ($n = 3$, 33.3%). Of those participants with a high school education, a greater percentage were in the partial breastfeeding category ($n = 30$, 37.0%),

followed closely by the exclusive breastfeeding category (n = 28, 34.6%), and the discontinued category (n = 23, 28.4%). Of the participants with bachelor's degrees, the largest percentage was in the discontinued category (n = 34, 57.6%), compared to the partial (n = 13, 22.0%) and the exclusive breastfeeding categories (n = 12, 20.3%). Of those participants who had a master's degree or higher, the greatest proportion were in the discontinued breastfeeding category (n = 8, 72.7%) compared to the exclusive breastfeeding (n = 2, 18.2%) and partial breastfeeding (n = 1, 9.1%) categories. It is important to note the small numbers of participants in some of the categories of the demographic variables by breastfeeding practice.

Results Organized by Research Aims

The main aim of this study was to examine the associations between breastfeeding practice and three maternal psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy. The main outcome variable of breastfeeding practice has three categories: discontinued breastfeeding, which included mothers who breastfed less than six months (n = 68, 4%); partial breastfeeding, which included mothers who breastfed through the first six months or more and supplemented with formula within the first six months (n = 48, 30%); and exclusive breastfeeding, which included mothers who exclusively breastfed through the first six months or more (n = 44, 27.5%). The categories of breastfeeding practice were created from two different variables, duration and exclusivity. The mean scores of the perceived stress, social support, and self-efficacy for each breastfeeding categories are displays in Table 13.

Additional analysis Kruskal-Wallis H tests were performed to examine the associations between psychosocial variables and the selected demographic variables. Psychosocial factor of perceived stress, social support, and breastfeeding self-efficacy were not significantly associated with household income and maternal educational levels. However, there was a statistically

significant difference between perceived stress and maternal employment status ($p = 0.01$). Participants who were not working had significantly lower perceived stress ($M = 18$, $SD = 7.49$) than those who were working full-time ($M = 22.7$, $SD = 6.59$) or part-time ($M = 23.5$, $SD = 6.87$). However, the levels of perceived stress among mothers who were working full-time did not differ significantly from mothers who were working part-time.

Table 13

The Mean Scores of Perceived Stress, Social Support, and Self-Efficacy for each Breastfeeding Category (N = 160)

Variable	Exclusive *M (SD)*	Partial *M (SD)*	Discontinued *M (SD)*
Perceived stress	16.1 (8.85)	18.2 (6.72)	22.4 (6.01)
Social support	29.7 (7.14)	28.8 (5.26)	25.8 (5.61)
Breastfeeding self-efficacy	53.6 (12.40)	45.8 (11.13)	37.9 (12.47)

Participants who were not working had also significantly ($p = 0.01$) higher levels of breastfeeding self-efficacy ($M = 46.3$, $SD = 13.43$) than those who were working part-time ($M = 36.3$, $SD = 12.83$). However, the levels of breastfeeding self-efficacy among mothers who were working full-time ($M = 41.9$, $SD = 12.97$) did not differ significantly from mothers who were working part-time or not working. In the following sections, multinomial logistic regression models were employed to test the associations between each maternal psychosocial factor and breastfeeding practice controlling for demographic factors. The results of these analyses are organized by the study's aims.

Aim 1*:* To determine the association between perceived stress and the practice of breastfeeding among first-time Saudi Arabian mothers.

The first multinomial logistic regression was employed to compare the risks of engaging in discontinuing breastfeeding and partially breastfeeding relative to exclusive breastfeeding. The multinomial logistic regression model was statistically significant, $\chi^2_{(16)} = 58.00$, $p < 0.001$, Pseudo $R^2 = 0.17$. Perceived stress was positively related to breastfeeding discontinuation prior to six months (*RRR* = 1.13, $p = .001$). As perceived stress increased by one unit, the relative risk of being in the discontinued breastfeeding category relative to exclusive breastfeeding category increased by 13% ($p = .001$) given that selected demographic variables including maternal age, employment status, household income, and educational level were held constant (see Table 14). The relative risk of being in the partial breastfeeding group compared to the exclusive group was not significantly related to the perceived stress (*RRR*=1.02, $p = .49$).

An additional multinomial logistic regression model was performed to examine the relative risks between partial and discontinued breastfeeding groups, using discontinued breastfeeding category as a reference group. The model was statistically significant, $\chi^2_{(16)} = 58.00$, $p < 0.001$, Pseudo $R^2 = 0.17$. For a one-unit increase in the perceived stress, the probability of being in the partial breastfeeding category relative to discontinued breastfeeding category decreased by 10% (*RRR*=0.90, $p= .002$), given other demographic variables were held constant including maternal age, employment status, household income, and educational level (Table 14). In summary, mothers' perceived stress level was significantly related to their breastfeeding duration, but not the breastfeeding exclusivity.

As shown in Table 14, the employment status, household income, and education level were statistically correlated with some breastfeeding practice. For working mothers, the risk of partially breastfeeding relative to exclusive breastfeeding was 4.54 times greater than among non-working ($p =.024$).

Table 14

Summary of Multinomial Logistic Regression Analysis of Perceived Stress Predicting Breastfeeding Practice (N = 160)

	Discontinued breastfeeding vs. Exclusive breastfeeding [e]			Partial breastfeeding vs. Exclusive breastfeeding [e]			Partial breastfeeding vs. Discontinued breastfeeding [f]		
		95% CI			*95% CI*			*95% CI*	
Predictor	*RRR*	*LL*	*UL*	*RRR*	*LL*	*UL*	*RRR*	*LL*	*UL*
Perceived Stress	1.13**	1.05	1.21	1.02	.96	1.08	.90**	.84	.96
Mother's age [a]									
24 to 27 years	.87	.25	3.09	.52	.16	1.72	.59	.18	1.93
28 to 31 years	.66	.18	2.43	.43	.13	1.48	.66	.19	2.23
32 to 38 years	.74	.17	3.30	.76	.20	2.87	1.02	.27	3.90
Employment status [b]									
Working	2.14	.59	7.70	4.54*	1.22	16.97	2.12	.76	5.94
Household monthly income SAR [c]									
7000 or more	4.52**	1.76	11.61	1.80	.70	4.63	.40	.16	.99
No answer	5.53	.52	58.48	6.03	.64	57.17	1.09	.22	5.34
Educational level [d]									
Bachelor's degree or higher	2.39	.92	6.18	.58	.21	1.63	.24**	.09	.64

Note. *$p < .05$, **$p < .01$

[a]Compared to Reference group the 20 to 23 year age category. [b]Compared to not working category [c]Compared to 6000 SAR or less category. [d]Compared to high school or less category. [e] Base outcome: exclusive breastfeeding. [f] Base outcome: discontinued breastfeeding. Model summary: Log likelihood = -143.78, $\chi^2_{(16)} = 58.00$, $p < 0.001$, Pseudo $R^2 = 0.17$

For participants who identified as having a household income of 7000 or more, the risk of discontinuing breastfeeding was 4.52 times greater than among mothers with family incomes of 6000 SAR or less. The last significant predictor was maternal educational level. The likelihood of engaging in partially breastfeeding versus discontinued breastfeeding decreased among mothers with a bachelor's educational level or higher as compared to mothers with a high school education or less (*RRR*= .24, p = .004).

Aim 2: To determine the association between social support and the practice of breastfeeding among first-time Saudi Arabian mothers.

The multinomial logistic regression model for social support predicting the practice of breastfeeding was statistically significant, $\chi^2_{(16)} = 55.71$, $p < 0.001$, Pseudo $R^2 = 0.16$. For a one-unit increase in the social support, the risk of discontinuing breastfeeding relative to exclusive breastfeeding decreased by 13% (*RRR* = 0 .87, p = .001). There were no significant differences in the probabilities of engaging in partial versus exclusive breastfeeding based on changes in the social support.

An additional multinomial logistic regression model was performed to examine the relative risk between partial and discontinued breastfeeding groups, using discontinued breastfeeding category as a reference group. The model was statistically significant, $\chi^2_{(16)} = 55.71$, $p < 0.001$, Pseudo $R^2 = 0.16$. For a one unit increase in the social support, the probability of being in the partial breastfeeding category relative to discontinued breastfeeding category increased by 12% (*RRR* = 1.12, p =.004), given selected demographic variables of maternal age, employment status, household income, and educational level were held constant (Table 15).

Table 15

Multinomial Logistic Regression Analysis of Social Support Predicting Breastfeeding Practice (N = 160)

	Discontinued breastfeeding vs. Exclusive breastfeeding [e]			Partial breastfeeding vs. Exclusive breastfeeding [e]			Partial breastfeeding vs. Discontinued breastfeeding [f]		
		95% CI			95% CI			95% CI	
Predictor	*RRR*	*LL*	*UL*	*RRR*	*LL*	*UL*	*RRR*	*LL*	*UL*
Social support	0.87**	.80	.94	.98	.91	1.05	1.12*	1.02	1.20
Mother's age [a]									
24 to 27 years	1.03	.30	3.60	.52	.16	1.73	.50	.14	1.63
28 to 31 years	.61	.17	2.23	.45	.13	1.53	.74	.22	2.52
32 to 38 years	.68	.16	2.88	.72	.19	2.70	1.07	.29	3.95
Employment status [b]									
Working	2.32	.64	8.36	4.57*	1.25	16.73	1.97	.70	5.56
Household monthly income SAR [c]									
7000 or more	5.78**	2.22	15.03	1.86	.73	4.76	.32*	.13	.81
No Answer	11.27	1.07	119.19	6.95	.73	66.32	.62	.13	3.01
Educational level [d]									
Bachelor's degree or higher	2.27	.88	5.88	.59	.21	1.65	.26*	.10	.69

Note. *$p < .05$, **$p < .01$

[a]Compared to Reference group the 20 to 23 year age category. [b]Compared to not working category [c]Compared to 6000 SAR or less category. [d]Compared to high school or less category. [e] Base outcome: exclusive breastfeeding. [f] Base outcome: discontinued breastfeeding. Model summary: Log likelihood = -144.92, $\chi^2_{(16)} = 55.71$, $p < 0.001$, Pseudo $R^2 = 0.16$

As shown in Table 15, the maternal employment status, household income, and maternal education level were statistically correlated with some breastfeeding categories. For working mothers, the risk of partially breastfeeding relative to exclusive breastfeeding was 4.57 times greater than among non-working mothers (p =.022). Additionally, for participants who identified as having a household income of 7000 or more, the risk of discontinuing breastfeeding was 5.78 times greater than among mothers with family incomes of 6000 SAR or less. Furthermore, mothers with household income of 7000 or more were less likely to engage in the partial breastfeeding relative to discontinued breastfeeding (*RRR*= .32, p = .017). The last significant association in the multinomial logistic regression models was maternal educational level. The likelihood of engaging in partially breastfeeding versus discontinued breastfeeding decreased among mothers with a bachelor's educational level or higher relative to mothers with a high school education or less (*RRR*= .26, p =.006).

Aim 3: To determine the association between breastfeeding self-efficacy and Breastfeeding Practice among first-time Saudi Arabian mothers.

The multinomial logistic regression model predicting breastfeeding patterns based on self-efficacy was statistically significant overall, $\chi^2_{(16)} = 79.05$, $p < 0.001$, Pseudo $R^2 = 0.23$. For a one unit increase in the breastfeeding self-efficacy, the risks of discontinuing breastfeeding (*RRR* = .88, $p < .001$) or switching to partial breastfeeding (*RRR*= .94, p = .006) declined significantly relative to exclusive breastfeeding (Table 16).

An additional multinomial logistic regression model was performed to examine the relative risk between partial and discontinued breastfeeding groups relative to breastfeeding self-efficacy, using discontinued breastfeeding category as a reference group. The model was statistically significant, $\chi^2_{(16)} = 79.05$, $p < 0.001$, Pseudo $R^2 = 0.23$.

Table 16

Multinomial Logistic Regression Analysis of Breastfeeding Self-efficacy Predicting Breastfeeding Practice (N = 160)

	Discontinued breastfeeding vs. Exclusive breastfeeding [e]			Partial breastfeeding vs. Exclusive breastfeeding [e]			Partial breastfeeding vs. Discontinued breastfeeding [f]		
		95% CI			95% CI			95% CI	
Predictor	*RRR*	*LL*	*UL*	*RRR*	*LL*	*UL*	*RRR*	*LL*	*UL*
Breastfeeding Self-efficacy	0.88**	.84	.93	.94*	.90	.98	1.06*	1.02	1.11
Mother's age [a]									
24 to 27 years	1.02	.26	4.05	.61	.17	2.13	.60	.14	1.92
28 to 31 years	.70	.16	2.84	.49	.14	1.73	.70	.23	3.62
32 to 38 years	1.75	.35	8.64	1.28	.31	5.24	.73	.16	3.60
Employment status [b]									
Working	2.23	.58	8.64	4.11*	1.06	15.81	1.84	.49	18.20
Household monthly income (SAR) [c]									
7000 or more	5.81**	2.04	16.58	1.99	.75	5.30	.34*	.03	7.56
No Answer	6.51	.47	90.14	7.06	.66	75.85	1.08	.01	3.10
Educational level [d]									
Bachelor's degree or higher	1.86	.65	5.33	.47	.16	1.40	.26*	.09	.67

Note. *$p < .05$, **$p < .01$

[a]Compared to reference group the 20 to 23 year age category. [b]Compared to not working category [c]Compared to 6000 SAR or less category. [d]Compared to high school or less category. [e] Base outcome: exclusive breastfeeding. [f]Base outcome: discontinued breastfeeding. Model summary: Log likelihood = -133.25, $\chi^2_{(16)}$ =79.05, $p < 0.001$, Pseudo $R^2 = 0.23$

For a one unit increase in the breastfeeding self-efficacy, the probability of being in the partial breastfeeding category relative to discontinued breastfeeding category increased by 6% (*RRR*=1.06, $p = .001$), given that demographics were held constant (Table 16). Different from perceived stress and social support, mothers' breastfeeding self-efficacy was significantly correlated with both breastfeeding duration and exclusivity.

As shown in Table 16, the employment status, household income, and education level were statistically significantly correlated with some breastfeeding categories. For working mothers, the risk of partially breastfeeding relative to exclusive breastfeeding was 4.11 times greater than among non-working mothers ($p = .040$). For participants, who identified as having a household income of 7000 or more, the risk of discontinuing breastfeeding relative to exclusive breastfeeding was 5.81 times greater than among mothers with family incomes of 6000 SAR or less ($p = .001$). Furthermore, mothers with household income of 7000 or more were less likely to engage in the partial breastfeeding relative to discontinued breastfeeding (*RRR*= .34, $p < .05$). As shown in Table 16, the last significant correlate was maternal educational level. The likelihood of engaging in partially breastfeeding versus discontinued breastfeeding significantly decreased among mothers with bachelor's educational level or higher relative to mothers with high school education or less (*RRR*= .26, $p = .006$).

Overall Theoretical Model

Three multinomial logistic regression models were utilized to examine the relative risks of engaging in different breastfeeding practices based on the scores of all three psychosocial variables together, using the same demographic control variables of maternal age, employment status, household income, and educational level.

The first multinomial logistic regression model included perceived stress and social support as the independent variables. The model was statistically significant, with $\chi^2_{(18)} = 59.30$, $p < .001$, Pseudo $R^2 = .17$. However, perceived stress and social support were not significantly correlated with breastfeeding practice. The second multinomial logistic regression model included perceived stress and breastfeeding self-efficacy. The model was statistically significant, with $\chi^2_{(18)} = 81.87$, $p < .001$, Pseudo $R^2 = .24$. Only breastfeeding self-efficacy was significantly related to breastfeeding practice ($p < .01$). The third overall multinomial logistic regression model included perceived stress, social support, and breastfeeding self-efficacy. The overall model was statistically significant, with $\chi^2_{(20)} = 82.81$, $p < .001$, Pseudo $R^2 = .24$. Only breastfeeding self-efficacy remained as a significant predictor of breastfeeding practice ($p < .01$).

The likelihood-ratio test was significant between the first model, that encompassed perceived stress and social support, and the overall model that included perceived stress, social support, and breastfeeding self-efficacy ($\chi^2_{(2)} = 23.51$, $p < .001$). In other words, adding "breastfeeding self-efficacy" led to a statistically significant enhancement in the overall model fit. In contrast, the likelihood-ratio test was non-significant between the second model (perceived stress and breastfeeding self-efficacy) and the overall model that included perceived stress, self-efficacy, and social support ($\chi^2_{(2)} = 0.94$, $p = .63$). In other words, adding social support did not result in a statistically significant improvement in the overall model fit. Likewise, adding perceived stress to a model that included social support and breastfeeding self-efficacy did not result in a statistically significant improvement in the overall model fit ($\chi^2_{(2)} = 0.65$, $p = .72$). In summary, "breastfeeding self-efficacy" was the most important factor influencing breastfeeding practice.

Chapter 6: Discussion and Implications

This cross-sectional, correlational study examined the associations between the practice of breastfeeding, and selected theory-based psychosocial factors: perceived stress, social support, and breastfeeding self-efficacy, among a sample of first-time Saudi Arabian mothers who initiated breastfeeding. To address the research purpose, a sample of 160 first-time mothers who initiated breastfeeding recruited from four primary care centers in Jeddah, KSA, were surveyed regarding the study variables. The major findings indicated that mothers with lower levels of stress, higher levels of social support, and higher levels of breastfeeding self-efficacy were more likely to continue breastfeeding throughout the first six months after childbirth than mothers with higher levels of stress, lower levels of social support and lower levels of breastfeeding self-efficacy. Moreover, mothers with higher levels of breastfeeding self-efficacy were more likely to exclusively breastfeed than those with lower levels of self-efficacy.

A discussion of the results described in Chapter 5 is presented in this final chapter. This discussion focuses on the interpretation of the findings based on the study's aims and hypotheses, and validation from the current literature. A discussion of study strengths, limitations, and implications for future research, practice, and policy will be provided in this chapter, followed by conclusions.

Discussion of the Main Research Findings According to Study's Aims

Aim 1. The first aim was to determine to what extent perceived stress was associated with the practice of breastfeeding at six to twelve months after birth among first-time Saudi Arabian mothers who initiated breastfeeding. It was hypothesized that mothers who had lower levels of stress would be more likely to exclusively breastfeed throughout the first six months after birth than mothers with higher levels of stress. The main outcome variable was the breastfeeding practice which had three categories: exclusive breastfeeding throughout the first

six months after childbirth, partial breastfeeding throughout the first six months after childbirth, and discontinued breastfeeding prior to six months. To examine the relative risks between the three groups of breastfeeding practice, two multinomial logistic regression models were performed using different breastfeeding categories as a reference group.

The current study found a significant risk of discontinuing breastfeeding prior to the recommended first six months relative to perceived stress; nonetheless, no significant differences arose in the relative risks of exclusive versus partial breastfeeding relative to perceived stress. In other words, the findings indicate that perceived stress was significantly associated with breastfeeding duration; however, perceived stress was not significantly related to breastfeeding exclusivity. The results suggest that hypothesis one is partially supported; that is, first-time mothers who had higher levels of perceived stress were somewhat more likely to discontinue breastfeeding during the first six months after birth than mothers who had lower levels of perceived stress.

The significant negative association between perceived stress and breastfeeding duration is consistent with previous findings from other countries (Dozier et al., 2012; Li, Kendall, Henderson, & Downie, 2008; Zhu, Hao, Jiang, Huang, & Tao, 2013). Yet, the comparisons between such findings are inconclusive due to the use of different tools and different prospective designs to examine the associations between maternal stress and breastfeeding duration. The finding from this study confirmed that first-time mothers who perceived less stress during the first six months of postpartum period were more likely to continue breastfeeding throughout the recommended breastfeeding period. This finding emphasizes the importance of addressing maternal perceived stress early after childbirth to improve mothers' ability to breastfeed.

The inverse association between perceived stress and breastfeeding duration may be explained, in part, by the following mechanisms that have been revealed in studies from different countries. First, high levels of maternal stress can lead to decreased breast milk volume and production (Dimitraki et al., 2016; Doulouger et al., 2013; Zhu et al., 2013), through reducing the production of the oxytocin hormone (Dewey, 2001). Perceived stress not only decreases breast milk volume, but also results in decreasing the immune components of breast milk (Thibeau et al., 2016).

A second mechanism that may explain the negative association between perceived stress and breastfeeding duration is the protective effects of breastfeeding against stressors. The response to stressors differs in breastfeeding mothers from mothers who do not breastfeed (Groer, 2005; Groer et al., 2002; Mezzacappa & Katlin, 2002). For instance, a review of the literature revealed that breastfeeding mothers had diminished reactivity to stress and environmental stimuli (Groer et al., 2002), which means that breastfeeding mothers can endure more stress that may result from trying to meet the demands of newborns. Furthermore, studies indicated that breastfeeding mothers reported more positive mood and less perceived stress than non-breastfeeding mothers (Groer, 2005; Mezzacappa & Katlin, 2002), possibly due to the role of the breastfeeding hormone, prolactin (Groer & Davis, 2006). A recent randomized controlled trial with 35 German women, diagnosed with posttraumatic stress disorder, showed that intranasal oxytocin, a hormone that is released during breastfeeding, reduces symptoms of posttraumatic stress disorder (Sack et al., 2017). These two mechanisms may explain why first time Saudi Arabian mothers who perceived less stress were able to breastfeed throughout the recommended six months after childbirth.

The non-significant finding between perceived stress and breastfeeding exclusivity may be a result of design limitations, given that maternal perceived stress in this study was retrospectively measured after breastfeeding practice may have been discontinued. This non-significant finding could not be validated with the current literature due to the lack of research that examined the association between perceived stress and breastfeeding exclusivity.

As mentioned previously, the finding partially supported the theory-based hypothesis of the negative association between perceived stress and breastfeeding practice. Despite the congruence of this findings with the literature (Dimitraki et al., 2016; Doulouger et al., 2013; Zhu et al., 2013), causal inferences cannot be assumed due to the lack of evidence on the time-order relationship between stress and breastfeeding outcomes. Furthermore, it is uncertain whether maternal stress is a predictor of breastfeeding discontinuation and shorter-duration, or a response (result) of breastfeeding practice due to breastfeeding-associated issues including fatigue, breast encouragement, sleep disturbance, and pain. Additional studies are needed to further explain the nature of the association between perceived stress and breastfeeding practice. It is important to incorporate the assessment of maternal stress into the prenatal and postnatal care to identify mothers at risk for breastfeeding discontinuation. Healthcare professionals need to intervene early and address the new-mother concerns during the stressful transition to the maternal role. The assessment of maternal stress within maternity care in the KSA is not a common practice; thus, a change in practice protocol and policy is needed.

Aim 2. The second aim was to determine the association between social support and the breastfeeding practice at six to twelve months after birth among first-time Saudi Arabian mothers. It was hypothesized that first-time mothers who had higher levels of social support would continue to exclusively breastfeed their infants throughout the first six months after birth

than first-time mothers who had lower levels of social support. Two multinomial logistic regression models were employed to examine the likelihood of engaging in different breastfeeding practices using two different reference groups.

The current study found that first-time mothers who initiated breastfeeding and who had higher levels of social support were more likely to continue exclusive or partial breastfeeding until their infants were six months old than first-time mothers who had initiated breastfeeding and who had lower levels of social support. However, social support was not related to breastfeeding exclusivity. The results suggest that hypothesis two was partially supported; that is, first-time mothers who had higher levels of social support were more likely to continue breastfeeding until their infants were six months old than first-time mothers who had lower levels of social support.

The significant association between social support and breastfeeding duration was congruent with findings from different countries. A recent Cochrane systematic review of 73 randomized and quasi-randomized controlled trials showed a negative association between social support and breastfeeding discontinuation (McFadden et al., 2017). The results of this systematic review confirmed that all forms of support led to a decrease in cessation of exclusive breastfeeding (RR 0.88, 95% CI 0.85 to 0.92); similar findings emerged in the current study. Therefore, it is important to support breastfeeding mothers regularly during the postnatal visits, and facilitate peer support for breastfeeding mothers.

Various sources can provide social support to breastfeeding mothers including family members, friends, doctors, nurses, and lactation consultants. The largest percentage of participants in the current study identified their mothers as the primary source of breastfeeding support and education. Some studies' findings indicated that support from a family member was

positively associated with breastfeeding duration among mothers in Kuwait (Dashti et al., 2010; Dashti, Scott, Edwards, & Al-Sughayer, 2014; Nassar et al., 2014). In contrast, studies from Western countries identified professional support provided by doctors or nurses as the most important source of breastfeeding support (Britton et al., 2007; Hannula, Kaunonen, & Tarkka, 2008; Jarlenski et al., 2014; McFadden et al., 2017). These variations in the support preference between the Western and Eastern countries may be due to the strong family relationships in Eastern culture (Kim, Sherman, & Taylor, 2008). Professional support becomes more effective when accompanied by peer support (Kaunonen, Hannula, & Tarkka, 2012). Likewise, antenatal support is insufficient to improve breastfeeding practice, and it is more effective when it continues after childbirth (Babakazo et al., 2015). Thus, consistent support from family members, health professionals, and peers (lay) is important for sustainment of breastfeeding among first-time mothers in the KSA.

The non-significant association between social support and breastfeeding exclusivity was consistent with a study's findings from Kuwait that revealed a positive association between grandmothers' support and breastfeeding duration, yet a non-significant association between grandmothers' support and breastfeeding exclusivity (Dashti et al., 2014). In the provided support to breastfeeding mothers, there may be little to no emphasis on the exclusivity of breastfeeding, which may explain this finding. Recommendations and instructions provided to new mothers from a family member may not always be congruent with the recommendations of the WHO on breastfeeding practice. Dashti and colleagues (2014) further explained these findings as a possible result of grandmothers' encouragement to supplement with formula to ensure that the infant is well-fed. Hence, breastfeeding Saudi Arabian mothers should not rely solely on their mothers' advice, but they should also be able to access evidence-based

breastfeeding resources. Given that the largest percentage of participants in the current study identified their mothers as the primary source of breastfeeding support and education, it is important to include the grandmothers in the future breastfeeding research.

Aim 3. The third aim was to determine to what extent breastfeeding self-efficacy was associated with the practice of breastfeeding at six to twelve months after birth among first-time Saudi Arabian mothers who initiated breastfeeding. It was hypothesized that first-time mothers who had higher levels of breastfeeding self-efficacy would continue to exclusively breastfeed their infants throughout the first six months of life than first-time mothers who had lower levels of breastfeeding self-efficacy. Two multinomial logistic regression models were employed to examine the likelihood of engaging in different breastfeeding practices.

The findings indicated that breastfeeding self-efficacy was significantly associated with both breastfeeding exclusivity and duration. The results suggest that the hypothesis was supported; that is, mothers who had lower levels of breastfeeding self-efficacy were more likely to discontinue breastfeeding altogether or to switch to partial breastfeeding during the first six months after birth, than mothers who had higher levels of breastfeeding self-efficacy. Consistent with this study's findings, previous correlational studies from developed countries have consistently found breastfeeding self-efficacy to be significantly associated with breastfeeding exclusivity and duration (Babakazo et al., 2015; Bailey et al., 2008; de Jager et al., 2015; Loke & Chan, 2013; Semenic et al., 2008). Furthermore, past research indicated that higher maternal breastfeeding self-efficacy at two days postpartum was a significant predictor of exclusive breastfeeding at six months postpartum (Henshaw et al., 2015). In addition, breastfeeding self-efficacy was a stronger correlate with exclusive breastfeeding duration at six-month postpartum than when measured at two months (de Jager et al., 2015), which relates to the influence of

successful past behavior. Therefore, it is important to encourage and reinforce the practice of breastfeeding after childbirth and during the postnatal and well-baby visits.

Breastfeeding self-efficacy is an ongoing process that regulates mothers' perceptions about breastfeeding practice. A positive breastfeeding experience, characterized by a mother's satisfaction with meeting her infant's nutritional needs, can shape a mother's confidence in breastfeeding. This confidence can be strengthened by positive feedback from healthcare providers, which in turn can reinforce the mother's decision regarding breastfeeding continuation and exclusivity.

The positive association between breastfeeding self-efficacy and breastfeeding practice in this study was also empirically supported in the literature. Three intervention studies showed that breastfeeding self-efficacy interventions, such as workbooks and self-efficacy-enhancing sessions, had positive effects on breastfeeding self-efficacy, exclusivity, and duration (Nichols et al., 2009; Otsuka et al., 2014; Wu et al., 2014). These empirical findings, when considered in relation to the results of the current study, suggest that breastfeeding self-efficacy is an important modifiable factor that can be enhanced through intervention. Therefore, concrete efforts should be taken by healthcare professionals to enhance breastfeeding self-efficacy after childbirth through providing positive reinforcement for all postpartum Saudi Arabian women.

To the best of the PI's knowledge, this is the first study to address breastfeeding self-efficacy among first-time Saudi Arabian mothers who initiated breastfeeding. As such it is difficult to compare this study's findings with others studies involving sample populations from different societies and cultural contexts. However, the findings provide implications for nursing research, practice, and policy which will be discussed later in this chapter.

Additional Findings

Association among maternal psychosocial variables. Perceived stress had a strong negative association with social support, indicating that first-time mothers who had higher levels of social support tended to have lower levels of perceived stress. This finding is consistent with other studies findings from developed countries that the influence of stress can be attenuated in the presence of social support (Coburn, Gonzales, Luecken, & Crnic, 2016; Kingston, Heaman, Fell, Dzakpasu, & Chalmers, 2012). Moreover, social support can moderate the effect of stress on health outcomes. For example, a recent study with first-time Swiss mothers ($N = 235$) revealed that the relationship between stress and health outcomes diminished through social support (Razurel, Kaiser, Antonietti, Epiney, & Sellenet, 2017). However, the variation in tools used to measure perceived stress and social support makes the comparison inconclusive across studies.

Social support can mitigate stress by providing a sense of mastery and improving a mother's ability to cope with postpartum stressors (Gadalla, 2009; Schwarzer & Knoll, 2007). Buffering effects become evident when a person has experienced support and stress in the same context (Cohen & McKay, 1984). In the current study, perceived stress and social support were examined in the same context of breastfeeding, which may strengthen the buffering mechanism between perceived stress and social support. For instance, a study of 92 undergraduate students investigated the buffering effects of perceived and received social support on stress (Cohen, McGowan, Fooskas, & Rose, 1984). Consistent with the current study, the statistical analyses strongly supported the stress-buffering effects of perceived social support (Cohen et al., 1984). Therefore, it is important to include the element of social support in future research that aims to promote the breastfeeding practice through the management of maternal stress.

Perceived stress was also negatively associated with breastfeeding self-efficacy in this study, suggesting that first-time mothers who had lower levels of perceived stress tended to have higher breastfeeding self-efficacy than first-time mothers who had higher levels of perceived stress. Findings from developed countries supported the significant negative association ($p < .001$) between perceived stress and breastfeeding self-efficacy (Dennis, 2006; Dennis, 2003). This is an important finding and relates to the theoretical framework of self-efficacy, where stress is an important antecedent variable that can impact an individual's beliefs in her perceived ability to execute certain behavior (Bandura, 1977a, 1986).

There are several causes of stress in the first year after birth for first-time mothers including financial stress, emotional stress (Dozier et al., 2012), sleep disturbances (Gardazi et al., 2016), and physical changes to the mother's body (Rallis et al., 2014). Dennis (1999) emphasized the need to assess and address maternal stress to enhance breastfeeding self-efficacy. Therefore, the association between maternal perceived stress and breastfeeding self-efficacy needs to be considered and integrated into future breastfeeding-enhancing strategies in the KSA. Moreover, clinicians need to address the maternal stress early during the postpartum period in order to enhance mothers' breastfeeding self-efficacy.

Social support in this sample was significantly positively associated with breastfeeding self-efficacy, suggesting that mothers who had higher levels of social support tended to have higher levels of breastfeeding self-efficacy than those who had lower levels of social support. Consistent findings have been documented in the literature. A recent study revealed a significant positive relationship between social support and breastfeeding self-efficacy among Iranian postpartum women at four to six months postpartum (Faridvand, Mirghafourvand, Malakouti, & Mohammad-Alizadeh-Charandabi, 2017). In addition, a study with expectant Chinese mothers

($N = 201$) revealed that five variables accounted for 34% of the variance in breastfeeding self-efficacy including perceived social support, previous breastfeeding experience, watching others breastfeed, timing of maternal decision to breastfeed, and perceived husbands' attitude toward breastfeeding (Zhu, Chan, Zhou, Ye, & He, 2014). Therefore, it is important to incorporate the element of social support into future breastfeeding research and programs that aim to promote maternal confidence in breastfeeding.

The significant positive association between social support and breastfeeding self-efficacy was also supported by the theoretical framework of breastfeeding self-efficacy, based on Bandura's social-cognitive theory (Bandura, 1977a, 1977b; Dennis, 1999). The concept of social support was embedded in the construct of "verbal persuasion" in the theoretical framework of breastfeeding self-efficacy (Dennis, 1999). Social support is considered a facilitator to breastfeeding self-efficacy.

Overall, the correlations among the three psychosocial variables of perceived stress, social support, and breastfeeding self-efficacy were significant. The strong correlations among the three psychosocial variables can potentially be explained by the following three reasons. First, there were overlaps in the scale constructs among the three scale items. For example, item 8 on the Social Provisions Scale, *"There was no one I can turn to for guidance in times of stress,"* indicates both a lack of social support and stress. In addition, the items from 4 to 8 on the Perceived Stress Scale indicate breastfeeding self-efficacy. For example, Item 6 in the perceived stress scale, *"When you breastfeed/breastfed, how often have/had you found that you could not cope with all the things that you had to do?,"* is the opposite of Item 2 in the Breastfeeding Self-efficacy Scale, *"I can/could always successfully cope with breastfeeding like I have with other challenging tasks".* Second, the three psychosocial scales demonstrated

theoretically-related concepts. For instance, the correlation between perceived stress and breastfeeding self-efficacy was examined as a measure for validity of the Breastfeeding Self-efficacy Scale (Dennis, 2003). Third, the participants were asked to think about their experience during breastfeeding and respond to the three scales, which may have resulted in consistent ratings based on their past thought processes.

Discussion of the overall conceptual framework. Three multinomial logistic regression models including all three psychosocial variables were utilized to examine the likelihood of engaging in different breastfeeding practices, using the same demographic control variables of maternal age, employment status, household income, and educational level. Among the three models, breastfeeding self-efficacy remained a significant factor of the breastfeeding practice ($p < .01$), and resulted in a statistically significant improvement in the overall model fit. The associations among selected psychosocial factors and breastfeeding practice in the conceptual framework of this study were supported by the original conceptual framework of breastfeeding self-efficacy, where only breastfeeding self-efficacy showed a direct relationship with breastfeeding practice (Dennis, 1999). Therefore, breastfeeding self-efficacy is an essential element to include in a breastfeeding intervention for first-time mothers who initiated breastfeeding.

The findings from this study support the adapted conceptual framework used, and add to the body of knowledge regarding theory-based psychosocial factors associated with breastfeeding practice, which has not been examined among Saudi Arabian first-time mothers. However, further research is warranted to support the current study findings using a larger sample.

Demographic characteristics. Participants in this study were of varied ages, incomes, and educational levels. The mean age of participants was 27.2 years, which is somewhat similar to reported average maternal ages in studies with Saudi Arabian mothers attending PCCs after six months of infant age (Al-Madani et al., 2010; Amin et al., 2011). However, studies in the KSA included mothers of different parity status, which makes the comparison of maternal ages less relevant. The majority of participants had a low to medium household income of 4,000–6,000 SAR (approximately $1,066– 1,600 USD), which is similar to the reported low household income of Saudi Arabian mothers who were living in Jeddah and attending well-child clinics (Fida & Al-Aama, 2003).

More than half of the mothers included in this study were not working and had no more than a high school education. Mothers' level of education and employment status in this study were similar to the characteristics of Saudi Arabia mothers attending PCCs in a similar study with a larger sample size of 671 mothers (Alzaheb, 2016b). In brief, mothers in this study were predominantly not working outside the home, married, with a midrange household income and a high school education. The study sample was relatively representative to the KSA population, though it has limitations due to convenient sampling.

Breastfeeding practices. The vast majority of mothers (70%) initiated breastfeeding within the first 24 hours after childbirth, which is consistent with findings from related studies where at least 78% of Saudi Arabian mothers initiated breastfeeding (Amin et al., 2011; El Mouzan et al., 2009; Shawky & Abalkhail, 2003). A recent study revealed that all Saudi Arabian mothers included in the survey ($N = 517$) had no concerns about initiation of breastfeeding after delivery (Alshebly & Sobaih, 2016). The high initiation rate among Saudi Arabian mothers indicated their willingness to breastfeed their infants.

In the current study, the proportions of mothers who exclusively or partially breastfed their infants for the first six months of infant age were 27.5% and 30.0%, respectively. The reported rates of exclusive breastfeeding at six months of infant's age in the KSA ranged widely from 0.8% to 37.5%, which was likely due to the lack of a standardized definition for "exclusive" breastfeeding practice (Al-Jassir et al., 2004; Al-Jassir et al., 2006; Alshebly & Sobaih, 2016; El-Gilany et al., 2011). The proportion of partial breastfeeding in the current study was lower than the reported range of partial breastfeeding (42–76%) in national surveys (Al-Jassir et al., 2006; Murshid, 2006), which may be related to the use of different sample populations including non-Saudi and multiparous mothers.

The largest proportion of the mothers in this study (72.5%) introduced formula, liquids, or solids to infants as nutritional supplements during the first six months after childbirth. Consistent with literature in the KSA (Al-Hreashy et al., 2008; Al-Jassir et al., 2006; Alshebly & Sobaih, 2016; El Mouzan et al., 2009), as well as in other developed countries (Gatti, 2008), this study provides further support of the "insufficient breast milk" as the most important reason for discontinuing breastfeeding or supplementing with formula prior to the recommended six months. Other reported reasons in this study were returning to work, introduction of formula in the first day of life, and illness of the baby or mother. About half of mothers in two studies (N = 728) conducted in Jeddah consistently identified "insufficient breast milk" as the main reason for breastfeeding cessation (Eldeek et al., 2012; Fida & Al-Aama, 2003). Nevertheless, a recent study with 123 first-time Canadian mothers revealed no significant association between the perception of "insufficient milk supply" and actual insufficient milk production as measured by infant weight before and after each breastfeed (Galipeau, Dumas, & Lepage, 2017).

There is a lack of evidence that supports any relationship between the perception of insufficient milk and the presence of physiologic or physical issues that could interfere with breastfeeding (Neifert, 2001). The explanation of "insufficient breast milk" as a predominant reason for early breastfeeding discontinuation can be explained by less breast stimulation when formula is being introduced to calm a crying or uncooperative baby (Wasser et al., 2011), which in turns leads to a substantial decrease in milk supply (Al Juaid et al., 2014).

Another reason that may lead to the perception of "insufficient breast milk" is related to mother's interpretations of her infant cues. Mothers who have less breastfeeding experience and knowledge may interpret normal infant signals such as infant crying and infant hunger cues as meaning they have insufficient breast milk (Al-Hreashy et al., 2008). Moreover, infant preference for unilateral breastfeeding is another documented issue among Saudi Arabian mothers that could result in decreased milk supply (Al-Abdi, Al Omran, Al-Aamri, Al Nasser, & Al Omran, 2015). Thus, healthcare professionals should assess the issue of "insufficient breast milk", and emphasize the importance of frequent breastfeeding to maintain the "breast milk supply".

Despite the non-significant associations between the perception of "insufficient breast milk" and the three selected psychosocial variables, studies from other developed countries identified a significant negative relationship between the perception of insufficient milk and breastfeeding self-efficacy (McCarter-Spaulding & Kearney, 2001; Otsuka et al., 2008). In this study, the variable of "insufficient breast milk" was one of the reasons of breastfeeding cessation or formula supplementation, and it was accessible only to mothers who stopped breastfeeding or partially breastfed their infants. The absence of the significant associations among the reported

"insufficient breast milk" and other selected demographic and psychosocial variables may have resulted from the homogeneity of participants who answered this question.

The practice of distributing free formula after childbirth in some hospitals may have a major influence on breastfeeding practices. Two-thirds of mothers in this study did receive free formula for their infants from a hospital, clinic, or other agency. The practice of providing formula for mothers, who are capable of breastfeeding their infants, could encourage the use of bottle feeding as a recommended and complete infant nutrition. In this study, a group of mothers (n = 16, 14%) reported that the introduction of formula in the first day of life was a reason for formula supplementation or early breastfeeding cessation. Similarly, approximately one-third of women in Jeddah reported that the availability and the use of free formula after childbirth was a barrier to breastfeeding (Mosalli et al., 2012). In addition, a qualitative study with six focus groups (N =43) of American women reported that the availability of the free formula negatively influenced their decision to breastfeed (Dunn, Kalich, Henning, & Fedrizzi, 2015). Therefore, these findings necessitate the critical need for avoiding the provision of free milk formulas for mothers after childbirth, and advocating for policy change.

The current practice in the majority of hospitals in the KSA is to care for healthy full-term infants in the newborn nurseries and routinely supplement with formula (Albokhary & James, 2014). This practice impedes the ability of mothers to practice breastfeeding on demand and build their breastfeeding confidence. In fact, research shows that almost all mothers are physiologically capable and ready to breastfeed their infants after childbirth (Wambach & Riordan, 2014). Therefore, it is important to promote breastfeeding after childbirth through rooming-in practice, and provide support and resources that enable breastfeeding Saudi Arabian mothers to continue breastfeeding on demand.

Demographic characteristics associated with breastfeeding practices. A non-significant association emerged between maternal age and the categories of breastfeeding practice. In contrast, the vast majority of studies conducted in the KSA revealed that older maternal age significantly aligned with longer duration of breastfeeding compared to younger mothers (Al-Jassir et al., 2006; Al-Madani et al., 2010; Alzaheb, 2016a; Amin et al., 2011). In addition, multiparous mothers were more likely to breastfeed for longer duration that primiparous mothers (Al Juaid et al., 2014). The homogeneity of the study sample, which included only primiparous mothers aged from 20-38 years, may explain the absence of significant associations between maternal age and the categories of breastfeeding practice in the current study.

The current study revealed a non-significant association between marital status and the categories of breastfeeding practice. Almost all mothers in the present study were married, which contributes to the non-significant findings between marital status and breastfeeding practice. There is a lack of literature about the association between marital status and breastfeeding practice in the KSA. However, a national survey revealed that married Saudi Arabian mothers were more likely to breastfeed their infants than widowed or divorced mothers (Murshid, 2006).

Previous studies focused on examining the association between the type of childbirth and breastfeeding initiation. Findings from previous studies revealed a negative association between breastfeeding initiation and cesarean section compared to vaginal delivery among Saudi Arabian mothers (Albokhary & James, 2014; Alzaheb, 2016b). In the current study, the type of childbirth was not significantly associated with the categories of breastfeeding practice. This finding is consistent with another study in the KSA that examined associations between type of childbirth and breastfeeding practice at six months postpartum, and found non-significant associations

between such variables (Al-Hreashy et al., 2008). The majority of mothers in this study (n = 133, 83.1%) had a vaginal delivery. The lack of variability in the type of childbirth in this sample may further explain the non-significant finding between the type of childbirth and breastfeeding practice.

The current study revealed a significant association between employment status and categories of breastfeeding practice. Furthermore, non-working mothers had significantly lower levels of perceived stress and higher level of breastfeeding self-efficacy than working mothers. The majority of first-time mothers who exclusively breastfed throughout the first six months were not working outside the home; in contrast, the vast majority of mothers who ceased breastfeeding prior to the recommended six months had returned to full time work. Consistently, other studies in the KSA also found that employed mothers tended to breastfeed less frequently and for a shorter duration than mothers who were not employed (Alzaheb, 2016a; Amin et al., 2011; El-Gilany et al., 2011). Thus, working Saudi Arabian mothers develop lower breastfeeding self-efficacy with infrequent breastfeeding than non-working mothers. Al-Binali (2012) found that work-related problems were the main reasons for stopping breastfeeding among 384 employed school teachers. Work-related responsibilities and problems could also explain the significant association between perceived stress and working status among first-time Saudi Arabian mothers. Although employed Saudi mothers are a minority in the KSA (10.1%; General Authority for Statistics, 2016), this finding suggests a critical need to support employed mothers with resources needed for continuing breastfeeding.

The current available policy allows for a total of one hour break time each day for breastfeeding mother to breastfeed her infant for the first year after birth. However, this policy is not valid for part-time mothers, and it has not been applied in all of workplaces. Therefore,

policymakers and employers should work to formulate and initiate breastfeeding policies that support breastfeeding in workplaces.

Maternal employment status was also positively associated with household income. Thus, a significant association emerged between household income and categories of breastfeeding practice. More than half of the mothers who exclusively breastfed their infants throughout the first six months had low to medium household incomes, whereas the majority of those who stopped breastfeeding had medium to high household incomes. These findings may indicate that formula feeding is more affordable and desirable for higher-income Saudi Arabian mothers, and emphasizes the need for including high-income families in breastfeeding promotion programs. Consistent with these findings, other studies revealed that exclusive breastfeeding was more prevalent among low-income Saudi Arabian mothers (al-Ayed & Qureshi, 1998; Alshebly & Sobaih, 2016; Amin et al., 2011). In contrast, according to the CDC (2012), low-income mothers in the USA had significantly lower rates of breastfeeding compared with high-income mothers. These variations in the associations between household incomes and breastfeeding practices can be explained in part by the resources available for low-income mothers. Low-income mothers in the USA can receive milk formula through community nutrition programs; however, no such programs are available for low-income mothers in the KSA.

There was a significant negative association between maternal education levels and breastfeeding practice. The greater proportion of mothers who exclusively or partially breastfed had a high school diploma, whereas more than half of mothers who discontinued breastfeeding had at least a bachelor's degree. These findings indicated that well-educated first-time Saudi Arabian mothers tend to discontinue breastfeeding and supplement with formula. The vast majority of studies conducted in the KSA consistently revealed negative associations between

maternal education levels and breastfeeding exclusivity and duration (Al-Jassir et al., 2004; Amin et al., 2011; El-Gilany et al., 2011; Mosalli et al., 2012; Murshid, 2006). In contrast, studies from Western countries revealed that mothers with a higher educational level were more likely to breastfeed than mothers with a lower educational level (Dennis, 2006; McQueen et al., 2015). This inconsistency may be attributed to the influence of social norms. For instance, Saudi Arabian mothers may avoid breastfeeding and introduce bottle feeding as a sign of modernization (WBTi, 2012). This emphasizes the need for tailored breastfeeding promotion programs for well-educated first-time Saudi Arabian mothers.

Maternal educational level was also significantly associated with the maternal employment status. Thus, another possible reason for the significant negative associations between breastfeeding practice and maternal educational levels is that mothers with a higher educational level tend to be employed in a workplace that may not have a supportive breastfeeding policy, which could be a reason for early breastfeeding cessation. In contrast, less educated mothers are more likely to be housewives and not work outside the house; thus, practice longer breastfeeding than those who work outside the home.

Study Strengths

As mentioned previously, this was the first study to address the associations among breastfeeding practice and the psychosocial factors of perceived stress, social support, and breastfeeding self-efficacy among first-time Saudi Arabian mothers. Thus, the findings highlighted the pattern of breastfeeding practice in the KSA in relation to maternal psychosocial factors. Moreover, the two scales of Social Provision and Breastfeeding Self-Efficacy were translated and validated into Arabic, and the pertinent excellent psychometric properties were reported in this study. The information on the Arabic versions of the scales will be helpful for future research among Arab population.

The study's conceptual framework filled two major gaps in the applications of the conceptual framework in the literature. First, the study's conceptual framework assessed the selected psychosocial factors as primary exposures; hence, it addressed the lack of literature concerning associations among study variables with breastfeeding practice as an outcome. Second, while existing literature focused on breastfeeding practice during the early postpartum period, the propositions in the conceptual framework were examined at six to 12 months postpartum with a sample of first-time mothers who initiated breastfeeding.

The rigor of the data collection procedures adds strength to the study findings. The data were collected from four geographically-different PCCs, which allowed the study sample to be more representative. The data collection procedure was standardized among the PCCs based on the data collection protocol. Moreover, there were almost no missing data in the surveys due to the use of electronic reminder strategy in Qualtrics.

Given that the study hypotheses were supported, the conceptual framework provided insight and foundation for future research. This study provided important information on the strengths and directions of the associations among the selected psychosocial variables and breastfeeding practice. This information along with the study's conceptual framework can be used in future prospective research to provide in-depth examination of the associations among the study variables, and draw inferences about causality to determine which factors influence the other.

Very few studies have controlled for the past breastfeeding experience in the examination of the association between breastfeeding self-efficacy and breastfeeding practice with controlling for past experience or parity. Past breastfeeding experience can substantially influence breastfeeding self-efficacy. It has been shown that multiparous mothers had a higher mean score

of breastfeeding self-efficacy than first-time mothers (Blyth et al., 2002; McCarter-Spaulding & Dennis, 2010). However, the sample in this study was limited to first-time mothers who initiated breastfeeding, which added strength to the findings.

Study Limitations

The following limitations should be considered when interpreting the study's findings. This was a cross-sectional, correlational study that examined the associations among the study variables. Therefore, causal inference cannot be assumed, based on the study findings. Additional limitations in this study relate to limited variability in the study sample. Participants in the current study comprised a non-random convenience sample confined to the city of Jeddah, making it difficult to compare proportions of breastfeeding duration and exclusivity with findings from national surveys. In addition, the sample was limited to first-time mothers of Saudi Arabian nationality who initiated breastfeeding after childbirth. These sample characteristics limited the generalizability of the findings to all populations in the KSA. Thus, the proportions of exclusive and partial breastfeeding in the current study did not necessarily represent the exclusive and partial breastfeeding rates in the KSA.

In this study, information on the major study variables and breastfeeding practices were obtained based on a retrospective self-report surveys at six to twelve months postpartum; thus, recall bias may exist. Recall bias is a major threat to the reliability of findings in studies with cross-sectional correlational designs. However, several studies revealed that the collected information regarding the practice of breastfeeding is valid and reliable particularly if collected within one to 20 years after childbirth. Launer and colleagues (1992) conducted a retrospective study with Bedouin Arab women ($N = 318$) to examine the accuracy of maternal recall of infant feeding events and the time of breastfeeding cessation. The researchers of this retrospective study interviewed women at 12 and 18 months after birth to inquire about their breastfeeding

practices and compared the responses to the standard data collected at six months postpartum (Launer et al., 1992). Launer and colleagues (1992) confirmed that the retrospective maternal recall on infant feeding was accurate and could be used with confidence. Likewise, two additional studies supported these findings and revealed that breastfeeding duration was accurately recalled at three years (Li, Scanlon, & Serdula, 2005), and up to 20 years after mothers gave birth (Natland, Andersen, Nilsen, Forsmo, & Jacobsen, 2012). Overall, breastfeeding practice is a unique experience for first-time mothers that can be easily recalled.

Finally, the scales used to measure the psychosocial factors of social support, perceived stress, and breastfeeding self-efficacy have some limitations. The total of the three scale scores were used in the analysis with no cut-off points; thus, it was not possible to distinguish between mothers at different levels of social support, stress, or breastfeeding self-efficacy. Furthermore, the three scales were used to measure the pertinent variables retrospectively at six to 12 months postpartum in relation to breastfeeding practice, making it hard to predict breastfeeding behavior that might be discontinued before six months postpartum. To minimize the risk of recall bias, the questionnaires included the phrase, "*When you breastfeed/breastfed*" multiple times in each scale.

Implications and Recommendations for Future Nursing Research

Findings from this study lay the foundation for future nursing research by identifying the theory-based factors that are associated with breastfeeding. Findings from this cross-sectional, correlational study suggest that perceived stress, social support, and breastfeeding self-efficacy are strongly associated with breastfeeding practices. The conceptual framework of this study can be applied to guide future intervention studies. Future research can build on these findings by developing effective breastfeeding interventions that incorporate these psychosocial variables.

Breastfeeding-promoting programs should target mothers at high risk for early breastfeeding cessation, especially well-educated and full-time employed Saudi Arabian mothers. Given that grandmothers were identified as the most important source of support, researchers should include them in the intervention program in the KSA.

It is recommended to replicate this study with a more diverse and larger sample. Future studies may include national representative samples from various geographic regions in the KSA. It would be also interesting to compare findings from this study to a study with a sample of non-Saudi mothers who live in the KSA. In addition, researchers could expand this study by including multiparous mothers.

The associations between selected psychosocial factors and breastfeeding practice are complex. It has not been established whether maternal perceived stress and breastfeeding self-efficacy are a response or a result of breastfeeding practice. Understanding such associations is important to refine the current theoretical frameworks. In addition, breastfeeding self-efficacy progresses over time as a woman engages in breastfeeding her infant. Therefore, more longitudinal studies that assess the pattern of breastfeeding self-efficacy over the postpartum period are warranted.

Moreover, randomized controlled trials are needed to assess the feasibility of breastfeeding intervention based on the three identified psychosocial factors. Future research should expand the study findings by including other theory-based factors that may influence breastfeeding practice such as breastfeeding knowledge and past experience. Although the role of the father in supporting breastfeeding practice is important, it has not been fully understood with Saudi Arabian population. Thus, future research may engage fathers to assess the influence of paternal support during breastfeeding practice.

Implications and Recommendations for Nursing Practice

Findings from this study generate several implications and recommendations for nursing practice. In this study, mothers with lower perceived stress, higher social support, and higher breastfeeding self-efficacy were more likely to continue breastfeeding until at least six months postpartum. Breastfeeding has well-documented health benefits for infants and mothers (Victora et al., 2016); however, mothers often face psychosocial issues that could prevent them from breastfeeding. This section provides a discussion of the nursing implications based on the major study findings that can be used by nurses, physicians, lactation consultants, and other healthcare professionals.

Mothers in the postpartum period, particularly first-time mothers, are vulnerable to stressors. Uncontrollable stress during the postpartum period can significantly negatively impact breastfeeding practice (Doulouger et al., 2013), and it could lead to postpartum depression (Brown et al., 2016). Therefore, it is important for healthcare providers, including nurses, to assess perceived maternal stress after childbirth by using objective or subjective measures, such as the Perceived Stress Scale (Cohen et al., 1983). Early intervention and management of stress during the early postpartum period are necessary to improve breastfeeding practice in the KSA.

Given the significant positive association in this study between social support and breastfeeding practice, the assessment for social support among breastfeeding mothers is an important strategy to incorporate into postnatal care in the KSA. Supporting mothers' breastfeeding practice plays an important role in improving the long-term health outcomes of mothers and infants. The nurse or lactation consultant can arrange group meetings or peer-support programs where new mothers can meet and share their concerns about breastfeeding with experienced mothers. In addition, the majority of working mothers in this sample discontinued breastfeeding prior to the recommended six months. Therefore, multi-disciplinary

efforts should be taken by employers to support breastfeeding mothers by creating programs in the workplace to promote breastfeeding duration and exclusivity in the KSA.

Clinicians should work to empower Saudi Arabian mothers with reliable evidence-based breastfeeding resources to promote the practice of breastfeeding. Furthermore, the role of nurses is vital in facilitating and coordinating support for family members after childbirth. Nurses can also offer different types of support in hospital and clinical settings. For example, nurses can provide emotional support through praising, encouraging, and reassuring breastfeeding mothers (McFadden et al., 2017). Moreover, nurses can provide educational support by providing information on breastfeeding practice, storage, and advantages.

Findings from this study identified breastfeeding-self-efficacy as the most significant correlate in breastfeeding practice. The confidence in the maintenance of exclusive breastfeeding can significantly impact the duration of exclusive breastfeeding (de Jager et al., 2015). However, the maintenance of breast milk supply depends on the frequency of breastfeeding not on the duration (Neville & Morton, 2001). Therefore, it is important to encourage the mothers to breastfeed their infants more often after childbirth to maintain their breast milk supply. Furthermore, information on breast milk storage should be provided. Clinicians should reinforce the practice of breastfeeding through re-assuring breastfeeding mothers that their infants maintain proper weight gains.

Health professionals need to assess breastfeeding self-efficacy after childbirth to identify mothers at high risk for breastfeeding cessation in the KSA. The short form of the Breastfeeding Self-Efficacy Scale is applicable to use in the clinical practices (Dennis, 2003), and it can be used as a diagnostic tool for mothers with low confidence. Moreover, items with low scores can be used to identify the areas of weakness as well as guide interventions (Dennis & Faux, 1999).

Healthcare professionals need to be aware of self-efficacy-enhancing strategies that can be used in clinical settings to improve maternal confidence in breastfeeding practice, such as providing workbooks, performing self-efficacy-enhancing meetings, helping mothers to ensure good infant latching, and providing positive reinforcement.

Nurses need to address the complaints of insufficient breast milk among breastfeeding Saudi Arabian mothers early to avoid breastfeeding discontinuation. Furthermore, it is important to identify whether the perception of insufficient breast milk relates to a psychological or a physiological issue (Lewis, 2009). It is also important for nurses to objectively assess insufficient breast milk to refute or confirm this issue. Nurses can use objective measures to measure the amount of breast milk, such as the breastfeeding meter.

Implications and Recommendations for Policy

Information gained from this study can be used by healthcare professionals to adopt the WHO breastfeeding recommendations. All previously mentioned implications need to be reinforced through policies and procedures in the clinical settings. Policies and strategies that support and promote breastfeeding should be developed with a multidisciplinary team, including social workers, physicians, nurses, and lactation consultants. The psychosocial factors are important components to be considered in developing breastfeeding supporting policy. The findings from this study can be integrated into practice by mandating the assessment of selected psychosocial factors during the prenatal and postnatal care.

Hospital practices during early mother–infant interactions could have a significant negative influence on a mother's breastfeeding confidence. For example, providing supplemental infant formula for mothers who are capable of practicing breastfeeding often discourages the practice of breastfeeding and negatively impacts early infant-mother attachment. In addition, the practice of separating the infants from their mothers in different rooms after birth is common in

the KSA (Albokhary & James, 2014), which may contribute to the low rate of breastfeeding. The practice of rooming-in enables mothers to practice breastfeeding on demand, receive support from the clinicians on overcoming breastfeeding issues, and build their confidence before discharge from the hospital. Thus, a policy that supports the practice of rooming-in where infant and mothers remain together in the same room after birth is warranted to improve breastfeeding practice in the KSA.

Every hospital in the KSA needs to activate the Baby-Friendly Hospital Initiative (BFHI). The BFHI includes *Ten Steps to Successful Breastfeeding* that aim to improve breastfeeding initiation, exclusivity and duration. Moreover, healthcare settings in the KSA should provide anticipatory guidance for all mothers during prenatal visits to promote breastfeeding, during postnatal visits to reinforce maternal confidence in breastfeeding practice, and during regular infant well-visits to ensure that infants are receiving enough nutrition through breastfeeding.

Conclusion

This study's findings add to the body of knowledge about the factors associated with breastfeeding exclusivity and duration among first-time Saudi Arabian mothers who initiated breastfeeding and who had infants six to 12 months of age. This study was guided by the conceptual framework of breastfeeding self-efficacy (Dennis, 1999). The associations among selected psychosocial variables and breastfeeding practice aligned with the study's theoretical framework. Moreover, the findings were congruent with previous research relevant to the associations between breastfeeding practice and maternal stress (Dimitraki et al., 2016; Doulouger et al., 2013; Zhu et al., 2013), social support (Britton et al., 2007; Hannula et al., 2008; Jarlenski et al., 2014; McFadden et al., 2017), and breastfeeding self-efficacy (Babakazo et al., 2015; Bailey et al., 2008; de Jager et al., 2015; Loke & Chan, 2013; Semenic et al., 2008).

The correlations among selected psychosocial variables were significant, indicating that these variables interplay and overlap in the underlying constructs. However, the tests of the overall statistical models in this study revealed that the breastfeeding self-efficacy is the most significant variable associated with breastfeeding practice. Secondary findings revealed that breastfeeding practices were significantly more prevalent among mothers who were not working outside the home, with a low-income and low level of education. These findings can be used as a foundation for further inquiry that aims to improve breastfeeding practice within the KSA population.

Despite mentioned limitations, this study provides numerous implications to nursing research, practice, and policy. Clinicians can incorporate the assessment of psychosocial factors into practice during prenatal and postnatal care. Hence, clinicians can identify mothers at risk for early cessation of breastfeeding based on their psychosocial characteristics. Moreover, healthcare providers can intervene early to encourage and support breastfeeding by addressing stressful events, creating support groups, providing anticipatory guidance, and reinforcing maternal confidence. It is imperative to disseminate study findings to the Ministry of Health in the KSA to facilitate the collaboration of multidisciplinary teams. Future researchers can use the findings from this study to identify target populations, and to develop effective breastfeeding interventions.

APPENDICES

APPENDIX A: Permission to use the Figure of Self-efficacy Framework from Published Article.

RE: Permission request to use a figure

permissions (US) <permissions@sagepub.com>

Fri 6/2/2017 1:22 AM

To:salmah Alghamdi <salmeeno@hotmail.com>;

Hello Salmah,

Thank you for your request. You can consider this email as permission to use the material as detailed below in your upcoming thesis/dissertation. Please note that this permission does not cover any 3rd party material that may be found within the work and you must provide proper credit to the original SAGE publication. Please contact us for any further usage of the material.

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Rights Coordinator
SAGE Publications Inc.
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From: salmah Alghamdi [mailto:salmeeno@hotmail.com]
Sent: Wednesday, May 31, 2017 2:38 PM
To: permissions (US) <permissions@sagepub.com>
Subject: Permission request to use a figure

Dear Editors in the Journal of Human Lactation,

I am a PhD Candidate from Michigan State University, USA. I am sending this email to request you permission to use a figure from published article in my dissertation. This figure is (Figure 1. Self-efficacy framework) that is in: Dennis, C. (1999). Theoretical underpinnings of breastfeeding confidence: A self-efficacy framework. *Journal of Human Lactation*, 15(3), 195-201.

Thank you
Salmah Alghamdi
PhD Candidate

APPENDIX B: Institutional Review Board (IRB) Approval from Michigan State University

MICHIGAN STATE UNIVERSITY

Initial IRB Application Determination *Exempt*

August 24, 2016

To: Mildred Horodynski
1355 Bogue Street
MSU
C244-Bott Nursing Education and Research building

Re: **IRB# x16-1028e** Category: EXEMPT 2
Approval Date: August 18, 2016

Title: Factors Associated with Breastfeeding Practice among Saudi Arabian Mothers (CGA#147849)

The Institutional Review Board has completed their review of your project. I am pleased to advise you that **your project has been deemed as exempt** in accordance with federal regulations.

The IRB has found that your research project meets the criteria for exempt status and the criteria for the protection of human subjects in exempt research. **Under our exempt policy the Principal Investigator assumes the responsibilities for the protection of human subjects** in this project as outlined in the assurance letter and exempt educational material. The IRB office has received your signed assurance for exempt research. A copy of this signed agreement is appended for your information and records.

Renewals: Exempt protocols do not need to be renewed. If the project is completed, please submit an ***Application for Permanent Closure***.

Revisions: Exempt protocols do not require revisions. However, if changes are made to a protocol that may no longer meet the exempt criteria, a new initial application will be required.

Problems: If issues should arise during the conduct of the research, such as unanticipated problems, adverse events, or any problem that may increase the risk to the human subjects and change the category of review, notify the IRB office promptly. Any complaints from participants regarding the risk and benefits of the project must be reported to the IRB.

Follow-up: If your exempt project is not completed and closed after three years, the IRB office will contact you regarding the status of the project and to verify that no changes have occurred that may affect exempt status.

Please use the IRB number listed above on any forms submitted which relate to this project, or on any correspondence with the IRB office.

Good luck in your research. If we can be of further assistance, please contact us at 517-355-2180 or via email at IRB@msu.edu. Thank you for your cooperation.

Sincerely,

Ashir Kumar, M.D.
BIRB Chair

c: Salmah Alghamdi, Jiying Ling

Office of Regulatory Affairs
Human Research Protection Programs

Biomedical & Health Institutional Review Board (BIRB)

Community Research Institutional Review Board (CRIRB)

Social Science Behavioral/Education Institutional Review Board (SIRB)

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APPENDIX C: Institutional Review Board (IRB) Approval from the Ministry of Health in Saudi Arabia

Kingdom of Saudi Arabia
Ministry of Health
King Fahad Medical City
(162)

وزارة الصحة
مدينة الملك فهد الطبية
King Fahad Medical City

المملكة العربية السعودية
وزارة الصحة
مدينة الملك فهد الطبية
(١٦٢)

IRB Registration Number with KACST, KSA: H-01-R-012
IRB Registration Number with OHRP/NIH, USA: IRB00008644
Approval Number Federal Wide Assurance NIH, USA: FWA00018774

February 29, 2016
IRB Log Number: 16-080E
Department: External
Category of Approval: EXEMPT

Dear Salmah Alghamdi,

I am pleased to inform you that your submission dated February 25, 2016 for the study titled '**Factors Associated with Breastfeeding Practice among Saudi Arabian Mothers with Six-Month-Old Infants**' was reviewed and was approved. Please note that this approval is from the research ethics perspective only. You will still need to get permission from the head of department or unit in KFMC or an external institution to commence data collection.

We wish you well as you proceed with the study and request you to keep the IRB informed of the progress on a regular basis, using the IRB log number shown above.

Please be advised that regulations require that you submit a progress report on your research every 6 months. You are also required to submit any manuscript resulting from this research for approval by IRB before submission to journals for publication.

As a researcher you are required to have current and valid certification on protection human research subjects that can be obtained by taking a short online course at the US NIH site or the Saudi NCBE site followed by a multiple choice test. Please submit your current and valid certificate for our records. Failure to submit this certificate shall a reason for suspension of your research project.

If you have any further questions feel free to contact me.

Sincerely yours,

F M
Approved
29 FEB 2016
I R B

Prof. Omar H. Kasule
Chairman Institutional Review Board--IRB.
King Fahad Medical City, Riyadh, KSA.
Tel: + 966 1 288 9999 Ext. 26913
E-mail: okasule@kfmc.med.sa

APPENDIX D: Protocol and Screening Questionnaire for Recruitment and Enrollment of Participants

Title of the study: Factors Associated with Breastfeeding Practice among Saudi Arabian Mothers.

Direction: The goal of this script is to provide data collectors with language to assist in recruiting mothers. Please follow the following steps as you attempt to recruit and enroll mothers with infants between 6 and 12 months of age.

Step1: Recruit potential participants by approaching them and saying: *Hi, (Mom). I would like to talk with you about participating in a research project with a doctoral student from Michigan State University, USA. Participating in this research will help researchers improve the practice of breastfeeding in Saudi Arabia. Participation is easy. If you choose to participate, you would complete either an online or paper survey. After completion of the questionnaire, you will receive a cash incentive in amount of (40 S.R.).Are you interested?*

If the participant answers**: Yes**: great, continue to step 2

If the participant answers: **No**: Stop and thank them.

Step2: *Now I need to ask you a few questions before we go any further.*

Assess eligibility of potential participant to participate in the study by asking the following questions. If the participant answers" **NO"** to any of the statements below, **THANK THEM & STOP**. If the participant answered "YES" to ALL of the above question, she meets the eligibility criteria. Continue to **Step 3**.

SCREENING QUESTIONS	YES	NO
Q1: Do you read and speak Arabic?		
Q2: Are you the mother of your baby?		
Q3: Is this your first child?		
Q4: Are you 18 years old or over?		
Q5: Is your baby's age between 6 to 12 months old?		
Q6: Was your infant born full term (delivered any time after 37 weeks)?		
Q7: Have you ever breastfed at any point of time after birth?		
Q8: Is your infant healthy with no major feeding problems or medical diagnoses that may interfere with breastfeeding?[1]		

Additional question for tracking purpose:

Throughout the first six months after birth, how you describe your breastfeeding practice:

- o Only **breastfeeding (breastmilk) with <u>no additional</u>** supplement (e.g., water, formula, juices) up until your infant was 6 months old.
- o **Continued breastfeeding up until your infant 6 months old, but also sometimes fed infant** formula
- o Breastfed, but stopped prior to 6 months.

[1]If you are unsure whether a feeding problem counts as "major" please contact Salmah Alghamdi at (0500088372 or algham25@msu.edu).

Step 3: Have participant sign the "Consent Form". The participant is now enrolled. Provide the participant with a copy of the consent form.

Step 4: Have participant complete the paper questionnaire **OR** online questionnaire on Qualtrics using the iPad. If the participant asks a question for clarification of a word in the survey, you may answer.

Step 5: Once the questionnaire is completed, give the participants a Thank You card with the total cash incentive of (40 S.R.).

Step 6: Have participant sign the receipt for receiving the cash incentive.

Step 7: Staple or paperclip the consent form, incentive receipt and survey (if taken hardcopy) and place in the lock-drop box.

APPENDIX E: English and Arabic Consent Form

Title of Research Project: Factors Associated with Breastfeeding Practice among Saudi Arabian Mothers.

Name of the Researchers: Salmah Alghamdi, PhD student, RN.

Purpose of the Research: The purpose of the study is to examine factors that may influence breastfeeding practices among first time mothers. As part of this research, you will be asked to read and complete the surveys. Your suggestions and feedback from this study may help researchers improve the practice of breastfeeding in Jeddah, Saudi Arabia.

Description of Project: A sample of 160 mother-infant dyads will be recruited from immunization clinics, well-child clinics, and physicians' offices at four public primary care centers (PCCs) in Jeddah, Saudi Arabia. Eligible mothers will be asked to fill out a survey about their breastfeeding practice. It will take approximately 15–17 minutes for you to complete the questionnaire.

You are able to participate in this study only if you have met all the following:

(1) Your age between18 years and 45 years

(2) You can read, understand and speak Arabic.

(3) You are first time mother

(4) Your infant was born full term (delivered any time after 37 weeks)

(5) Your infant's age is 6 -12 months.

(6) You have started breastfeeding at any point in time after birth.

(7) You and your infant are healthy with no diagnosed medical conditions.

What you will do: You will be given the surveys that are related to breastfeeding and asked to complete them.

Costs to Participants: There is no cost to participate in this study.

Compensation: After the completion of questionnaire, you will receive a total cash of 40 Saudi Arabia Riyals SAR (about $10.67) .

Potential Benefits: You may not benefit directly as a result of taking part in this study, however, your answers may contribute to the understanding of low rates of breastfeeding in Saudi Arabia.

Potential Risks: We do not anticipate any risks to you for participating in this survey. No medical tests or procedures will be performed. Participants could become stressed when trying to recall information.

Privacy and Confidentiality: The mothers' identities will not be evident in any reports, presentations, or publications. Codes will be used to label study records rather than names. The data collected for this study will be protected and kept confidential in a secure location and password protected computer at MSU for a minimum of three years. Only the appointed researchers and the MSU Human Research Protection Program (HRPP) will have access to the data.

Participation is Voluntary: Participation in this survey study is entirely voluntary. Mothers can stop any time with no penalty. You may choose not to answer some questions. Deciding to stop participating in the study after saying yes will not affect any relationship or interfere with any services, or benefits you or your infant are currently receiving.

Conflicts of Interest: No person with this study has any financial interest or other opportunity for personal benefit related to the conduct of this study.

Contact Information: If you have any concerns or questions about this study, such as scientific issues, how to do any part of it please contact the researcher Salmah Alghamdi, Jeddah Saudi Arabia (0500088372), MSU College of Nursing, Bott Building (313-529-1562); email: (algham25@msu.edu) at any time.

If you have questions or concerns about your roles and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 408 West Circle Drive, Olds Hall Room 207, MSU, East Lansing, MI 48824.

DOCUMENTATION OF INFORMED CONSENT:

Your signature below means that you voluntarily agree to participate in this research study.

Signature _____

Date _____

You will be given a copy of this form to keep

Arabic consent form

استمارة موافقة مشارك

عنوان مشروح البحث العوامل المتعلقة بالرضاعة الطبيعية بين الامهات السعوديات

اسم الباحثة: سالمة الغامدي، طالبة دكتوراه، قسم تمريض , تخصص أطفال

الغرض من البحث: الغرض من هذه البحث هو دراسة العلاقة بين العوامل الاجتماعية والنفسيه مثل التوتر والدعم الاجتماعي والكفاءة الذاتية وبين الرضاعة الطبيعية في عينة من الامهات السعوديات لمن لديهن مواليد رضع في عمر ستة شهور

وصف المشروع: جمع معلومات عن الرضاعة الطبيعية والعاوامل التي قد تؤثر عليها بواسطة استبيان عن الرضاعة الطبيعية من عينة تتكون من 160 من الامهات المراجعين لعيادة الاطفال الاصحاءمن المراكز الصحية في جدة المملكة العربية السعودية. ملء الاستبيان سوف يستغرق من 15_17 دقيقة تقريبا.

تستطيع الام المشاركة في هذا المشروع البحثي إذا:

(1) اذالاكان عمرك مابين 18 الى 45

(2) اذاكنتي تستطيعين قراءة العربية، وفهمها، والتحدث بها.

(3) اذا كنت ام للمرة الاولى

(4) اذا كان الرضيع ليس خديج (اكمل 37 اسبوع عند الولادة)

(5) عمر الرضيع مابين ستة اشهر الى 12شهرا

(6) قد سبق للام الرضاعة الطبيعية

(7) ليس لدى اي من الام او الرضيع اي مشاكل صحية

ما هو دورك في هذه المشروع البحثي ؟ سنقوم بإعطاءك الاستبيان وسيطلب منك ملء وتكملة هذه الاستبيانات.

التكاليف التي تتكبدها المشاركات: لا تتكبد المشاركة أي تكلفة للمشاركة في هذه الدراسة.

المكافأة: سوف تحصلين على 40 ريال سعودي بعد الانتهاء من تعبئة الاستبيان.

المنافع المحتملة: قد لا تحصل الام انتفاعا مباشرا نتيجة لمشاركتها في هذه الدراسة، ولكن اجوبتها قد تفيد الاخرين وتساعدهم في تصميم الدراسات المستقبلية في المملكة العربية السعودية.

المخاطر المحتملة: تعد المخاطر المحتملة من هذه الدراسة مخاطر طفيفة. لن يتم اجراء أي اختبارات او إجراءات طبية.

الخصوصية والسرية: لن يتم اظهار هوية المشاركات عند كتابة أي تقارير، او عمل أي عروض، او عند النشر. سيتم استخدام رموز لتصنيف سجلات الدراسة بدلا من استخدام الأسماء. سيتم حفظ وحماية البيانات المجمعة من هذه الدراسة في سرية تامة في مكان آمن في جامعة ولاية ميتشغان لمدة ثلاثة سنوات على الأقل. يسمح فقط للباحثين المعنيين وبرنامج حماية الموارد البشرية بجامعة ولاية ميتشغان بالدخول على هذه البيانات والاطلاع عليها.

المشاركة تطوعية: تعد مشاركتك مشاركة تطوعية تماما. فيمكنك التوقف في أي وقت دون وقوع أي جزاء عليها. ويمكنك ان تمتنعين عن إجابة بعض الأسئلة. لن يؤثر قرارك في التوقف عن المشاركة بالدراسة بعد ان وافقتي على المشاركة بها على أي من الخدمات التي تحصلين عليها من هذا المركز. فرفض المشاركة لا يتضمن توقيع أي إجراءات جزائية.

اختلاف المصالح: لا يطمح أي شخص يقوم على هذه الدراسة في الحصول على أي مصلحة مالية او الحصول على أي فرص أخرى للمصلحة الشخصية تتعلق بإجراء هذه الدراسة.

الأسئلة: إذا كانت لديك اية استفسارات او مخاوف تتعلق بدورك او حقوقك كمشارك بحثي، او تريدين ان تحصلي على اية معلومات او تقدم معطيات، او ترغب في تسجيل شكوى عن هذه الدراسة، يمكنك التواصل، دون ذكر أسماء، مع برنامج حماية الموارد البشرية بجامعة ولاية ميتشغان على رقم الهاتف التالي:517-355-2180 ، او على فاكس رقم 517-432-4503 ، او على البريد الإلكتروني irb@msu.edu أو البريد العادي على العنوان التالي:

408 West Circle Drive, Olds Hall Room 207, MSU, East Lansing, MI 48824

إذا كانت لديك أي مخاوف او استفسارات عن هذه الدراسة البحثية، برجاء التواصل مع الباحثة : سالمة الغامدي، جدة، المملكة العربية السعودية (0500088372)، جامعة ولاية ميتشغان، كلية التمريض، بوتبليدج(3135291562)؛ بريد إلكتروني: algham25@msu.edu في أي وقت.

قبول المشاركة في البحث:

لقد قمت بقراءة المعلومات الواردة في استمارة الموافقة على المشاركة أمامي. ويدل توقيعي ادناه على رغبتي في المشاركة في هذه الدراسة البحثية.

التوقيع : _____

التاريخ:_____

سوف يتم اعطاءك نسخة من هذا االإقرار

APPENDIX F: English And Arabic Version of Self- Administered Survey

Dear Mothers,

Welcome to the Breastfeeding Study! We appreciate you taking time to help us make the study the best it can be. This survey will ask questions about your ideas, thoughts, and activities related to you and your baby. Try to answer each question as best you can. There is no right or wrong answer.
Some of the questions might sound similar, but do be sure to answer each one so that we have complete information from you.

All of your answers will be kept completely private and only my research team will have access to this information.

Demographic Questionnaire

1. Site:

- 1
- 2
- 3
- 4

2.Your Age (years) _____

3. Infant's age

- 6 months
- 7 months
- 8 months
- 9 months
- 10 months
- 11 months
- 12 months

4. Sex of Infant: (please circle only one response)
- Male
- Female

5. Relationship Status: (please circle only one response)
- Married
- Divorced
- Widowed

6. Your employment status (outside of the home): (please circle only one response)
   - Working full-time (at least 35 hours per week)
   - Working part-time
   - Not Working

7. How many people live in your household **including** yourself? _____

8. Do you live with any extended family member (e.g., mother, mother-in-law, grandmother)?
   - Yes
   - No

9. If you answered "yes" to the previous question, does she/he support and encourage you to breastfeed?
   - Yes
   - No

10. What best describes your household monthly income:
   - SR3000 or Less
   - SR 4000– SR 6000
   - SR 7000– SR 12000
   - SR13000 or More
   - Don't know
   - Choose not to answer

11. Your highest educational level:
   - Less than high school
   - High school
   - Bachelor's degree
   - Master degree or higher

12. How did you give birth?
   - Vaginal delivery
   - Caesarean section

13. Did your mother ever breastfeed?

   - Yes
   - NO
   - Don't know

If answered "NO" or "Don't know" skip question #14 and continue the survey

14. Did your mother breastfeed you throughout the first six months of your life?

   - Yes
   - No
   - Don't know
   -

Breastfeeding Self-Efficacy Scale–Short Form

For each of the following statements, please mark your answer by circling the number that is closest to how confident you feel/felt when you are/were breastfeeding. There is no right or wrong answer. **WHEN YOU BREASTFEED/BREASTFED:**	**Not at all confident**	**Not very confident**	**Sometimes confident**	**Confident**	**Very confident**
1- I can/could always determine that my baby is/was getting enough milk	1	2	3	4	5
2- I can/could always successfully cope with breastfeeding like I have with other challenging tasks	1	2	3	4	5
3- I can/could always breastfeed my baby without using formula as a supplement	1	2	3	4	5
4- I can/could always ensure that my baby is properly latched on for the entire feeding	1	2	3	4	5
5- I can/could always manage the breastfeeding situation to my satisfaction	1	2	3	4	5
WHEN YOU BREASTFEED/BREASTFED:					
6- I can/could always manage to breastfeed even if my baby is crying	1	2	3	4	5
7- I can/could always keep wanting to breastfeed	1	2	3	4	5
8- I can/could always comfortably breastfeed with my family members present	1	2	3	4	5
9- I can/could always be satisfied with my breastfeeding experience	1	2	3	4	5
10- I can/could always deal with the fact that breastfeeding can be time consuming	1	2	3	4	5
11- I can/could always finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5
12- I can/could always continue to breastfeed my baby for every feeding	1	2	3	4	5
13- I can/could always manage to keep up with my baby's breastfeeding demands	1	2	3	4	5
14- I can/could always tell when my baby is finished breastfeeding	1	2	3	4	5

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Social Provisions Scale–Short Version

In answering the next set of questions, think about your relationship with friends, family members, coworkers, and others when you are/were breastfeeding. Please circle the number that is closest to what extent you agree with each statement. There is no right or wrong answer. **WHEN YOU BREASTFEED/BREASTFED:**	**Strongly Disagree**	**Disagree**	**Agree**	**Strongly Agree**
1. There are/were people I can depend on to help me if I really need it.	1	2	3	4
2. I feel/felt that I do not have close personal relationships with other people.	1	2	3	4
3. There is/was no one I can turn to for guidance in times of stress.	1	2	3	4
4. There are/were people who enjoy the same social activities that I do.	1	2	3	4
5. I do/did not think other people respect my skills and abilities.	1	2	3	4
WHEN YOU BREASTFEED/BREASTFED:				
6. If something went wrong, no one would come to my assistance.	1	2	3	4
7. I have/had close relationships that provide me with a sense of emotional security and well-being.	1	2	3	4
8. I have/had relationships where my competence and skills are recognized.	1	2	3	4
9. There is/was no one who shares my interests and concerns.	1	2	3	4
10. There is/was a trustworthy person I could turn to for advice if I were having problems.	1	2	3	4

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Perceived Stress Scale

The questions in this scale ask about your feelings and thoughts during breastfeeding. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way. There is no right or wrong answer. **WHEN YOU BREASTFEED/BREASTFED:**	**Never**	**Almost Never**	**Sometimes**	**Fairly Often**	**Very Often**
1. How often have/had you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. How often have/had you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. How often have/had you felt nervous and "stressed"?	0	1	2	3	4
4. When you are/were breastfeeding, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. How often have/had you felt that things were going your way?	0	1	2	3	4
WHEN YOU BREASTFEED/BREASTFED:					
6. How often have/had you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. How often have/had you been able to control irritations in your life?	0	1	2	3	4
8. How often have /had you felt that you were on top of things?	0	1	2	3	4
9. How often have/had you been angered because of things that were outside of your control?	0	1	2	3	4
10. How often have/had you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

Breastfeeding Practice Questionnaire

For each of the following set of statements, please circle the response that best describes your breastfeeding experience, practice, and how long you breastfed your baby. Please circle or mark the best tells us your experience.

1. Did you start breastfeeding **within the first 24 hours** after delivery?

- Yes
- No

2. Did you receive any **free formula** for your baby either from the hospital or clinic or other agencies?

- Yes: If you answered YES, answer question #3.
- No: If you answered NO, skip question #3 and go to question #4.

3. Did you use any of the free formula for your baby?

- Yes
- No

4. During pregnancy, did you have any type of breastfeeding education?

- Yes
- No

5. After delivery, have you had any help and/or support for breastfeeding and ensuring good latching?

- Yes: If you answered YES, answer question #6.
-
- No: If you answered NO, skip question #6 and go to question #7.
-

6. If you answered "Yes" to the previous question (#5), please circle from whom you received breastfeeding help, and/or support for breastfeeding after childbirth? (Circle all that apply)

- Nurse
- Doctor
- Lactation consultant
- Mother
- Grandmother
- Sister
- Husband
- Friend
- Other: (please identify) _____

7. Have you received any education to continue breastfeeding for the first 6 months?

- Yes
- No

8. Have you received any education to breastfeed exclusively without supplementing formula?

- Yes
- No: If you answered NO, skip question #9 and go to question #10.

9. If you answered "Yes" to the previous question, please circle from whom you received education on breastfeeding duration and exclusivity? (Circle all that apply)

- Nurse
- Doctor
- Lactation consultant
- Mother
- Grandmother
- Sister
- Husband
- Friend
- Other: (please identify) _____

10. For how long did you breastfeed your infant:

- Less than a month.
- 1 month
- 2 months
- 3 months
- 4 months
- 5 months
- 6 months
- More than 6 months

If you chose 6 months or more than six months go to question#11, If you chose any of the first 6 options (THAT IS, less than a month to 5 months') for the above question, then skip#11 and continue the survey

11. How would you describe your breastfeeding practice with your baby:

- I fed my baby **only breastmilk with <u>no additional</u>** supplement (e.g., water, formula, juices, solids) for the **<u>entire first 6 months of age.</u>**
- I sometimes fed my baby **some <u>formula or/and other food supplement (solids) b</u>**efore my baby was 6 months old

If you chose the first option for the previous question, this is the end of this survey.

Thank you for your participation!

If you chose the second option please continue with the survey.

12. What are the reason(s) you stopped breastfeeding or supplemented with formula: (Check **<u>all</u>** that apply.)

- Insufficient milk
- Return to work
- New pregnancy
- Sickness of baby or mother
- Introduction of the formula in the first day of life
- Other _____(Identify)
- Not applicable/ did not stop breastfeeding

13. What is the **<u>most important</u>** reason you stopped breastfeeding or supplemented with formula? (**Check only one**.)

- Insufficient milk
- Return to work
- New pregnancy
- Sickness of baby or mother
- Introduction of the formula in the first day of life
- Other _____(Identify)
- Not applicable/ did not stop breastfeeding

14. How old was your baby when you began formula feeding?

- Younger than one month
- 1 month
- 2 months
- 3 months
- 4 months
- 5 months
- 6 months
- Not yet started

15. If you gave your baby **any type** of liquid supplements **prior to 6 months** of infant's age, what kind of liquid supplement(s) did you give (Circle all that apply)

- I have not provided any type of liquid supplements
- Water
- Juice
- Herbal tea
- Other _____(Identify)

16. If your baby has started eating **any type** of solid foods **prior to 6 months** of age, how old was your baby when s/he **first** started eating solid foods?

- Not yet started solid food.
- Younger than one month
- 1 month
- 2 months
- 3 months
- 4 months
- 5 months
- 6 months
- Older than 6 months

You have completed the questionnaire. Thank you!

استبيان ديموغرافي

اسم المركز_____

تاريخ اليوم_____

إن الأسئلة التالية تخبرني عن النساء المشاركين في هذا المشروع. ستبقى كل إجاباتك سرية تماما ولن يطلع عليها احد سوى الباحث.

1- رقم المركزالصحي

- 1
- 2
- 3
- 4

2- عمرك (سنة)_____

3- عمر الرضيع

- 6 اشهر
- 7 اشهر
- 8 اشهر
- 9 اشهر
- 10 اشهر
- 11 شهرا
- 12 شهرا

4- جنس الرضيع (يرجى وضع دائرة واحدة):

- ذكر
- أنثى

5- الحالة الاجتماعية :

- متزوجة
- مطلقة
- أرملة

6- وضع العمل الخاص بك (خارج المنزل):

- العمل بدوام كامل (35 ساعة على الأقل في الأسبوع)
- العمل بدوام جزئي
- لا يعمل

7- كم عدد الأشخاص الذين يعيشون في منزلك معك؟ _____

8- هل تعيش مع احد من افراد من العائلة او الأقارب مثل ام الزوج الام او الجدة:

- نعم
- لا

9- إذا كانت الإجابة ب "نعم" على السؤال السابق، هل احدهم قدم لك دعم وتشجيع للرضاعة الطبيعية ؟

- نعم
- لا

10- كم هو الدخل الشهري للأسرة:

- 3000 ريال سعودي او اقل
- مابين 4000 الى 6999 ريال سعودي
- مابين 7000 الى 12000 ريال سعودي
- أكثر من 13000 ريال سعودي
- لا أعرف
- لا ارغب في الإجابة

11- ماهو مستواك التعليمي :

- دون المرحلة الثانوية
- المرحلة الثانوية
- درجة البكالوريوس
- درجة الماجستير أو أعلى

12- كيف كانت طريقة الولادة:

- ولادة طبيعية مهبلية
- عملية قيصرية

13- هل كانت امك ترضع رضاعة طبيعية:

- نعم
- لا
- لا اعلم

14- اذا اجبت" نعم" على السوال السابق، هل كانت امك ترضع رضاعة طبيعية لفترة 6 شهور؟

- نعم
- لا
- لا اعلم

مقياس الكفاءة الذاتية في الرضاعة الطبيعية – نموذج مختصر

	لكل من العبارات التالية، الرجاء اختيار الإجابة التي تعبر بالشكل الأفضل عن مدى ثقتك في إرضاع طفلك الحديث الولادة رضاعة طبيعية. الرجاء الإشارة إلى إجابتك بوضع دائرة حول الرقم <u>الأقرب لإحساسك اثناء فترة الرضاعة الطبيعية</u> حيث أنه ليس هناك إجابة صحيحة أو إجابة خاطئة	**لست واثقة إطلاقا**	**لست واثقة جدا**	**واثقة أحيانا**	**واثقة**	**واثقة جدا**
	عندما كنتي ترضعين طفلك :					
1	أستطيع دائما تحديد فيما إذا كان طفلي يحصل على الكمية الكافية من الحليب	1	2	3	4	5
2	أستطيع دائماً التكيف مع الرضاعة الطبيعية كما أتكيف مع أي تحدٍ آخر	1	2	3	4	5
3	أستطيع دائما إرضاع طفلي رضاعة طبيعية دون إعطائه الحليب الصناعي كمُكمّل	1	2	3	4	5
4	أستطيع دائما التأكد من أن طفلي يلتقم الحلمة بإحكام طوال فترة إرضاعه	1	2	3	4	5
5	أستطيع دائما إدارة أوضاع الرضاعة الطبيعية إلى الحد الذي يرضيني	1	2	3	4	5
	عندما كنتي ترضعين طفلك :					
6	أستطيع المداومة في إرضاع طفلي رضاعة طبيعية حتى لو كان يبكي	1	2	3	4	5
7	أستطيع دائما الاستمرار في الرغبة بإرضاع طفلي رضاعة طبيعية	1	2	3	4	5
8	أستطيع دائما إرضاع طفلي براحة حتى في ظل وجود أفراد أسرتي	1	2	3	4	5
9	أستطيع دائما أن أكون راضية عن تجربتي مع الرضاعة الطبيعية	1	2	3	4	5
10	أستطيع دائما التكيف مع حقيقة أن الرضاعة الطبيعية تستغرق وقتاً طويلاً	1	2	3	4	5
11	أستطيع دائماً إنهاء إرضاع طفلي من ثدي واحد قبل الانتقال إلى الثدي الآخر	1	2	3	4	5
12	أستطيع دائماً الاستمرار في إرضاع طفلي طبيعيا في كل رضعة	1	2	3	4	5
13	أستطيع دائما تلبية احتياجات طفلي من الرضاعة الطبيعية	1	2	3	4	5
14	أستطيع دائما أن أقول فيما إذا كان طفلي قد أنهى الرضاعة الطبيعية	1	2	3	4	5

مقياس المؤن الاجتماعية – نموذج مختصر

	خلال إجابتك عن مجموعة الأسئلة التالية، فكري بعلاقتك الحالية مع الأصدقاء وأفراد العائلة وزملاء العمل وغيرهم أثناء فترة الرضاعة الطبيعية. الرجاء وضع دائرة حول الرقم الأقرب للدرجة التي تصف علاقتك الحالية مع الآخرين. ليس هناك إجابة صحيحة أو إجابة خاطئة. **عندما كنتي ترضعين طفلك :**	**لا أوافق بشدة**	**لا أوافق**	**أوافق**	**أوافق بشدة**
1	هناك أشخاص أستطيع الاعتماد عليهم لمساعدتي إذا احتجت فعلا إلى ذلك	1	2	3	4
2	أشعر أنه ليس لدي علاقات شخصية وثيقة مع الأشخاص الآخرين	1	2	3	4
3	ليس هناك من ألجأ إليه لإرشادي في أوقات الضغوط	1	2	3	4
4	هناك أشخاص يستمتعون بنفس الأنشطة الاجتماعية التي أقوم بها	1	2	3	4
5	لا أعتقد بأن الآخرين يحترمون مهاراتي وقدراتي	1	2	3	4
	عندما كنتي ترضعين طفلك :				
6	إذا حصلت مشكلة ما، فلن يحضر أحد لمساعدتي	1	2	3	4
7	لدي علاقات وثيقة تمنحني إحساسا بالأمان العاطفي والسعادة	1	2	3	4
8	لدي علاقات مع أشخاص يقدرون كفاءتي ومهاراتي	1	2	3	4
9	ليس هناك أحد يشاركني اهتماماتي ومخاوفي	1	2	3	4
10	هناك شخص جدير بالثقة أستطيع اللجوء إليه للحصول على المشورة في حال واجهت أية مشاكل	1	2	3	4

مقياس تصور التوتر

	الأسئلة التالية تستفسر عن مشاعرك و أفكارك خلال فترة الرضاعة الطبيعية. نرجو منك الاجابة لكل من العبارات التالية بوضع دائرة حول الرقم الأنسب عندما كنتي ترضعين طفلك :	اطلاقاً (أبداً)	نادرا	أحياناً	كثيراً	دائما (في أغلب الأحيان)
1	الى أي مدى أحسست بالانزعاج بسبب حدوث أمر غير متوقع ؟	0	1	2	3	4
2	الى أي مدى أحسست بعدم القدرة على التحكم في الأمور الهامة بحياتك ؟	0	1	2	3	4
3	الى أي مدى أحسست بالتوتر و الضغط النفسي ؟	0	1	2	3	4
4	الى أي مدى أحسست بالثقة في قدرتك على التعامل مع مشاكلك الخاصة ؟	0	1	2	3	4
5	الى أي مدى أحسست أن الأمور تسير كما تريد ؟	0	1	2	3	4
	عندما كنتي ترضعين طفلك :					
6	الى أي مدى وجدت نفسك غير قادر على التأقلم مع كل الأمور الواجب عليك القيام بها ؟	0	1	2	3	4
7	إلى أي مدى تمكنت من التحكم في الأمور التي تزعجك ؟	0	1	2	3	4
8	الى أي مدى أحسست بأنك تملك زمام الأمور (مسيطر على كافة أمورك) ؟	0	1	2	3	4
9	الى أي مدى أحسست بالغضب بسبب أمور خارجة عن تحكمك ؟	0	1	2	3	4
10	إلى أي مدى أحسست بأن الصعاب تتراكم عليك لدرجة أنك لم تعد تستطيع التغلب عليها ؟	0	1	2	3	4

استبيان عن الرضاعة الطبيعية

لكل من المجموعة التالية من البيانات، يرجى وضع دائرة حول الإجابة التي تصف تجربتك في ممارسة الرضاعة الطبيعية.
يرجى وضع دائرة أو علامة على أفضل إجابه على الأسئلة التالية. لا توجد إجابة صحيحة أو خاطئة

1- هل بدأتي الرضاعة الطبيعية في غضون ال 24 ساعة الأولى بعد الولادة؟

- نعم
- لا

2- هل حصلتي على رضعات صناعية لطفلك مجانا؟

- نعم
- لا

3- اذا اجبتي بنعم على السوال السابق هل استخدمتي اي من الرضعات الصناعية المجانية؟

- نعم
- لا

4- خلال فترة الحمل، هل تلقيتي اي تعليم عن الرضاعة الطبيعية ؟

- نعم
- لا

5- بعد الولادة، هل تلقيتي أي نوع من التعليم الرضاعة الطبيعية، والمساعدة، أو دعم لممارسة الرضاعة الطبيعية ؟

- نعم
- لا

6- إذا كانت الإجابة "نعم" على السؤال السابق (رقم 5)، يرجى وضع دائرة من الذي زودك بالمعلومات او دعمك وشجعك للرضاعة الطبيعية، مساعدة، و / أو الدعم بعد الولادة؟ (دائرة على كل ما ينطبق)

- ممرضة
- طبيب
- مستشارة رضاعة
- أم
- جدة
- أخت
- زوج
- صديق
- _____اخرين (يرجى التحديد)

7- بعد الولادة، هل تلقيتي أي نوع من التعليم عن فترة استمرار الرضاعة الطبيعية الى 6 شهور ؟

- نعم
- لا

8- هل تلقيتي اي تعليمات عن ارضاع مولودك رضاعة طبيعية فقط بدون حليب صناعي:

- نعم
- لا

9- إذا كانت الإجابة "نعم" على السؤال السابق، يرجى وضع دائرة من الذي زودك بالمعلومات ؟ (دائرة على كل ما ينطبق)

- ممرضة
- طبيب
- مستشارة رضاعة
- أم
- جدة
- أخت
- زوج
- صديق
- _____اخرين (يرجى التحديد)

10- لمدة كم شهر ارضعتي طفلك؟

- أقل من شهر واحد
- شهر واحد
- شهرين
- ثلاثة اشهر
- اربعة اشهر
- خمسة اشهر
- ستة اشهر
- اكثر من 6 اشهر

إذا اخترت 6 أشهر أو أكثر من ستة أشهر انتقلي الى السؤال (11) لإكمال الاستبيان و اذا اخترتي اي من الخيارات الست الاولى على السوال السابق (أي، أقل من شهر- إلى 5 أشهر) تخطي سؤال رقم 11 واكملي الاستبيان

11- كيف تصفين ممارستك للرضاعة الطبيعية:

• أنا اغذي **طفلي فقط حليب الأم بواسطة الرضاعة الطبيعية مع عدم وجود** غذاء إضافي (مثل والمياه والعصائر والمواد الصلبة) لكامل 6 أشهر الأولى من العمر.

• أنا في بعض الأحيان اغذي **مولودي حليب صناعي** أو / وغيرها من المكملات الغذائية قبل ان يكمل 6 اشهر.

إذا اخترت "الخيار الاول" على السؤال السابق، فهو نهاية الاستبيان

أشكركم على مشاركتكم

وإذا كانت الإجابة "الخيار الثاني"، يرجى الاستمرار في ملء الاستمارة

12- ما هي الأسباب التي دعتك للتوقف عن الرضاعة الطبيعية او التزويد بالحليب الصناعي (اختاري كل ماينطبق):

- حليب الام غير كافي
- العودة إلى العمل
- الحمل الجديد
- مرض الطفل أو الأم
- إدخال الرضاعة الصناعية في اليوم الأول من الحياة
- أخرى _____ (حددي)
- لاينطبق\ لم اتوقف عن الرضاعة الطبيعية

13- ما **هي اهم الأسباب** التي دعتك للتوقف عن الرضاعة الطبيعية او التزويد بالحليب الصناعي (اختاري خيار واحد):

- حليب الام غير كافي
- العودة إلى العمل
- الحمل الجديد
- مرض الطفل أو الأم
- إدخال الرضاعة الصناعية في اليوم الأول من الحياة
- أخرى _____ (حددي)
- لاينطبق\ لم اتوقف عن الرضاعة الطبيعية

14- كم كان عمر الرضيع عند بدء الرضاعة الصناعية

- اقل من شهر واحد
- شهر واحد
- شهرين
- ثلاثة اشهر
- اربعة اشهر
- خمسة اشهر
- ستة اشهر
- لم يبدا الرضاعة الصناعية بعد

15- ما هو نوع المكملات الغذائية السائلة التي أدخلت لطعام الطفل **قبل 6 اشهر** من عمر الرضيع؟ (اختاري كل ماينطبق)

- لاينطبق السؤال
- ماء
- عصير
- شاي أعشاب
- أخرى _____ (حددي)

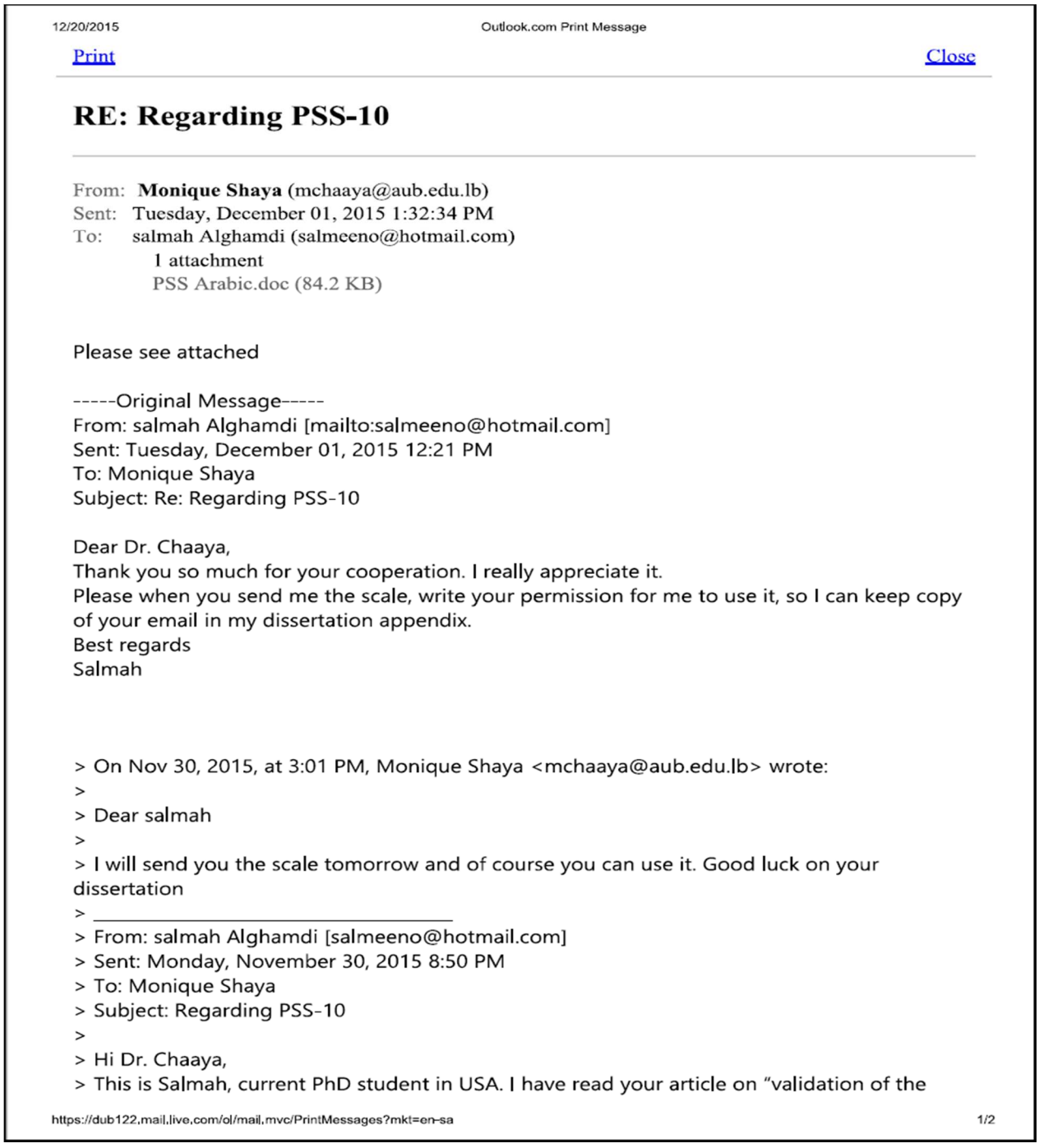
16- اذا بدأ طفلك الاكل **قبل 6 اشهر** كم كان عمر الرضيع عند تقديم اي نوع من طعام الاطفال :

- لم يبدأ الطعام بعد
- اقل من شهر واحد
- شهر واحد
- شهرين
- ثلاثة اشهر
- اربعة اشهر
- خمسة اشهر
- ستة اشهر
- اكثر من 6 شهور

لقد اكملتي الاستبيان

شكرا جزيلا على مشاركتك

APPENDIX G: The Permission to use the Validated Arabic Version of the Perceived Stress Scale-10 item.



12/20/2015 Outlook.com Print Message

Print Close

RE: Regarding PSS-10

From: **Monique Shaya** (mchaaya@aub.edu.lb)
Sent: Tuesday, December 01, 2015 1:32:34 PM
To: salmah Alghamdi (salmeeno@hotmail.com)
1 attachment
PSS Arabic.doc (84.2 KB)

Please see attached

-----Original Message-----
From: salmah Alghamdi [mailto:salmeeno@hotmail.com]
Sent: Tuesday, December 01, 2015 12:21 PM
To: Monique Shaya
Subject: Re: Regarding PSS-10

Dear Dr. Chaaya,
Thank you so much for your cooperation. I really appreciate it.
Please when you send me the scale, write your permission for me to use it, so I can keep copy of your email in my dissertation appendix.
Best regards
Salmah

> On Nov 30, 2015, at 3:01 PM, Monique Shaya <mchaaya@aub.edu.lb> wrote:
>
> Dear salmah
>
> I will send you the scale tomorrow and of course you can use it. Good luck on your dissertation
> _____
> From: salmah Alghamdi [salmeeno@hotmail.com]
> Sent: Monday, November 30, 2015 8:50 PM
> To: Monique Shaya
> Subject: Regarding PSS-10
>
> Hi Dr. Chaaya,
> This is Salmah, current PhD student in USA. I have read your article on "validation of the

https://dub122.mail.live.com/ol/mail.mvc/PrintMessages?mkt=en-sa 1/2

Arabic version of the Cohen Perceived stress scale (PSS-10)" . I found it very helpful for me as I am planning on using this scale with Arabic speakers in my dissertation work. Could you provide me with copy of the Arabic version that you have used in this article, and give me the permission to used it in my dissertation.

> Thank you so much

> Salmah

>

APPENDIX H: The Permission to use the Social Provisions Scale

Print Close

RE: Scale Request

From: **Russell, Daniel W [HD FS]** (drussell@iastate.edu)
Sent: Monday, October 12, 2015 4:30:39 PM
To: salmah Alghamdi (salmeeno@hotmail.com)
3 attachments
Social Provisions Scale chapter.pdf (218.7 KB) , Social Provisions Scale-Short Version.pdf (128.7 KB) , Iifas.pdf (3.8 MB)

You have my permission to use the Social Provisions Scale in your dissertation research. I have attached a paper that provides psychometric data for the measure. A copy of the scale is attached at the end of the paper, along with scoring instructions. I have also attached a copy of the short version of the scale.

Also attached is a measure of attitudes toward breast feeding that we developed for a study we conducted at the U. of Iowa that you may find useful.

Daniel W. Russell, Ph.D.

Professor, Department of Human

Development & Family Studies

Iowa State University

(515) 294-4187

Fax: 294-2502

From: salmah Alghamdi [mailto:salmeeno@hotmail.com]
Sent: Monday, October 12, 2015 1:22 AM
To: Russell, Daniel W [HD FS] <drussell@iastate.edu>
Subject: Scale Request

Hi Dr. Russell,

I am requesting permission to use the Social Provisions Scale -10 item the short version in my dissertation research entitled, Factors Associated with Breastfeeding Behavior at 6 Months Postpartum.

I will be measuring breastfeeding self-efficacy, stress, social support, and other selected socio-demographic variables.

I am also requesting a copy of this instrument along with a paper representing psychometric data. If this scale was translated in Arabic please provide me with the Arabic version as well. Otherwise, I am also requesting your permission to translate the scale to Arabic language in order to use it with my Arabic speaking sample.

My home address is : 960 West Edgewood Blvd #143

Lansing, MI 48911

Thank you so much for your time

Salmah Alghamdi

Doctoral Student

Michigan State University

algham25@msu.edu

APPENDIX I: The Permission To Use the Breastfeeding Self-Efficacy Scale

Print Close

RE: Breastfeeding Self-efficacy Scale Request

From: **Cindy-Lee Dennis** (cindylee.dennis@utoronto.ca)
Sent: Wednesday, October 14, 2015 8:47:41 PM
To: salmah Alghamdi (salmeeno@hotmail.com)
1 attachment
BSES-SF-Arabic.docx (21.7 KB)

Dear Salmah,

Thank you for your interest in my Breastfeeding Self-Efficacy Scale. It was nice speaking with you today. I have attached the short-form for use in your study. Please let me know if you require additional assistance or would like to discuss collaborative opportunities.

Warm regards,

Cindy-Lee Dennis

Cindy-Lee Dennis, PhD
Professor in Nursing and Medicine, Dept. of Psychiatry;
Canada Research Chair in Perinatal Community Health;

Shirley Brown Chair in Women's Mental Health Research, Women's College Research Institute;

University of Toronto
155 College St
Toronto, Ontario
Canada M5T 1P8
Tel: (416) 946-8608
www.cindyleedennis.ca

From: salmah Alghamdi [mailto:salmeeno@hotmail.com]
Sent: October 12, 2015 10:01 AM
To: Cindy-Lee Dennis
Subject: Breastfeeding Self-efficacy Scale Request

Hi Dr. Dennis,

I am requesting your permission to use the Breastfeeding Self-efficacy Scale in my dissertation research entitled, Factors Associated with Breastfeeding Behavior at 6 Months Postpartum.

I will be measuring breastfeeding self-efficacy, stress, social support, and other selected socio-demographic variables.

I am also requesting a copy of this instrument and any related psychometric paper. If this scale has been translated in Arabic please provide me with the Arabic version as well. Otherwise, I am also requesting your permission to translate the scale to Arabic language in order to use it with my Arabic speaking sample.

My home address is : 960 West Edgewood Blvd #143

Lansing, MI 48911

Thank you so much for your time

Salmah Alghamdi

Doctoral Student

Michigan State University

Algham25@msu.edu

313-529-1562

APPENDIX J: Assessment of Content Validity Index

Breastfeeding Self-Efficacy Scale–Short Form

Breastfeeding Self-Efficacy is defined as a woman's confidence in her ability to successfully breastfeed her baby.

Please rate the relevancy of the following items as related to the definitions above by circling your answer.

Items	**Not Relevant**	**Somewhat Relevant**	**Very Relevant**	**Comments**
1. I can/could always determine that my baby is/was getting enough milk	1 2 3	4 5 6 7	8 9 10	
2. I can/could always successfully cope with breastfeeding like I have with other challenging tasks	1 2 3	4 5 6 7	8 9 10	
3. I can/could always breastfeed my baby without using formula as a supplement	1 2 3	4 5 6 7	8 9 10	
4. I can/could always ensure that my baby is properly latched on for the entire feeding	1 2 3	4 5 6 7	8 9 10	
5. I can/could always manage the breastfeeding situation to my satisfaction	1 2 3	4 5 6 7	8 9 10	
6. I can/could always manage to breastfeed even if my baby is crying	1 2 3	4 5 6 7	8 9 10	
7. I can/could always keep wanting to breastfeed	1 2 3	4 5 6 7	8 9 10	
8. I can/could always comfortably breastfeed with	1 2 3	4 5 6 7	8 9 10	

	my family members present										
9.	I can/could always be satisfied with my breastfeeding experience	1	2	3	4	5	6	7	8	9	10
10.	I can/could always deal with the fact that breastfeeding can be time consuming	1	2	3	4	5	6	7	8	9	10
11.	I can/could always finish feeding my baby on one breast before switching to the other breast	1	2	3	4	5	6	7	8	9	10
12.	I can/could always continue to breastfeed my baby for every feeding	1	2	3	4	5	6	7	8	9	10
13.	I can/could always manage to keep up with my baby's breastfeeding demands	1	2	3	4	5	6	7	8	9	10
14.	I can/could always tell when my baby is finished breastfeeding	1	2	3	4	5	6	7	8	9	10

©Dr. Cindy-Lee Dennis

Other comments (if any) :

Social Provisions Scale–Short Version

Social support is defined as any form of social resources or helping relationships that are provided or perceived as available

Please rate the relevancy of the following items as related to the definitions above by circling your answer.

Items	**Not Relevant**	**Somewhat Relevant**	**Very Relevant**	**Comments**
1. There are/were people I can depend on to help me if I really need it.	1 2 3	4 5 6 7	8 9 10	
2. I feel/felt that I do not have close personal relationships with other people.	1 2 3	4 5 6 7	8 9 10	
3. There is/was no one I can turn to for guidance in times of stress.	1 2 3	4 5 6 7	8 9 10	
4. There are/were people who enjoy the same social activities that I do.	1 2 3	4 5 6 7	8 9 10	
5. I do/did not think other people respect my skills and abilities.	1 2 3	4 5 6 7	8 9 10	

6. If something went wrong, no one would come to my assistance.	1	2	3	4	5	6	7	8	9	10
7. I have/had close relationships that provide me with a sense of emotional security and well-being.	1	2	3	4	5	6	7	8	9	10
8. I have/had relationships where my competence and skills are recognized.	1	2	3	4	5	6	7	8	9	10
9. There is/was no one who shares my interests and concerns.	1	2	3	4	5	6	7	8	9	10
10. There is/was a trustworthy person I could turn to for advice if I were having problems.	1	2	3	4	5	6	7	8	9	10

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Other comments (if any) :

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