Psychosocial Correlates of Exclusive Breastfeeding Duration to Six Months

Postpartum

By

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Doctor of Psychology (Health)

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Abstract

The overall aim of this thesis was to explore the role of psychosocial factors involved in exclusive breastfeeding to six months postpartum. Study One was a systematic review examining psychological correlates of exclusive breastfeeding for four to six months duration. The findings of the review highlighted a paucity of literature in this area, with only nine papers from eight studies included in the review. The findings also revealed that psychosocial factors such as self-efficacy, postpartum depression and maternal breastfeeding intentions were predictors of exclusive breastfeeding duration. Moreover, the findings indicated that further research is required to investigate a wider range of psychosocial factors to better understand the contribution of these modifiable factors to a woman’s duration of exclusive breastfeeding. In light of these findings, Study Two was a retrospective investigation of the psychosocial variables associated with exclusive breastfeeding and evaluated a conceptual model of psychosocial correlates of exclusive breastfeeding duration. The participants were 174 women aged 18 years and older who had given birth six months to two years prior. Participants completed a questionnaire, which asked them to report on three time points: pre-pregnancy, during pregnancy and during the first six months postpartum. Correlation analyses, t-tests and path analysis were used to statistically analyse the data. The results of this study showed that women who exclusively breastfed to six months postpartum exhibited higher intention to exclusively breastfeed, breastfeeding self-efficacy, comfort breastfeeding in public, perceived physical strength and reported less perceived breastfeeding difficulties than women who did not exclusively breastfeed to six months postpartum. Furthermore, the finding of the path analyses indicated that breastfeeding self-efficacy was a strong significant predictor of both exclusive
breastfeeding intention and duration. Maternal attitude towards pregnancy (both during pregnancy and postpartum), psychological adjustment and early breastfeeding difficulties were also found to be significant predictors of exclusive breastfeeding intention and duration. However, due to the limitation of retrospective research, Study Two needed to be replicated using a prospective longitudinal design to determine whether the findings were robust. As such, Study Three was a longitudinal prospective study, which followed 125 pregnant women from 32 weeks gestation to six months postpartum. Participants completed questionnaires at three time points: 32 weeks gestation, two months postpartum and six months postpartum. 

Psychosocial variables such as breastfeeding self-efficacy, body attitude, psychological adjustment, attitude towards pregnancy, breastfeeding intentions, confidence to exclusively breastfeed, motivation to exclusively breastfeed and importance of exclusive breastfeeding were assessed in addition to exclusive breastfeeding outcomes. Correlation and path analysis was used to statistically analyse the data. Path models at each of the three time points were developed to assess the relationships of psychosocial factors on exclusive breastfeeding over time. The findings revealed that breastfeeding self-efficacy at 32 weeks gestation, two and six months postpartum was a strong predictor of exclusive breastfeeding to six months postpartum. At 32 weeks gestation confidence to exclusively breastfeed was the only direct predictor of exclusive breastfeeding duration to six months postpartum. Psychological adjustment was predictive of exclusive breastfeeding duration at both two months and six months postpartum and body image predicted breastfeeding outcomes at six months postpartum. In addition to direct relationships, the results highlighted a range of interrelationships between variables indirectly influencing exclusive breastfeeding outcomes.
Together, these three studies highlight that psychosocial factors contribute to a woman’s ability to maintain exclusive breastfeeding to six months postpartum. This research has important clinical implications as currently, in Australia, only 17% of infants are being exclusively breastfed to six months postpartum. Psychological interventions based on strengthening breastfeeding self-efficacy and enhancing psychological adjustment during this time would be beneficial for new mothers and may improve the breastfeeding outcomes in Australia.
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CHAPTER ONE

Introduction

Since 2001, the World Health Organization has recommended that all infants worldwide should be exclusively breastfed for the first six months of life for optimal health outcomes for the infant, mother and society (World Health Organization [WHO], 2011). The WHO defines exclusive breastfeeding as the consumption of breast milk only (including expressed milk and medicines) and excludes infant formula, non-human milk, water or water-based drinks, tea and fruit juice. Although the health benefits of breastfeeding are well researched and acknowledged worldwide, the benefits of breastfeeding exclusively and for a longer duration are not as widely understood and hence, the WHO guideline is often not adhered to (Australian Bureau of Statistics [ABS], 2013; McAndrew et al., 2010; Millar & Maclean, 2005; Jones, Kogan, Singh, Dee, & Grummer-Strawn, 2011).

Breast milk is the best source of nutrition for infants as it provides all the energy and nutrients required for optimal growth and development during this critical growth period and has significant benefits for mother, infant and society (Cattaneo et al., 2006; Kramer & Kakuma, 2012; Oddy, de Klerk, Sly, & Holt, 2002). For infants, breast milk provides important advantages for physical, neurological and cognitive development, as well as immuno-protective components which contribute to the protection from allergies, infectious and non-communicable diseases (Horta & Victora, 2013; Huh, Rifes-Shiman, Taveras, Oken, & Gillman, 2008; Ip et al., 2007; Oddy, et al., 2002; Quinn et al., 2001). Maternal benefits of breastfeeding include reduced postpartum bleeding, assisted post-birth weight loss (Kramer & Kakuma, 2012) and protection against breast and ovarian cancers (Ip, et
Economically, breastfeeding reduces the financial cost of infant feeding on both families and societies (Ball & Bennett, 2001; Bartick & Reinhold, 2010; Cattaneo, et al., 2006). In addition, breastfeeding reduces the burden on health care systems as infant and childhood health is improved and reduces the loss of productivity due to parental absence from work related to infant or childhood illness (Ball & Bennett, 2001; Bartick & Reinhold, 2010). Bartick and Reinhold (2010) recently reported a cost-analysis study, which projected the cost on the United States healthcare system if 80% and 90% of families in the US complied with the recommendation to exclusively breastfeed for six months. The cost analysis was conducted for ten paediatric diseases which the US Agency for Healthcare Research and Quality had reported risk ratios to support breastfeeding for, including lower respiratory tract infections, atopic dermatitis, asthma, type 1 diabetes mellitus and childhood obesity. The cost analysis showed that if 90% of US families exclusively breastfed for 6 months, the US would save $13 billion per year and prevent 911 deaths, of which 95% of would be infant deaths. This saving reduced to $10.5 billion and 741 deaths when 80% of families complied with this recommendation (Bartick & Reinhold, 2010). At a global level, breastfeeding is a safe, sanitary and sustainable method of infant feeding which reduces the increased risk of infant mortality and morbidity caused by poor sanitation, nutrition, housing and other indicators of economic status (Jason, Nieburg, & Marks, 1984).

Prior to 2001, the WHO recommendation was for infants to be exclusively breastfed to four months postpartum. In review of this recommendation, the WHO commissioned a systematic review of the literature, which was published in the Cochrane Collaboration (Kramer & Kakuma, 2002) and was updated in 2012 (Kramer & Kakuma, 2012). The authors reviewed clinical trials and observational
studies, which compared child and maternal health outcomes with exclusive breastfeeding for six or more months versus exclusive breastfeeding for at least three to four months (with continued mixed feeding until at least six months). The studies came from a range of countries and cultures including both developed and developing countries. The Cochrane review (Kramer & Kakuma, 2012) found 23 eligible studies - 11 from developing countries and 12 from developed countries. To be eligible for the review, studies needed to be controlled clinical trials or observational studies which specifically compared child or maternal health outcomes with exclusive breastfeeding for six months or more compared to exclusive breastfeeding for at least three to four months with continued mixed breastfeeding until at least six months (Kramer & Kakuma, 2012). The results revealed that exclusive breastfeeding to six months (compared to three to four months with continued mixed feeding thereafter) had several advantages including a lower risk of gastrointestinal infection, more rapid maternal weight loss and delayed return of menstrual periods. Kramer and Kakuma showed that there was no evidence for deficits in weight or length gain for exclusively breastfed infant (a common argument against exclusive breastfeeding) however, acknowledged that more studies are needed to confirm this. This review found that infants who were exclusively breastfed for six months compared to four months (with mixed feeding thereafter) had no reduced risk of other infections, allergic disease, obesity, dental caries or cognitive ability. Kramer & Kakuma (2012) concluded that although infants and mothers should be considered on an individual basis, the available evidence suggests that as a general, worldwide policy, exclusive breastfeeding for the first six months of life in both developed and developing countries should be recommended.
A limitation of this Cochrane review (Kramer & Kakuma, 2002, 2012) is that in the reviewed studies, infants who were not exclusively breastfed to six months were mixed fed after four month postpartum. Hence, they were still receiving some breast milk beyond 4 months. However, Australian statistics show that by four months postpartum, almost 30% of infants are not receiving any breast milk (ABS, 2013). This review does not account for the health benefits of exclusive breastfeeding compared to no breast milk during these months.

Other studies have shown that the duration of exclusive breastfeeding beyond four months postpartum may provide further protection against diseases such as maternal diabetes (Stuebe, Rich-Edwards, Willett, Manson, & Michels, 2005) and childhood obesity (Gillman, 2008; Huh, et al., 2011) compared to either no breastfeeding, formula feeding, or the introduction of solids before this time. Recent literature proposes that there may be a critical period in early infancy where the risk for childhood obesity develops (Gillman, 2008) and that exclusive breastfeeding may be protective during this time (Huh, et al., 2011). In a recent prospective cohort study of 847 children in the United States, Huh et al. (2011) found that infants who were either not breastfed at all or who were introduced to solid foods prior to four months of age, had a six-fold increase in the risk of childhood obesity at three years of age. In contrast, the timing of solid food introduction had no effect on infants who were breastfed for at least four months (Huh, et al., 2011). Although this study did not differentiate between exclusivity of breastfeeding, given the literature highlighting that the protective benefits of breastfeeding are enhanced with exclusive breastfeeding (Chantry, Howard, & Auinger, 2006; Kramer & Kakuma, 2012), there may be an even stronger protective effect of exclusive breastfeeding during this
proposed critical period. These studies also highlight the importance of the duration of exclusive breastfeeding for the future health and development of the child.

The literature shows that exclusive breastfeeding provides important benefits beyond that of mixed or formula feeding, and suggests that women should aim to exclusively breastfeed for as long as possible up to six months postpartum. Despite this, very few women worldwide are meeting the WHO's recommendation of exclusive breastfeeding to six months postpartum and the majority are not meeting four months postpartum (ABS, 2013). In 2003 the National Health and Medical Research Council (NHMRC, 2003) articulated the goal that 50% of infants in Australia should be exclusively breastfed for the first six months. However, the most recent data shows that Australia is falling well below this target. In Australia, the most recent data comes from the 2011 to 2012 National Health Survey (ABS, 2013). This report showed that during 2011 to 2012, 92% of children aged zero to two years had received breast milk at some stage. However, less than 60% were exclusively breastfed to two months postpartum, less than 40% to four months and only 17% of children aged six months to three years had been exclusively breastfed to at least six months of age (ABS, 2013). Promisingly though, almost three quarters (74%) of children were receiving some breast milk at four months, an increase of around 10% from the last National study in 2004 (Australian Institute of Family Studies [AIFS], 2008). Similar exclusive breastfeeding rates have been demonstrated in other western countries. In the United States, the 2007 National Survey of Children’s Health collected data from over 25,000 children. The survey showed that 75% of the children had been breastfed at some point and of these children, 16.8% had been exclusively breastfed to six months of age (Jones et al., 2011).
In the UK, a recent National Infant Feeding Survey of over 15,000 infants born in the UK in 2010 showed that 81% of infants were breastfed from birth, of which 69% were exclusively breastfed (McAndrew et al., 2012). Both of these rates were increased from the 2005 Infant Feeding Survey (76% and 65% respectively; Bolling, Grant, Hamlyn, & Thornton, 2007). A pattern consistent with the 2005 Infant Feeding Survey and international trends was the steep decline of exclusive breastfeeding rates in the initial weeks after birth. At one week postpartum, 46% of new mothers were exclusively breastfeeding, 23% by six weeks postpartum, 12% at four months postpartum and less than 1% of UK infants were exclusively breastfed at six months postpartum in both the 2005 and 2010 Infant Feeding Survey (Bolling et al., 2007; McAndrew et al., 2012). In the 2005 infant feeding survey, 64% of women who exclusively breastfed from birth, lost exclusive breastfeeding status by introducing formula to the infants diet, where as 10% lost exclusivity by introducing solid foods (Bolling, et al., 2007). This was also reflected in the 2010 survey, which showed that 64% of infants had received some formula milk by six weeks of age (McAndrew et al., 2012). A Norwegian Infant nutrition survey found that 90% of infants were being exclusively breastfed at one month, 44% at four months and 7% at six months of age. The survey also found that 21% of infants were introduced to solid foods before four months of age (Lande, Andersen, & Baeug, 2003).

Developing countries report the highest rates of exclusive breastfeeding with 38% of infants being exclusively breastfed between four and six months postpartum (UNICEF, 2011).
Socio-Demographic Factors Associated with Breastfeeding.

In an effort to improve breastfeeding rates, a significant amount of research has been conducted examining the characteristics of women who intend to breastfeed, initiate breastfeeding at birth and maintain breastfeeding their infant for a longer duration. Traditionally, the focus has been on socio-demographic factors which show that women with a younger maternal age, lower socio economic status, lower level of education, single and those who live in rural and remote areas are less likely to initiate breastfeeding or if they do initiate, breastfeed for a shorter duration than their counterparts (Baxter, Cooklin, & Smith, 2009; Dubois & Girard, 2003; Jones et al., 2011; O'Brien, Fallon, Broadribb, & Hegney, 2007; Taveras et al., 2003). In the UK, the 2010 National Infant Feeding Survey (McAndrew et al., 2012) showed that the increase in rates of both any breastfeeding and exclusive breastfeeding between the years 2000 and 2010 could be explained by changes in the age and educational profile of new mothers. The Survey showed that women in managerial and professional roles, women with the highest levels of education, women aged 30 or above at the time of the birth and first time mothers all were more likely to initiate breastfeeding at birth and maintain both any breastfeeding or exclusive breastfeeding for a longer duration (McAndrew et al., 2012). Additionally, maternal smoking and early return to work have been shown to be negatively related to exclusive breastfeeding duration (Scott, Binns, Oddy, & Graham, 2006).

Identifying these socio-demographic factors as being predictive of breastfeeding initiation and duration has been an important part of understanding which populations may be at greatest risk of early cessation of breastfeeding and may require more intervention. However, these factors are very resistant to change at the individual level and tend to remain stable over time.
Psychosocial Factors Associated with Breastfeeding Duration

Identifying factors that predict a woman’s decision to breastfeed and maintain breastfeeding has been the focus of breastfeeding research in more recent years. O’Brien, Buikstra and Hegney (2008) recently showed that psychological factors such as maternal anxiety, dispositional optimism and breastfeeding self-efficacy were more predictive of breastfeeding duration than the identified socio-demographic factors combined. This finding has been supported by additional studies which have shown that when socio-demographic factors are controlled for, psychosocial factors have a significant effect on breastfeeding outcomes (Blyth et al., 2002; Blyth et al., 2004; Scott, Shaker, & Reid, 2004; Scott et al., 2006; Tatone-Tokuda, Dubois, & Girard, 2009; Taveras, et al., 2003). These studies provide a promising outlook for breastfeeding research given that psychosocial factors such as anxiety, depression, self-efficacy and attitude can be changed over time and intervention can occur at the individual level. Understanding the relationship between psychosocial factors and breastfeeding also provides a potential framework in which to assess and intervene, in order to improve breastfeeding outcomes at the population level.

Breastfeeding Self-Efficacy

Breastfeeding self-efficacy is the most consistently reported psychosocial factor associated with exclusive breastfeeding outcomes. The literature clearly and consistently shows that a woman’s level of breastfeeding self-efficacy is strongly associated with an increased duration of exclusive breastfeeding (Blyth et al., 2002; Blyth et al., 2004; Kronborg & Vaeth, 2004). Self-efficacy is a psychological concept derived from Bandura’s social learning theory (Bandura, 1977) and has been
repeatedly shown to be predictive of a range of health related behaviours (Gale, Batty, & Deary, 2008; Scott, Oddy, Binns, & Graham, 2006; Steptoe & Wardle, 2001). Self-efficacy is a cognitive process of an individual’s own confidence in their perceived ability to perform a behavior to achieve a desired outcome. More specifically, self-efficacy refers to an individual’s confidence in their ability to regulate their motivation, thought processes, emotional states and social environment to perform the desired behavior (Bandura, 1977). An important aspect of self-efficacy is that it is not a reflection of an individual’s true ability, but rather their confidence in their perceived ability. Bandura advocated that self-efficacy is a task specific phenomenon and that an individual’s self-efficacy can significantly change across situations and hence, it is important to measure self-efficacy not as a measure of overall ability, but in relation to specific tasks. The breastfeeding self-efficacy scale (Dennis & Faux, 1999) is a task specific measure of self-efficacy used to measure a mother’s perceived ability to successfully breastfeed her infant.

According to self-efficacy theory, mothers with high breastfeeding self-efficacy are more likely to initiate breastfeeding, persist when they experience difficulties, adopt self-encouraging thoughts and are more likely to react positively and be able to overcome difficulties they face with breastfeeding (Bandura, 1977; Dennis, 1999). Bandura (1977) identified four ways by which self-efficacy can be developed or increased: (i) mastery experience (e.g., succeeding at previous breastfeeding experiences or overcoming obstacles early in postpartum); (ii) vicarious experiences (e.g., watching other women successfully breastfeed or overcome difficulties); (iii) verbal persuasion (e.g., verbal encouragement from others, friends, family or health professionals); (iv) physiological states (happiness, bonding; (Bandura, 1977; Dennis, 1999).
The role of self-efficacy in both the initiation and duration of exclusive breastfeeding is well reported in the breastfeeding literature. In a large Australian sample, (O'Brien & Fallon, 2005) showed that breastfeeding self-efficacy was a unique predictor of exclusive breastfeeding duration, predicting 38% of the total variance in breastfeeding outcomes. This study also showed that there was a 6% decrease in the probability of early cessation of exclusive breastfeeding for every 1-point increase in breastfeeding self-efficacy score (OR=.94; 95% CI=.90-.97). Although this study only examined breastfeeding outcomes to six weeks postpartum, it provides support for the importance of strong breastfeeding self-efficacy for the maintenance of exclusive breastfeeding in the early postpartum and overcoming the early difficulties experienced by new mothers.

Blyth et al. (2002) showed that breastfeeding self-efficacy could be identified as early as antenatally and very early in the postpartum, and that breastfeeding self-efficacy at this time was predictive of later self-efficacy and breastfeeding outcomes. This study included an Australian sample of 300 women, recruited during the last trimester of their pregnancy and telephone interviewed at one week and again at four months postpartum to assess breastfeeding self-efficacy and infant feeding methods (Blyth et al., 2002). The results showed that both antenatal and one-week postpartum breastfeeding self-efficacy scores were significantly related to exclusive breastfeeding outcomes at one week and at four months postpartum. Mothers with high breastfeeding self-efficacy were more likely to be breastfeeding and doing so exclusively, at both one week and four months postpartum (79.5%) than mothers with low self-efficacy scores (50%). Blyth et al. (2002) also showed that mothers with previous breastfeeding experience (having breastfed previous infants) reported significantly higher breastfeeding self-efficacy scores during pregnancy (p < .01).
and this was maintained at both one week and four months postpartum (Blyth et al., 2002), highlighting the importance of ‘mastery of experience’ on building self-efficacy.

One of the mechanisms through which self-efficacy enhances breastfeeding outcomes is likely to be through overcoming early breastfeeding difficulties. Women often experience difficulties with breastfeeding in the early postpartum and some of the most commonly reported reasons for discontinuing breastfeeding are sore or cracked nipples, difficulties latching on and insufficient milk supply (Li, Fein, Chen, & Grummer-Straus, 2008; Tarrant et al., 2010; Taveras, et al., 2003). These difficulties usually occur in the first few weeks postpartum and can often be resolved with perseverance and professional advice. Scott et al. (2006) reported that 36% of women in their study reported having at least one or more problems with breastfeeding in the first four weeks postpartum. Women who experience these barriers, gain experience of overcoming the difficulty and persisting with breastfeeding will strengthen their breastfeeding self-efficacy, which, in turn, will strengthen their ability to overcome future barriers reducing the likelihood of early cessation of breastfeeding.

In a US study, DiGirolamo, Thompson, Martorell, Fein & Grummer-Straus (2005) found that 37% of women reported difficulties during the first week postpartum and that this was a significant risk factor for early cessation of breastfeeding by 10 weeks postpartum. However, if women persevered beyond 10 weeks, difficulties with breastfeeding in the first week postpartum were not a risk factor for cessation of breastfeeding beyond 10 weeks. Similarly, Scott et al. (2006) showed that difficulty with breastfeeding in the first few weeks postpartum was a significant risk factor for the early cessation of breastfeeding. In this study, women
who experienced difficulties with breastfeeding in the first four weeks postpartum were more likely to discontinue full breastfeeding before six months and any breastfeeding before 12 months. These studies highlight the importance of ‘mastery of experience’ in developing self-efficacy (Bandura, 1977). Women who experience breastfeeding difficulties and do not overcome challenges early in the postpartum or have had negative previous breastfeeding experiences may be less likely to build the confidence to be able to pursue through future difficulties they may experience with breastfeeding. In contrast, women with past experiences of success have more confidence in their ability to succeed again. This also has important implications in that enhancing a woman’s self-efficacy not only impacts on their experience breastfeeding their current infant but any subsequent infants they may have in the future.

In contrast to these findings, Clifford, Campbell, Speechley & Gorodzinsky (2006) found that having no previous breastfeeding experience predicted full breastfeeding at both one week and six months postpartum. There are a few possible explanations for this finding; firstly, this result could be due to the additional demands of having older children to look after as well as the infant rather than the effect of having prior breastfeeding experiences. Secondly, if the mother had a negative experience of breastfeeding in the past, she may have very low breastfeeding self-efficacy going in to the pregnancy the next time and more reluctant to initiate breastfeeding. Finally, other factors involved in developing and strengthening self-efficacy such as verbal persuasion, vicarious experiences and physiological states may have been implicated in their earlier development of low self-efficacy.
The application of self-efficacy to breastfeeding outcomes has been widely researched. The literature highlights the important role that self-efficacy plays in influencing a women’s intention to exclusively breastfeed and how likely they are to pursue through early breastfeeding difficulties. Furthermore, self-efficacy is an important psychological factor to focus research on as it has been shown to be amendable to change over time through intervention and personal experiences. Interventions to strengthen prospective mothers’ breastfeeding self-efficacy have shown to positively affect exclusive breastfeeding outcomes (Noel-Weiss, Rupp, Cragg, Bassett, & Woodend, 2006) with one study showing that attending a self-efficacy based prenatal workshop independently predicted exclusive breastfeeding duration (Semenic, Loiselle, & Gottlieb, 2008). A limitation of breastfeeding self-efficacy research is that some studies tend to examine breastfeeding self-efficacy in the later stages of pregnancy and at only one time point. However, studies have found that self-efficacy assessments early in the postpartum are stronger predictors of exclusive breastfeeding duration than assessments during pregnancy (Blyth et al., 2002; Blyth et al., 2004).

Postnatal Depression

Postnatal depression is a devastating condition, which is estimated to affect around 10-20% of all new mothers (Buist et al., 2008; Cox, Murray, & Chapman, 1993; Milgrom, Martin, & Negri, 1999; O'Hara & Swain, 1996). Incidence rates of postnatal depression vary depending on the methodology and depression screening tool used, but have been reported to be as high as 35% when using symptom check list data (Campbell & Cohn, 1991; Cutrona, 1982). Postnatal depression is characterized by feelings of sadness, guilt, worthlessness and anxiety; thoughts about
suicide and death; difficulties in concentration and decision making; disturbances in appetite and sleep and a lack of interest and energy. New mothers with postnatal depression may experience feelings of failure especially in the role of being a mother, a lack of confidence and negative feelings toward their baby, which often affects their ability to nurture their baby as they would like to (Beck, 2008; Hall, 2006; Haynes, 2007; Milgrom, et al., 1999). The consequences of postnatal depression impact not only the woman but has a substantial widespread effect on her partner, family, infant and the mother-infant interaction. Longer term effects of postnatal depression include deficits in the emotional, social and cognitive development of the infant, as well as economic productivity of both the woman and her partner. The difficulties that develop in these significant relationships often persist long after the maternal depressive symptoms are alleviated (Milgrom et al., 1999). The findings of early studies suggested that women who breastfed their infants were more likely to experience symptoms of postnatal depression (Alder & Bancroft, 1988; Alder & Cox, 1983). Although this view has since been refuted, this early work opened up important dialogue on the idea that infant feeding method and maternal wellbeing may be interrelated.

There are a number of methodological issues, which make the literature on depression and breastfeeding outcomes difficult to integrate and draw conclusions from. Firstly, there is a wide range of depression screening tools that are used in the literature. One of the most commonly used tools is the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987). The EPDS is a screening rather than diagnostic tool and uses a clinical cut off point of 12 to identify women at risk of postnatal depression. A common problem in the literature is that studies appear to use differing cut off points in their methodology resulting in
inconsistency and a tendency towards measuring women with either lesser or more severe symptoms of postnatal depression. For example, Hatton et al. (2005) used a cut of point of 14 on the EPDS, which indicates major depression and therefore would not have captured women with milder depressive symptoms.

Despite these methodological limitations, a recent review of the literature showed that the literature consistently shows a strong relationship between depressive symptomatology and infant feeding method, specifically, that women who breastfeed are less likely to suffer from postnatal depression (Donaldson-Myles, 2011). What is less clear in the literature is whether exclusive breastfeeding and breastfeeding for a longer duration, provides additional protection against depressive symptoms than mixed feeding. This is difficult to conclude due to variations in definitions of ‘exclusive’ breastfeeding and limitations in the way that researchers examine feeding practices.

Akman et al. (2008) measured postnatal depression and exclusive breastfeeding at 1 and 4 months postpartum, although, no operationalized definition of ‘exclusive’ was provided. This study found that the one month postpartum EPDS score for mothers who were exclusively breastfeeding at four months was significantly lower than those who were not breastfeeding (EPDS scores 6 and 12 respectively, p = .0001). Interestingly, these groups did not differ on other factors, which may contribute to depressive symptoms such as anxiety and perceived social support. This study also showed that in this sample, 87% of women with EPDS scores of 13 or above had discontinued exclusive breastfeeding by four months postpartum.

Henderson, Evans, Straton, Priest and Hagan (2003) used the EPDS to screen participants for symptoms of depression and those with scores above 12 (clinical cut
off for depression) were offered a diagnostic psychological interview by a trained clinical psychologist who diagnosed depression based on the criteria from the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association [APA], 2000). This study found that after adjustment for other significant demographic factors, women with DSM-IV diagnosed depression had 1.25 times greater risk of early cessation of ‘full’ breastfeeding (combination of Labbok & Krasovec’s (1990) ‘exclusive’ & ‘almost exclusive’ categories) than women who did not have depressive symptoms (EPDS score less than 12; 95% CI = 1.03-1.52).

Although the findings are clear in that women with less depressive symptoms appear to breastfeed for longer (Donaldson-Myles, 2011), the mechanism of this relationship is not as well understood. Whether breastfeeding itself provides functions as a protective mechanism against the development of depressive symptoms or rather the experience of depressive symptoms leads to the early cessation of breastfeeding as a consequence is not so clear. Henderson et al. (2003) found that the onset of postnatal depression in most cases occurred before the cessation of breastfeeding. Of the women who developed postnatal depression in the first six months after birth, 82% stopped breastfeeding at a time after the onset of depression and 11% stopped at the time they became depressed (Henderson, et al., 2003). A more recent study of 594 Canadian women used a time-sequenced analysis approach to examining the relationship between the timing of infant feeding outcomes and maternal postpartum depressive symptomatology (Dennis & McQueen, 2007). The aim of this study was to determine the time sequence of whether depressive symptomatology predicted infant feeding outcomes or whether infant feeding outcomes predicted depressive symptomatology. Dennis and
McQueen (2007) found no relationship between infant feeding outcomes at one week postpartum and the development of depressive symptomatology at four or eight weeks. Mothers who were bottle-feeding at one week postpartum were no more likely to have an EPDS score higher than 12 (clinical cut off) at one week, or to develop depressive symptomatology at four and eight weeks than mothers who were breastfeeding.

Dennis and McQueen (2007) found that mothers with an EPDS score greater than 12 at one week postpartum were significantly more likely at both four and eight weeks postpartum to have discontinued breastfeeding, be unsatisfied with their infant feeding method, experience significant breastfeeding problems and report lower levels of breastfeeding self-efficacy. Of the mothers who were breastfeeding at one week postpartum and discontinued by eight weeks (n = 125), 47% had at least one EPDS score greater than 12 within the first two months postpartum and 37% had an EPDS score greater than 12 at one, four and eight weeks postpartum. Taken together, these results suggest that it may not be the infant feeding method that predicts the development of postpartum depressive symptoms but rather the development of postpartum depressive symptoms in the early postpartum weeks that predict the duration of ‘full’ breastfeeding.

In contrast, there are a few studies whose findings suggest that postnatal depression and infant feeding method, particularly exclusive breastfeeding, are not related (McCarter-Spaulding & Horowitz, 2007; McKee, Zayas & Jankowski, 2004). For example, McCarter-Spaulding and Horowitz (2007) conducted a study examining the patterns of exclusive breastfeeding, combination feeding and bottle feeding among a sample of women identified with elevated postpartum depression symptoms. The sample consisted of 122 women who were participating in an
intervention for promoting maternal-infant interaction. The findings revealed that the severity of depressive symptoms was not predictive of the level of exclusive breastfeeding or any breastfeeding at all. They argued that women may receive a reciprocal emotional benefit from the experience of breastfeeding, despite feeling depressed. Their study also had a biased sample, which had a strong representation of women who are most likely to breastfeed and maintain exclusive breastfeeding (maternal age, education, income etc.). It may be that these maternal demographic characteristics may be protective and may mediate a mother’s ability to persist with breastfeeding despite their depressive symptoms.

**Intention**

Maternal breastfeeding intention is shown in the literature to be a significant modifiable variable that is predictive of breastfeeding outcomes (Bai, Middlestadt, Peng, & Fly, 2010; Blyth, et al., 2004). Women are found to most often, feed their infant by the method they intended to antenatally (Bai, et al., 2010; Dennis & McQueen, 2007; O'Brien & Fallon, 2005). Blyth et al. (2004) found that mothers who intended to breastfeed their infant for less than six months were 2.4 times more likely to have discontinued breastfeeding at four months postpartum than those who intended to breastfeed for more than 12 months (35% and 87% respectively). More recently, an Australian study of 594 mothers (Dennis & McQueen, 2007) found that the majority of women reported being satisfied with their method of infant feeding (level of breastfeeding or formula feeding) at all measured time points; 84% at one week postpartum, 82% at four weeks postpartum and 88% at eight weeks postpartum and indicated that they were feeding their infant by the method they had planned to antenatally (87%, 80% and 79% respectively).
Studies have also shown that the timing of the infant feeding decision can be related to breastfeeding outcomes. Scott, Landers, Hughes and Binns (2001) reported that women who had made the decision to breastfeed prior to becoming pregnant were more likely to still be breastfeeding when discharged from hospital (OR = 3.08, 95% CI 2.04-4.67) and less likely to have discontinued breastfeeding before six months postpartum (RR = 0.58, 95% CI 0.44-0.77). Scott et al. (2001) argued that women who have decided to breastfeed prior to pregnancy may have a stronger desire and determination to breastfeed than women who do not consider their infant feeding options until later in the pregnancy. They found that compared to a range of psychosocial and socio-demographic factors, intended duration was the strongest predictor of actual breastfeeding duration. Women who had intended to breastfeed for less than four months were over four times more likely to have discontinued breastfeeding (OR = 4.18, 95% CI 2.81-6.22) than women who intended to breastfeed for four months or more months.

Behavioural intention has also been linked to self-efficacy and it is proposed that the two constructs may go hand in hand. Kronborg and Vaeth (2004) demonstrated that the duration of exclusive breastfeeding was related positively to both maternal intention to breastfeed (p<.001) and breastfeeding self-efficacy (p<.012). Breastfeeding self-efficacy and intended duration both independently predicted exclusive breastfeeding outcomes but were also shown to predict each other. This finding may reflect that the intention to breastfeed and therefore the behaviour may be influenced by the individual’s expectation of being able to accomplish the task. New mothers who do not have strong exclusive breastfeeding self-efficacy (belief that they are capable of exclusive breastfeeding) may be less likely to intend to do so and therefore less likely to actually exclusively breastfeed.
their infant. This hypothesized interrelationship has been demonstrated in a study by DiGirolamo et al. (2005), where prenatal intention was found to be strongly predictive of breastfeeding initiation. However, intention was outweighed by the mother’s initial experiences of breastfeeding, which were more predictive of the maintenance of breastfeeding. Together these findings suggest that even when women have the intention to exclusively breastfeed their infant, difficulties in the early postpartum may affect their ability to maintain exclusive breastfeeding for their intended duration, particularly when they have low self-efficacy in their ability to successfully exclusively breastfeed their infant.

These findings highlight the intricate relationship between breastfeeding self-efficacy and breastfeeding intentions and the importance of building mother’s breastfeeding self-efficacy antenatally. O’Brien and Fallon (2005) showed that the probability of early cessation of exclusive breastfeeding was increased three-fold (OR = .27, 95% CI = .12-.60) if the infant feeding decision was made after pregnancy compared to if it was made before pregnancy. Women who make the decision to breastfeed exclusively their infant prior to birth, may have higher breastfeeding self-efficacy and greater motivation to continue through early difficulties than those who make their infant feeding decision after the birth, when they may already be experiencing difficulties and barriers to breastfeeding.

*Attitude towards Breastfeeding*

An individual’s attitude is proposed to consist of his/her beliefs about the consequences of behaviour, whether it will produce a given outcome, as well as the individual’s positive or negative evaluation of his/her own performance of the behaviour (Ajzen, 1985, 1991). Bai et al. (2010) recently used this framework of
attitude to examine the relative importance of psychosocial factors underlying a mother’s decision to continue exclusively breastfeeding to six months postpartum. They found that a woman’s attitude towards exclusive breastfeeding was a strong, independent predictor of her intention to maintain exclusive breastfeeding to six months postpartum ($\gamma = 0.67$, $P < .01$; Bai, et al., 2010).

Similarly, in a prospective cohort study of 1,163 women, Taveras et al. (2003) found that maternal attitude towards the importance of exclusive breastfeeding was associated significantly with exclusive breastfeeding duration ($p<.001$). Of the women who did not perceive exclusive breastfeeding as being important ($n = 53$; 5%), 42% ($n = 42$) had discontinued exclusive breastfeeding at two weeks postpartum and 70% ($n = 26$) by 12 weeks postpartum, compared to 12% ($n = 110$) and 36% ($n = 292$) respectively of women who perceived exclusive breastfeeding as being very important. More recently, Scott et al. (2006) compared women who scored either high (more than 65) or low (less than 65) on the Iowa Infant Feeding Attitude Scale (IIFAS) and found that women with a higher IIFAS score, showing a favourable attitude towards breastfeeding, were less likely to have discontinued predominant breastfeeding at six months than those with less favourable attitudes. Furthermore, the risk of early cessation of predominant breastfeeding before six months and of any breastfeeding at 12 months was negatively associated with a woman’s IIFAS score. Hence, women who had a positive attitude towards breastfeeding were more likely to be fully breastfeeding or feeding their infant any breast milk between one and 12 months postpartum than women who were either ambivalent or who had a negative attitude towards breastfeeding.
Scott et al. (2006) also showed that paternal attitude to breastfeeding positively influenced breastfeeding outcomes up to 12 months postpartum. Of the women who believed their partner preferred exclusive breastfeeding, 53% were still fully breastfeeding at three months 59% were still partially breastfeeding at six months postpartum. In contrast, of the women who perceived their partner to either prefer formula feeding or be ambivalent about how the infant was fed 26% were fully breastfeeding at three months and 30% were partially breastfeeding at six months postpartum. Semenic et al. (2008) also highlighted the importance of paternal attitude on breastfeeding outcomes. They found that more positive paternal attitudes towards exclusive breastfeeding relative to formula feeding were significantly associated with a longer duration of exclusive breastfeeding ($p < .04$).

To date, there have been no studies to the author’s knowledge that have examined how a woman’s attitude towards pregnancy itself may influence breastfeeding outcomes. Specifically, whether a woman’s attitude towards pregnancy itself and their experiences of pregnancy have an impact on their breastfeeding outcomes.

**Body Image**

There is very limited recent research available, which examines the effect of body image on women’s breastfeeding intentions or breastfeeding outcomes. However, given that pregnancy and the postpartum is a time of such significant changes to a woman’s body, it is likely that dissatisfaction with the changes in a woman’s body may negatively influence how she feels about her own body and breastfeeding. Early research shows that a woman’s body image becomes increasingly negative as she progresses through pregnancy (Drake, Verhulst,
Fawcett, & Barger, 1988; Moore, 1978) and reaches its peak early in the postpartum (Drake, et al., 1988). A more recent study showed that during the postpartum period, women’s feelings of fatness and their salience of weight and shape increases significantly and is strongest at six months postpartum (Clark, Skouteris, Wertheim, Paxton, & Milgrom, 2009).

The literature surrounding body image and breastfeeding outcomes tends to focus on body mass index (BMI) as a measure of body image. However, BMI is purely a calculation of weight relative to height and is most likely not the only factor contributing to poor body image. For example, an early study found that it was women’s attitude towards their body shape rather than their absolute size of the body that predicted their planned infant feeding method (Foster, Slade, & Wilson, 1996). The findings of this study also showed that women who were intending to breastfeed their infant reported being significantly more satisfied with their body shape. Whereas, women who were not intending to breastfeed were less satisfied and wanting to regain control over their bodies as soon as possible. This finding seems to be counterintuitive; qualitative studies suggest that women use breastfeeding as a means of controlling shape and losing the weight gained during pregnancy (Foster, et al., 1996). Therefore, it would seem likely that women who show more concern over their body shape would breastfeed to lose the pregnancy weight quicker.

A study of Taiwanese women found that pre pregnancy body image (which was influenced by body weight) was associated with intended breastfeeding method (Huang, Wang, & Chen, 2004). This study used the attitude to body image scale (Strang & Sullivan, 1985) and asked participants to report their feelings about their bodies pre-pregnancy and during the third trimester. The attitude to body image scale measures attitudes about ten aspects of the body; body weight, chest, waist, buttocks,
legs, feet, facial appearance, shoulder width, abdomen and hair. Strang and Sullivan (1985) found that women who had a more positive body image pre-pregnancy were more likely to exclusively breastfeed their infant than women with a more negative pre-pregnancy body image (p < .05).

More recently, studies examining obese populations have found that women with BMI’s in the obese range (greater than 30) may be less likely to initiate and continue to exclusively breastfeed (Kugyelka, Rasmussen, & Frongillo, 2004; Mok et al., 2008). Mok et al. (2008) found that breastfeeding initiation was lower for obese (48%) than normal weight (64%) mothers. Obese mothers were less likely to maintain full breastfeeding at one month and three months and reported feeling uncomfortable breastfeeding in public more often than normal weight mothers. Feeling uncomfortable (physically or psychologically) breastfeeding in public would considerably impact a mother’s ability to maintain exclusive breastfeeding for very long. Additionally, obese women report greater breastfeeding difficulties, however, were less likely to seek support for breastfeeding in the first three months postpartum (Kugyelka, et al., 2004; Mok, et al., 2008). Possible explanations for these findings include firstly, that obesity is associated with a reduced prolactin response and may lead to reduced milk production, which in turn might lead to the early cessation of breastfeeding (Rasmussen & Kjolhede, 2004). Secondly, that obese women may have difficulties getting their infants to latch on and suckle properly due to larger breast or nipple size. Thirdly, obese women may experience more embarrassment related to body shape or size while feeding in public or self-conscious about exposing their body in public or wearing clothes that make feeding easier. These factors have also been associated with reduced initiation and duration (Hoover, 2007). Additionally, body image perception is likely to be influenced by and
influence depressive symptoms. Clark et al. (2009) found that women who reported more depressive symptoms also reported higher levels of body dissatisfaction across five time points during pregnancy and postpartum (from 17 weeks gestation to 12 months postpartum). The relationship between body dissatisfaction and depressive symptoms may be an important factor influencing the early cessation of exclusive breastfeeding.

These studies have shown significant relationships between different aspects of women’s body image and breastfeeding outcomes. The literature shows that: (1) women with a more positive body image pre-pregnancy were more likely to exclusively breastfeed their infant (Huang, et al., 2004); (2) women with body mass index’s in the obese range are less likely to initiate and continue to exclusively breastfeed (Kugyelka, et al., 2004; Mok, et al., 2008) and finally, (3) a woman’s attitude towards her body shape may be more predictive of her feeding intentions more so than her physical body size (Foster, et al., 1996). Additional aspects of body image other than BMI such as perceived fatness, pre-pregnancy breast size either too large or too small and perceived attractiveness may also influence women’s exclusive breastfeeding outcomes. For example, women with small breasts may be less concerned about breastfeeding in public than women with large breasts as smaller breasts are easier to conceal under clothing when breastfeeding in public, although this has not been empirically examined. A woman’s perception of body shape, pre, during and post pregnancy, is also likely to influence her body image. A women’s evaluation of these factors may be better conceptualized as body dissatisfaction, referring to the subjective negative evaluation of one’s figure or body parts (Presnell, Bearman, & Stice, 2004). Body dissatisfaction may be a better predictor of exclusive breastfeeding outcomes than BMI in isolation (Huang, et al.,
Although body image appears to be an important factor in feeding outcomes, the actual mechanism of these relationships is still not clear. It may be that body image acts as a mediating factor on breastfeeding outcomes through influencing other factors such as depression.

**Locus of Control**

Locus of Control is a psychological construct developed from Rotter’s social learning theory (Rotter, 1966) and refers to an individual’s tendency to attribute events that occur as the result of either personal actions (internal locus of control) or external forces beyond their control (external locus of control; Rotter, 1966). Individuals with an internal locus of control are more likely to attribute events in life to their own ability, to engage in more problem focused coping strategies, to work for achievements, set and work towards long term goals and are more able to tolerate delays in reward for their efforts (Rotter, 1966). Locus of control has been used to explain, predict and change various health related behaviours (Gale, et al., 2008; Rosenstock, Strecher, & Becker, 1988; Steptoe & Wardle, 2001). However, despite the literature examining individual differences in locus of control and its influence on various health behaviour outcomes, it is a theoretical construct that has been neglected in the breastfeeding literature.

An individual’s control beliefs can vary across different behaviours, hence situation specific locus of control scales have been developed to assess individuals control beliefs across various domains. For example, the multidimensional health locus of control scale (Wallston, Wallston, & DeVellis, 1978) has been widely used to assess individuals beliefs about the personal control they hold over their own health and their health outcome. Specific to the antenatal period, the fetal health
locus of control scale (Labs & Wurtele, 1986) was developed to assess a pregnant woman’s locus of control beliefs specific to the health of her developing fetus. Women with a high internal fetal health locus of control are more likely to take personal responsibility for the health and development of their infant and hold the belief that the behaviours they engage in can influence the health and development of their infant. In a study of 789 British women, Haslam, Lawrence and Haefel (2003) examined the relationship between women’s intention to breastfeed and health related beliefs. They found that locus of control beliefs was significantly related to intention to breastfeed. Women who intended to breastfeed their infant (either exclusive breastfeeding or partial breastfeeding) were significantly more likely to have an internal locus of control (70%) than an external locus of control (30%). Women with a strong internal locus of control were also more likely to be engaging in positive health related behaviours such as taking vitamins and iron supplements during pregnancy and less likely to engage in negative health behaviours such as smoking and drinking alcohol during pregnancy (Haslam, et al., 2003).

Locus of control theory suggests that having a strong internal locus of control reduces the associated stress of a situation by changing the meaning the person attributes it (Rotter, 1966). For example, when a mother has a strong internal locus of control, rather than appraising a stressful situation (for example, her infant not latching on to the breast) as beyond her control, she holds the belief that she can take steps to influence the outcome (for example, seek help). It is through this sense of control that stress is alleviated compared to having a sense of helplessness in a situation (Haslam, et al., 2003). According to locus of control theory, individuals with high internal locus of control are more likely to take the appropriate steps to
overcome challenging life events (Rotter, 1966). For example, if a woman with a high internal locus of control was having difficulty breastfeeding, she may be more likely to seek help or advice, and pursue through the difficulties longer because of her belief that the behaviours she engages in (breastfeeding) impacts the health of her infant. This highlights that locus of control is not only a useful construct to apply to breastfeeding initiation but may also explain why some women have more motivation to breastfeeding and maintain breastfeeding by persisting through the difficulties that they face.

There is a strong relationship between locus of control beliefs and intention to breastfeeding (Haslam, et al., 2003). Hence, establishing women's maternal and fetal health locus of control beliefs during pregnancy, may help to identify those at risk of either not breastfeeding or early cessation, who may need additional support or education. Increasing a woman’s sense of control over her own and her infants health may be a modifiable factor involved with the maintenance of exclusive breastfeeding over time.

*Return to Work*

Some studies have found that women’s intention to return to work can be associated with early cessation of exclusive breastfeeding. Scott et al. (2006) showed that women who returned to work before their infant was six months old were less likely to be fully breastfeeding at six months or breastfeeding at all by 12 months postpartum (p<.01).

Studies have also shown that women’s work status before birth may also be related to breastfeeding outcomes. Clifford et al. (2006) found that mothers who worked full time outside the home during pregnancy were 33% less likely to be fully
breastfeeding at six months, than women who worked part time, casually or not at all. This is likely to be more of an indication that women who work in full time roles during pregnancy may be more likely to return to work earlier, and to a full time position, rather than the actual influence of working during pregnancy.

The impact of early return to work on breastfeeding duration is evident when comparing breastfeeding rates in countries with varying maternity leave initiatives. For example, Nordic countries who obtain high breastfeeding rates, also have generous statutory maternity leave programs (Ekstrom, Widstrom, & Nissen, 2003; Lande, et al., 2003). In Norway, women receive a total of 116 weeks of job-protected maternity leave, including 42 weeks of leave remunerated at 100 percent of normal earnings. Consequently, 85% of Norwegian infants are still receiving some breast milk at four months and 80% at six months postpartum (Lande, et al., 2003). In contrast to this, Australian maternity leave provisions provide 52 weeks of job-protected but unpaid leave, albeit almost half of Australian women are not entitled to this due to being employed on either a part-time (22%) or casual (29%) basis (Office of the status of women, 2004). Consequently, most Australian infants are mixed fed with 74% receiving some breast milk at four months of age but this drops to 48% receiving any breast milk between four to six months of age (ABS, 2013). Early return to work makes it more difficult for women to maintain breastfeeding, particularly when workplaces are not conducive to breastfeeding practices. The intention to return to work within the first six months postpartum may serve as a significant barrier for women initiating, and then maintaining, exclusive breastfeeding.
Summary and Rationale

The majority of the existing breastfeeding literature has focused on breastfeeding in general (not exclusive breastfeeding) and has focused on socio-demographic factors. As such, the association between psychosocial variables and exclusive breastfeeding outcomes is less established. Whilst there has been a shift in the literature towards examining the psychosocial factors associated with breastfeeding, the majority of this research has focused on either breastfeeding initiation or duration to only a short time in the postpartum (usually before three months). As shown in the breastfeeding rates both in Australia and internationally, this is not where the problem lies. The difficulty for women appears to be in maintaining breastfeeding, particularly exclusive breastfeeding, to 6 months post birth and there is very limited research in to what psychosocial factors may be associated with successful maintenance of exclusive breastfeeding.

Study One: A Systematic Review of the Literature

The aim of this research was to determine what psychosocial factors are implicated in a woman’s ability to successfully maintain exclusive breastfeeding to six months postpartum. In order to inform this research, Study One was a comprehensive systematic review of the literature over the past decade from the year 2000 to 2011. This review included studies that have examined the associations between psychosocial factors and exclusive breastfeeding and a duration extending to at least four to six months postpartum. The systematic review excluded studies which only focused on initiation, and which failed to define exclusive breastfeeding in accordance with either the WHO (2011) or IGAB (Labbok & Krasovec, 1990) definitions (i.e., no form of nutrition other than breast milk, including no water). The
search for eligible articles was conducted in June, 2011. The systematic review was accepted for publication in a peer reviewed journal *Midwifery* in April, 2012 and published in 2013 (see de Jager et al., 2013). The findings of this systematic review were then used to inform the methodology of Study Two and Study Three.

**Study Two: A Retrospective Investigation of the Psychosocial Variables Associated with Exclusive Breastfeeding Duration**

The aim of Study Two, which was accepted in May 2013 for publication in the journal *Midwifery*, was twofold: firstly, to compare women who exclusively breastfed to six months postpartum and those who did not on a range of psychosocial variables, and secondly, to evaluate a conceptual model of psychosocial correlates of exclusive breastfeeding duration. This study included a questionnaire comprised of both validated psychometric tests and exploratory questions. Participants reported retrospectively on their experiences at three time points; before pregnancy, during pregnancy and the first six months postpartum. This study measured factors that were identified in the systematic review as being important in relation to exclusive breastfeeding such as breastfeeding self-efficacy, depression, intention, maternal attitude as well as more exploratory factors such as locus of control, body image and coping styles. Participants were also asked to report, retrospectively, about their breastfeeding behaviour and exclusive breastfeeding outcomes up to six months postpartum.

A conceptual model based on theory and previous research findings was developed as a prediction of the interaction between psychosocial variables and exclusive breastfeeding outcomes. Path analysis was used to examine this model statistically. The conceptual model hypothesized that exclusive breastfeeding
duration would be related positively to a new mother’s positive attitude towards pregnancy, internal Locus of control, prior intentions to exclusively breastfeed and high self-efficacy. It was also hypothesized that exclusive breastfeeding duration would be negatively related to early maternal return to work and high depressive symptoms.

Finally, it was hypothesized that the impact of these relationships on exclusive breastfeeding duration will be mediated by early breastfeeding difficulties, perceived social support and maternal coping styles. The plain language statement, consent forms and questionnaire for this study are presented in Appendix B.

**Study Three: A Longitudinal Prospective Study Investigating the Role of Psychosocial Factors in Exclusive Breastfeeding Duration**

Study three, which was submitted for publication in the journal *Midwifery* in February 2014, was a longitudinal prospective study, which followed a group of women from 32 weeks gestation to six months postpartum, and was informed by the findings of the systematic review (Study One) and the findings of Study Two. The aim of Study Three was to examine the effect of psychosocial factors on exclusive breastfeeding duration to six months postpartum. Questionnaires were developed based on the findings of Study One and Study Two, with a range of psychosocial factors including psychological adjustment, body image, breastfeeding self-efficacy, intention to exclusively breastfeed and attitude towards pregnancy. Additionally, participants were asked about their breastfeeding behaviours over the past month as well as their current breastfeeding status at each time point. Participants completed questionnaires at three time points - 32 weeks gestation, two months postpartum and six months postpartum. Three models were developed to examine the effect of
psychosocial factors at the different time points on the outcome variable of exclusive breastfeeding duration. The models were statistically examined using longitudinal path analysis. Correlation analyses were also used to examine the interrelationships between psychosocial factors. The plain language statement, consent forms and questionnaires for this study are presented in Appendix C.
References


International Lactation Consultant Association, 20(1), 30-38. doi:
10.1177/0890334403261109


Clifford, T., Campbell, M., Speechley, K., & Gorodzinsky, F. (2006). Factors influencing full breastfeeding in a southwestern ontario community:


CHAPTER TWO

Study One: Psychosocial Correlates of Exclusive Breastfeeding: A Systematic Review

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This paper was submitted for publication to the journal of Midwifery. Midwifery have specific guidelines for structure, formatting and referencing. This paper was prepared in accordance with those guidelines\(^a\)
Abstract

**Background:** The World Health Organization recommends that all infants worldwide are exclusively breastfed for the first six months of life for optimal health and development. However, very few women worldwide are meeting this recommendation. Psychosocial factors have been identified as potentially modifiable factors implicated in a woman’s ability to successfully exclusively breastfeed, however there is very limited research examining these factors specifically for exclusive breastfeeding to six months duration.

**Methods:** A search of psychological, nursing and medical databases was conducted in June 2011 for studies published from 2000 to 2011 examining psychological correlates of exclusive breastfeeding to four to six months duration.

**Results:** Nine papers from eight studies were found to be eligible for the review. Psychological factors have been reported to be highly predictive of exclusive breastfeeding outcomes. Research to date shows that psychosocial factors are not only importantly implicated in exclusive breastfeeding duration but they can also be changed through intervention and experiences.

**Conclusions:** While there is a wealth of literature on the role of psychosocial factors in breastfeeding, there is very limited research specifically examining the role of psychosocial factors of exclusive breastfeeding to six months duration. Interpreting the results of the available literature is difficult due to the various methodologies and definitions of exclusive breastfeeding and small sample sizes. Further research, specifically, longitudinal cohort studies are needed which
examine psychological determinants of exclusive breastfeeding and infant feeding methods from pregnancy through to six months postpartum.

**Keywords:** Exclusive breastfeeding, breastfeeding, duration, psychosocial predictors
Background

Breastfeeding is widely recognized as the ideal form of infant feeding for optimal outcomes for both infant and mother. Breast milk is the optimal source of nutrition for the growth and development of an infant (Kramer & Kakuma, 2002; WHO, 2011). Breast milk provides infants under six months of age with all of their energy and nutrient requirements, and provides important advantages, for physical, neurological and cognitive development as well as protection from infectious diseases and allergies (Oddy et al., 2002). Babies who are not breastfed have an increased risk or morbidity and mortality from respiratory tract infections, atopic dermatitis, childhood asthma, type II diabetes, obesity and sudden infant death syndrome (Horta & Victora, 2013; Ip et al., 2007). Research suggests the health benefits of breastfeeding in general are enhanced with a longer duration and intensity of breastfeeding (Chantry et al., 2006) and it is now recognized that exclusive breastfeeding (the consumption of breast milk only) from birth to six months of age is associated with the best outcomes for both baby and mother (Kramer & Kakuma, 2002; WHO, 2011).

The World Health Organization (WHO, 2011) currently recommends that all infants worldwide are exclusively breastfed for the first six months of life, with continued breastfeeding up to two years of age. However, very few women worldwide meet this recommendation. While initiation rates of exclusive breastfeeding are as high as 96% in developed countries such as Australia (Australian Institute of Health and Welfare; AIHW, 2011), this rate dramatically declines in the first few weeks postpartum to only 15% of infants being exclusively breastfed at five months of age (AIHW, 2011) and around nine percent at six months (Australian Institute of Family Studies; AIFS, 2008; Forster et al., 2004). These rates
are fairly consistent worldwide, with less than 36% of infants being exclusively breastfed at any point less than six months of age (UNICEF, 2011).

There is a substantial amount of literature describing the socio-demographic predictors of the initiation and duration of breastfeeding (O’Brien et al., 2008; O’Brien et al., 2009; AIHW, 2011). The literature consistently shows that maternal age, socio-economic status, level of education, marital status and location are associated with breastfeeding initiation and duration. These demographic factors have not only been widely researched, they are also resistant to change. A recent study showed that psychosocial factors were more predictive of exclusive breastfeeding duration than demographic factors combined (O’Brien et al., 2008).

Given the proportion of women who are not meeting the WHO global recommendation of exclusive breastfeeding to six months, there is very limited research examining psychosocial predictors of exclusive breastfeeding duration. There is a wealth of literature examining the effects of psychosocial factors on breastfeeding in general, but given the complexity of examining exclusive breastfeeding and the small proportion of participants who achieve exclusive breastfeeding to six months, it can be very difficult to study. The aim of the current review was to identify empirical studies, from the last decade, which have examined psychosocial factors associated with exclusive breastfeeding duration. A meta-analysis was not possible given that the studies included here were too heterogeneous with very little consistency in relation to the collection and measurement of outcome data. The specific questions addressed in this review were:

1. What psychosocial factors have been investigated as correlates of exclusive breastfeeding and what do the findings reveal?
(2) What methodological issues arise in studies of exclusive breastfeeding to date?

(3) What future recommendations can be given from research to date?

Our review was based on the guidelines set out by the PRISMA statement for systematic reviews (Moher et al., 2009).

Method

Eligibility Criteria

Papers were limited to those published in peer-reviewed journals in the English language between the years 2000 to 2011. Methodology was not limited in any way. The exclusion criteria were studies that paid a particular focus on disadvantaged groups or abnormality during pregnancy (e.g., teenage pregnancy, premature birth, gestational diabetes). Additionally, studies were excluded from the review if they did not examine the duration of exclusive breastfeeding to at least four months postpartum.

Search Strategy

The search strategy involved systematically reviewing published peer-reviewed articles from the years 2000 to 2011. The databases searched included the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, psychARTICLES and psychINFO. The search was performed for research articles investigating the effect of psychosocial factors on exclusive breastfeeding duration. The key terms used are shown in Box 1. This search strategy aimed to maximize the potential of finding all relevant papers published in the last 10 years. In addition to
this search strategy, a hand search of the reference list of relevant papers was performed. The search was conducted in December 2011. An example of a full search strategy is shown in Figure 1.

**Box 2.1. Search terms**

<table>
<thead>
<tr>
<th>Search Terms</th>
</tr>
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<tr>
<td>Feeding AND Infant</td>
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<td>Determinants AND infant AND feeding</td>
</tr>
<tr>
<td>Predictors AND infant AND feeding</td>
</tr>
<tr>
<td>Psychosocial AND determinants AND feeding</td>
</tr>
<tr>
<td>Determin* AND breast* AND infan*</td>
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<tr>
<td>Psych* AND determin* AND breast* AND infan*</td>
</tr>
<tr>
<td>Psych* AND determin* AND exclusive* AND feed*</td>
</tr>
<tr>
<td>Return to work AND breastfeed*</td>
</tr>
<tr>
<td>Exclusive<em>AND breastfeed</em></td>
</tr>
<tr>
<td>Predict* AND Exclusive* AND depress*</td>
</tr>
<tr>
<td>Body image, self confidence, self-efficacy, stress, anxiety, body*, duration, locus of control</td>
</tr>
</tbody>
</table>

**Selection Process**

Studies were eligible for the review if they specifically examined psychosocial factors related to exclusive breastfeeding duration. Studies were not included that examined the effect on breastfeeding initiation or feeding method choice as this has previously been examined extensively in the literature. One author (ED) independently screened the titles and abstracts of identified citations for potential eligibility. All authors then examined the full texts of potential articles to determine eligibility for inclusion in the review.
**Data Abstraction**

Data from the studies were collated and synthesized manually, and placed into tables to allow for the comparison of the study aims, psychosocial factors investigated, definition of exclusive breastfeeding used, outcome measures, sample and methodology, measures used and findings (see Table 2.1 and Table 2.2).
Figure 2.2. Flow diagram of studies included in the review

- Records identified through database searching (n = 375)
- Additional records identified through other sources (n = 12)

Records after duplicates removed (n = 378)

Records screened (n = 378) → Records excluded (n = 300)

Full-text articles assessed for eligibility (n = 78) → Full-text articles excluded, with reasons (n = 67)
  - Did not meet EBF criteria, n = 38
  - Not psychological factors, n = 9
  - EBF initiation not duration, n = 1
  - Outcome less than 4 months PP = 7
  - Review paper, n = 8
  - Qualitative paper, n = 2
  - Descriptive paper, n = 1
  - Other, n = 1

Studies included in qualitative synthesis and review (n = 9)
Table 2.1.

**Systematic Review Table (alphabetical according to first author)**

<table>
<thead>
<tr>
<th>First author, Country</th>
<th>Psychosocial factors(s)</th>
<th>Definition of exclusive breastfeeding</th>
<th>Outcome measure (SD), Design/Method</th>
<th>Measures Used</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akman et al. 2008</td>
<td>Depression</td>
<td>‘Exclusive’ but not specifically stated what criteria</td>
<td>EBF at 1 and 4 months PP</td>
<td>Edinburgh postpartum depression scale (EPDS)</td>
<td>All mothers initiated BF, 91% &amp; 68.1% were EBF at 1 &amp; 4 months.</td>
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<tr>
<td></td>
<td>Anxiety</td>
<td></td>
<td>Participants: mothers who gave birth at university hospital June-December 2005.</td>
<td>State-trait anxiety inventory</td>
<td>EPDS scores of mothers who discontinued EBF before 4 months was significantly higher than those who were EBF (p = .002).</td>
</tr>
<tr>
<td></td>
<td>Social support</td>
<td></td>
<td>Uneventful pregnancy &amp; birth</td>
<td>Multidimensional scale of perceived social support</td>
<td>There was no difference between anxiety or social support scores between the two groups.</td>
</tr>
<tr>
<td></td>
<td>Attachment</td>
<td></td>
<td>Mean age: 29.2 years</td>
<td>Adult attachment scale</td>
<td>13.6% of mothers were at high risk for depression</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sample size: 60 participants, 37 multiparous, 32 had BF infants before</td>
<td></td>
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</tbody>
</table>
Maternal depressive symptoms, anxiety and social support were assessed at 1 month PP. Infants were examined and evaluated at 1 and 4 months PP.

(EPDS >13) 87.5% of mothers with EPDS >13 had discontinued EBF by 4 months.

Mothers at high risk of depression were less likely to be EBF (p < 0.01*).

Median state and trait anxiety scores and social support scores of mothers were not different between groups according to their EBF status.

<table>
<thead>
<tr>
<th>Bai et al. 2010</th>
<th>Maternal EBF intention</th>
<th>American Academy of Pediatrics; APA (2005) guideline: Breast milk only, either by direct nursing or using a</th>
<th>Duration of EBF: 18+, spoke English &amp; were 3 months or less postpartum. Recruited at baseline between June and October 2006 and</th>
<th>Participants: mothers who were EBF, aged</th>
<th>Baseline: Breastfeeding questionnaire; devised to measure the constructs of TPB, intention to EBF for 6 months &amp; demographic variables</th>
<th>Strong, positive correlation between intended &amp; actual EBF duration (r = 0.66, p &lt; .01*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Maternal EBF</td>
<td>American Academy of Pediatrics; APA (2005) guideline: Breast milk only, either by direct nursing or using a</td>
<td>Duration of EBF: 18+, spoke English &amp; were 3 months or less postpartum. Recruited at baseline between June and October 2006 and</td>
<td>Participants: mothers who were EBF, aged</td>
<td>Baseline: Breastfeeding questionnaire; devised to measure the constructs of TPB, intention to EBF for 6 months &amp; demographic variables</td>
<td>Strong, positive correlation between intended &amp; actual EBF duration (r = 0.66, p &lt; .01*)</td>
</tr>
<tr>
<td>Aim: To investigate the relative importance of the psychosocial factors underlying a mother’s decision to continue EBF for 6 months</td>
<td>Maternal EBF intention</td>
<td>American Academy of Pediatrics; APA (2005) guideline: Breast milk only, either by direct nursing or using a</td>
<td>Duration of EBF: 18+, spoke English &amp; were 3 months or less postpartum. Recruited at baseline between June and October 2006 and</td>
<td>Participants: mothers who were EBF, aged</td>
<td>Baseline: Breastfeeding questionnaire; devised to measure the constructs of TPB, intention to EBF for 6 months &amp; demographic variables</td>
<td>Strong, positive correlation between intended &amp; actual EBF duration (r = 0.66, p &lt; .01*)</td>
</tr>
</tbody>
</table>
months using the theory of planned behaviour.

Follow up:

Semi-structured phone interview. Outcome behaviour was assessed by asking mothers about their feeding practices at 6 months postpartum.

| Mean age: 27.4 years |
| Sample size: 78 |
| Design method: prospective cohort study |

Follow better predictors of EBF duration (p <.01*) than perceived behavioural control (p > .05*).

However, combined these 3 constructs accounted for 50.2% (p <.01*) of the variance of the intention to continue EBF for 6 months.

| Blyth et al. 2002 Australia |
| Breastfeeding SE IGAB (Labbok & Krasovec, 1990) EBF at 1 and 4 months PP |
| Participants: women in the last trimester of pregnancy recruited from antenatal clinic in a metropolitan Brisbane hospital between January and July 2001. |
| Breastfeeding status questionnaire |
| Antenatal & 1 week BFSE scores were significantly related to BF outcomes at 1 week & 4 months. Mothers with high BFSE were more likely to be EBF at 1 week & 4 months PP than mothers with low SE scores |

| Mean age: 28.5 years |
| Sample size: 300 |
| Design Method: |

Significant differences were found in antenatal BFSE scores between primiparous & multiparous with...
prospective longitudinal study. Telephone interviews were conducted at 1 week & 4 months PP to assess infant feeding methods & BF SE

previous BF experience, this difference was maintained at 1 week & 4 months PP & is consistent with BFSE theory (mastery experience)

SE assessments early in the postnatal period have increased predictive power of BF duration than antenatal SE assessment

<table>
<thead>
<tr>
<th>Blyth et al. 2004 Australia</th>
<th>Aim: to assess the effect of maternal confidence (breastfeeding self efficacy) on breastfeeding duration</th>
<th>Self efficacy</th>
<th>IGAB (Labbok &amp; Krasovec, 1990)</th>
<th>EBF at 4 months</th>
<th>Participants: women in the last trimester of pregnancy recruited from antenatal clinic in a metropolitan Brisbane hospital between January and July 2001.</th>
<th>telephone interviews assessed feeding methods at 1 week &amp; 4 months postpartum</th>
<th>92% participants initiated BF, 28.6% were EBF at 4 months.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Intention</td>
<td></td>
<td></td>
<td>Maternal intention and BFSE were significant predictors of BF duration &amp; exclusivity. Mothers with higher BFSE were more likely to breastfeed for longer, and exclusively</td>
<td>Mean age: 28.5 years</td>
<td>Sample size: 300</td>
</tr>
</tbody>
</table>
Design Method:
prospective longitudinal study.

Questionnaires containing variables of interest were administered to women during their last trimester. Telephone interviews were conducted at 1 week & 4 months PP to assess infant feeding methods & BF confidence

compared to mothers with low BFSE (79.5% v 50%)

Mothers who intended to EBF for less than 6 months were 2.45 times (OR) as likely to have discontinued EBF at 4 months than those who intended to EBF for more than 12 months (35.7% v 87.5%, p < .001*)

Women who had previous BF experience were 2.27 times more likely to be EBF at 4 months than those without previous experience (p < .05*)

There was no statistically significant relationship between perceived level of support and BF duration.
Clifford et al. 2006

Canada

Aim: To examine factors associated with Full breastfeeding at 1 weeks and 6 months PP

Maternal Anxiety
Depression

IGAB (Labbok & Krasovec, 1990)

‘Full breastfeeding’

Participants: cohort of women who had given birth in 2 obstetric hospitals in Ontario between January and September 1999. Eligible participants were English speaking, gave birth to a singleton baby of normal weight for gestational age. Women were approached prior to discharge from hospital.

Sample size: 856

Mean age: 79% > 35 years, 66% 20-34 years

Design Method:
Infant feeding information (infant nutrition and maternal health behaviours)

67.8% FBF at 1 week
22.8% FBF at 6 months

67.8% FBF at 1 week
22.8% FBF at 6 months

Associated with earlier cessation of FBF at 6 months PP:

- Elevated maternal trait anxiety at 1 week PP. Not unexpected as trait anxiety is a marker for the need to be in control. BF doesn’t allow much control for the mum

- Full time employment outside the home prior to delivery. Mothers who worked full time outside the home during pregnancy were 33% more likely to not be FBF at 6 months

State-Trait Anxiety Inventory
Edinburgh Postnatal Depression Scale
Social Behaviours Inventory

FBF at 1 week & at 6 months PP

Infant feeding information (infant nutrition and maternal health behaviours)
Questionnaires were mailed to mothers at 4 time points over the first 6 months PP (1 week, 6 weeks, 3 months, 6 months). Mothers also completed short form instruments detailing infants current cry/fuss behaviours.

**Henderson et al. 2003**

**Australia**

**Aim:** to investigate the relationship between maternal postnatal depression and breastfeeding duration.

<table>
<thead>
<tr>
<th>Henderson et al. 2003</th>
<th>Postnatal depression</th>
<th>IGAB (Labbok &amp; Krasovec, 1990)</th>
<th>Duration of full BF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australia</strong></td>
<td></td>
<td>‘Full BF’</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Full BF combines exclusive – no other liquid or solid but breast milk &amp;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Almost exclusive – vitamins, minerals, water, juice &amp; ritualistic feeds can be given infrequently</td>
<td></td>
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<tr>
<td></td>
<td>Breastfeeding status self-report questionnaires</td>
<td>Edinburgh Postnatal Depression Scale</td>
<td>Median duration of BF was 26 weeks (95% CI 21,34) for women with early onset depression, 28 (95% CI 28-39) weeks for women with late-onset depression &amp; 39 weeks (95% CI 34,43) for women without depression.</td>
</tr>
<tr>
<td></td>
<td>Mean age: 88% &gt; 25yrs age</td>
<td>Sample size: 1745</td>
<td>Early cessation of breastfeeding was significantly associated with postnatal depression (p = .025)</td>
</tr>
</tbody>
</table>

- Not having previous BF experience predicted its continuation.
months postpartum had a 1.25 times greater risk of having stopped breastfeeding than women who were not depressed at that time (95% CI 1.03, 1.52).

The onset of postnatal depression occurred before cessation of BF in 93% of cases. Of women who developed postnatal depression in the 6 months after birth, 82% stopped BF at a time after onset and 11% stopped at the time they became depressed.

<table>
<thead>
<tr>
<th>Kronborg &amp; Vaeth 2004</th>
<th>Intention</th>
<th>EBF: child being fed only on mother’s milk and receiving formula</th>
<th>EBF at 4 months PP</th>
<th>Participants: Danish mothers giving birth to a single child across September and October</th>
<th>Self-report questionnaires previously tested for acceptability and comprehension in a pilot</th>
<th>98.7% initiated BF, at 4 months PP 59% were EBF. 51% of those who stopped, did so in the first 5 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>Experience</td>
<td>Social influence &amp; subjective norms</td>
<td>Participants: Danish mothers giving birth to a single child across September and October</td>
<td>Self-report questionnaires previously tested for acceptability and comprehension in a pilot</td>
<td>98.7% initiated BF, at 4 months PP 59% were EBF. 51% of those who stopped, did so in the first 5 weeks</td>
<td></td>
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</tbody>
</table>

Aim: to examine the extent that

EBF: child being fed only on mother’s milk and receiving formula

Participants: Danish mothers giving birth to a single child across September and October

Self-report questionnaires previously tested for acceptability and comprehension in a pilot
Psychosocial factors are related to breastfeeding duration and to identify mothers with a high risk of early cessation of BF.

- **Social support** at most once a week
- **Self-efficacy**

1999.

**Sample size:** 471

**Mean age:** 28.7 years

**Design Method:**
Prospective longitudinal study. A cohort of new mothers was established and followed up for four months (17 weeks) from time of delivery.

Data was collected through self-report questionnaires given to the mothers within 3 weeks after birth

Duration of EBF positively related to intention to EBF (p = .001), previous BF experience (p < .001*), BF SE (p < .001*), confidence in BF (SE) (p = .012) and knowledge about BF (p = .001).

Cessation rate for mothers with moderate to low SE was twice as high as the rate for mothers with high SE.

SE and intended duration were both independent predictors but also mutually associated. This may reflect that the intention and therefore the behaviour is affected by the expectation of being able to accomplish the task.
<table>
<thead>
<tr>
<th>Semenic et al. 2008 Canada</th>
<th>Self-efficacy</th>
<th>IGAB (Labbok &amp; Krasovec, 1990), ‘almost exclusive breastfeeding’</th>
<th>Number of weeks of EBF</th>
<th>Participants: Women who planned to EBF for at least 6 weeks. Recruited between February and July 2003.</th>
<th>Sample size: 189</th>
<th>Socio-demographic data incl. maternal age, education, employment status, return to work, country of birth, smoking status, household income &amp; partners education</th>
<th>Most participants did not meet EBF goals – only 5% EBF for 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aim: to determine the influence of socio-demographic, psychosocial and perinatal factors on the length of exclusive breastfeeding among 189 Canadian primiparous mothers</td>
<td>Perceived support</td>
<td></td>
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<td></td>
<td>Modifiable psychosocial factors include 3 personal factors (maternal infant feeding beliefs, BFSE, perceived infant satisfaction with BF) &amp; 3 contextual factors (paternal infant feeding beliefs, general postpartum support &amp; BF informational support)</td>
<td>Higher maternal BFSE (p = .03) &amp; more positive maternal as well as paternal (p = .05) &amp; p = .04) attitudes towards BF relative to FF were significantly associated with a longer duration of EBF</td>
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<td>Breastfeeding beliefs &amp; Bottle feeding beliefs scales</td>
<td>The early introduction of solid foods accounted for cessation of EBF before 6 months among those who</td>
</tr>
</tbody>
</table>
were also telephoned at 6 weeks about their breastfeeding status and use of formula or solids, and again at 4 months and 6 months if they were still BF at the previous time point.

<table>
<thead>
<tr>
<th><strong>Scott et al. 2006</strong></th>
<th><strong>Australia</strong></th>
<th>Attitude towards infant feeding</th>
<th>WHO (1991) definitions</th>
<th>Full BF to six months PP</th>
<th><strong>Participants:</strong> women recruited from 2 maternity hospitals in Perth from September 2002 to July 2003.</th>
<th>IIFAS – Iowa Infant Feeding Attitude Scale</th>
<th>At 6 months, 45.9% of infants were receiving any breast milk, 12% were being fully BF and less than 1% were being EBF. At 12 months only 19.2% were receiving any breast milk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim:</strong> To identify factors that are associated with the duration of full BF to six months and any BF to 12 months</td>
<td></td>
<td>Exclusive = only breast milk with other liquids (including water) or solids</td>
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</table>
Fully or predominantly BF = breast milk as the main source of nourishment, with or without water-based drinks, fruit juice or oral rehydration solution but did not receive any other liquids (including breast milk substitutes) or solid.

Study investigated 'full breastfeeding' because of the few infants exclusively breastfed.

years, 30% 30-34 years

Design method:
Completed a baseline questionnaire before discharge.

Women were followed up by telephone interview at 4, 10, 16, 22, 32, 40 & 52 weeks PP.

BF duration was independently, positively associated with maternal infant feeding attitudes. Women who had a favourable attitude towards BF or intended to BF to six months were more likely to be fully BF or giving their infant any breast milk at most time points.

Risk for cessation of full BF before 6 months and any BF at 12 months was negatively associated with a woman’s IIFAS score – women with higher IIFAS scores that favoured BF were less likely to have discontinued BF than those with lower scores.

BF duration was negatively
associated with BF difficulties in the first 4 weeks. Women who had experienced difficulties with BF in the first 4 weeks had a higher risk for discontinuing full BF before 6 months and any BF before 12 months.

*Precise p value was not provided by the author

BF = Breastfeeding; EBF = Exclusive Breastfeeding; SE = Self-Efficacy; BFSE = Breastfeeding Self-Efficacy; PP = Postpartum; PPD = Postpartum Depression;
### Table 2.2

**Summary of Definitions and Methodology used to Examine Exclusive Breastfeeding**

<table>
<thead>
<tr>
<th>Study Reference</th>
<th>How Exclusive Breastfeeding was defined</th>
<th>How Exclusive Breastfeeding was measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akman et al. 2008</td>
<td>No definition or criteria for ‘exclusive’ breastfeeding was specifically stated</td>
<td>Complete dietary history of infants was obtained during home visits. Mothers were grouped according to the status of exclusivity of breastfeeding at the fourth month. Data collection: 1 week, 1 month and 4 months postpartum</td>
</tr>
<tr>
<td>Bai et al. 2010</td>
<td>American Academy of Pediatrics, 2005 Exclusive breastfeeding for 6 months is using only breast milk; fully breastfeeding, either by direct nursing or using a bottle; and giving no solids, no infant formula, no cows milk, no goats milk, no juice and no water and for the full 6 months from birth.</td>
<td>Baseline instrument was a qualitative survey. Follow up was a semi-structured telephone interview. Specific questions not specified. Mothers asked about infant-feeding practices at 6 months postpartum. Data collection: baseline (less than 3 months postpartum), 6 months postpartum</td>
</tr>
<tr>
<td>Study Authors</td>
<td>IGAB (Labbok &amp; Krasovec, 1990)</td>
<td>Self-report postal questionnaires included a measure of current breastfeeding status. The specific questions that participants were asked to determine exclusivity are not specified.</td>
</tr>
<tr>
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</tr>
<tr>
<td>Study</td>
<td>Methodology</td>
<td>Duration of Breastfeeding</td>
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<tr>
<td>Semenic et al. 2008</td>
<td>This study did not systematically assess the use of other liquids such as water or juice, therefore the definition of ‘exclusive breastfeeding’ was consistent with the IGAB (Labbok &amp; Krasovec, 1990), ‘almost exclusive breastfeeding’</td>
<td>Telephone interview about feeding status. The number of weeks of exclusive breastfeeding was calculated from maternal reports of their infants age at introduction of formula or solid foods. Specific questions are not specified. Data collection: 6 weeks, 4 months and 6 months postpartum</td>
</tr>
<tr>
<td>Scott et al. 2006</td>
<td>World Health Organization Exclusive Predominant or full Because of the small number of infants who were exclusively breastfed, using the WHO definition, which precludes the giving of water, this study investigated the duration of full breastfeeding</td>
<td>Self-report questionnaires at baseline while in the hospital or shortly after discharge. Participants were then followed up with telephone interviews. Data collection: 4, 10, 16, 22, 32, 40 and 52 weeks postpartum.</td>
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Note: IGAB – Interagency Group for Action on Breastfeeding; WHO – World Health Organization; EBF – Exclusive breastfeeding
Results

Description of Included Studies

The search strategy yielded 378 results; 78 full-text papers were assessed for eligibility and only nine papers were considered relevant for this review. Two of these papers (Blyth et al., 2002 & Blyth et al., 2004) reported data from the one study, albeit different factors were examined in each. Therefore, our review included nine published papers from eight different studies. Figure 2.2 outlines the flow diagram of studies included in this review. The original purpose of this review was to examine exclusive breastfeeding to six months, however due to changes in global recommendations during this time, and a lack of published literature, studies were included that examined a lesser duration (no less than four months postpartum) as long as the emphasis was placed on duration not initiation. Similarly, some studies were included that did not define exclusive breastfeeding in accordance with the WHO definition (no liquids or solids other than breast milk), or Interagency Group for Action on Breastfeeding (IGAB; Labbok & Krasovec, 1990) as long as they combined exclusive and predominant breastfeeding. For definitions of these terms, see Table 2.3 and Table 2.4. Four of the included studies were conducted in Australia, two in Canada, one each in Turkey, USA and Denmark. A full list of excluded studies and their reasons for exclusion can be found in Table 2.5.

Table 2.3.

World Health Organization Breastfeeding Definitions (WHO, 2008)

<table>
<thead>
<tr>
<th>Label</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Exclusive</td>
<td>The infant receives only breast milk (including expressed milk) and</td>
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<td>The infant receives only breast milk (including expressed milk) and</td>
</tr>
</tbody>
</table>
medicines (including oral rehydration solutions, vitamins and minerals), but no infant formula or non-human milk

**Predominant or Full**  
In addition to breast milk (including expressed milk) and medicines, the infant may receive water, or water-based drinks, tea or fruit juice (which are not recommended for infants), but no infant formula or non-human milk

**Complementary or partial**  
In addition to breast milk (including expressed milk), the infant receives solid or semi-solid food. This may include any food or liquid, including infant formula and non-human milk

**Breastfed or any breast milk**  
Includes all of the above definitions

**Ever breastfed**  
The infant has been breastfed, or received expressed breast milk or colostrum, at least once

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<thead>
<tr>
<th>Label</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Exclusive</td>
<td>No other liquid or solid is given to the infant</td>
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<tr>
<td>Almost Exclusive</td>
<td>Vitamins, minerals, water, juice or ritualistic feeds given infrequently in addition to breastfeeds</td>
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<tr>
<td>Partially - high</td>
<td>More than 80% of feeds are breastfeeds</td>
</tr>
<tr>
<td>Partially - medium</td>
<td>20% to 80% of feeds are breastfeeds</td>
</tr>
<tr>
<td>Partially - low</td>
<td>Less than 20% of feeds are breastfeeds</td>
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<tr>
<td>Token</td>
<td>Minimal, occasional, irregular, breastfeeds</td>
</tr>
</tbody>
</table>

Table 2.4.

*Interagency Group for Action on Breastfeeding (IGAB) Definitions (Labbok & Krasovec, 1990).*
Methodology

All of the studies in the review used self-report measures to examine both infant feeding methods and psychological constructs. In two of the studies, participants mailed the questionnaires (Clifford et al., 2006; Henderson et al., 2003) and in six of the studies telephone interviews at different time points were used to collect the data (Bai et al., 2010; Blyth et al., 2002; Blyth et al., 2004; Scott et al., 2006; Semenic et al., 2008). The specific follow up method was not specified for one study (Kronborg & Vaeth, 2004). Table 2.2 provides the time points for follow up data collection.

Outcome Measures

Of the eight studies reviewed, only three studies examined exclusive breastfeeding according to the WHO (2011) or IGAB (Labbok & Krasovec, 1990) definitions (see Tables 2.3 and 2.4) for the full recommended duration of six months postpartum (Bai et al., 2010; Henderson et al., 2003; Semenic et al., 2008). Three of the studies measured exclusive breastfeeding to four months postpartum (Akman et al., 2008; Blyth et al., 2002; Blyth et al., 2004; Kronborg & Vaeth, 2004). The remaining two studies (Clifford et al., 2006; Scott et al., 2006) measured ‘full breastfeeding’ to six months postpartum. Given the only slight differences between ‘full breastfeeding’ and ‘exclusive breastfeeding according to the WHO and IGAB definitions (see Tables 2.3 and 2.4), these studies were considered eligible to be included in the review.
Table 2.5.

List of Excluded Studies and Reasons for Exclusion in Reverse Chronological Order

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<tr>
<th>#</th>
<th>Authors</th>
<th>Reason</th>
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<tbody>
<tr>
<td>2</td>
<td>Whalen &amp; Cramton, 2010 <em>Curr Opin Pediatr</em>, 22(5), 655-663.</td>
<td>Review paper</td>
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<td>3</td>
<td>Tarrant et al., 2010 <em>BMC Pregnancy Childbirth</em>, 10(27).</td>
<td>Descriptive study</td>
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<td>4</td>
<td>Katz, Nilsson &amp; Rasmussen, 2010 <em>J Hum Lact</em>, 26(2), 138-147.</td>
<td>Not EBF or duration</td>
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<td>5</td>
<td>Kervin, Kemp &amp; Pulver, 2010 <em>Paediatr Child H</em>, 46(3), 85-91.</td>
<td>Outcome 2 weeks PP</td>
</tr>
<tr>
<td>6</td>
<td>Liu, Smith, Dobre &amp; Ferguson, 2010 <em>Obesity</em>, 18(1), 175-182.</td>
<td>Not EBF</td>
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<td>9</td>
<td>Dennis &amp; McQueen, 2009 <em>Pediatrics</em>, 123(4), e736-751</td>
<td>Review Paper</td>
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<td>10</td>
<td>Britton, McCormick, Renfrew, Wade &amp; King, 2009 *Cochrane Database of Systematic Reviews 2007, Issue 1</td>
<td>Review paper</td>
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<td>Author(s) and Year</td>
<td>Journal and Volume</td>
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<td>13</td>
<td>Gjerdingen et al., 2009</td>
<td><em>Women Health, 49</em>(6-7), 491-504.</td>
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<td>14</td>
<td>O’Brien et al., 2009</td>
<td><em>J Hum Lact, 25</em>(1), 55-63.</td>
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<td>15</td>
<td>Nichols et al., 2009</td>
<td><em>Health Educ Behav, 36</em>(2), 250-259.</td>
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<td>17</td>
<td>Guendelman et al., 2009</td>
<td><em>Pediatrics, 123</em>(1), e38-e46.</td>
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<td>19</td>
<td>Tatone-Tokuda, Dubois &amp; Girard, 2009</td>
<td><em>Health Educ Behav, 36</em>(2), 302-320.</td>
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<td>20</td>
<td>Bai, Middlestadt, Peng &amp; Flys, 2009</td>
<td><em>J Hum Nutr Diet, 22</em>(2), 134-140</td>
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<td>21</td>
<td>Li et al., 2008</td>
<td><em>Acta Paediatr, 97</em>(2), 221-225.</td>
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<td>22</td>
<td>Mok et al., 2008</td>
<td><em>Pediatrics 121</em>(5), e1319-e1324</td>
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<td>23</td>
<td>Manios et al., 2008</td>
<td><em>Public Health Nutr, 12</em>(4), 517-524.</td>
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<td>27</td>
<td>Amir &amp; Donath, 2007</td>
<td><em>BMC</em></td>
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<td>Reference</td>
<td>Journal/Year</td>
<td>Outcome/Publication Date</td>
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<td>28</td>
<td>Dennis &amp; McQueen, 2007 <em>Acta Paediatr</em>, 96(4), 590-594.</td>
<td>Outcome 8 weeks postpartum</td>
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<td>29</td>
<td>McCarter-Spaulding &amp; Horowitz, 2007 <em>MCN</em>, 32(1), 10-17.</td>
<td>Outcome 2-4 weeks postpartum</td>
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<tr>
<td>31</td>
<td>Ladomenou, Kafatos &amp; Galanakis, 2007 <em>Acta Paediatrica</em>, 96(10), 1441-1444.</td>
<td>Not EBF</td>
</tr>
<tr>
<td>33</td>
<td>Baghurst et al., 2007 <em>Midwifery</em>, 23(4), 382-391.</td>
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</tr>
<tr>
<td>35</td>
<td>Noel-Weiss et al., 2006 <em>JOGNN</em>, 35(5), 616-624</td>
<td>Outcome 8 weeks postpartum</td>
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<tr>
<td>36</td>
<td>Dunn, Davies, McCleary, Edwards &amp; Gaboury, 2006 <em>JOGNN</em>, 35(1), 87-97.</td>
<td>Outcome 6 weeks postpartum</td>
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<tr>
<td>38</td>
<td>Oddy et al., 2006 <em>Journal of Pediatr</em>, 149(2), 185-191.</td>
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<tr>
<td></td>
<td>Author(s) and Year</td>
<td>Journal/Reference</td>
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<td>43</td>
<td>Hilson, Rasmussen &amp; Kjolhede, 2006</td>
<td><em>J Nutr</em>, 136, 140-146.</td>
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<td>44</td>
<td>Rempel &amp; Fong, 2005</td>
<td><em>Psychol Health</em>, 20(4), 443-466.</td>
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<tr>
<td>47</td>
<td>Harder, Bergmann, Kallischnigg &amp; Plagemann, 2005</td>
<td><em>Am J Epidemiol</em>, 162(5), 397-403.</td>
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<td>49</td>
<td>Hilson, Rasmussen &amp; Kjolhede, 2004</td>
<td><em>J Hum Lact</em>, 20(1), 18-29.</td>
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<td>50</td>
<td>Kugyelka et al., 2004</td>
<td><em>J Nutr</em>, 134(7), 1746-1753.</td>
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<td>54</td>
<td>Haslam, Lawrence &amp; Haefeli, 2003</td>
<td><em>Fam Pract</em>, 20(5), 528-530.</td>
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<td>Dubois &amp; Girard, 2003</td>
<td><em>Can</em></td>
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<td>Journal and Year</td>
<td>Authors</td>
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<tr>
<td>58</td>
<td>Creedy et al., 2003 <em>Res Nurs Health, 26</em>(2), 143-152.</td>
<td>Not EBF duration</td>
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<tr>
<td>59</td>
<td>Dennis, 2002 <em>JOGNN, 31</em>(1), 12-32.</td>
<td>Review paper</td>
</tr>
</tbody>
</table>

**Psychosocial Factors Investigated**

Only two of the reviewed studies examined the effect of postnatal depression on exclusive breastfeeding duration (Akman et al., 2008; Henderson et al., 2003). Anxiety was examined by two studies (Akman et al., 2008; Clifford et al., 2006) and
social support was examined by five studies (Akman et al., 2008; Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth, 2004; Semenic et al., 2008). Three studies examined the effect of maternal intention to exclusively breastfeed (Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth, 2004) and three studies examined attitude towards exclusive breastfeeding (Bai et al., 2010; Scott et al., 2006; Semenic et al., 2008). One study examined the effect of maternal-infant attachment on exclusive breastfeeding duration (Akman et al., 2008). However, notably, a consistent factor examined in the literature was the effect of maternal self-efficacy on exclusive breastfeeding duration (Blyth et al., 2002; Blyth et al., 2004; Clifford et al., 2006; Kronborg & Vaeth, 2004; Scott et al., 2006; Semenic et al., 2008).

**Self-Efficacy**

Five studies examined the effect of maternal self-efficacy on exclusive breastfeeding duration. Self-efficacy refers to an individual’s confidence of their perceived ability to perform a specific behaviour (Bandura, 1977). Breastfeeding self-efficacy specifically refers to a mother’s self-perceived ability to successfully breastfeed her infant (Dennis, 1999). Four of the five studies found strong positive associations between breastfeeding self-efficacy and exclusive breastfeeding duration (Blyth et al., 2002; Blyth et al., 2004; Kronborg & Vaeth, 2004; Scott et al., 2006; Semenic et al., 2008) while one study showed no relationship (Clifford et al., 2006). The early cessation rate for mothers with low self-efficacy was up to twice as high as the cessation rate for mothers with high self-efficacy (Kronborg & Vaeth, 2004).

One study measured antenatal breastfeeding self-efficacy (Blyth et al., 2002 & Blyth et al., 2004) and found a significant relationship between this variable and
exclusive breastfeeding outcome at four months postpartum. The remaining four studies assessed self-efficacy in the early postpartum weeks (between 24 hours and 3 weeks postpartum; Clifford et al., 2006; Semenic et al., 2008; Scott et al., 2006; Kronborg & Vaeth, 2004).

One study showed that self-efficacy levels could be increased through intervention and reported that an increase in self-efficacy levels independently predicted exclusive breastfeeding duration (Semenic et al., 2008). All five of the studies highlighted the importance of the early postpartum weeks for the development of self-efficacy and found that experiencing early breastfeeding difficulties was associated negatively with exclusive breastfeeding duration (Blyth et al., 2002; Blyth et al., 2004; Scott et al., 2006; Semenic et al., 2008; Kronborg & Vaeth, 2004). However, women with high antenatal self-efficacy were more likely to “push through” these early difficulties and breastfeed exclusively (Blyth et al., 2002).

One study examined the difference in self-efficacy scores between primiparous and multiparous mothers (Blyth et al., 2002). Blyth et al. (2002) reported higher breastfeeding self-efficacy for multiparous women during pregnancy and at both one week and four months postpartum. These women were also more likely to be exclusively breastfeeding than primiparous mothers at four months postpartum. Additionally, Kronborg and Vaeth (2004) examined the effect of self-efficacy on exclusive breastfeeding intentions and reported that higher breastfeeding self-efficacy was highly correlated with intention to exclusively breastfeed and to do so for a longer duration.
**Postpartum Depression**

Two studies examined the relationship between postpartum depressive symptoms and exclusive breastfeeding duration (Akman et al., 2008; Henderson et al., 2003). Both studies used the Edinburgh Postpartum Depression Scale (EPDS; Cox et al., 1987) to measure depressive symptoms and reported a strong negative relationship between EPDS scores and exclusive breastfeeding duration. Women with increased symptoms of postnatal depression were at greater risk of early cessation of exclusive breastfeeding than women who did not show depressive symptoms.

Only one of these studies conducted a time-sequence analysis (Henderson et al., 2003), which showed that, in most cases, the onset of postnatal depressive symptoms occurred before the cessation of full breastfeeding. Of the women who developed postnatal depression in the first six months after birth, 82% stopped exclusively breastfeeding at a time after the onset of depression and 11% stopped at the time they became depressed.

**Anxiety**

One study showed strong negative correlations between maternal anxiety and exclusive breastfeeding duration (Clifford et al., 2006). However, a second study showed no relationship between anxiety scores and breastfeeding status (Akman et al., 2008). Both of these studies specifically examined differences between state and trait anxiety and reported no difference between median levels of state and trait anxiety scores for women according to their exclusive breastfeeding status.
Social Support

Five studies examined the role of perceived social support on exclusive breastfeeding duration. One study reported strong predictive power of the perceived social support from family, friends and health professionals on exclusive breastfeeding duration (Bai et al., 2010), whereas four studies found no relationship (Akman et al., 2008; Blyth et al., 2004; Kronborg & Vaeth, 2004; Semenic et al., 2008). Four of these studies were prospective longitudinal studies (Akman et al., 2008; Blyth et al., 2004; Semenic et al., 2008; Kronborg & Vaeth, 2004) and one was a prospective cohort study (Bai et al., 2010).

Intention to Breastfeed

Three studies examined the effect of intention to breastfeed on exclusive breastfeeding outcomes (Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth, 2004). All three studies reported strong positive correlations between the mother’s intended and actual duration of exclusive breastfeeding. While all three studies collected information about intended breastfeeding duration after the birth of the infant, none of the studies collected information about the maternal intentions for exclusive breastfeeding antenatally.

Attitude Towards Breastfeeding

Three studies examined the effect of maternal attitude towards breastfeeding on exclusive breastfeeding duration (Bai et al., 2010; Scott et al., 2006; Semenic et al., 2008) and reported strong predictive power of attitude for exclusive breastfeeding duration. In all three studies, women who had a positive attitude towards breastfeeding were more likely to be exclusively breastfeeding between one
and 12 months postpartum than women who were either ambivalent or had a negative attitude towards breastfeeding. Semenic et al. (2008) examined both maternal and paternal breastfeeding attitude and found a significant effect of paternal attitude on exclusive breastfeeding duration. If the infant’s father reported a preference for exclusive breastfeeding or breast milk compared to formula then the mother was more likely to exclusively breastfeed for longer.

**Discussion**

This review outlines the findings of eight recent studies that have examined psychosocial factors and their associations with exclusive breastfeeding duration. The differences between the definition adopted for exclusive breastfeeding, the wide variety of methodologies included, and outcome measures between four and six months makes comparing and integrating the findings difficult. While this review summarized the findings of each type of psychosocial factor examined separately, it is important to note that most of the reviewed studies examined a combination of these factors. The findings here suggest that the duration of exclusive breastfeeding is determined by a combination of psychosocial factors either supporting or inhibiting a woman’s ability to exclusively breastfeed for the recommended six months postpartum.

*What psychosocial factors have been investigated as correlates of exclusive breastfeeding and what do the findings reveal?*

Psychosocial factors such as self-efficacy, postnatal depression, anxiety, maternal intention to breastfeed, attitudes toward breastfeeding and social support have been implicated in exclusive breastfeeding duration. To date, the psychosocial
factor with the most empirical support is self-efficacy. The findings of the studies included in this review consistently showed that increased self-efficacy was predictive of increased duration of exclusive breastfeeding and highlight the early postpartum weeks as critical for the development of self-efficacy. Breastfeeding self-efficacy is an important variable of exclusive breastfeeding duration as, according to self-efficacy theory, it is able to predict: (a) whether a mother chooses to exclusively breastfeed or not; (b) how much effort she will expend; (c) whether she will have self-enhancing or self-defeating thought patterns; and (d) how she will respond emotionally to breastfeeding difficulties (Bandura, 1977; Dennis, 1999).

Breastfeeding self-efficacy theory identifies four ways which self-efficacy can be developed or increased: (i) mastery experience (e.g., succeeding at previous breastfeeding experiences); (ii) vicarious experiences (e.g., watching other women successfully breastfeeding); (iii) verbal persuasion (e.g., verbal encouragement from others, friends, family or health professionals); (iv) physiological states (happiness, bonding) (Bandura, 1977; Dennis, 1999).

According to breastfeeding self-efficacy theory, mothers with high self-efficacy are more likely to initiate breastfeeding, persist when they experience difficulties, adopt self-encouraging thoughts and are more likely to react positively and be able to overcome difficulties (Bandura, 1977; Dennis, 1999). The empirical findings reported here are all consistent with self-efficacy theory and highlight the concept of mastery experience. If women experience breastfeeding difficulties early in the postpartum period, they are less likely to build the confidence to be able to overcome future difficulties they may experience with breastfeeding.

Akman et al. (2008) and Henderson et al. (2003) both provide strong support for findings in the general breastfeeding literature that postpartum depressive
symptoms are related strongly to breastfeeding duration. However, an important factor in the study of the relationship of postpartum depression and infant feeding outcomes is the timing of the onset of the depressive symptoms. Henderson et al. showed that the onset of postnatal depression occurred before cessation of exclusive breastfeeding in most cases. This provides support for the time sequence of depressive symptoms on exclusive breastfeeding duration, such that depressive symptoms precede the cessation of exclusive breastfeeding rather than vice versa.

Maternal intention was consistently reported as a strong predictor of exclusive breastfeeding duration. A woman’s exclusive breastfeeding intentions can strongly predict the intensity and duration of her exclusive breastfeeding duration. Additional breastfeeding literature has shown that the timing of the infant feeding decision may be predictive of feeding outcomes and that making the decision to exclusively breastfeed before or during pregnancy is associated with a longer duration of full or exclusive breastfeeding than if the decision was made after birth (Scott et al., 2001; O’Brien & Fallon, 2005). However, all of the studies in this review only measured intention after the birth suggesting that the effect of maternal intention may be larger than indicated in this review when measured antenatally. The literature also showed that maternal breastfeeding self-efficacy and intention are highly correlated. This may reflect that the intention and therefore the behaviour may be influenced by the individual’s expectation of being able to accomplish the task. Women who don’t have the self-efficacy to believe that they are capable of succeeding at exclusive breastfeeding may be less likely to intend to do so and therefore less likely to actually exclusively breastfeed.

Although both maternal and paternal attitude towards breastfeeding and the benefits of breast milk predict exclusive breastfeeding outcomes, there is a gap in the
literature regarding how a woman’s attitude towards pregnancy itself may influence her exclusive breastfeeding outcomes. Specifically, it is not known whether women who do not enjoy or who have a negative attitude towards their pregnancy are less likely to exclusively breastfeed than women who have a positive experience and attitude towards pregnancy and the related postpartum experiences.

**What methodological issues arise in studies of exclusive breastfeeding to date?**

There are three main difficulties to measuring the correlates of exclusive breastfeeding. Firstly, there is inconsistency among the definitions used in the literature which makes it difficult to interpret data and compare studies (AIHW, 2011a). The differences in the two main definitions used in the literature (Labbok & Krasovec, 1990; WHO, 2011) may impact on research findings. For example, the specificity with the IGAB definition of exclusive breastfeeding (see Table 2.4) has meant most studies that adhere to these definitions tend to combine ‘exclusive’ and ‘almost exclusive’ as ‘fully breastfeeding’. This results in a higher proportion of women being classified as ‘fully breastfeeding’ (and possible interpreted as exclusively breastfeeding) due to the less stringent criteria having to be met. Furthermore, this may also bias research findings as it may categorize women incorrectly as having exclusively breastfed when they have not. Other studies (not included in this review) claim to measure exclusive breastfeeding, however do not follow the WHO or the IGAB guidelines and define their own criteria of ‘exclusive’ breastfeeding (Kools et al., 2006; Mok et al., 2008; Taveras et al., 2003). For example, Taveras et al. (2003) defined exclusive breastfeeding as giving no more than one and a half cups or 50% of the infants daily calories of formula per day. This means that the infant may only be breastfed 50% of the time and still be considered
to be exclusively breastfed. This inconsistency in the literature makes it difficult and confusing to compare results and interpret the findings.

Secondly, the current recommendation for exclusive breastfeeding to six months has only been in place since 2003, therefore research conducted before or around this time focused on women who had the goal of exclusively breastfeeding to four months. The Australian Institute of Health and Welfare (AIHW; 2011b) are currently developing a set of national breastfeeding indicators, which will increase the availability of more comprehensive measures for reporting and monitoring infant feeding behaviour based on the new guidelines.

Thirdly, there is a lack of validated measures for exclusive breastfeeding. For example, a common measure used is the Breastfeeding Self-Efficacy Scale (Dennis & Faux, 1999), however these questions were developed to measure a mother’s confidence in general breastfeeding, not exclusive breastfeeding, and as the literature suggests, the psychological factors for exclusive breastfeeding may be different (Bai et al., 2010). Even if the particular factors involved are not different, an individual’s confidence in their ability to breastfeed at all may be very different to their confidence in their ability to exclusively breastfeed. Additionally, although validated measures such as the Breastfeeding Self-Efficacy Scale (Dennis & Faux, 1999) and the Edinburgh Postpartum Depression Scale (EPDS; Cox et al., 1987) are widely used in the literature, for some psychosocial constructs, such valid and reliable measures are either not available or not widely used. For example, constructs such as intention to exclusively breastfeed and attitude towards exclusive breastfeeding are often measured using scales or questions developed by the researchers and are not explicitly stated in the papers; Additionally, it is unclear in the literature whether the psychosocial constructs being measured adequately capture a women’s experience of
exclusive breastfeeding, or whether there are other factors involved that have not been determined. For example, other psychosocial factors such as the actual experience of feeding the infant at the breast, a woman’s body image, the amount of exposure a women has to other women breastfeeding and her family’s beliefs about infant feeding may also be factors associated with exclusive breastfeeding, yet these factors have not been examined systematically and rigorously in previous research.

A final limitation of the reviewed literature is the very small sample sizes in studies published to date. Although the sample sizes of most studies start off adequately, many women do not achieve their goal of exclusively breastfeeding to four or six months, therefore making sample sizes across the time points quite small. For example, in a study of 189 participants, only five percent (n = 9) exclusively breastfed to six months postpartum (Semenic et al., 2008).

What future recommendations can be given from research to date?

More research is needed to further investigate the role that psychosocial factors play in the duration of exclusive breastfeeding. Studies are needed that specifically examine exclusive breastfeeding according to the WHO (2011) definitions and to six months postpartum duration. A longitudinal prospective study examining psychosocial factors and infant feeding methods throughout pregnancy and the postpartum would provide the most comprehensive view of psychosocial factors, which may lead to the early cessation of exclusive breastfeeding. This is quite novel as very few studies track women, and hence collect data, through both pregnancy and the postpartum.

Currently, there is evidence to support the efficacy of improving psychosocial factors in order to improve infant feeding outcomes. However, there
needs to be more consistency in the definitions of exclusive breastfeeding used in the literature and measures designed specifically for exclusive breastfeeding, not just breastfeeding in general. Furthermore, additional psychosocial factors such as locus of control and body image have been shown in the breastfeeding literature to be important factors for predicting breastfeeding duration. However, to our knowledge there are no studies to date examining these factors specifically for exclusive breastfeeding and therefore none eligible to be examined in this review.

Conclusion

In conclusion, considering the health benefits associated with exclusive breastfeeding for both mother and infant, and the low rate of women meeting these recommendations, there is very limited research that specifically examines correlates of exclusive breastfeeding to six months postpartum. The current literature review highlights the importance of psychosocial factors on a women’s ability to maintain exclusive breastfeeding to six months. In particular, psychosocial factors such as self-efficacy, postpartum depression and maternal breastfeeding intentions have been shown to be very strong predictors of exclusive breastfeeding outcomes. Further research is required with a wider scope of psychosocial factors, such as locus of control, body image and exposure to and beliefs around infant feeding practices, to better understand the contribution of these factors to a woman’s successful or not successful exclusive breastfeeding experience. Additionally, more refined and standardised methodologies, consistent definitions of exclusive breastfeeding and methods of measurement will improve our understanding of infant feeding practices.
References


*Pediatrics, 127*(2), 544-551.


CHAPTER THREE

METHOD

STUDY TWO: METHOD

Aim

The aim of Study Two was twofold: firstly, to compare women who exclusively breastfed to six months postpartum and those who did not on a range of psychosocial variables, and secondly, to evaluate a conceptual model of psychosocial correlates of exclusive breastfeeding duration.

Participants

The sample consisted of 174 women aged 18 years and above who had given birth between six months to two years prior. The age of the participants at the time they gave birth ranged from 20 to 39 years (M=29.3, SD=4.0) and between 21 and 40 years (M=30.8, SD=4.1) at the time of completing the study. The sample was predominantly Australian born, with 70.1% (n=122) born in Australia, 17.2% (n=30) born in the United States and 2.9% (n=5) the United Kingdom. Eighty six percent (n=150) were married, 10.3% (n=18) were in a defacto relationship and 2.8% (n=5) were either single or divorced. Twenty-nine percent (n = 50) of participants had a university post-graduate degree, 38.5% (n=67) had a university undergraduate degree, 19% (n=33) had a diploma qualification and 13.2% (n=23) highest qualification was secondary school. In this sample, 17.8% (n=44) had an annual household Australian income of less than $50,000, 37.9% (n=66) $50,000 to $90,000, 27.5% (n=48) $90,000 to $130,000 and 16.1% (n=28) more than $131,000. Fifty eight percent (n=102) worked full time during their pregnancy, 19% (n=33) worked part time, 4.6%
(n=8) worked casually, and 17.8% (n=31) did not work during the pregnancy. After giving birth, 9.2% (n=16) returned to work on a full time basis, 54.6% (n=95) returned part time, 12.6% (n=22) returned to casual work and 23.6% (n=41) did not return to work. The most commonly reported reason for returning to work was financial reasons (30%, n=40). The mean pre-pregnancy body mass index (BMI) was 25.5 (SD = 6.1) and mean postpartum BMI was 26.9 (SD = 6.9).

Sixty four percent (n=111) were first time mothers, 24% (n=42) had two children, 9.2% (n=16) had three and 3% (n=5) had four or more children. Of the participants, 59% (n=103) completed the questionnaire based on a child who was between 6 to 12 months of age, 6% (n=11) between 12 to 18 months and 34% (n=60) between 18 months to 2 years of age. Ninety six percent of participants (n=167) reported that they intended to breastfeed their infant, 3.4% (n=6) were not sure and 0.6% (n=1) did not intend to breastfeed. Of the participants who intended to breastfeed their infant, 4.6% (n=8) intended to breastfeed for less than one month, 1.7% (n=3) for 1 to 4 months, 6.3% (n=11) for 4 to six months, 34.5% (n=60) for 6 to 12 months and 52.3% (n=91) intended to breastfeed their infant for more than 12 months. In this sample, 7% (n=13) of the participants reported exclusively breastfeeding their infant for less than 1 month duration, 4% (n=8) for 1 up to 2 months, 7% (n=13) for more than 2 and up to 4 months, 49% (n=85) for more than 4 months and 31% (n=55) exclusively breastfed their infant for 6 or more months.

Materials

An online questionnaire was developed for this study. The questionnaire was divided into four sections: (1) demographic information; (2) pre-pregnancy; (3) pregnancy, and (4) postpartum. The questionnaire asked women to think back to these
time points and report on various psychosocial factors as well as their breastfeeding practices. Table 1 outlines the measures included in each section. Refer to Appendix B for the complete questionnaire.

Table 3.1.

**Table 3.1.**

*Questionnaire Time Points and Measures Included at Each Time Point*

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Pre-Pregnancy</em></td>
<td>Weight and Height (one month before pregnancy)</td>
</tr>
<tr>
<td></td>
<td>Brief COPE</td>
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<tr>
<td></td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td><em>During Pregnancy</em></td>
<td>Fetal Health Locus of Control Scale</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding intentions</td>
</tr>
<tr>
<td></td>
<td>Attitude to pregnancy</td>
</tr>
<tr>
<td></td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Depression Anxiety and Stress Scale</td>
</tr>
<tr>
<td><em>Post Pregnancy (birth to 6 months)</em></td>
<td>Hospital experiences</td>
</tr>
<tr>
<td></td>
<td>Return to work intentions &amp; outcome</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding difficulties</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding outcomes &amp; feeding practices</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding Self-Efficacy Scale</td>
</tr>
<tr>
<td></td>
<td>Depression Anxiety and Stress Scale</td>
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<tr>
<td></td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Weight and Height (six months postpartum)</td>
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<td></td>
<td>Attitude towards pregnancy in postpartum</td>
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<tr>
<td></td>
<td>Comfort breastfeeding in public (in the first six months postpartum)</td>
</tr>
</tbody>
</table>
Reliability analyses were conducted for each of the scales and subscales used in the analyses. Cronbach’s alpha scores of greater than $\alpha = .70$ are considered sufficient for the use of a scale (DeVellis, 2003). All scales had a Cronbach’s alpha score greater than or equal to $\alpha = .70$, with the exception of ‘internal locus of control’, a psychometrically validated scale which showed moderate reliability in this sample ($\alpha = .60$). Cronbach’s alpha is sensitive to item number, as such scales with less than ten items which do not meet $\alpha = .70$ or above requirement should report the mean inter-item correlation which between .2 to .4 is considered sufficient reliability (Briggs & Cheek, 1986).

**Measures**

*Maternal Demographic Information*

The questionnaire began with demographic questions about the participant. This included questions such as current age of the participant and the age of the child she was reporting on, participant’s age at the time of birth, number of children, marital status, highest level of education, family income and country of birth. Family income brackets, ranged from *Less than $30,000* to *More than $131,000* and increased in increments of $20,000. Participants indicated their highest level of education by selecting one of the following options; *Secondary school, diploma qualification, university undergraduate or university postgraduate*. Participants were asked about their employment status during pregnancy including their workload (*full time, part time or casual*), whether they return to work after the birth and the main reasons why they returned to work (*financial reasons, career opportunities or other*).
The Body Attitude Questionnaire (BAQ; Ben-Tovim & Walker, 1991) was used to measure different aspects of body image. This study used the short form of the BAQ, which consists of four subscales, ‘Feeling Fat’, ‘Strength and Fitness’, ‘Salience of Weight and Shape’ and ‘Attractiveness’. The BAQ was originally developed using an Australian sample and initial testing showed that the subscales yield valid and reliable scores with high convergent and discriminant validity and good test-retest reliability ($r = .64$ to $.90$; Ben-Tovim & Walker, 1991). The short form of the BAQ is a 28-item scale to which participants are asked to indicate to what extent they agree with each statement where one equals definitely disagree and five equals definitely agree. Items from the scale include ‘I usually felt physically attractive’ (Attractiveness), ‘I felt fat when I couldn’t get clothes over my hips’ (Feeling Fat), ‘I hardly ever thought about the shape of my body’ (Salience of Weight and Shape) and ‘I had a strong body’ (Strength).

The BAQ is not designed to yield a total ‘body attitude’ score. The subscales are scored so that a higher score represents a stronger attitude towards the aspect of body attitude being measured. For example, higher scores for ‘feeling fat’ indicates feeling fat more often or more intensely, higher scores for ‘salience of weight and shape’ indicates that the participant thinks about their weight and shape more often whereas higher scores for ‘Strength’ represents feeling stronger and fitter and higher scores for ‘Attractiveness’ indicates more perceived attractiveness. Therefore scores represent a more positive or negative attitude, depending on each particular scale. Six of the items are negatively worded and hence are reverse scored (items 2, 8, 9, 11, 13, 27). Participants completed the BAQ in all three stages of the questionnaire, however only postpartum BAQ (women’s attitude towards their body during the first six
months postpartum) was used in the path analyses. In this sample, the subscales of the BAQ had good reliability for use in the analyses. Table 2 displays the reliability statistics for the BAQ subscales at each time point.

Table 3.2.

Reliability Statistics Of The Body Attitude Questionnaire Subscales At Each Time Point

<table>
<thead>
<tr>
<th>Scale</th>
<th>Reliability</th>
<th>Number of items in scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BAQ pre-pregnancy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>.92</td>
<td>12</td>
</tr>
<tr>
<td>Strength</td>
<td>.81</td>
<td>6</td>
</tr>
<tr>
<td>Salience</td>
<td>.79</td>
<td>5</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.74</td>
<td>5</td>
</tr>
<tr>
<td><strong>BAQ during pregnancy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>.91</td>
<td>12</td>
</tr>
<tr>
<td>Strength</td>
<td>.75</td>
<td>6</td>
</tr>
<tr>
<td>Salience</td>
<td>.70</td>
<td>5</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.71</td>
<td>5</td>
</tr>
<tr>
<td><strong>BAQ postpartum</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>.93</td>
<td>12</td>
</tr>
<tr>
<td>Strength</td>
<td>.77</td>
<td>6</td>
</tr>
<tr>
<td>Salience</td>
<td>.80</td>
<td>5</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.81</td>
<td>5</td>
</tr>
</tbody>
</table>

Breastfeeding Self-Efficacy Scale – Short Form

The Breastfeeding Self-Efficacy Scale (BSES; Dennis, 1999) was developed as a behaviour specific measure of self-efficacy, measuring a mother’s confidence in
her ability to successfully breastfeed her infant. The scale was originally developed as a 33-item self-report scale and has since been refined to a 14-item short-form (BSES-SF; Dennis, 2003). The scale covers two aspects of breastfeeding self-efficacy, ‘technique’ and ‘intrapersonal thoughts’. Items regarding ‘technique’ cover the physical actions and tasks a mother performs that are necessary for successful breastfeeding for example “I can always ensure that my baby is properly latched on for the whole feeding” whereas items regarding ‘intrapersonal thoughts’ cover a mother’s perceptions of breastfeeding, including her attitudes and beliefs related to a successful breastfeeding experience such as “I can always successfully cope with breastfeeding like I have with other challenging tasks”. Each item on the scale is worded positively and preceded by the phrase “I can always”. The scores are anchored with a 5-point Likert scale (1 = not at all confident to 5 = always confident) and participants are asked to indicate to what extent they agree with each statement. The scores for each item are summed to produce a total breastfeeding self-efficacy score and produce a range from 14 to 70 with higher scores indicating a higher level of breastfeeding self-efficacy. Participants completed the BSES in the postpartum stage of the questionnaire.

Initial psychometric testing of the BSES-SF indicated that the scale is an excellent measure of breastfeeding self-efficacy and in particular, identifying women at high risk of early cessation of breastfeeding (Dennis, 2003). Comparisons were done between participant scores on the original BSES and the BSES-SF across different time points. BSES-SF scores correlated significantly with the respective BSES scores at 1 (r = 0.99), 4 (r = 0.99) and 8 (r = 0.99) weeks postpartum (Dennis, 2003). Initial psychometric testing of the BSES-SF showed a Cronbach’s alpha coefficient of $\alpha = 0.94$, inter-item correlations ranging from 0.41 to 0.73 and strong
predictive validity of exclusive breastfeeding outcome with significant differences in one week BSES-SF scores for mothers either exclusively breastfeeding compared to bottle feeding their infant at eight weeks postpartum \( t (387) = 17.56, p < .001; \) Dennis, 2003). The BSES-SF has strong construct validity, with initial testing showing significant differences between BSES-SF scores for first time mothers and mothers with previous breastfeeding experience, at 1 week \( t (481) = 4.82, p < .001 \), 4 weeks \( t (449) = 2.31, p = .2 \) and 8 weeks postpartum \( t (387) = 2.01, p = .05 \). The BSES had good reliability for use with this sample with a Cronbach alpha of \( \alpha = .95 \) (14 items) for the total BSES score. Only the total BSES score was used in the analyses.

**Depression Anxiety Stress Scale**

The Depression Anxiety and Stress Scale 21 (DASS-21) is a shortened form of Lovibond and Lovibond’s (1995) original 42-item self-report measure of depression, anxiety and stress. The DASS-21 is a 21-item self-report questionnaire used to measure the severity of symptoms common to depression, anxiety and stress. The DASS-21 is not a diagnostic tool but is widely used as a screening tool for psychiatric symptoms. Participants usually respond to each item in terms of the presence of the symptom over the last seven days, however in this study, participants were asked to respond to each item in terms of the presence of the symptom during the first six months postpartum. Each item is scored from zero (*did not apply to me at all over the last week*) to three (*applied to me very much or most of the time over the last week*). Scores for each subscale are summed and multiplied by two (for the 21 item short form) to produce an overall score for each of depression, anxiety and stress. Scores can range from zero to 126 with higher scores reflecting elevated
symptomatology. The DASS-21 can also be used to produce a total score as a measure of overall ‘psychological adjustment’. Henry and Crawford (2005) tested the validity of the DASS-21 on a large non-clinical sample (N = 1794). Cronbach’s alpha was $\alpha = .89$ for the ‘depression’ scale, $\alpha = .82$ for ‘anxiety’, $\alpha = .90$ for ‘stress’ and $\alpha = .93$ for the total ‘psychological adjustment’ scale. Participants completed the DASS in the post pregnancy stage of the study. In this study, the total score for ‘psychological adjustment’ was in the path analysis and individual subscales ‘depression’ ‘anxiety’ and ‘stress’ were used in the t-test analyses. Table 3 displays the reliability statistics for the DASS subscales.

Table 3.3.

*Reliability Statistics of the Depression Anxiety and Stress Scale Subscales*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Reliability (Cronbach’s Alpha)</th>
<th>Number of items in scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>.88</td>
<td>7</td>
</tr>
<tr>
<td>Anxiety</td>
<td>.81</td>
<td>7</td>
</tr>
<tr>
<td>Stress</td>
<td>.88</td>
<td>7</td>
</tr>
<tr>
<td>Psychological adjustment</td>
<td>.86</td>
<td>21</td>
</tr>
</tbody>
</table>

*Fetal Health Locus of Control Scale*

The Fetal Health Locus of Control Scale (FHLoC; (Labs & Wurtele, 1986) was developed as a situation specific measure of locus of control beliefs. The FHLoC scale is an 18-item measure of a mother’s control beliefs over the health and development of her fetus. Participants are asked to indicate to what extent they agree with a series of statements regarding their control over the health and development of their fetus, such as ‘the care I receive from health professionals is what is responsible
for the health of my unborn baby’ and ‘by attending prenatal classes taught by competent health professionals, I can greatly increase the odds of having a health, normal baby’. Responses are measured on a six point Likert scale with one indicating ‘strongly disagree’ to six indicating ‘strongly agree’. The FHLoC scale yields three subscales, each dimensions of locus of control: Internal (6 items), External/Chance (6 items) and Powerful Others (6 items). Each subscale has a possible range of scores from zero to 54 with higher scores indicating stronger control beliefs (e.g. higher ‘internal’ score indicates stronger internal locus of control beliefs; higher perceived control over outcomes).

Initial psychometric testing of the FHLoC scale showed factor loadings of at least .50 for each item on to their respective factors and Cronbach’s alpha reliabilities indicate strong internal consistencies for the three subscales (internal, external and powerful others) and good test-retest reliabilities (Labs & Wurtele, 1986). Participants completed the FHLoC scale in the pregnancy stage of the questionnaire. Table 4 displays the reliability statistics for the FHLoC subscales. All three subscales were used in the t-test analyses, however only the internal locus of control subscale was used in the path analyses. Internal locus of control yielded a scale reliability score of $\alpha = .60$, no item deletion was able to improve its level of internal consistency. Given that the FHLoC is a psychometrically validated scale and $\alpha = .60$ is still considered moderate reliability it was decided to retain this variable in the analyses.
Table 3.4.

**Reliability Statistics of the Fetal Health Locus of Control Scale**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Reliability (Cronbach’s Alpha)</th>
<th>Number of items in scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>.60</td>
<td>6</td>
</tr>
<tr>
<td>External</td>
<td>.75</td>
<td>6</td>
</tr>
<tr>
<td>Powerful others</td>
<td>.83</td>
<td>6</td>
</tr>
</tbody>
</table>

**Attitude Towards Pregnancy**

This scale was developed by the researchers to measure attitude towards pregnancy during pregnancy. The scale had a total of 13 items, which were anchored in a five point Likert scale ranging from one (definitely disagree) to five (definitely agree). The participants were asked to indicate to what extent each statement applied to them and how they felt during their pregnancy. The content of the items covered how women felt about the changes to their body and their experience of the pregnancy stage. Items included ‘*I was happy with my growing body during pregnancy*’ and ‘*I enjoyed being pregnant*’. Half of the items were worded positively and half were worded negatively and recoded in the scoring (items 7 to 13). Total scores ranged from 13 to 65 with a higher score indicating a more positive attitude towards pregnancy during pregnancy. Participants completed this scale in the pregnancy stage of the questionnaire. This scale met reliability criteria for use with this sample; $\alpha = .88$, 13 items).

**Attitude Towards Pregnancy in Postpartum**

This scale was developed by the researchers to measure maternal attitude towards pregnancy and postpartum experiences in the first six months postpartum.
The scale had a total of 7 items, which were anchored in a five point Likert scale ranging from one (definitely disagree) to five (definitely agree). The content of the items covered how women felt about their changes in their body and their experiences of the postpartum stage. Items included ‘I felt self conscious and embarrassed about my body shape after giving birth’ and ‘I was confident that my body would return to its previous shape by 12 months postpartum’. Half of the items were worded positively, half were worded negatively and recoded in the scoring (items 4 to 7). Scores ranged from seven to 35 with higher scores indicating a more positive postpartum attitude. Participants completed this scale in the postpartum stage of the questionnaire. Tests of scale reliability showed that the scale was reliable for use with this sample; $\alpha = .70$.

**Exclusive Breastfeeding Intention**

Participants were asked whether during their pregnancy, if they had intended on exclusively breastfeeding their infant (Yes; No; Wasn’t completely sure) and if ‘Yes’, for what duration they intended to exclusively breastfeed for (Less than 1 month; 1 to 2 months; 2 to 4 months; 4 to 6 months; 6 to 12 months). These two questions were combined in a total ‘exclusive breastfeeding intention’ score, where a higher score indicated a stronger intention to exclusively breastfeed and to do so for a longer duration. Participants completed these questions in the during pregnancy stage of the questionnaire.

**Work after Pregnancy**

Participants were asked whether they had returned to work after the birth of their child (Yes; No) and if ‘Yes’, to what work loading (Full time; Part time; Casual)
and how soon after the birth of the child (Less than 1 month; 3 to 6 months; 6 to 9 months; 9 to 12 months; I have not returned to work). These two questions were summed to form a total work after pregnancy measure. Higher scores reflected returning to work earlier and to a full time loading.

Breastfeeding Difficulties

This was a measure developed by the researchers. Participants were asked about any early difficulties they experienced with initiating or maintaining breastfeeding in the early postpartum. Participants were asked to indicate to what extent the two statements “I experienced difficulties with the initiation of breastfeeding” and “I found breastfeeding to be painful” applied to them following the birth of their infant. Participants responded on a six-point Likert scale (1 = never to 6 = always), possible range of scores was two to twelve, with higher score indicating more perceived early breastfeeding difficulties. Tests of scale reliability showed that the scale was reliable for use with this sample with Cronbach’s $\alpha = .73$).

Brief COPE

The Brief COPE (Carver, 1997) is a shortened form of the original COPE inventory (Carver, Scheier, & Weintraub, 1989). The Brief COPE is a 28-item scale, measuring both adaptive and maladaptive coping strategies. The scale yields 14 subscales, comprised of two items each. Each subscale is a different coping strategy. The scale developers do not suggest a particular method of grouping these subscales but rather suggest that if needed, researchers develop their own models of second-order factors based on the data from their individual research samples (Jacobson, 2005). In this sample, three coping strategies were combined to give an overall score
for ‘problem focused coping’ strategies (active coping, use of instrumental social support and planning), five strategies were combined to give an overall score for ‘emotion focused coping’ (use of emotional support, positive reframing, humour, acceptance and religion) and six strategies were combined to give an overall score for ‘maladaptive coping strategies’ (self-distraction, denial, substance use, behavioural disengagement, venting and self-blame). A higher score reflects more engagement in the particular style of coping. In this study, women were asked to respond to the questions in the context of how they would normally react in a stressful situation and were asked to indicate to what extent they agreed with statements such as “I turn to work or other activities to take my mind off things” (self-distraction), ‘I get emotional support from others’ (use of emotional support), ‘I criticize myself’ (self-blame) and ‘I use alcohol or other illicit drugs to make myself feel better’ (substance use).

Participants completed the COPE scale during the pre-pregnancy stage of the questionnaire. Although all three subscales yielded good scale reliabilities for use with the sample, only the ‘problem focused coping’ subscale was used in the analyses ($\alpha = .70; 6$ items).

Comfort Breastfeeding in Public

This scale was developed by the researchers to measure comfort breastfeeding in public places during the first six months postpartum. Participants were asked to what extent they agreed with five different statements such as ‘I felt comfortable breastfeeding in public’ and ‘I felt self-conscious that people may be looking at me while I was breastfeeding my baby’. Scores were measured on a five point Likert scale where one equals ‘definitely disagree’ and five equals ‘definitely agree’. The possible range of scores was five to twenty five, a higher score reflected the
individual being more comfortable breastfeeding in public places. This scale did not meet reliability criteria using Cronbach’s alpha of .70 or above (Devellis, 2003). However, this scale met reliability criteria with an inter-item correlation of .25 (4 items). This scale was completed in the post pregnancy stage of the questionnaire.

Exclusive Breastfeeding Duration

Exclusive breastfeeding duration was the outcome measure and was a single item measure, asking participants how long they exclusively breastfeed their infant for (less than one month; greater than one month but less than two months; greater than two months but less than four months; greater than four months but less than six months; six months or more). A higher score indicates longer duration of exclusive breastfeeding. This measure was used as the outcome variable in the path analysis.

Procedure

The Deakin University Human Research Ethics Committee (refer to Appendix A) approved this research. A questionnaire was developed and placed online in June 2011. The questionnaire asked women to report retrospectively on their experiences pre-pregnancy, during pregnancy and in the first six months postpartum. The sample was recruited via online social networking sites including motherhood and parenting sites. Additionally, researchers and participants also publicized information about the study via word of mouth to their own social networks. Participants aged 18 years or above and who had recently given birth between six months to two years prior, were invited to complete the online questionnaire via a web link. Before completing the questionnaire, participants were provided with a Plain Language Statement (refer to Appendix B) that informed participants they would be asked questions about their
experiences pre-pregnancy, during pregnancy and in first six months postpartum and any (emotional) risks to the participant were outlined so that participants were fully informed. Participants were also informed the study was voluntary and were advised that they may withdraw participation at any time without any negative consequences. Participants could ask any questions via contact details provided. A participant’s informed consent was inferred when the woman submitted the questionnaire. The online questionnaire was completed at the woman’s own convenience and took approximately 30 minutes to complete. Participants were not provided with any incentive or reward to participate in this study.

Data Screening

Prior to conducting analyses, the data were screened for missing values. Little’s MCAR test showed that the missing data were missing completely at random ($\chi^2 = 39885, \text{df} = 39750, p > .05$). Thirty-one cases had greater than five percent missing values, of these cases six were deemed to have too much missing data (more than 20%) and were deleted from the data set. Of the remaining cases (n = 25), 10 were purposefully missed data (for example, women who have not breastfed their baby skip the BSES-SF). For the remaining cases (n = 15) mean replacement was used to replace missing data.

Tests were conducted for normality, linearity, homoscedasticity and outliers using SPSS version 18. The Kolmogorov-Smirnov test of normality indicated that the data was not normally distributed, and thus the assumption of normality was violated (p < .05). However, given the large sample size the K-S normality test was deemed unreliable (Tabachnick & Fidell, 2007) and an analysis of outliers was used to examine the distribution of the data. Using the established cut-off points of +/- 2 for
skew and +/- 7 for kurtosis (Tabachnick & Fidell, 2007), five outliers were identified, both log and square root transformations were performed on the outlying variables and no improvements to the spread of the data were found. Therefore, due to the nature of the data these scores were deemed to reflect natural variations and were not removed from the data set. Power analyses reveal that for adequate power (.80 for effect size .20 at α = .05) a sample size of 170 is required for these analyses. This requirement was met with N=174.

**STUDY THREE: METHOD**

**Aim**

The aim of Study Three was to examine the effect of psychosocial factors on exclusive breastfeeding duration to six months postpartum in a longitudinal, prospective study.

**Participants**

A total sample of 197 participants was recruited for this study. Seventy-two participants had incomplete time points; hence a total sample of 125 women completed the study to six months postpartum. This is equal to an attrition rate of 36%. The participants in this study were aged between 22 and 47 years old (Median = 31.0, IQR = 6.75). Seventy five percent (n = 94) were married, 19% (n = 24) were in a defacto relationship and 5% (n = 6) were single. The sample was predominantly Australian born 81% (n = 101), with the remaining participants born in New Zealand 2% (n = 3), Asia 8% (n = 10), the UK/Europe 6% (n = 7) or the U.S. 2% (n = 3). In this sample, 19% (n = 24) had completed postgraduate education, 44% (n = 55) a bachelor degree, 28% (n = 35) had completed other formal education past secondary
school (certificates, diploma, advanced diploma’s etc.), 5% had a year 12 equivalent education and 3% (n = 4) had completed less than a year 12 equivalent.

At 32 weeks pregnancy 98% of participants (n = 123) intended to breastfeed (any breast milk) their infant, one participant did not intend to breastfeed and one participant was undecided. Of those intending to breastfeed, 78% (n = 96) intended to exclusively breastfeed their infant (nothing but breast milk), 16% (n = 20) were undecided and 6% (n = 7) had decided not to exclusively breastfeed. Of the participants who intended to exclusively breastfeeding their infant, 53% (n = 66) intended to do so to six months postpartum, 23% (n = 29) for four to five months, 6% (n = 7) for three to four months, 1% (n = 2) for two to three months, 1% (n = 2) for one to two months and 1% (n = 2) intended to exclusively breastfeed for less than one month.

At six months postpartum 12% (n = 15) of participants reported they were currently exclusively breastfeeding their infant, 1% (n = 2) reported using breastfeeding and formula, 6% (n = 8) were using formula only, 39% were breastfeeding and giving their infant solids, 21% were breastfeeding, formula and solids and 20% (n = 25) were feeding their infant formula and solids only. Of the participants who were not currently exclusively breastfeeding at six months postpartum, 88% (n = 97) reported exclusively breastfeeding for a period of time. Of these participants, 33% (n = 37) reported exclusively breastfeeding for between five to six months, 24% (n = 26) for more than four but less than five months, 12% (n = 13) for less than four but more than three months, 4% (n = 5) for less than three but more than two months, 6% (n = 7) for less than two months but more than six weeks and 12% (n = 13) reported exclusively breastfeeding for less than six weeks.
Approximately half the participants (n = 64) in this study were pregnant for the first time (primigravida). At 32 weeks gestation, women who had been pregnant at least one time previously (multigravida) were more likely to intend to exclusively breastfeed their infant for longer (M = 8.70, SE = .14) than primigravida participants (M = 7.96, SE = .23). This difference was statistically significant t(85) = -2.71, p < .01. However this difference in intention did not translate into behaviour as there was no significant differences between multigravida and primigravida women and exclusive breastfeeding duration at 2 months t(20) = -1.69, p > .05, or at 6 months postpartum t(121) = .40, p = >.05.

Materials

There were three questionnaires developed for this study. The questionnaires asked women to report on various psychosocial factors as well as their breastfeeding practices and exclusive breastfeeding status. Table 5 outlines the measures included in each section. Refer to Appendix C for the complete questionnaires. As the questionnaires for this study were developed based on the findings of Study One and Study Two, some of the measures are the same. As such, a description of the measure and the original psychometric properties will not be repeated here, please refer back to the materials section of Study Two in this chapter. The additional measures are described below. There are some measures, which were included in the questionnaires but were not included in the analyses due to reduced power and initial non-significant associations between the variable with other psychosocial variables and the outcome measure.
Table 3.5.

*Study Three Time Points and the Measures Included*

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 weeks gestation</td>
<td>Demographic information</td>
</tr>
<tr>
<td></td>
<td>Attitude towards pregnancy</td>
</tr>
<tr>
<td></td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Exclusive breastfeeding intention</td>
</tr>
<tr>
<td></td>
<td>Depression Anxiety Stress Scale</td>
</tr>
<tr>
<td></td>
<td>Fetal Health Locus of Control</td>
</tr>
<tr>
<td></td>
<td>COPE</td>
</tr>
<tr>
<td></td>
<td>Motivation to exclusively breastfeed</td>
</tr>
<tr>
<td></td>
<td>Importance to exclusively breastfeed</td>
</tr>
<tr>
<td></td>
<td>Confidence to exclusively breastfeed</td>
</tr>
<tr>
<td>2 months postpartum</td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding Self-Efficacy Scale</td>
</tr>
<tr>
<td></td>
<td>Depression Anxiety Stress Scale</td>
</tr>
<tr>
<td></td>
<td>COPE</td>
</tr>
<tr>
<td></td>
<td>Current feeding practices</td>
</tr>
<tr>
<td></td>
<td>Exclusive breastfeeding status</td>
</tr>
<tr>
<td>6 months postpartum</td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding Self-Efficacy Scale</td>
</tr>
<tr>
<td></td>
<td>Depression Anxiety Stress Scale</td>
</tr>
<tr>
<td></td>
<td>COPE</td>
</tr>
<tr>
<td></td>
<td>Multidimensional Health Locus of Control</td>
</tr>
<tr>
<td></td>
<td>Motivation to exclusively breastfeed</td>
</tr>
<tr>
<td></td>
<td>Importance to exclusively breastfeed</td>
</tr>
<tr>
<td></td>
<td>Confidence to exclusively breastfeed</td>
</tr>
<tr>
<td></td>
<td>Current feeding practices</td>
</tr>
<tr>
<td></td>
<td>Exclusive breastfeeding status</td>
</tr>
</tbody>
</table>
Measures

Maternal Demographic Information

Maternal demographic information was included in the first questionnaire at 16 weeks gestation. Demographic information included the participant’s age, how many weeks pregnant she was and current marital status (Married; Divorced; Defacto; Separated; Widowed; Never married/single). Additionally, country of birth, highest level of education and annual family income was collected. Family income was specified by participants choosing an income bracket, which ranged from ‘Under $25,000’ to ‘$105,000 – 125,000’ and increased in increments of $20,000. Participants indicated their highest level of education by selecting one of the following options; Still at secondary school; Did not finish secondary school; Year 12 or equivalent; Certificate level; Advanced diploma/Diploma; Graduate diploma/Graduate certificate; Bachelor degree; Postgraduate degree. Finally participants were asked the number of children they had not including the current pregnancy.

Body Attitude Questionnaire- Short Form

In this study, the Body Attitude Questionnaire (BAQ; Ben-Tovim & Walker, 1991) was included at all three time points. This study only used three of the subscales; Attractiveness, Salience of weight and shape and Feelings of fatness. All three subscales at each time point were included in the path analyses. The subscales met reliability criteria at each time point (see Table 6). For more information on this scale refer back to pages 98 to 99.
Table 3.6.

*Reliability Statistics of the Body Attitude Questionnaire Subscales at Each Time Point*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Reliability (Cronbach’s Alpha)</th>
<th>Number of items in scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 weeks gestation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>.92</td>
<td>12</td>
</tr>
<tr>
<td>Salience</td>
<td>.77</td>
<td>5</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.72</td>
<td>5</td>
</tr>
<tr>
<td>2 months postpartum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>.93</td>
<td>12</td>
</tr>
<tr>
<td>Salience</td>
<td>.83</td>
<td>5</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.74</td>
<td>5</td>
</tr>
<tr>
<td>6 months postpartum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>.95</td>
<td>12</td>
</tr>
<tr>
<td>Salience</td>
<td>.85</td>
<td>5</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.85</td>
<td>5</td>
</tr>
</tbody>
</table>

*Breastfeeding Self-Efficacy Scale – Short Form*

The Breastfeeding Self-Efficacy Scale (BSES; Dennis, 1999) was measured at both two months postpartum and six months postpartum. The BSES met scale reliability criteria for use with this sample; $\alpha = .96$ at both time points. For more information on this scale refer back to pages 99 to 101.

*Depression Anxiety Stress Scale*

The Depression Anxiety and Stress Scale (DASS-21) was used in this study as a measure of ‘psychological adjustment’. Scores for each subscale are summed and
multiplied by two to give a total score. Higher scores indicate a higher level of symptomatology and poorer psychological adjustment. The DASS was included at each time point in this study. Psychological adjustment met scale reliability criteria at all three time points; α = .93; α = .85; α = .88 respectively. For more information on this scale refer back to pages 101 to 102.

*Attitude Towards Pregnancy*

Attitude towards pregnancy was measured at 32 weeks gestation. This scale met the reliability criteria for use with this sample; α = .87. For more information on this scale refer back to page 104.

*Fetal Health Locus of Control Scale*

The Fetal Health Locus of Control Scale (FHLoC; Labs & Wurtele, 1986) was included in the 32 weeks gestation time point. This scale met reliability criteria for use within this sample; Internal α = .91; External α = .79; Powerful others α = .73. The FHLoC was not included in the main analyses as initial correlation analyses showed that the FHLoC had no significant relationships between other psychosocial variables or exclusive breastfeeding outcomes. For more information on this scale refer back to pages 102 to 103.

*Multidimensional Health Locus of Control Scale*

The Multidimensional Health Locus of Control Scale (MHLC; Wallston, Wallston, & DeVellis, 1978) was included in study three as a more general measure of health locus of control beliefs (i.e. not specific to fetal health). This scale was measured at six months postpartum. The MHLoC did not meet reliability criteria for
use with this sample with Cronbach’s alpha scores of; Internal $\alpha = .43$; External $\alpha = .14$; Powerful others $\alpha = .18$. As such, the MHLoC was not included in the main analyses. Additionally, initial correlation analyses showed that the MHLoC had no significant relationships between other psychosocial variables or exclusive breastfeeding outcomes.

**Brief COPE**

The COPE scale was included in this study at 32 weeks gestation and at two months postpartum. The scale met reliability criteria for use with this sample; Problem focused coping $\alpha = .93$; Emotion focused coping $\alpha = .85$; Maladaptive coping $\alpha = .79$. This scale was not included in the main analyses as initial correlation analyses showed that the COPE had no significant relationships between other psychosocial variables or exclusive breastfeeding outcomes. For more information on this scale refer back to pages 106 to 107.

**Exclusive Breastfeeding Duration**

Exclusive breastfeeding duration was the outcome measure and was a single item measure, asking participants how long they exclusively breastfeed their infant for (less than 1 month; greater than 1 month but less than 2 months; greater than 2 months but less than 4 months; greater than 4 months but less than 6 months; 6 months or more). A higher score indicates longer duration of exclusive breastfeeding. This measure was used as the longitudinal outcome variable in three path analyses.
Procedure

The Deakin University Human Research Ethics Committee and Melbourne Health granted Ethics approval for this study (see Appendix A). Participants in the current study were part of a longitudinal study examining the health and wellbeing of women throughout pregnancy and the first 12 months postpartum: The Maternal and Infant Wellbeing Study (MIWS). Participants were recruited via advertising on mother, child and baby forums, parenting magazines, baby and children’s markets, obstetrician referrals, general media advertising and through a publically funded antenatal clinic located in the Western metropolitan region of Melbourne, Victoria, Australia.

Those interested in participating contacted the project manager, who then mailed out the cover letter, plain language statement, consent forms (see Appendix C), and a reply paid envelope, to their nominated address. These documents provided participants with information regarding the names and contact details of the researchers, the purpose of the study, types of questions asked, the frequency and type of data collection and the approximate time it would take to complete each questionnaire (10 to 30 minutes). Additionally, information on confidentiality and the possible benefits and risks of participating in the study were provided. The participants were informed that participation was voluntary and were advised that they may withdraw participation at any time without any negative consequences.

Those who agreed to participate returned their signed consent forms in the reply paid envelopes. Participants were coded and only ID numbers were printed on questionnaires. The written self-administered questionnaire packs were mailed out to the participants to a nominated address at each time point with a cover letter, questionnaire pack (for the corresponding time point) and returned paid postage
envelope for participants to return the questionnaire once completed. Participants were sent the questionnaire one week prior to the required time point (e.g. 1 week before they were due to be 6 months postpartum). Participants were asked in the cover letter to complete and return the questionnaire as soon as possible. As part of the MIWS study, participants completed questionnaires at 18 time points from 16 weeks gestation to 12 months postpartum. Participants were rewarded for their continued participation in the study with a $30 Coles Myer gift voucher upon return of their one month postpartum questionnaire and again on return of their 12 month postpartum questionnaire.

A data tracking file was kept with detailed records of each time point, the date that each participant was due to receive each questionnaire (i.e., the date each participant would be 1 months postpartum etc.). Once the questionnaires were returned, they were screened for missing data and for any clinically significant scores on the DASS or EPDS. Participants who scored 12 or more (clinical cut off for postnatal depression) on the EPDS were promptly sent a distress letter with information of how to access support services if required. The data from the questionnaire was entered into SPSS (version 21; IBM, 2013). A record was kept of the date each questionnaire was sent out and the date it was received back. Participants who did not return a questionnaire were followed up with an email reminder and if participants missed multiple time points they received a telephone call to a nominated contact number. This study incorporated measures in the questionnaires at three time points; 32 weeks gestation (Time 1), two months postpartum (Time 2) and six months postpartum (Time 3).
Data Screening

Prior to conducting analyses, the data were screened for missing values. Participants who were missing one or more complete time points were removed from the dataset (n = 73). In all of these cases the six month postpartum time point was missing, hence there were no outcome measures for these participants. On the remaining data Little’s MCAR test showed that the missing data was missing completely at random ($\chi^2 = 11211$, df = 58983, p > .05). Thirty-eight cases had greater than five percent missing values, none of these cases had more than 20% missing data and as such were retained in the dataset. The replacement method expectation maximization was used to replace this missing data.

Tests were conducted for normality, linearity, homoscedasticity and outliers using SPSS version 21. The Kolmogorov-Smirnov test of normality indicated that the data was not normally distributed, and thus the assumption of normality was violated (p < .05). However, given the large sample size the K-S normality test was deemed unreliable (Tabachnick & Fidell, 2007) and an analysis of outliers was used to examine the distribution of the data. Using the established cut-off points of +/- 2 for skew and +/- 7 for kurtosis (Tabachnick & Fidell, 2007), ten outliers were identified. Both log and square root transformations were performed on the outlying variables and no improvements to the spread of the data were found. Therefore, due to the nature of the data these scores were deemed to reflect natural variations and were not removed from the data set.

Power analyses reveal that for adequate power (.80 for effect size .20 at $\alpha = .05$) a sample size of 130 was required for the analyses in this study. The sample size of N = 125 fell short of this, thus increasing the likelihood of the null hypothesis
would be supported. The results of this study are interpreted with caution given the reduced power in this study.
References


CHAPTER FOUR

Study Two: The Role of Psychosocial Factors in Exclusive Breastfeeding to Six Months Postpartum

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b This paper was submitted for publication to the journal of Midwifery. Midwifery have specific guidelines for structure, formatting and referencing. This paper was prepared in accordance with those guidelines
Abstract

**Objective:** To investigate the psychosocial variables associated with the ability to exclusively breastfeed to six months postpartum. Additionally, to evaluate a conceptual model of psychosocial correlates of exclusive breastfeeding duration.

**Design:** Online, retrospective questionnaire.

**Setting:** The questionnaire was placed online and participants accessed it through social networking sites including groups relating to breastfeeding, motherhood and parenting. Participants were also able to share the link with their own networks. This online setting facilitated recruitment of a wide range of Australian and international participants.

**Participants:** 174 women aged 18 years and older who had given birth between six months to two years prior. Participants completed an online questionnaire, which asked them to report on three time points: pre-pregnancy, during pregnancy and during the first six months postpartum. Data were collected from June to December 2011.

**Measurements:** Psychometrically validated tools such as the Breastfeeding Self-Efficacy Scale, Body Attitude Questionnaire, Depression Anxiety and Stress Scale, Fetal Health Locus of Control Scale, and the brief COPE scale were used to measure psychosocial variables. Additional scales were developed by the researchers and met scale reliability criteria.

**Findings:** Correlation analyses, t-tests and path analysis were used to statistically analyse the data. Results showed that women who exclusively breastfed to six months postpartum exhibited higher intention to exclusively breastfeed, breastfeeding self-efficacy, comfort breastfeeding in public, perceived physical strength and reported less perceived breastfeeding difficulties. Path analyses
indicated that breastfeeding self-efficacy was a strong significant predictor of both exclusive breastfeeding intention and duration. Maternal attitude towards pregnancy (both during pregnancy and postpartum), psychological adjustment and early breastfeeding difficulties were also found to be significant predictors of exclusive breastfeeding intention and duration.

**Key conclusions:** Psychosocial factors are likely to play a significant role in the maintenance of exclusive breastfeeding for 6 months post birth. Future research should adopt a prospective study design to examine the influence of psychosocial factors systematically and rigorously.

**Implications for practice:** Longitudinal, prospective studies are needed to further examine the role of psychosocial factors on exclusive breastfeeding outcomes. Interventions, which involve improving psychosocial factors such as breastfeeding self-efficacy, may improve exclusive breastfeeding outcomes.

**Keywords:** Exclusive breastfeeding, breastfeeding duration, psychosocial factors
Introduction

The World Health Organization (WHO) recommends that for optimal health and development, all infants worldwide should be exclusively breastfed for the first six months of life (WHO, 2011). Exclusive breastfeeding is defined as the consumption of breast milk only (including expressed milk and medicines) and excludes infant formula, non-human milk, water or water-based drinks, tea or fruit juice (WHO, 2008). Exclusive breastfeeding provides the infant with all of the nutrients required for optimal growth and development during this period and has significant benefits for mother, infant and society (Kramer & Kakuma, 2002; Oddy et al., 2002; Cattaneo et al., 2006). For infants, breast milk provides important advantages for physical, neurological and cognitive development, as well as the protection from allergies, infectious and non-communicable diseases (Oddy et al., 2002; Horta & Victora, 2013; Ip et al., 2007; Huh et al., 2011). Maternal benefits of breastfeeding include reduced postpartum bleeding, assisted post-birth weight loss (Kramer & Kakuma, 2002) and protection against breast and ovarian cancers (Ip et al., 2007). Breastfeeding reduces the financial cost of infant feeding on both families and societies and reduces the burden of disease associated with some non-communicable childhood diseases (Cattaneo et al., 2006). When compared to breastfeeding in general, exclusive breastfeeding has been associated with increased health outcomes (Kramer & Kakuma, 2002). Studies have shown that the protective effects of breast milk are enhanced with a longer duration of exclusive breastfeeding (Kramer & Kakuma, 2002; Chantry et al., 2006) and may provide further protection against diseases such as childhood obesity (Gillman et al., 2008; Huh et al., 2011) and maternal diabetes (Stuebe et al., 2005).
Despite these well-documented benefits of exclusive breastfeeding, very few women worldwide are meeting the World Health Organization’s recommendation of exclusive breastfeeding to six months postpartum. In 2003 the National Health and Medical Research Council (NHMRC) articulated the goal that 50% of infants should be exclusively breastfed for the first six months. However, the most recent data shows that Australians are falling well below this target. In Australia, the most recent data comes from the 2011 to 2012 National Health Survey (Australian Bureau of Statistics; ABS, 2013). This report showed that during these years, 92% of children aged zero to two years had received breast milk at some stage. However, only 17% of children aged six months to two years had been exclusively breastfed to at least six months of age. Promisingly though, almost three quarters (74%) of children were receiving some breast milk at four months, an increase of around 10% from the last National study in 2004 (Australian Institute of Family Studies, 2008). Similar rates have been shown for other western countries, with 14% of infants born in the USA in 2004 exclusively breastfed for six months (Centers for Disease Control and Prevention, 2011) and in 2005 only 17% of Canadians and less than 1% of UK infants, were exclusively breastfed to six months (Millar & Maclean 2005; Bolling et al., 2007). Developing countries report the highest rates of exclusive breastfeeding with 38% of infants being exclusively breastfed between four and six months postpartum (UNICEF, 2011).

There is currently a wealth of literature describing the socio-demographic predictors of the initiation and duration of breastfeeding (O’Brien et al., 2008; O’Brien et al., 2009; Australian Institute of Health and Welfare, 2011). In contrast, much less is known about the influence of psychosocial factors on exclusive breastfeeding. Recently, O’Brien et al. (2008) showed that psychosocial factors, such
as breastfeeding self-efficacy, dispositional optimism, faith in breast milk, anxiety and breastfeeding intentions were more predictive of breastfeeding duration than the demographic factors combined. Additionally, the findings of a recent systematic review showed that there is very limited research specifically examining exclusive breastfeeding using well recognized, standardized definitions of exclusive breastfeeding such as that recommended by the WHO, and to the recommended duration of six months postpartum (de Jager et al., 2013).

In the past 12 years, only eight studies have examined the influence of psychosocial factors on exclusive breastfeeding for four to six months postpartum, showing that maternal self-efficacy (Blyth et al., 2002; Blyth et al., 2004; Kronborg & Vaeth, 2004; Semenic et al., 2008), depression (Henderson et al., 2003; Akman et al., 2008), anxiety (Clifford et al., 2006), intention to breastfeed (Blyth et al., 2004; Kronborg & Vaeth 2004; Bai et al., 2010), attitude towards breastfeeding (Scott et al., 2006; Semenic et al., 2008; Bai et al., 2010), and social support (Bai et al., 2010), are associated with exclusive breastfeeding for at least 4 months.

Hence, in preparation for a longitudinal study which will track women from early pregnancy through to the first year postpartum, we conducted a preliminary study with women who had given birth in the last two years (2009 and 2010), asking them to recall their pre-pregnancy, pregnancy and postpartum experiences in relation to psychosocial factors and exclusive breastfeeding outcomes. Retrospective recall of infant feeding practices and other factors related to pregnancy (including pre pregnancy weight, pregnancy complications and breastfeeding practices) have been shown to be salient and reliable due to these phases in women’s lives being perceived as highly significant (Launer et al., 1992; Tomeo et al., 1999). Most of the research to date has examined the effect of individual psychosocial variables on
exclusive breastfeeding outcomes directly. However, it is likely that the predictors of
exclusive breastfeeding are multi-factorial. Our proposed model of psychosocial
predictors of exclusive breastfeeding duration was informed by the findings of our
systematic review (de Jager et al., 2013), which specifically examined psychosocial
factors and exclusive breastfeeding duration past four months postpartum. Some of
the proposed pathways are exploratory and have not been previously investigated in
the exclusive breastfeeding literature (e.g., the relationship between body attitude
and comfort breastfeeding in public). The rationale for the factors and paths to
exclusive breastfeeding included in this model is provided henceforth.

The literature has consistently reported that a woman’s level of breastfeeding
self-efficacy is strongly related to exclusive breastfeeding duration and that
experiencing early breastfeeding difficulties is negatively related to both
breastfeeding self-efficacy and exclusive breastfeeding duration (Blyth et al., 2002;
Blyth et al., 2004; Kronborg & Vaeth 2004). Maternal intention is one of the
strongest predictors of actual exclusive breastfeeding outcomes (Blyth et al., 2004;
Kronborg & Vaeth 2004; Bai et al., 2010) and women with higher breastfeeding self-
efficacy are more likely to intend to exclusively breastfeed and do so for a longer
duration (Kronborg & Vaeth, 2004); these findings are reflected as paths in Figure 1.

Various studies have shown significant relationships between different
aspects of women’s body image and breastfeeding outcomes. For example, studies
have shown that: (1) women with a more positive body image pre-pregnancy were
more likely to exclusively breastfeed their infant (Huang et al., 2004); (2) women
with body mass index’s in the obese range are less likely to initiate and continue to
exclusively breastfeed (Kugyelka et al., 2004; Mok et al., 2008); and finally, (3) a
woman’s attitude towards her body shape may be more predictive of her feeding
intentions more so than her physical body size (Foster et al., 1996). Although body image appears to be an important factor in feeding outcomes, the actual mechanism of these relationships is not clear. Clark et al. (2009) showed that during the postpartum period, women’s feelings of fatness and their salience of weight and shape increases and is strongest at six months postpartum. Hence, our model proposes that different aspects of body image may indirectly impact exclusive breastfeeding duration via their impact on ‘comfort breastfeeding in public’. That is, if a woman has strong ‘feelings of fatness’ or ‘salience of weight and shape’, then she may be more self-conscious or reluctant to have any part of her body exposed in public.

Psychosocial factors such as depression and anxiety have previously been linked to early cessation of breastfeeding (Henderson et al., 2003; Akman et al., 2008). Consistent with self-efficacy theory (Bandura, 1977; Dennis, 1999), our model proposes that the mechanism for this effect may be through negative psychological symptoms precipitating early breastfeeding difficulties and reduced breastfeeding self-efficacy. Based on previous literature, maternal attitude is predicted to have a strong relationship with breastfeeding outcomes (Scott et al., 2006; Semenic et al., 2008; Bai et al., 2010). Additionally, while exploratory in nature, it is hypothesized that there will be a relationship between attitude towards pregnancy and breastfeeding self-efficacy. Based on self-efficacy theory, it may be likely that women who have a more negative attitude towards pregnancy have less confidence in their ability to perform pregnancy related behaviours such as breastfeeding (Dennis, 1999). Additionally, women who report a more negative attitude towards pregnancy and the postpartum may experience breastfeeding difficulties and have lower self-efficacy to overcome these difficulties, which in turn
may adversely affect their breastfeeding outcomes (Bandura, 1977; Dennis & Faux, 1999). Finally, locus of control theory (Rotter, 1966) states that people with a higher internal locus of control have the belief that their own actions determine their behavioural outcomes. Although, not widely used in the breastfeeding literature, locus of control has been used to explain and predict change in different health related behaviours (Rosenstock et al., 1988) and may be an important factor in exclusive breastfeeding duration. Haslam et al. (2003) showed that women who planned to breastfeed had a significantly higher internal locus of control than those who did not and that these women were more likely to engage in positive health related behaviours throughout their pregnancy. According to locus of control theory (Rotter, 1966; Labs & Wurtele, 1986), women with a high internal locus of control may be more likely to engage in problem-focused coping styles when faced with breastfeeding difficulties, which may contribute to a stronger breastfeeding self-efficacy, and in turn increase their intention to exclusively breastfeed.

The aim of this study was twofold: firstly, to compare women who exclusively breastfeed to six months postpartum and those who do not on a range of psychosocial variables, and secondly, to evaluate a conceptual model of psychosocial correlates of exclusive breastfeeding duration.
Figure 4.1. Proposed path model of the association between psychosocial factors and exclusive breastfeeding duration
Method

Sample

The sample consisted of 174 women who had given birth between six months to two years prior to participation. Participants were eligible to complete the study if they were 18 years or above and had given birth within the last two years. Participants were later excluded who had not reached six months postpartum at the time of completing the study. Australian and International participants took part in this study. Of the participants, 71% (n=124) were born in Australia, 14% (n=24) in the United States and 15% (n=26) in the European Union. A questionnaire was developed and placed online in June 2011. Participants were invited to complete the questionnaire via social networking sites including motherhood and parenting sites. Before completing the questionnaire, participants were provided with a Plain Language Statement and submitting the questionnaire online was considered their consent for participation.

Ethical Consideration

Deakin University ethics committee approval was granted for this study.

Data Collection

The online questionnaire was completed at the participants’ convenience and took approximately 30 minutes to complete. The questionnaire was divided into four sections: (1) demographic information; (2) pre-pregnancy; (3) pregnancy, and (4) postpartum and asked women to think back to these time points and report on various psychosocial factors as well as their breastfeeding practices. Table 4.1
outlines the measures included in each section. The data were collected between June and December 2011.

Measures

The following psychosocial variables were assessed in this study. Table 4.1 shows the time points that each measure was included in the retrospective questionnaire. For each measure, the possible range of scores and scale reliability statistic is provided in Table 4.2.

Table 4.1.

*Questionnaire Time Points and Measures Included at Each Time Point*

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Measures</th>
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<td><em>Demographic Information</em></td>
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<td>Parity</td>
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<td>Marital status</td>
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<td>Level of education attained</td>
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<td>Household income</td>
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<td></td>
<td>Work status, before and during pregnancy</td>
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<td>Weight and Height (one month before pregnancy)</td>
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<td>Fetal Health Locus of Control Scale</td>
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<td></td>
<td>Breastfeeding intentions</td>
</tr>
<tr>
<td></td>
<td>Attitude to pregnancy</td>
</tr>
<tr>
<td><em>Post Pregnancy (birth to 6 months)</em></td>
<td>Hospital experiences</td>
</tr>
</tbody>
</table>
Attitude Towards Pregnancy

A scale of 13 items was developed by the researchers to measure participant’s attitudes towards pregnancy. The participants were asked to indicate to what extent each statement applied to them and how they felt during pregnancy. The content of the items covered how women felt about the changes to their body and their experience of the pregnancy stage. Items included ‘I was happy with my growing body during pregnancy’ and ‘I enjoyed being pregnant’. Higher scores indicated a more positive attitude towards pregnancy. The scale met reliability criteria for use within this sample.

Attitude Towards Pregnancy in Postpartum

A scale of 7 items was developed by the researchers to measure participants’ attitudes towards pregnancy and postpartum experiences in the first 6 months postpartum. The content of the items covered how women felt about their changes in their body and their experiences of the postpartum stage. Items included ‘I felt self-conscious and embarrassed about my body shape after giving birth’ and ‘I was
confident that my body would return to its previous shape by 12 months postpartum’. Higher scores indicated a more positive postpartum attitude. The scale met reliability criteria for use within this sample.

**Body Attitude Questionnaire- Short Form**

The short form of the Body Attitude Questionnaire (BAQ; Ben-Tovim & Walker, 1991) consists of four subscales: ‘Feeling Fat’, ‘Strength and Fitness’, ‘Salience of Weight and Shape’ and ‘Attractiveness’. The scale was developed using an Australian sample and initial testing showed that the subscales yield high convergent and discriminant validity and good test-retest reliability (r = .64 to .90). Higher scores indicate stronger perceptions of each subscale (Ben-Tovim & Walker, 1991). In this study, BAQ scores reflect women’s attitude towards their body during the first six months postpartum.

**Breastfeeding Difficulties**

Participants were asked about any early difficulties they had with initiating or maintaining breastfeeding. A higher score indicated more perceived early breastfeeding difficulties.

**Breastfeeding Intention**

Participants were asked whether before giving birth they had intended on exclusively breastfeeding their infant and if so, for what duration. These two questions were recoded and combined in a total ‘breastfeeding intention’ score, where a higher score indicated intention to exclusively breastfeed for a longer duration.
Breastfeeding Self-Efficacy Scale – Short Form

The 14-item Breastfeeding Self-Efficacy Scale (BSES-SF; Dennis & Faux, 1999) measures a mother’s confidence in her ability to successfully breastfeed her infant. Higher scores indicate higher levels of breastfeeding self-efficacy. Psychometric testing of the BSES-SF showed strong predictive validity of exclusive breastfeeding outcomes with significant differences in self-efficacy for mothers exclusively breastfeeding compared to bottle-feeding their infant (p < .001; Dennis, 2003). The BSES-SF also has strong construct validity, with significant differences between scores for first time mothers and mothers with previous breastfeeding experience, at 1 week (p < .001) and 8 weeks postpartum (p < .05; Dennis 2003).

Brief COPE

The Brief COPE (Carver, 1997) is a shortened form of the original COPE inventory (Carver et al., 1989), which has shown to be useful in health related research. The Brief COPE is a 28-item scale, which comprises 14 commonly used coping strategies. This was included in the pre-pregnancy time point of the questionnaire as an indication of participants coping style prior to having a baby. For this study, three coping strategies (active coping, use of instrumental social support and planning) were combined to give an overall score for use of ‘problem focused coping’ strategies. A higher score reflects more engagement in problem focused coping strategies.
Table 4.2.

Means, Standard Deviations and Inter Correlations among Psychosocial Factors Implicated
in Exclusive Breastfeeding

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<td>25.2</td>
<td>12.2</td>
<td>37.1</td>
<td>15.9</td>
<td>19.6</td>
<td>3.3</td>
<td>18.2</td>
<td>7.2</td>
</tr>
<tr>
<td>SD</td>
<td>1.2</td>
<td>0.9</td>
<td>1.5</td>
<td>8.4</td>
<td>4.6</td>
<td>13.1</td>
<td>7.3</td>
<td>21.9</td>
<td>3.8</td>
<td>11.0</td>
<td>3.8</td>
<td>4.4</td>
<td>1.8</td>
<td>3.1</td>
<td>2.3</td>
</tr>
<tr>
<td>α</td>
<td>.88</td>
<td>.70</td>
<td>.95</td>
<td>.60</td>
<td>.86</td>
<td>.80</td>
<td>.93</td>
<td>.81</td>
<td>.77</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Range of scores 1-6 0-3 2-9 13-60 7-35 14-70 0-54 0-126 5-25 12-60 5-25 6-30 1-6 6-24 2-10

α = Cronbach’s Alpha (Scale reliability), BF = breastfeeding, EBF = exclusive breastfeeding, FHLoC = fetal health locus of control, BFSE = breastfeeding self-efficacy, PFC = problem focused coping, PP = postpartum *Correlation is significant at the 0.05 level ** Correlation is significant at the 0.01 level
**Comfort Breastfeeding in Public**

Participants were asked about their level of comfort breastfeeding in public places during the first six months postpartum. Higher scores reflect the individual being more comfortable breastfeeding in public places.

**Depression Anxiety Stress Scale**

The Depression Anxiety Stress Scale 21 (DASS-21) was used to measure symptoms of depression, anxiety and stress as well as an overall measure of psychological adjustment. The DASS-21 is an efficient, reliable screening measure for clinical symptoms of depression, anxiety and stress (Lovibond & Lovibond, 1995). Validity testing in a non-clinical sample (n = 1794) yielded reliability scores of $\alpha = .82$ to $\alpha = .93$ for each of the scales and total scores (Henry & Crawford, 2005). Generally, participants are asked to respond to each item in terms of the presence of the symptom over the last seven days. In this study, participants responded in the context of how they felt during the first six months postpartum. Higher scores reflect elevated symptomatology.

**Exclusive Breastfeeding Duration**

This was a single item measure, asking participants how long they exclusively breastfed their infant (1 = less than 1 month, 2= greater than 1 month but less than 2 months, 3= greater than 2 months but less than 4 months, 4= greater than 4 months but less than 6 months, 5 = 6 months or more). The World Health Organization’s definition of exclusive breastfeeding was included in this question to ensure accuracy of the participant’s interpretation of ‘exclusive’ breastfeeding (WHO, 2008). This was used as the outcome variable in the path analysis.
**Fetal Health Locus of Control Scale**

The Fetal Health Locus of Control Scale (FHLoC; Labs & Wurtele, 1986) is an 18-item measure of a mother’s control beliefs over the health and development of her fetus. The FHLoC was administered in the ‘during pregnancy’ section of the questionnaire and participants were asked to think back to while they were pregnant and answer to what extent they agreed to a series of statements. Subscales are scored for three dimensions of locus of control: Internal, External/Chance and Powerful Others. Higher scores indicate stronger control beliefs in each of the domains. Initial testing of the scale showed factor loadings of at least .50 for each item and Cronbach’s alpha reliabilities indicate strong internal consistencies for the subscales (Labs & Wurtele, 1986).

**Work After Pregnancy**

Participants were asked whether they had returned to work after the birth of their child and to what loading. These two questions were recoded and summed to form a total work after pregnancy measure. Higher scores indicate returning to work earlier and to a full time loading.

**Data Analyses**

Correlational analyses using SPSS version 20 (IBM corporation, 2011) were performed to examine the interrelationships between the psychosocial variables examined in this study and exclusive breastfeeding duration. Table 4.2 displays the correlation matrix. Descriptive statistics were analysed for two groups: women who exclusively breastfed to 6 months postpartum and women who did not.
Independent samples t-tests were used to statistically compare the differences between the mean scores on psychosocial variables. Finally, a path analyses was run using AMOS (version 20; IBM corporation, 2011) to test the proposed conceptual model of the relationships between the psychosocial factors on exclusive breastfeeding duration (Figure 4.1). Model fit was measured using chi-square goodness-of-fit statistics, the chi-square divided by degrees of freedom (CMIN/DF; < 3 denoting good fit), the comparative fit index (CFI; good fit >.95, acceptable fit >.90; Hu & Bentler, 1999), and the root mean square error of approximation (RMSEA; good fit <.06, acceptable fit <.08; Hu & Bentler, 1999).

Figure 4.2 illustrates the path model with the significant pathways in bold. Note that this is the full model and not a reduced model recomputed with non-significant pathways removed. The reported values in Figure 4.2 are the standardised regression weights of the model. Standardised regression weights indicate the strength of a relationship between a given predictor and an outcome in a standardised form. It is interpreted as the change in the outcome variable (in standard deviations) associated with a one standard deviation change in the predictor variable (Field, 2009). Additionally, the correlations between the factors in the path model are included in the analysis however are not depicted in Figure 4.2 for ease of interpretation, and are instead presented in Table 4.4. The standardised regression weights for the non-significant pathways are displayed in Table 4.5.

Given that the majority of reported effects in this study are correlations, Pearson’s r is reported as an effect size. Effects based on group differences (t-tests) have been transformed into r-based effects for consistency. Pearson’s r estimates the amount of variance explained in the model, \( r = .10 \) is considered a small effect, \( r = .30 \) a medium effect and \( r = .50 \) a large effect (Cohen, 1992).
Reliability analyses were conducted on the scales and subscales used in the analyses. Cronbach’s alpha scores of greater than $\alpha = .70$ are considered sufficient for the use of a scale (DeVellis, 2003). All scales had a Cronbach’s alpha score greater than or equal to $\alpha = .70$ (see Table 4.2), with the exception of ‘internal locus of control’, a psychometrically validated scale which showed moderate reliability in this sample ($\alpha = .60$). The possible range of scores for each scale is shown in Table 4.2. Finally, power analyses reveal that for adequate power (.80 for effect size .20 at $\alpha = .05$) a sample size of 170 is required for these analyses. This requirement was met with the study’s sample size of 174 participants.

Findings

The age of the participants at the time they gave birth ranged from 20 to 39 years ($M=29.3$, $SD=4.0$). Sixty four percent ($n=111$) were first time mothers, 24% ($n=42$) had two children, 9.2% ($n=16$) had three and 3% ($n=5$) had four or more children. Of the participants, 59% ($n=103$) completed the questionnaire based on a child who was between 6 to 12 months of age, 6% ($n=11$) between 12 to 18 months and 34% ($n=60$) between 18 months to 2 years of age. In this sample, 7% ($n=13$) of the participants reported exclusively breastfeeding their infant for less than 1 month duration, 4% ($n=8$) for 1 up to 2 months, 7% ($n=13$) for more than 2 and up to 4 months, 49% ($n=85$) for more than 4 months and 31% ($n=55$) exclusively breastfed their infant for 6 or more months.
Figure 4.2. Significant pathways in path model of the association between psychosocial factors and exclusive breastfeeding duration.

**p=<0.01; **p=<0.001
Study aim 1: to compare women who exclusively breastfeed to six months postpartum and those who do not on a range of psychosocial variables

Table 4.3 reports the mean scores and standard deviations for each of the psychosocial variables examined separately for both women who did and did not exclusively breastfeed to six months postpartum. Independent samples t-tests were conducted to examine differences in mean scores and the results are presented in Table 4.3. The results showed that women who exclusively breastfed for six or more months postpartum had higher scores on their intention to exclusively breastfeed (p < .01), level of breastfeeding self-efficacy (p < .001), perceived postpartum strength (p < .01), and level of comfort breastfeeding in public (p < .001) and lower scores on reported breastfeeding difficulties (p < .001).

Table 4.3.
Means, Standard Deviations (in parenthesis) and T-Test of the Psychosocial Variables for Women grouped by Exclusive Breastfeeding Duration

<table>
<thead>
<tr>
<th>Variable</th>
<th>EBF &lt; 6 months</th>
<th>EBF 6 or &gt; months</th>
<th>t</th>
<th>p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant age</td>
<td>30.5 (4.7)</td>
<td>30.9 (3.9)</td>
<td>-.64</td>
<td>.522</td>
<td>.05</td>
</tr>
<tr>
<td>Infant age</td>
<td>1.26 (.59)</td>
<td>1.25 (.63)</td>
<td>.05</td>
<td>.964</td>
<td>.00</td>
</tr>
<tr>
<td>EBF duration</td>
<td>2.1 (.98)</td>
<td>4.5 (.63)</td>
<td>-13.5</td>
<td>.000***</td>
<td>.72</td>
</tr>
<tr>
<td>EBF intention</td>
<td>7.4 (1.8)</td>
<td>8.3 (1.3)</td>
<td>-2.9</td>
<td>.005**</td>
<td>.40</td>
</tr>
<tr>
<td>BFSE</td>
<td>41.3 (14.9)</td>
<td>59.5 (9.6)</td>
<td>-6.8</td>
<td>.000***</td>
<td>.46</td>
</tr>
<tr>
<td>Attitude to pregnancy</td>
<td>54.3 (8.5)</td>
<td>56.2 (8.3)</td>
<td>-1.2</td>
<td>.226</td>
<td>.09</td>
</tr>
<tr>
<td>Postpartum attitude</td>
<td>24.4 (4.6)</td>
<td>25.3 (4.7)</td>
<td>-1.0</td>
<td>.299</td>
<td>.08</td>
</tr>
<tr>
<td>Early BF difficulties</td>
<td>4.3 (1.8)</td>
<td>3.1 (1.7)</td>
<td>3.7</td>
<td>.000***</td>
<td>.27</td>
</tr>
<tr>
<td>Psych adjustment</td>
<td>30.8 (27.9)</td>
<td>23.7 (19.9)</td>
<td>1.4</td>
<td>.164</td>
<td>.21</td>
</tr>
<tr>
<td>Depression</td>
<td>9.4 (9.7)</td>
<td>6.0 (6.4)</td>
<td>1.9</td>
<td>.057</td>
<td>.29</td>
</tr>
<tr>
<td>Anxiety</td>
<td>7.0 (8.5)</td>
<td>5.8 (6.3)</td>
<td>.78</td>
<td>.439</td>
<td>.12</td>
</tr>
<tr>
<td></td>
<td>Mean 1</td>
<td>Mean 2</td>
<td>SD 1</td>
<td>SD 2</td>
<td>Z</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>------</td>
</tr>
<tr>
<td>Stress</td>
<td>14.4 (11.1)</td>
<td>11.9 (9.5)</td>
<td>1.3</td>
<td>.180</td>
<td>.10</td>
</tr>
<tr>
<td>FHLoC Internal</td>
<td>41.3 (6.9)</td>
<td>41.4 (7.4)</td>
<td>-.12</td>
<td>.907</td>
<td>.00</td>
</tr>
<tr>
<td>FHLoC External</td>
<td>27.9 (9.1)</td>
<td>25.0 (11.3)</td>
<td>1.4</td>
<td>.164</td>
<td>.11</td>
</tr>
<tr>
<td>FHLoC Powerful</td>
<td>18.4 (7.7)</td>
<td>15.1 (10.1)</td>
<td>1.8</td>
<td>.077</td>
<td>.13</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling fat</td>
<td>40.3 (10.0)</td>
<td>36.3 (11.1)</td>
<td>1.9</td>
<td>.055</td>
<td>.15</td>
</tr>
<tr>
<td>Strength</td>
<td>17.6 (4.3)</td>
<td>20.1 (4.2)</td>
<td>-3.1</td>
<td>.002**</td>
<td>.23</td>
</tr>
<tr>
<td>Salience of shape and</td>
<td>13.1 (4.6)</td>
<td>11.9 (3.6)</td>
<td>1.3</td>
<td>.185</td>
<td>.20</td>
</tr>
<tr>
<td>weight</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attractiveness</td>
<td>14.9 (3.9)</td>
<td>16.2 (3.8)</td>
<td>-1.8</td>
<td>.074</td>
<td>.14</td>
</tr>
<tr>
<td>Comfort BF in public</td>
<td>6.0 (2.4)</td>
<td>7.5 (2.1)</td>
<td>-3.7</td>
<td>.000***</td>
<td>.27</td>
</tr>
<tr>
<td>PFC</td>
<td>18.0 (3.0)</td>
<td>18.3 (3.1)</td>
<td>-.57</td>
<td>.569</td>
<td>.04</td>
</tr>
<tr>
<td>Return to work</td>
<td>1.4 (.83)</td>
<td>1.4 (.95)</td>
<td>.34</td>
<td>.733</td>
<td>.03</td>
</tr>
</tbody>
</table>

**Note:** PFC = problem focused coping; *p=<.05; ** p=<.01; *** p=<.001

**Study aim 2: to evaluate a conceptual model of psychosocial correlates of exclusive breastfeeding duration to six months postpartum**

The fit indices suggest that the path model provides an acceptable fit to the data, $\chi^2=143.3$ (76), $p < .001$, CMIN/DF = 1.88, CFI = .90, and RMSEA = .07. The path model estimated 60 parameters (pathways). Of these, 9 directional pathways and 13 co-variances were significant. Breastfeeding self-efficacy was found to be the only variable directly associated with exclusive breastfeeding duration. Psychological adjustment and postpartum attitude were both significantly associated with early breastfeeding difficulties, which was associated with breastfeeding self-efficacy. Both breastfeeding self-efficacy and attitude during pregnancy were significantly associated with a woman’s intention to exclusively breastfeed. However, in this sample, intention was not related directly to exclusive breastfeeding duration. Perceived body image was not found to be associated with comfort.
breastfeeding in public, although psychological adjustment was. A woman’s perceived strength was significantly associated with her level of breastfeeding self-efficacy.

Table 4.4.
**Correlations Between Factors in the Path Analysis Model**

<table>
<thead>
<tr>
<th></th>
<th>Correlation</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pregnancy attitude</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological adjustment</td>
<td>-.32</td>
<td>.000***</td>
</tr>
<tr>
<td>Attitude to pregnancy in postpartum</td>
<td>.39</td>
<td>.000***</td>
</tr>
<tr>
<td>Work after pregnancy</td>
<td>-.01</td>
<td>.916</td>
</tr>
<tr>
<td>BAQ attractiveness</td>
<td>.09</td>
<td>.174</td>
</tr>
<tr>
<td>BAQ feeling fat</td>
<td>-.14</td>
<td>.020*</td>
</tr>
<tr>
<td>Internal locus of control</td>
<td>.14</td>
<td>.039*</td>
</tr>
<tr>
<td><strong>Postpartum attitude</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAQ attractiveness</td>
<td>.47</td>
<td>.000***</td>
</tr>
<tr>
<td>BAQ feeling fat</td>
<td>-.43</td>
<td>.000***</td>
</tr>
<tr>
<td>Psychological adjustment</td>
<td>-.15</td>
<td>.017*</td>
</tr>
<tr>
<td><strong>BAQ ‘salience of weight and shape’</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAQ feeling fat</td>
<td>.52</td>
<td>.000***</td>
</tr>
<tr>
<td>BAQ attractiveness</td>
<td>-.21</td>
<td>.003**</td>
</tr>
<tr>
<td>BAQ strength</td>
<td>-.20</td>
<td>.011*</td>
</tr>
<tr>
<td><strong>BAQ ‘feeling fat’</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAQ attractiveness</td>
<td>-.45</td>
<td>.000***</td>
</tr>
<tr>
<td>BAQ strength</td>
<td>-.20</td>
<td>.004*</td>
</tr>
<tr>
<td><strong>BAQ ‘strength’</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAQ attractiveness</td>
<td>.31</td>
<td>.000***</td>
</tr>
</tbody>
</table>

*Note:* * p=<0.05; ** p=<0.01; *** p=<0.001
The standardised regression weights for the non-significant pathways are displayed in Table 4.5. Although these pathways were not significant, it is worth noting that the direction of these relationships is consistent with the model only not strong enough to reach significance level with this sample. For example, ‘feeling fat’ was negatively associated with ‘comfort breastfeeding in public’ and ‘internal locus of control’ was positively related to ‘breastfeeding self-efficacy’.

The correlations between the factors in the path model are presented in Table 4.4. Psychological adjustment was shown to be significantly associated with both pregnancy attitude \((r = -.32, p < .001)\) and postpartum attitude \((r = -.15, p < .05)\). Although three of the body image variables (salience of weight and shape, feeling fat, and attractiveness) were not directly associated with comfort breastfeeding in public (as predicted in the model), they were significantly correlated with variables with significant pathways, suggesting that the effect of body image on comfort breastfeeding is indirect. For example, postpartum feeling fat was correlated significantly with both pregnancy attitude \((r=-.14, p < .05)\) and postpartum attitude \((r = -.43, p < .001)\), which was also highly correlated with postpartum attractiveness \((r = .47, p<.001)\).

Table 4.5.

*Standardised Regression Weights and P Values for Non-Significant Pathways*

<table>
<thead>
<tr>
<th>Regression weights</th>
<th>(\beta) (beta weights)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>To ‘exclusive breastfeeding duration’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comfort BF in public</td>
<td>-.02</td>
<td>.80</td>
</tr>
<tr>
<td>Intention to EBF</td>
<td>.11</td>
<td>.09</td>
</tr>
<tr>
<td>Early BF difficulties</td>
<td>.10</td>
<td>.22</td>
</tr>
<tr>
<td>Problem focused coping</td>
<td>-.04</td>
<td>.55</td>
</tr>
</tbody>
</table>
Discussion

This study was a retrospective study, asking women who had given birth in the last six months to two years to report on their experiences pre-pregnancy, during pregnancy and the first six months postpartum. Although maternal recall of the antenatal period is considered valid and reliable (Tomeo et al., 1999), there are limitations inherent to a retrospective design. Specifically in this study, subsequent antenatal experiences may have influenced the woman’s recall and bias. Subsequent breastfeeding experiences are likely to influence women’s reports on their breastfeeding self-efficacy and may bias their memory of true levels of self-efficacy.
in the early postpartum period of the infant they were reporting for. However, only 24% (n=42) of the women in this study had one other child; accordingly, this limitation may have minimally impacted present findings.

The use of online questionnaires for research has become a quick and effective way of reaching a wide range of participants. Advantages of online research include gaining access to specific and unique populations, time efficiency (for both participants and researchers) and reduced cost (Wright, 2005). These advantages to online research were important for this study given the population of women with young children. The main identified disadvantages of online research are sampling issues, particularly participant characteristics and self-selection biases (Wright, 2005). This was controlled as much as possible in this study by having a demographic section, where participant characteristic information was collected and participants who did not meet the eligibility criteria were removed from the study. Self-selection biases are difficult to control in both online and traditional methods (Wright, 2005). In this current study, 49% (n = 85) reported exclusively breastfeeding their infant for greater than four months and 31% (n=55) for six or more months. These figures are well above the Australian average (17% at 6 months; ABS, 2013) and appear to be representative of a biased sample. It is possible that women who are motivated to complete a questionnaire on breastfeeding are those who have had a positive experience, whereas women who did not have a positive experience or did not exclusively breastfeed may not want to complete a breastfeeding questionnaire. This assumption is supported by the anecdotal data collected in this study. Participants were provided the opportunity to comment and of the 174 participants, 110 wrote a comment and of these comments only 4% (n=4).
expressed difficulties or negative feelings towards their experiences with breastfeeding.

Although the current study had limitations inherent within a retrospective design, the exploratory purpose of the study was achieved. Consistent with the previous literature, we found that breastfeeding self-efficacy was the strongest correlate of exclusive breastfeeding duration (see systematic review, de Jager et al., 2013). According to breastfeeding self-efficacy theory, mothers with high breastfeeding self-efficacy are more likely to initiate exclusive breastfeeding, persist when they experience difficulties, adopt self-encouraging thoughts, react more positively and be able to overcome difficulties (Dennis, 1999). This is demonstrated in our results through the negative association between perceived early breastfeeding difficulties and breastfeeding self-efficacy. When grouped by exclusive breastfeeding status, women who did not exclusively breastfeed to six months postpartum reported significantly more early breastfeeding difficulties and significantly lower breastfeeding self-efficacy. This is consistent with previous studies, which have highlighted the importance of maternal experiences in the early postpartum for the development of breastfeeding self-efficacy (Blyth et al., 2002; Kronborg & Vaeth, 2004; Semenie et al., 2008). According to self-efficacy theory one way to develop or increase self-efficacy is through ‘mastery of experience’ (e.g., drawing on past experiences of success in the behaviour; Bandura, 1977; Dennis, 1999). According to ‘mastery of experience’ it is important for new mothers to experience small successes with breastfeeding early in the postpartum in order to develop their confidence and ability to overcome obstacles and persist with breastfeeding. This also emphasizes the importance of assessing and promoting antenatal breastfeeding self-efficacy. Blyth et al. (2002) showed that women with
high antenatal self-efficacy were more likely to overcome early breastfeeding difficulties and exclusively breastfeed for a longer duration and Semenic et al. (2008) showed that early postpartum self-efficacy levels enhanced through intervention were independently predictive of exclusive breastfeeding duration.

Also consistent with both self-efficacy theory (Dennis, 1999) and previous literature (Kronborg & Vaeth, 2004) is the relationship in our model between self-efficacy and intention. The higher self-efficacy an individual has in their ability to breastfeed, the more likely they are to intend to exclusively breastfeed their infant. However, it was surprising that although breastfeeding self-efficacy was associated with intention and duration, a mother’s intention to exclusively breastfeed was not associated with exclusive breastfeeding duration. This is inconsistent with previous research, which has shown that women more often than not, feed their infant by the method and for the duration which they intended to (Blyth et al., 2004; Kronborg & Vaeth 2004; Bai et al., 2010). These studies all examined breastfeeding intentions in the early postpartum, whereas other authors have shown that having the intention to exclusively breastfeed either before or during pregnancy may be predictive of a longer duration of exclusive breastfeeding than if the decision was made after birth (Scott et al., 2001; O’Brien & Fallon, 2005). Accordingly, this study asked women to report what their exclusive breastfeeding intentions were during pregnancy. The non-significance of this pathway is also surprising given the interrelatedness of intention and self-efficacy, which has been previously reported in the literature (Kronborg & Vaeth, 2004) and makes sound theoretical sense (Bandura, 1977; Dennis & Faux, 1999). Kronborg and Vaeth (2004) showed that self-efficacy and intention were not only predictive of exclusive breastfeeding outcomes, but strongly predictive of each other; this is likely to reflect that the intention is influenced by the
individual’s expectation of being able to accomplish the task. Mothers who do not believe that they are capable of succeeding at exclusive breastfeeding may be less likely to intend to do so and therefore less likely to actually exclusively breastfeed her infant.

A woman’s breastfeeding intentions are also likely to be highly influenced by social pressures and the cultural expectations placed on them. These influences may bias the way women respond to questions regarding their breastfeeding intentions, particularly when assessed retrospectively in light of their breastfeeding outcomes. Previous authors have explored the dilemma in breastfeeding research, that women may feel a moral obligation to say that they intended to breastfeed their infant in order to uphold the view of a ‘good mother’, despite their true intentions (Knaak, 2006; Crossley, 2009).

One of the novel aspects of this study was evaluation of the relationship between body image during the postpartum and exclusive breastfeeding outcomes. Our model proposed that the body attitude constructs of ‘feeling fat’, ‘attractiveness’, ‘salience of weight and shape’, and ‘strength’ would be related to how comfortable a woman feels breastfeeding in public. It was hypothesized that women who report more perceived feelings of fatness, stronger salience of weight and shape and less attractiveness may be less inclined to be comfortable breastfeeding in public given that part of their body may be exposed. Although these pathways were not found to be directly related to comfort breastfeeding in public, the strong correlations between feelings of fatness and perceived attractiveness with maternal attitude both during pregnancy and the postpartum indicate that these body image constructs are likely to have an indirect effect on breastfeeding outcomes, however the exact mechanism of the relationship needs further investigating.
Strong internal locus of control had no relationship to level of self-efficacy or intention to exclusively breastfeed. Although these relationship have not been examined previously in the exclusive breastfeeding literature, the finding is inconsistent with locus of control theory that proposes individuals with a stronger internal locus of control exhibit more perceived control of their behavior, tend to assign a greater likelihood to their efforts being successful, are more likely to appraise stressful situations more positively and actively seek out help or information to help them succeed (Rotter, 1966; Haslam et al., 2003). An explanation for this non-significant finding may be the use of the fetal health locus of control scale. This scale was originally developed for the purpose of measuring women’s control beliefs of their developing fetus and predicting health related behaviours during pregnancy (e.g., smoking, drinking alcohol and attending prenatal classes; Labs & Wurtele, 1986). The use of this scale to predict postnatal health behaviours, such as exclusive breastfeeding duration, may not accurately measure maternal locus of control beliefs relating to their infant. A more appropriate measure for future research might be the multidimensional health locus of control scale (Wallston et al., 1978), which measures an individual’s control beliefs for more general health related behaviours.

This study showed that psychosocial factors such as maternal intention, self-efficacy, attitude towards pregnancy and body image are significantly associated with exclusive breastfeeding duration. Furthermore, although some of the predicted relationships in the path analysis were not shown to be significant, the direction of the relationships were consistent with what was expected; hence, it would be beneficial to replicate this study with a larger sample size and a more rigorous, prospective design. Future research which follows women throughout pregnancy
and the postpartum, measuring psychosocial variables and exclusive breastfeeding outcomes may contribute important findings to the literature in this area.

Additionally, future studies examining *exclusive* breastfeeding need to provide an operationalized definition, which complies with the WHO (2008) definitions of exclusive breastfeeding to maintain consistency across the literature, as this is a general limitation of research in this area (see de Jager et al., 2013). The results of this study have important clinical application. As psychosocial factors are amendable to change, interventions designed to address these factors may result in better exclusive breastfeeding outcomes, improving the long-term health outcomes of the population.
References


CHAPTER FIVE

Study Three: A Longitudinal Study of the Effect of Psychosocial Factors on Exclusive Breastfeeding Duration\textsuperscript{c}

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\textsuperscript{c} This paper was submitted for publication to the journal of Midwifery. Midwifery have specific guidelines for structure, formatting and referencing. This paper was prepared in accordance with those guidelines
Abstract

Objective: To examine the effect of psychosocial factors on exclusive breastfeeding duration to six months postpartum

Design: Longitudinal, prospective questionnaire based study

Setting: Participants were recruited from a publically funded antenatal clinic located in the western metropolitan region of Melbourne, Victoria, Australia and asked to complete questionnaires at three time points; 32 weeks pregnancy, 2 months postpartum and six months postpartum.

Participants: The participants were 125 pregnant women aged 22 to 44 years.

Measurements and findings: Psychosocial variables such as breastfeeding self-efficacy, body attitude, psychological adjustment, attitude towards pregnancy, intention, confidence and motivation to exclusively breastfeed and importance of exclusive breastfeeding were assessed using a range of psychometrically validated tools. Exclusive breastfeeding behaviour up to six months postpartum was also measured. At 32 weeks gestation a woman’s confidence to achieve exclusive breastfeeding was a direct predictor of exclusive breastfeeding duration to six months postpartum. At two months postpartum, psychological adjustment and breastfeeding self-efficacy were predictive of exclusive breastfeeding duration. Finally, at six months postpartum, psychological adjustment, breastfeeding self-efficacy, confidence to maintain exclusive breastfeeding and feeling fat were directly predictive of exclusive breastfeeding duration.

Key conclusions: Psychosocial factors are significantly predictive of exclusive breastfeeding duration. Self-efficacy, psychological adjustment, body image, motivation and confidence are all important psychosocial factors implicated in a woman’s ability to maintain exclusive breastfeeding over time.
**Implications for practice:** Individualized antenatal breastfeeding education and support may be strengthened by strategies that build a woman’s confidence to exclusively breastfeed. Implementing psychosocial supports and methods providing positive feedback that increase a women’s self-efficacy to exclusively breastfeed to six months are also important two months postpartum.

**Keywords:** Exclusive breastfeeding, breastfeeding duration, psychosocial factors
Introduction

Breast milk is the optimal source of nutrition for the growth and development of an infant. The health advantages associated with exclusive breastfeeding at both the individual and population level are well documented in the literature (Batrick & Reinhold, 2010; Cattaneo et al., 2006; Kramer & Kakuma, 2012; Oddy et al., 2002). Since 2001 The World Health Organization (2011) has recommended that infants worldwide are exclusively breastfed (breast milk as the only nutrition) for the first six months of life. A systematic review published by the Cochrane Collaboration (Kramer & Kakuma, 2002), has demonstrated the significant advantages of exclusive breastfeeding to six months, compared to three to four months for selected infant and maternal outcomes. Despite this, over the last decade, there has only been an increase of 8% in the rate of women maintaining exclusive breastfeeding beyond four months postpartum (Australian Bureau of Statistics [ABS], 2013). In the most recent Australian data the 2011 to 2012 National Health Survey showed that less than 60% of Australian infants were exclusively breastfed to two months postpartum, less than 40% to four months and only 17% of children aged six months to two years had been exclusively breastfed to at least six months postpartum (ABS, 2013). Similar rates have been reported in other developed countries including the United States (Jones, 2011), United Kingdom (McAndrew et al., 2012) and Canada (Bolling, Grant, Hamlyn & Thornton, 2007).

Given that the majority of women initiate breastfeeding, it is important to investigate the factors associated with maintaining exclusive breastfeeding. It is likely that a range of psychosocial factors contribute to a woman’s ability to maintain exclusive breastfeeding (O’Brien et al., 2008; de Jager et al., 2013; de Jager et al., 2014). Selected psychosocial factors have been identified as potentially
modifiable factors, however, to date, there has been very limited research examining these factors, specifically for exclusive breastfeeding and for duration beyond three months postpartum. A recent systematic review of the literature, reviewed nine papers from the last 10 years, which had examined psychosocial factors and exclusive breastfeeding to four to six months postpartum (de Jager et al., 2013). The systematic review showed that psychosocial factors such as self-efficacy (Blyth et al., 2002, 2004; Kronborg and Vaeth, 2004; Semenic et al., 2008), postpartum depression (Henderson et al., 2003; Akman et al., 2008), anxiety (Clifford et al., 2006), intention to breastfeed (Blyth et al., 2004; Kronborg & Vaeth, 2004; Bai et al., 2010), attitude towards breastfeeding (Scott et al., 2006; Semenic et al., 2008; Bai et al., 2010) and social support (Bai et al., 2010) were associated with exclusive breastfeeding duration beyond four months postpartum. In a more recent paper, a conceptual model of psychosocial correlates of exclusive breastfeeding duration was evaluated with a sample of 174 women who had given birth in the previous two years completing a questionnaire on their breastfeeding experience (de Jager et al., 2014). The findings revealed that breastfeeding self-efficacy was an independent and significant predictor of both intention to exclusively breastfeed and exclusive breastfeeding duration to six months. Maternal attitude towards pregnancy, psychological adjustment and breastfeeding difficulties were also established as having a significant influence on exclusive breastfeeding intention and duration (de Jager et al., 2014). Although this study demonstrated the role that psychosocial factors are likely to play in the maintenance of exclusive breastfeeding duration, the findings were limited by the retrospective design. Hence, the aim of the current study was to replicate and extend the findings of de Jager et al. (2014) by evaluating
a conceptual model of psychosocial predictors using a more robust prospective longitudinal design.

Method

Sample

Participants were recruited via advertising on mother, child and baby forums, parenting magazines, baby and children’s markets, obstetrician referrals, general media advertising and through a publically funded antenatal clinic located in the western metropolitan region of Melbourne, Victoria, Australia. Participants were provided with a Plain Language Statement and Consent Form and were offered the opportunity to ask any questions before voluntary written informed consent was obtained. A total sample of 196 pregnant women was recruited, however only 125 women continued their participation to six months postpartum. Power analyses revealed that for adequate power (.80 for effect size .20 at $\alpha = .05$) a sample size of 130 was required for these analyses; results below are interpreted with caution given the final sample size was slightly under the target required.

Ethical Consideration

The Deakin University Human Research Ethics Committee and Melbourne Health granted Ethics approval for this study.

Data Collection

The participants completed written self-administered questionnaires at three time points; 32 weeks gestation (Time 1), two months postpartum (Time 2) and six months postpartum (Time 3). The questionnaires were mailed to the participants at a
nominated address and returned in reply paid envelopes included with the questionnaire. Each questionnaire took between 30 and 45 minutes to complete and were mailed to the participants approximately one week prior to the required time point. Participants were requested to complete the questionnaire within one to two weeks.

Measures

The following psychosocial variables were assessed in this study Table 5.1 provides an overview of which measures were assessed at each time point. Reliability analyses were conducted on the scales and subscales used in the analyses. Cronbach’s alpha scores of greater than $\alpha = .70$ are considered sufficient for the use of a scale (DeVellis, 2003). All scales had a Cronbach’s alpha score greater than or equal to $\alpha = .70$ (see Table 5.2). The possible range of scores for each scale is also shown in Table 5.2.

Attitude Towards Pregnancy

A scale of 13 items was developed by the researchers to measure participants’ attitudes towards pregnancy. The participants were asked to indicate to what extent each statement applied to them and how they felt during pregnancy. The content of the items asked how women feel about the changes to their body and their experience of the pregnancy stage. Items included ‘I am happy with my growing body during pregnancy’ and ‘I enjoy being pregnant’. Higher scores indicate a more positive attitude towards pregnancy. Participants completed this scale at 32 weeks pregnancy and the scale met reliability criteria for use with this sample.
Table 5.1.

*Questionnaire Time Points and Measures Included at Each Time Point*

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 weeks gestation</td>
<td>Demographic information</td>
</tr>
<tr>
<td></td>
<td>Attitude towards pregnancy</td>
</tr>
<tr>
<td></td>
<td>Body Attitude Questionnaire</td>
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<tr>
<td></td>
<td>Exclusive breastfeeding intention</td>
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<tr>
<td></td>
<td>Psychological adjustment (DASS)</td>
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<tr>
<td></td>
<td>Motivation to exclusively breastfeed</td>
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<td>Importance to exclusively breastfeed</td>
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<tr>
<td></td>
<td>Confidence to exclusively breastfeed</td>
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<tr>
<td>2 months postpartum</td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding Self-Efficacy Scale</td>
</tr>
<tr>
<td></td>
<td>Psychological adjustment (DASS)</td>
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<tr>
<td></td>
<td>Current feeding practices</td>
</tr>
<tr>
<td></td>
<td>Exclusive breastfeeding status</td>
</tr>
<tr>
<td>6 months postpartum</td>
<td>Body Attitude Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding Self-Efficacy Scale</td>
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<tr>
<td></td>
<td>Psychological adjustment (DASS)</td>
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<td>Confidence to exclusively breastfeed</td>
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<tr>
<td></td>
<td>Current feeding practices</td>
</tr>
<tr>
<td></td>
<td>Exclusive breastfeeding status</td>
</tr>
</tbody>
</table>

*DASS = depression anxiety and stress scale*

*Body Attitude Questionnaire- Short Form*

The short form of the Body Attitude Questionnaire (BAQ; Ben-Tovim & Walker, 1991) consists of four subscales: ‘Feeling Fat’, ‘Strength and Fitness’,
‘Salience of Weight and Shape’ and ‘Attractiveness’. The scale was developed using an Australian sample and initial testing showed that the subscales yield high convergent and discriminant validity and good test-retest reliability ($r = .64$ to $.90$). Higher scores indicate stronger perceptions of each subscale (Ben-Tovim & Walker, 1991). This study used three of the subscales: feeling fat, salience of weight and shape and attractiveness. Participants completed the BAQ at each time point and each subscale met scale reliability criteria for use with this sample.

**Exclusive Breastfeeding Intention**

In the initial questionnaire completed at 32 weeks gestation, participants were asked to document their intention to exclusively breastfeed with response options “Yes”, “No” or “Unsure”, and if relevant the duration they intended to exclusively breastfeed (less than 1 month; 1-2 months; 2-3 months; 3-4 months; 4-5 months; 6 months). These two questions were recoded and combined in a total ‘exclusive breastfeeding intention’ score, where a higher score indicated intention to exclusively breastfeed for a longer duration.

**Breastfeeding Self-Efficacy Scale – Short Form**

The 14-item Breastfeeding Self-Efficacy Scale (BSES-SF; Dennis & Faux, 1999) measures a mother’s confidence in her ability to successfully breastfeed her infant. Higher scores indicate higher levels of breastfeeding self-efficacy. Psychometric testing of the BSES-SF showed strong predictive validity of exclusive breastfeeding outcomes with significant differences in self-efficacy for mothers who exclusively breastfeed compared to bottle-feed their infant ($p < .001$; Dennis, 2003). The BSES-SF also has strong construct validity, with significant differences between
scores for first time mothers and mothers with previous breastfeeding experience, at 1 week (p < .001) and 8 weeks postpartum (p < .05; Dennis 2003). Participants completed the BSES-SF at two months postpartum and six months postpartum. The BSES-SF met scale reliability criteria for use with this sample.

*Psychological Adjustment (Depression Anxiety and Stress Scale)*

The Depression Anxiety Stress Scale 21 (DASS-21) was used as an overall measure of psychological adjustment. The DASS-21 is an efficient, reliable screening measure for clinical symptoms of depression, anxiety and stress (Lovibond & Lovibond, 1995). Validity testing in a non-clinical sample (n = 1794) yielded reliability scores of $\alpha =$ .82 to $\alpha =$ .93 for each of the scales and total scores (Henry & Crawford, 2005). Participants are asked to respond to each item in terms of the presence of symptoms over the last seven days. Higher scores reflect elevated symptomatology. Participants completed the DASS-21 at each time point (32 weeks, two months postpartum and six months postpartum) and the scale met reliability criteria for use with this sample.

*Motivation to Exclusively Breastfeed*

Participants were asked to rate on a scale of 0 to 10 how much they agreed with two statements “I am motivated to initiate exclusive breastfeeding (breast milk only) after the birth” and “I am motivated to maintain exclusive breastfeeding (breast milk only) until my baby is six months of age”. Participants completed this scale at 32 weeks pregnancy and at six months postpartum. Items were treated as two separate variables; motivation to initiate and motivation to maintain exclusive breastfeeding until six months postpartum.
Importance to Exclusively Breastfeed

Participants were asked to rate on a scale of 0 to 10 how much they agreed with two statements “I feel that initiating exclusive breastfeeding (breast milk only) after the birth is important” and “I feel that maintaining exclusive breastfeeding (breast milk only) until my baby is six months of age is important”. Participants completed this scale at 32 weeks pregnancy and at six months postpartum. Items were treated as two separate variables; importance to initiate and to maintain exclusive breastfeeding until six months postpartum.

Confidence to Exclusively Breastfeed

Participants were asked to rate on a scale of 0 to 10 how much they agreed with two statements “I am confident that I can initiate exclusive breastfeeding (breast milk only) after the birth” and “I am confident that I can maintain exclusive breastfeeding (breast milk only) until my baby is six months of age”. Participants completed this scale at 32 weeks pregnancy and at six months postpartum. Items were treated as two separate variables; confidence to initiate and confidence to maintain exclusive breastfeeding until six months postpartum.

Exclusive Breastfeeding at Two Months Postpartum

In the questionnaire completed at two months postpartum, participants were asked to respond ‘Yes’ or ‘No’ to the question “Are you currently exclusively breastfeeding your infant? (I.e. feeding nothing but breast milk)”.

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Exclusive Breastfeeding at Six Months Postpartum

In the questionnaire completed at two months postpartum, participants were asked to respond ‘Yes’ or ‘No’ to the question “Are you currently exclusively breastfeeding your infant? (I.e. feeding nothing but breast milk)”.

Exclusive Breastfeeding Duration

Exclusive breastfeeding duration was used as the outcome variable in the path analyses at each time point. Participant’s exclusive breastfeeding status at each time to six months postpartum was scored and combined to provide an overall exclusive breastfeeding duration score. Higher scores indicate exclusivity and longer duration of breastfeeding.

Demographic Details

Participant information including age, relationship status, parity, household income, highest level of education and nationality were collected at 32 weeks gestation time point.
Table 5.2.

Correlation Matrix, Means, Standard Deviations, Cronbach’s Alpha and Possible Range of Scores for all Variables Examined in the Models

|     | 1 | 2  | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  | 12  | 13  | 14  | 15  | 16  | 17  | 18  | 19  | 20  | 21  | 22  | 23  | 24  | 25  | 26  | 27  | 28  |
|-----|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   |   |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 2   | .17|    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 3   |    | .17|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 4   |   |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 5   |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 6   |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 7   |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 8   |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 9   |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 10  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 11  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 12  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 13  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 14  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 15  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 16  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 17  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 18  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 19  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 20  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 21  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 22  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 23  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 24  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 25  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 26  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 27  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 28  |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

1. EBF Intention
2. Age
3. Gender
4. Ethnicity
5. Occupation
6. Education
7. Income
8. Marital Status
9. Number of Children
10. Income Level
11. Employment Status
12. Relationship Status
13. Living Arrangement
14. Religion
15. Political Affiliation
16. News Consumption
17. Internet Use
18. Social Media Use
19. Physical Activity
20. Smoking
21. Drinking
22. Dietary Habits
23. Sleep Quality
24. Stress Levels
25. Mental Health
26. Social Support
27. Life Satisfaction
28. Health Status

Note: *p < .05, **p < .01
<table>
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<tr>
<th></th>
<th>Imp_Init</th>
<th>Imp_Maint</th>
<th>Moto_Maint</th>
<th>Imp_Maint</th>
<th>Motiv_Maint</th>
<th>Imp_Maint</th>
<th>Conf_Maint</th>
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<tr>
<td></td>
<td><em>0.58</em>*</td>
<td><em>0.62</em>*</td>
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<td><em>0.22</em></td>
<td><em>0.22</em></td>
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<tr>
<td>M</td>
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<td>12.4</td>
<td>6.35</td>
<td>12.4</td>
<td>6.35</td>
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<td>.08</td>
<td>.14</td>
<td>.08</td>
<td>.14</td>
<td>.08</td>
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<tr>
<td>Range of scores</td>
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<td>12-65</td>
<td>0-126</td>
<td>2-9</td>
<td>12-65</td>
<td>0-126</td>
<td>2-9</td>
</tr>
</tbody>
</table>

Note: * = p < .05; ** = p < .01
Data Analyses

Correlational analyses using SPSS version 20 (IBM corporation, 2011) were conducted to examine the interrelationships between the psychosocial variables in this study. Table 5.2 displays the correlation matrix.

Path analysis using SPSS AMOS version 20 (IBM corporation, 2011) was used to test three proposed conceptual models of the relationships between psychosocial variables on exclusive breastfeeding duration at three different time points (32 weeks pregnancy, two months postpartum and six months postpartum; Figures 5.1 to 5.3). The path models were used to analyse the data longitudinally by examining the effect of psychosocial variables at each time point on overall exclusive breastfeeding duration. Exclusive breastfeeding duration was the outcome variable at each time point. The models were developed based on previous research (de Jager et al., 2013) and the significant relationship between variables in the correlation matrix (Table 5.2). Thus, the path models are based on the previous literature but are also exploratory in nature. The model fit was measured using chi-square goodness-of-fit statistics, the chi-square divided by degrees of freedom (CMIN/DF; < 3 denoting good fit), the comparative fit index (CFI; good fit >.95, acceptable fit >.90; Hu & Bentler, 1999), and the root mean square error of approximation (RMSEA; good fit <.06, acceptable fit <.08; Hu & Bentler, 1999).

The reported values in Figures 5.1 to 5.3 are the standardised regression weights of the model (β, beta weights). Standardised regression weights indicate the strength of a relationship between a given predictor and an outcome in a standardised form. It is interpreted as the change in the outcome variable (in standard deviations) associated with a one standard deviation change in the predictor variable (Field, 2009). Additionally, the correlations between the factors in the path model are
included in the analysis however are not depicted in these figures for ease of interpretation, and are instead presented in Table 5.3. The standardised regression weights for the non-significant pathways are displayed in Table 5.4.

Table 5.3.

*Correlations Between Factors in the Models*

<table>
<thead>
<tr>
<th></th>
<th>Correlation</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Motivation to initiate</em></td>
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<td></td>
</tr>
<tr>
<td>Confidence to initiate</td>
<td>.52</td>
<td>.000***</td>
</tr>
<tr>
<td>Confidence to maintain</td>
<td>.61</td>
<td>.000***</td>
</tr>
<tr>
<td><em>Confidence to initiate</em></td>
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<tr>
<td>Confidence to maintain</td>
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<td>.000***</td>
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<tr>
<td><em>Salience of weight and shape</em></td>
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<tr>
<td>Feeling fat</td>
<td>.74</td>
<td>.000***</td>
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<td>Attractiveness</td>
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<td><em>Feeling fat</em></td>
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<td>Attitude towards pregnancy</td>
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<td>Attitude towards pregnancy</td>
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<td>.000***</td>
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<td><em>Psychological Adjustment</em></td>
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<td>Feeling fat</td>
<td>.32</td>
<td>.000***</td>
</tr>
<tr>
<td>Salience of weight and shape</td>
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<td>.003**</td>
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<td>Attractiveness</td>
<td>-.21</td>
<td>.023*</td>
</tr>
<tr>
<td>Attitude towards pregnancy</td>
<td>-.27</td>
<td>.004**</td>
</tr>
</tbody>
</table>

**Model 2**

*Salience of weight and shape*

| Feeling fat              | .76         | .000*** |

178
Attractiveness -.42 .000***

Feeling fat
Attractiveness -.55 .000***

Psychological Adjustment
Salience of weight and shape .13 .028*

Model 3

Confidence to maintain
Motivation to maintain .53 .000***
Importance to maintain .42 .000***

Motivation to maintain
Importance to maintain .77 .000***

Psychological Adjustment
Attractiveness -.29 .002**
Salience of weight and shape .27 .003**
Feeling fat .19 .036*

Attractiveness
Salience of weight and shape -.48 .000***
Feeling fat -.56 .000***

Salience of weight and shape
Feeling fat .76 .000***

Note:
* p=<0.05; ** p=<0.01; ***p=<0.001

Table 5.4.

Standardised Regression Weights and P Values for Non-Significant Pathways

<table>
<thead>
<tr>
<th>Regression weights</th>
<th>β (beta weights)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological adjustment</td>
<td>.12</td>
<td>.17</td>
</tr>
<tr>
<td>Motivation to initiate</td>
<td>.03</td>
<td>.79</td>
</tr>
<tr>
<td>Confidence to initiate</td>
<td>.02</td>
<td>.86</td>
</tr>
<tr>
<td>Model 2</td>
<td>To ‘Breastfeeding Self-Efficacy’</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td>Salience of weight and shape</td>
<td>.01</td>
<td>.94</td>
</tr>
<tr>
<td>Feeling fat</td>
<td>-.21</td>
<td>.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model 3</th>
<th>To ‘Exclusive breastfeeding duration’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation to maintain</td>
<td>.07</td>
</tr>
<tr>
<td>Importance to maintain</td>
<td>.01</td>
</tr>
<tr>
<td>Salience of weight and shape</td>
<td>.13</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>.07</td>
</tr>
</tbody>
</table>

**Findings**

**Participant Characteristics**

The age of the participants ranged from 22 to 44 years (Median = 31.0, Interquartile Range = 6.75). Seventy five percent (n = 94) of the participants were
married, 19% (n = 24) were in a de facto relationship and 5% (n = 6) were single. The sample was predominantly Australian born 81% (n = 101), with the remaining participants born in New Zealand 2% (n = 3), Asia 8% (n = 10), the UK/Europe 6% (n = 7) or the U.S. 2% (n = 3). In this sample, 19% (n = 24) had completed postgraduate education, 44% (n = 55) a bachelor degree, 28% (n = 35) had completed other formal education past secondary school (certificates, diploma, advanced diploma’s etc.), 5% had a year 12 equivalent education and 3% (n = 4) had completed less than a year 12 equivalent.

At 32 weeks pregnancy 98% of participants (n = 123) intended to breastfeed (any breast milk) their infant, one participant did not intend to breastfeed and one participant was undecided. Of those intending to breastfeed, 78% (n = 96) intended to exclusively breastfeed their infant (nothing but breast milk), 16% (n = 20) were undecided and 6% (n = 7) had decided not to exclusively breastfeed. Of the participants who intended to exclusively breastfeeding their infant, 53% (n = 66) intended to do so to six months postpartum, 23% (n = 29) for four to five months, 6% (n = 7) for three to four months, 1% (n = 2) for two to three months, 1% (n = 2) for one to two months and 1% (n = 2) intended to exclusively breastfeed for less than one month.

At six months postpartum 12% (n = 15) of participants reported they were currently exclusively breastfeeding their infant, 1% (n = 2) reported using breastfeeding and formula, 6% (n = 8) were using formula only, 39% were breastfeeding and giving their infant solids, 21% were breastfeeding, formula and solids and 20% (n = 25) were feeding their infant formula and solids only. Of the participants who were not currently exclusively breastfeeding at six months postpartum, 88% (n = 97) reported exclusively breastfeeding for a period of time. Of
these participants, 33% (n = 37) reported exclusively breastfeeding for between five to six months, 24% (n = 26) for more than four but less than five months, 12% (n = 13) for less than four but more than three months, 4% (n = 5) for less than three but more than two months, 6% (n = 7) for less than two months but more than six weeks and 12% (n = 13) reported exclusively breastfeeding for less than six weeks.

Approximately half the participants (n = 64) in this study were pregnant for the first time (primigravida). At 32 weeks gestation, women who had been pregnant at least one time previously (multigravida) were more likely to intend to exclusively breastfeed their infant for longer (M = 8.70, SE = .14) than primigravida participants (M = 7.96, SE = .23). This difference was statistically significant t(85) = -2.71, p < .01. However this difference in intention did not translate into behaviour as there was no significant differences between multigravida and primigravida women and exclusive breastfeeding duration at 2 months t(20) = -1.69, p > .05, or at 6 months postpartum t(121) = .40, p = >.05.

Model 1- 32 Weeks Pregnancy

Figure 5.1 displays Model 1 at 32 weeks gestation. The fit indices suggest that the path model provides a good fit to the data, $\chi^2 = 32.0$ (20), p < .05, CMIN/DF = 1.60, CFI = .97 and RMSEA = .07. This path model estimated 45 parameters (pathways). Of these, 3 directional pathways and 13 co-variances were significant. At 32 weeks pregnancy, a woman’s level of confidence in her ability to maintain exclusive breastfeeding was the only direct predictor of exclusive breastfeeding duration ($\beta = .26$, p < .05). However, both motivation to initiate ($\beta = .22$, p < .01) and confidence to maintain exclusive breastfeeding ($\beta = .44$, p < .001) were predictive of their intention to exclusively breastfeed their infant. At this time point,
psychological adjustment was not associated directly with exclusive breastfeeding duration, however, it was correlated significantly with aspects of body image (attractiveness; \( r = -.21 \), salience of weight and shape; \( r = .27 \), and feeling fat; \( r = .32 \)) and maternal attitude towards pregnancy (\( r = -.27 \)). Maternal attitude towards pregnancy was significantly correlated with body image (attractiveness, \( r = .45 \); salience of weight and shape, \( r = -.50 \); feeling fat, \( r = -.67 \)).

Model 2 – Two Months Postpartum

Figure 5.2 displays Model 2 at two months postpartum. The fit indices suggest that Model 2 path model provides a good fit to the data, \( \chi^2 = 6.15 \) (6), \( p > .05 \), CMIN/DF = 1.03, CFI = 1.00 and RMSEA = .014. This path model estimated 22 parameters (pathways). Of these, five directional pathways and four co-variances were significant. In this model, psychological adjustment (\( \beta = .10 \), \( p < .01 \)), breastfeeding self-efficacy (\( \beta = .12 \), \( p < .01 \)) and exclusive breastfeeding status (\( \beta = .88 \), \( p < .001 \)), at two months postpartum were all directly predictive of exclusive breastfeeding to six months postpartum. Psychological adjustment was related negatively to breastfeeding self-efficacy (\( \beta = -.29 \), \( p < .001 \)), indicating that greater symptoms of depression, anxiety and stress are associated with lower breastfeeding self-efficacy. Breastfeeding self-efficacy at two months postpartum was also predictive of current exclusive breastfeeding status (at two months postpartum; \( \beta = .27 \), \( p < .01 \)). In this model, body image was not related directly to breastfeeding self-efficacy or exclusive breastfeeding duration; however, a woman’s salience of weight and shape was correlated significantly with her psychological adjustment (\( r = .13 \), \( p < .05 \)), which had both direct and indirect pathways to self-efficacy and exclusive breastfeeding duration. This suggests that although body image may not
directly predict a woman’s breastfeeding confidence or duration it may have an indirect effect through psychological adjustment.

**Model 3 – Six Months Postpartum**

Figure 5.3 displays Model 3 at six months postpartum. The fit indices suggest that Model 3 path model provides a good fit to the data, $\chi^2 = 18.15$ (18), $p > .05$, $\text{CMIN}/\text{DF} = 1.01$, $\text{CFI} = 1.00$ and $\text{RMSEA} = .01$. This path model estimated 27 parameters (pathways) and of these, four directional pathways and nine co-variances were significant. At six months postpartum, feeling fat ($\beta = .27$, $p < .05$), breastfeeding self-efficacy ($\beta = .24$, $p < .001$), psychological adjustment ($\beta = .20$, $p < .01$) and confidence to maintain exclusive breastfeeding ($\beta = .44$, $p < .001$) were all significantly related to exclusive breastfeeding duration. At six months postpartum, although attractiveness and salience were not related directly to exclusive breastfeeding duration, all three body image variables were correlated significantly with psychological adjustment (salience of weight and shape, $r = .27$, $p < .01$; feeling fat, $r = .19$, $p < .05$; attractiveness, $r = -.29$, $p < .01$) again suggesting that the effect of body image on breastfeeding outcomes is likely to be through psychological adjustment.

The standardised regression weights for the non-significant pathways of each model are shown in Table 5.4. Although these pathways are non-significant in these models, many of these variables were significantly correlated (see correlation matrix, Table 5.2). It is also worth noting that the direction of relationships is consistent with the model (for example, six months psychological adjustment to breastfeeding self-efficacy $\beta = -.15$, $p = .08$), however not strong enough to reach significance in this sample.
Figure 5.1. Model 1 – relationship between psychosocial factors at 32 weeks gestation and exclusive breastfeeding duration

* p = <.05; ** p = < .01; *** p = < .001; EBF = exclusive breastfeeding
Figure 5.2. Model 2 – relationship between psychosocial factors at 2 months postpartum and exclusive breastfeeding duration

* p = < .05; ** p = < .01; *** p = < .001; EBF = exclusive breastfeeding
Figure 5.3. Model 3 – relationship between psychosocial factors at 6 months postpartum and exclusive breastfeeding duration

* p = <.05; ** p = < .01; *** p = < .001; EBF = exclusive breastfeeding
Discussion

This study was a longitudinal study, which followed 125 women from 32 weeks gestation through to six months postpartum. The aim of this study was to examine the relationship between psychosocial factors on the duration of exclusive breastfeeding during the first six months postpartum. This study used path analysis to examine the direct, and indirect, associations between the psychosocial factors and exclusive breastfeeding at three time points: 32 weeks pregnancy, two months postpartum and six months postpartum.

The main limitation of this study was the sample size. Although a sample of 125 participants is considered moderate for use with path analysis (Klein, 1998), the statistical power was reduced by the large amount of pathways being examined within each model. Reduced statistical power increases the likelihood that the null hypothesis will be supported (Ellis, 2010). Accordingly, results need to be interpreted with caution. Given the reduced statistical power, it is possible that some non-significant results may have reached statistical significance had the sample size been larger. For example, in Model 2 (2 months postpartum) the pathway between ‘feeling fat’ to ‘breastfeeding self-efficacy’ was negative ($\beta = -.21$) which is consistent with previous literature, however, was not sufficiently powered to reach significance in the path model ($p = .11$), despite being significantly correlated ($r = -.25$, $p < .01$). Similarly in Model 3 (six months postpartum) there was a positive relationship between motivation to maintain exclusive breastfeeding and exclusive breastfeeding duration ($\beta = .07$), however this effect was also not strong enough to reach significance ($p = .59$), despite being significantly correlated ($r = .26$, $p < .05$).

A further limitation of this study was the inclusion of both primigravida and multigravida women together in the analyses. Women who have had previous
pregnancies may have a different experience of pregnancy and the postpartum than first time mothers. For example, Dennis and Faux (1999) showed that breastfeeding self-efficacy was significantly lower for first time mothers compared to mothers with previous breastfeeding experience. Additionally, reports of body image may be different for women who are experiencing changes to their body for the first time compared to women who have experienced pregnancy before and psychological adjustment may differ between these populations (Fuller-Tyszkiewicz, Skouteris, Watson, & Hill, 2013). Separating primigravida and multigravida participants in the analyses was beyond the scope of this paper, given our sample size restricted the number of analyses we could conduct. Finally, there was a participant attrition rate of 36% in the current study despite efforts by the research team to prevent women from dropping out including contacting the women via telephone or email with reminders if their questionnaires weren’t received within three to four weeks. High attrition rates are a common problem of longitudinal research and may be heightened in this population due to pregnancy and the postpartum often being a period of significant adjustment; indeed, other longitudinal studies in Australia have reported attrition rates of up to 60% (Soloff, Millward & Sanson, 2003; Hure et al., 2013). Replication of the current study with a larger sample size is warranted, albeit strategies to prevent high attrition rates need to be considered and carefully planned at the outset in order to curtail excessive study drop out.

In this study, at 32 weeks gestation, 52.8% of participants reported that they intended to exclusively breastfeed their infant to six months postpartum. At six months postpartum only 12% had maintained exclusive breastfeeding. There has been considerable research focusing on the effect of maternal intention on breastfeeding outcomes. Studies that have examined both any breastfeeding
including exclusive breastfeeding have reported that women’s infant feeding behaviour is associated with their infant feeding intention (Blyth et al., 2004; Kronborg & Vaeth, 2004; Dennis & McQueen, 2007; Bai et al., 2010). Further, studies have shown that the effect of intention to breastfeed is stronger when the decision to exclusively breastfeed is made before the birth compared to after the birth (Scott et al., 2001; O’Brien & Fallon, 2005). The results of this study contradict previous research and indicate that intention alone is not sufficient to predict a woman’s breastfeeding outcomes. Further, it indicates that the ability to maintain exclusive breastfeeding over time is likely to be positively and negatively influenced by the interaction of a range of psychosocial factors.

Intention to exclusively breastfeed at 32 weeks gestation was not a direct predictor of exclusive breastfeeding duration in the path model reported in this study (Model 1). However, intention to breastfeed was correlated strongly with how confident and motivated a woman felt she was to initiate and maintain exclusive breastfeeding and how important she believed initiating and maintaining exclusive breastfeeding was for her infant. At 32 weeks gestation (Model 1) a woman’s motivation to initiate and confidence to maintain exclusive breastfeeding were both predictive of exclusive breastfeeding intention. This is consistent with self-efficacy theory and the development of self-efficacy (Bandura, 1977; Dennis & Faux, 1999). The stronger self-efficacy a woman has in her ability to be able to maintain exclusive breastfeeding, the higher her motivation is likely to be to initiate exclusive breastfeeding (Bandura, 1977; Dennis & Faux, 1999). Although breastfeeding self-efficacy was not measured specifically at this time point (32 weeks gestation) the associations between motivation to initiate, confidence to maintain and exclusive
breastfeeding intention is indicative of the role of self-efficacy on maternal intention to exclusively breastfeed.

Consistent with previous literature, breastfeeding self-efficacy was found to be a significant predictor of exclusive breastfeeding duration at both two months and six months postpartum. High breastfeeding self-efficacy has been shown consistently to be predictive of positive breastfeeding outcomes (Blyth et al., 2002, 2004; Kronborg & Vaeth, 2004; Semenic et al., 2008). In this study, the effect of self-efficacy on exclusive breastfeeding duration was stronger at six months than at two months postpartum. This may be reflective of the self-efficacy concept of ‘mastery of experience’. Self-efficacy theory states that one way of developing or strengthening self-efficacy is through experiencing some success with the behaviour or drawing on past successes of a similar behaviour (referred to as ‘mastery of experience’; Bandura, 1977; Dennis, 1999). At six months postpartum, exclusively breastfeeding women are more likely to have experienced greater success at exclusive breastfeeding and overcome more barriers along the way than they had at two months postpartum, strengthening their level of breastfeeding self-efficacy. Self-efficacy is an important psychosocial construct to examine in relation to breastfeeding, as it is consistently shown to have a strong effect on breastfeeding outcomes and it also amendable to change with appropriate intervention (Semenic et al., 2008). What needs to be examined further is the mechanism of the effect of breastfeeding self-efficacy on breastfeeding duration. One possible explanation, demonstrated in Model 2 is through the interaction with psychological adjustment.

Psychological adjustment was predictive of exclusive breastfeeding duration at both two months and six months postpartum. At two months postpartum, psychological adjustment was significantly predictive of both breastfeeding self-
efficacy and exclusive breastfeeding duration, however, this same interaction was not seen at six months postpartum. This may suggest that the impact of symptoms of depression, anxiety and stress negatively impact breastfeeding outcomes at two months postpartum through reducing a woman’s breastfeeding self-efficacy or confidence in her ability to breastfeed. Previous studies have shown that women with increased symptoms of postnatal depression were at greater risk of early cessation of exclusive breastfeeding than women who did not show depressive symptoms (Henderson et al., 2003; Akman et al., 2008). Further, women who have stronger symptoms of psychological distress may not be able to expend as much effort maintaining breastfeeding, may have more self-defeating thought patterns and respond negatively to breastfeeding difficulties, all of which would reduce their level of self-efficacy earlier on in the postpartum as opposed to later on when women are more efficient at breastfeeding (Bandura, 1977; Dennis, 1999).

To date there has been very limited research that has examined the effect of body image on breastfeeding outcomes. Given that pregnancy and the postpartum is a time of significant changes to a woman’s body size and shape, it is likely that dissatisfaction with these changes may negatively influence her psychological adjustment and comfort with breastfeeding. Clark et al. (2009) showed that during the postpartum period, women’s feelings of fatness and their salience of weight and shape increased significantly and was at its peak at six months postpartum. Further, women with more depressive symptoms tend to report higher levels of body dissatisfaction throughout both pregnancy and the postpartum (Clark et al., 2009; Rallis et al., 2007; Skouteris et al., 2005). In the current study, we examined the effect of body image at all three time points. In each model, all three body image variables showed no direct relationship with exclusive breastfeeding duration.
However, at both 32 weeks gestation and six months postpartum, all three aspects of body image (fatness, salience, attractiveness) were correlated significantly in the path model with psychological adjustment, which at six months postpartum was a direct predictor of exclusive breastfeeding duration. At six months postpartum, feeling fat was also predictive directly of exclusive breastfeeding duration. Clark et al. (2009) suggest that by six months postpartum women may have stronger feelings of fatness if they feel as though they have not regained their pre-pregnancy body, whereas there is less pressure for this to have occurred by two months postpartum. This would explain the effect of feeling fat influencing exclusive breastfeeding duration at six months but not at two months postpartum in these models.

Consistent with previous literature, the findings of this study highlighted the importance of psychosocial factors on a woman’s ability to maintain exclusive breastfeeding over time. In particular, self-efficacy, psychological adjustment and body image are key psychosocial factors implicated in a woman’s ability to maintain exclusive breastfeeding for a longer duration. What this study added was a prospective longitudinal design, investigating a range of psychosocial factors with the specificity of exclusive breastfeeding to six months postpartum. Previous studies have tended to focus on one psychosocial factor, have been inconsistent with the definition of ‘exclusive’ breastfeeding and have not measured breastfeeding outcomes to six months postpartum. This study informs clinical practice in a number of ways with the identification of a woman’s confidence to achieve exclusive breastfeeding in pregnancy as a predictor of exclusive breastfeeding duration to six months postpartum. Individualized antenatal breastfeeding education and support may be strengthened by strategies that build a woman’s confidence to exclusively breastfeed. Implementing psychosocial supports and methods providing positive
feedback that increases a women’s self-efficacy to exclusively breastfeed to six months may also be beneficial postnatally.
References


CHAPTER SIX
Summary and General Discussion

Exclusive breastfeeding to six months postpartum has been the global recommendation for infant feeding for over a decade (World Health Organization [WHO], 2011). Breast milk is the optimal source of nutrition for health and development; providing the infant with their complete energy and nutrient requirements and important advantages for physical, neurological and cognitive development. Breast milk provides protection from infectious diseases and allergies and decreases the risk of morbidity and mortality from a variety of childhood disease (Horta & Victora, 2013; Huh, Rifas-Shiman, Taveras, Oken, & Gillman, 2008; Ip et al., 2007; Quinn et al., 2001). Despite this, very few women comply with the World Health Organizations recommendation, resulting in reduced health outcomes for women and their offspring (Cattaneo et al., 2006; Kramer & Kakuma, 2012; Oddy, de Klerk, Sly, & Holt, 2002).

Demographic factors such as age, education and income can predict whether a woman will be more likely to initiate and maintain breastfeeding (McAndrew et al., 2012). However, these population level predictors are resistant to change. Recently, research has shown that psychosocial factors are more predictive of breastfeeding duration than the identified socio demographic factors combined (O’Brien, Buikstra & Hegney, 2008). As such, studies have been investigating the relationship between various psychosocial factors and breastfeeding outcomes. However, very few studies have focused specifically on exclusive breastfeeding (in contrast to any level of breastfeeding) and duration of exclusive breastfeeding.
The aim of this thesis was threefold: the first aim was to specifically examine which psychosocial factors are implicated in a woman’s ability to successfully maintain exclusive breastfeeding (in contrast to any level of breastfeeding) to six months postpartum. The second aim was to examine a range of psychosocial factors, their interrelationships and their direct and indirect effects on exclusive breastfeeding duration. Finally, the third aim was to examine these relationships prospectively in a six month longitudinal study. In order to address these three specific aims, three studies were conducted; two studies have been accepted for publication in peer reviewed journals (Studies One and Two) and Study Three has been submitted for publication.

Study One was a systematic review of the literature published over the last decade (years 2000 to 2011), examining psychological correlates of exclusive breastfeeding for four to six months duration. The systematic review highlighted the dearth of research specifically on both exclusive breastfeeding and exclusive breastfeeding for duration of at least four months. The review found that from the years 2000 to 2011, there were only nine published articles which specifically examined psychosocial factors, exclusive breastfeeding and exclusive breastfeeding duration of at least four months postpartum (Akman, Kuscu, & Yurdakul, 2008; Bai, Middlestadt, Peng & Fly, 2010; Blyth, et al., 2002; Blyth, Creedy & Dennis, 2004; Clifford, Campbell, Speechley & Gorodzinsky, 2006; Henderson, Evans, Straton, Priest & Hagan, 2003; Kronborg & Vaeth, 2004; Scott, Binns, Oddy & Graham, 2006; Semenic, Loiselle & Gottlieb, 2008). These studies highlighted that psychosocial factors such as anxiety (Akman et al., 2008; Clifford et al., 2006), depression (Akman et al., 2008; Henderson et al., 2003), social support (Akman et al., 2008; Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth, 2004; Semenic et
al., 2008), maternal intention (Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth, 2004), attitude towards breastfeeding (Bai et al., 2010; Scott et al., 2006; Semenic et al., 2008), maternal-infant attachment (Akman et al., 2008) and maternal self-efficacy (Blyth et al., 2002; Clifford et al., 2006; Kronborg and Vaeth, 2004; Semenic et al., 2008) contribute to a woman’s ability to maintain exclusive breastfeeding.

Study Two was a retrospective investigation of the psychosocial variables associated with the ability to maintain exclusive breastfeeding to six months postpartum. This study asked women who had given birth in the previous two years to report on their experiences at three stages; before pregnancy, during pregnancy and during the first six months postpartum. The aim of Study Two was firstly to investigate the psychosocial variables associated with exclusive breastfeeding to six months postpartum, and secondly, to evaluate a conceptual model of psychosocial correlates of exclusive breastfeeding duration. The psychosocial variables measured in this study were informed by the systematic review and also exploratory in nature due to the limited range of factors examined to date. Psychosocial variables such as locus of control, body image and attitude towards pregnancy had before not been examined in relation to exclusive breastfeeding outcomes.

Study Three was a longitudinal, prospective study, which aimed to examine the relationship between psychosocial factors during pregnancy and the first six months postpartum and the duration of exclusive breastfeeding. Women completed questionnaires at 32 weeks gestation, 2 months postpartum and six months postpartum. This study measured a range of psychosocial variables, informed by Study One and Study Two as well as exploratory variables such as perceived motivation, confidence and importance to exclusively breastfeed. Participants
breastfeeding behaviour and exclusive breastfeeding status was also assessed at each time point.

**Main Findings of this Thesis**

The findings of the systematic review revealed that to date, maternal self-efficacy is the most widely researched psychosocial factor. Five of the nine studies examined self-efficacy and showed that increased self-efficacy is predictive of increased duration of exclusive breastfeeding (Blyth et al., 2002; 2004; Kronborg & Vaeth, 2004; Scott et al., 2006; Semenic et al., 2008). Further, these studies highlighted the early postpartum weeks as being a critical period for the development of self-efficacy. Women who experience difficulties breastfeeding in the early postpartum and do not experience success at overcoming breastfeeding obstacles are more likely to have lower self-efficacy later in the postpartum and exclusively breastfeed for a shorter duration.

In line with the findings of the systematic review, the findings of both Study Two and Study Three found self-efficacy to be the strongest predictor of exclusive breastfeeding outcomes. In Study Two, breastfeeding self-efficacy was the only psychosocial variable that was associated directly with exclusive breastfeeding duration. In this study, breastfeeding self-efficacy was also associated with a woman’s pre-pregnancy intention to exclusively breastfeed, her perception of early breastfeeding difficulties and level of internal locus of control. Longitudinally, breastfeeding self-efficacy was significantly predictive of overall exclusive breastfeeding duration at all three time points (32 weeks gestation, 2 and 6 months postpartum). Additionally, at two months postpartum women who had more symptoms of depression, anxiety and stress (psychological adjustment) had
significantly lower levels of breastfeeding self-efficacy. These findings are consistent with self-efficacy theory and highlight (i) the importance of self-efficacy on the maintenance of exclusive breastfeeding duration, (ii) the interrelationship between self-efficacy and other psychosocial factors such as depression, locus of control and intention and (iii) the indirect effect of self-efficacy on breastfeeding outcomes through these other variables such as depression, locus of control and intention.

According to self-efficacy theory, self-efficacy is predictive of: a) whether an individual will choose to engage in the behaviour or not; b) how much effort they are likely to expend achieving their goals; c) whether they adopt self-enhancing or self-defeating thought patterns; and d) how they react emotionally and how resilient they are to barriers or setbacks (Bandura, 1977; Dennis, 1999). Additionally, self-efficacy theory identifies four ways in which self-efficacy is developed or can be increased: (i) mastery of experience (e.g. drawing on experiences of previous success at breastfeeding, or experiencing success with breastfeeding early on); (ii) vicarious experience (e.g., watching other women successfully exclusively breastfeed); (iii) verbal persuasion (e.g., verbal encouragement from others, friends, family, health care professionals or positive self-talk); and (iv) interpretation of physiological states (e.g., feelings of happiness, bonding, attachment that breastfeeding brings).

Accordingly, mothers with high self-efficacy are more likely to initiate exclusive breastfeeding, report less perceived breastfeeding difficulties and despite these difficulties are able to persist when they experience difficulties; they are more likely to adopt self-enhancing thoughts and react positively to their own physiological responses to be able to overcome difficulties (Bandura, 1977; Dennis, 1999). This is also consistent with the present findings. The self-efficacy concept
that these studies have provided the most empirical support for is that of mastery of experience. In Study two women who reported more difficulties with breastfeeding in the first few weeks after the birth of their infant, reported lower levels of self-efficacy during the first six months postpartum. Longitudinally, breastfeeding self-efficacy was a much stronger predictor of exclusive breastfeeding duration at six months than it was at two months. This indicates that it may take some time experiencing success; breastfeeding in different situations and achieving different types of barriers, to strengthen the relationship between self-efficacy and breastfeeding outcomes. Interestingly, in Study Three there was no significant difference between first time mothers (primigravida) and mothers who had at least one other pregnancy (multigravida) on breastfeeding self-efficacy. This is inconsistent with previous literature (Blyth et al., 2002) and self-efficacy theoretical concept, mastery of experience. Blyth et al. found that multigravida mothers reported higher breastfeeding self-efficacy during pregnancy and at both four weeks and four months postpartum. Multigravida mothers were also more likely to be exclusively breastfeeding at four months postpartum than primigravida mothers.

The findings of the systematic review identified depression as being significantly implicated in exclusive breastfeeding outcomes. That is, women with elevated symptoms of postnatal depression are at greater risk of early cessation of exclusive breastfeeding (Akman et al., 2008; Henderson et al., 2003). Previously, researchers had proposed that breastfeeding is protective of depressive symptoms and that early cessation of breastfeeding can lead to the onset of postnatal depression (Astbury, Brown, Lumley & Small, 1994; Hannah, Adams & Lee, 1992). However, in contrast to this, Henderson et al. (2003) showed that the onset of depressive symptoms occurred before the cessation of exclusive breastfeeding. This indicates
that the time sequence involved in the relationship between depression and breastfeeding outcomes is not clear.

In contrast to the current literature, Study Two and Study Three revealed conflicting results. Cross-sectionally, the level of depressive, anxiety and stress symptoms that participants reported during the first six months postpartum was not related to exclusive breastfeeding duration. However longitudinally, women who reported higher symptoms of depression, anxiety and stress at both two and six months postpartum, exclusively breastfed for a shorter duration than women who reported less symptoms. This provides support for the time sequence identified by Henderson et al. (2003). The onset of early symptoms of depression, anxiety and stress predicted exclusive breastfeeding duration later on at six months postpartum. The difference between these findings cross-sectionally in Study Two and longitudinally in Study Three is likely due to differences in methodology. In Study Two mothers reported retrospectively on their level of symptoms across the different time points. Although maternal recall is considered to be very reliable (Tomeo et al., 1999), their retrospective reports may have been influenced by their current psychological state and experiences since the birth. In contrast, longitudinally, women were reporting on their current feelings and as such, more likely to be reporting on a more accurate account of their experiences.

New mothers with symptoms of depression, anxiety and stress often experience feelings of failure and lack confidence in their role as a mother (Beck, 2008; Hall, 2006; Haynes, 2007; Milgrom et al., 1999; Milgrom et al., 2006). These feelings may lead to reduced interest and confidence (self-efficacy) in their ability to breastfeed. This interaction between psychological adjustment and self-efficacy was evident in Study Three at two months but not at six months postpartum. This
suggests that symptoms of depression, anxiety and stress impact breastfeeding outcomes negatively at two months postpartum by reducing a woman’s breastfeeding self-efficacy. In contrast, at six months postpartum when women are more efficient at breastfeeding and have developed stronger self-efficacy, symptoms of depression, anxiety, and stress have less influence on their self-efficacy and thus their ability to continue to exclusively breastfeed. This finding highlights the importance of identifying women who may be struggling to adjust psychologically to the pressures of having an infant and infant feeding in the early postpartum. However, further research clarifying the time sequence of depression and exclusive breastfeeding cessation and the precise mechanism of this relationship is needed in order to identify women who may be at risk of early cessation of exclusive breastfeeding and to inform the development of effective psychological interventions.

The findings of the systematic review also identified maternal attitude as a predictor of exclusive breastfeeding duration (Bai et al., 2010; Scott et al., 2006; Semenic et al., 2008). These studies examined attitude towards breastfeeding compared to other methods of infant feeding, such as formula or mixed feeding. What has not been examined in the literature to date is women’s attitudes towards pregnancy itself and toward their experience of pregnancy. This was a novel aspect of Study Two and Study Three. In Study Two, women who had a more positive attitude towards pregnancy, had higher intention to exclusively breastfeed their infant; longitudinally this relationship was not supported. Although in Study Three the direction of the relationship between attitude towards pregnancy and exclusive breastfeeding duration was in the right direction, the effect did not reach significance. In both studies two and three attitude towards pregnancy was strongly
related to all three aspects of body image, that is, salience of weight and shape, feelings of fatness and attractiveness, as well as psychological adjustment. This suggests that maternal attitude towards pregnancy is more likely to influence other psychosocial factors such as a woman’s body image and psychological adjustment rather than breastfeeding outcomes directly.

Although none of the studies eligible for inclusion in the systematic review examined the relationship between body image and exclusive breastfeeding duration, previous literature has identified significant relationships between different aspects of women’s body image and breastfeeding outcomes. The previous literature shows that: (1) women with a more positive body image pre-pregnancy were more likely to exclusively breastfeed their infant (Huang, et al., 2004); (2) women with body mass index’s in the obese range are less likely to initiate and continue to exclusively breastfeed (Kugyelka, et al., 2004; Mok, et al., 2008) and finally, (3) a woman’s attitude towards her body shape may be more predictive of her feeding intentions more so than her physical body size (Foster, et al., 1996). Given that pregnancy and the postpartum is a time of significant changes to a woman’s body size and shape, Study Two and Study Three predicted that dissatisfaction with these changes would negatively impact a woman’s psychological adjustment and comfort breastfeeding, in turn reducing exclusive breastfeeding duration.

Clark et al. (2009) showed that during the postpartum, women’s feelings of fatness and their salience of weight and shape increased significantly and was at its peak at six months postpartum. Study Three provided longitudinal support for this finding; at 32 weeks gestation and two months postpartum body image had no direct effect on exclusive breastfeeding duration. However, at six months postpartum, women’s perceived feelings of fatness was a direct predictor of their exclusive
breastfeeding duration. Women who had stronger feelings of fatness exclusively breastfed for a shorter duration. There are two explanations for this finding. Firstly, women who have stronger feelings of fatness (whether perceived or actual) may experience more embarrassment related to their body shape or size while feeding in public or feel self-conscious about exposing their body in public or wearing clothes that make feeding easier. Secondly, women who are larger may have difficulties getting their infants to latch on and suckle properly due to larger breast or nipple size. Both of these explanations have previously been associated with reduced initiation and duration rates in women who are uncomfortable with their body (Hoover, 2007). Clark et al. (2009) suggest that by six months postpartum women may have stronger feelings of fatness if they feel as though they have not regained their pre-pregnancy body, whereas there is less pressure for this to have occurred by two months postpartum. This would explain the effect of feeling fat influencing exclusive breastfeeding duration at six months but not at two months postpartum in Study Three.

Additionally, studies have shown that women who have more symptoms of depression report higher levels of body dissatisfaction during both pregnancy and the postpartum (Clark et al., 2009; Rallis et al., 2007; Skouteris et al., 2005). While not directly related to exclusive breastfeeding duration, both cross-sectionally and longitudinally, women’s body image was related strongly to their level of psychological adjustment.

Maternal intention to exclusively breastfeed was one of the most researched psychosocial variables identified in Study One. Three of the nine studies in the systematic review examined the relationship between intention and exclusive breastfeeding outcomes (Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth,
All three studies reported that most women who intended to exclusively breastfeed their infant did so and that stronger intentions resulted in a longer duration of exclusive breastfeeding. In contrast, Study Two and Study Three did not find any support for this relationship. In both Study Two and Study Three, intention to exclusively breastfeed had no direct association with exclusive breastfeeding outcomes; most women who intended to exclusively breastfeed did not. In previous literature, intention is mostly examined in the early postpartum (Bai et al., 2010; Blyth et al., 2004; Kronborg & Vaeth, 2004). However, Scott et al. (2001) suggested that women are more likely to exclusively breastfeed for longer when they make the decision to do so during their pregnancy. This has also been supported by O’Brien & Fallon (2005). As such, both Study Two and Study Three examined intention during pregnancy. This may have influenced the non-significant relationship between exclusive breastfeeding intentions and outcomes in Study Two and Three. Asking women to report on their exclusive breastfeeding intentions during their pregnancy, may result in a more idealistic response (Crossley, 2009; Knaak, 2006) rather than a realistic, informed response had intention been measured after birth when women had initiated feeding.

**Novel Psychosocial Factors Examined in Study Two and Three**

There were several variables included in study two and three that had not been explored previously in the context of exclusive breastfeeding duration. For example, locus of control is a psychological construct often used in health psychology to examine individual’s control beliefs (internal, external and powerful others) and their engagement in health related behaviours (see Steptoe & Wardle, 2001). In Study Two, the fetal health locus of control scale (Labs & Wurtele, 1986)
was used to measure how much control women believe they have over the health and development of their developing baby. The fetal health locus of control scale has been used to predict maternal engagement in health related behaviour such as smoking during pregnancy, exercise and attending antenatal appointments (Labs & Wurtele, 1986). Unexpectedly, in Study Two locus of control did not differ significantly between women who did and did not exclusively breastfeed to six months postpartum. In the path model, locus of control was only associated directly with problem focused coping, which in turn was not associated significantly with any other variable. Given the scales focus on the health of the fetus antepartum, a more general health locus of control scale, or one which focuses on the health of the child postpartum may have been more appropriate. Subsequently, Study Three used the Multidimensional Health Locus of Control Scale (Wallston et al., 1978) as a measure of women’s control beliefs for more general health related behaviours. Again, locus of control did not show strong significant relationships with any breastfeeding outcome or psychosocial variables longitudinally. As such, locus of control was omitted from the path analyses due to reduced power in the study.

Although locus of control was not found to be an important psychosocial factor in predicting exclusive breastfeeding outcomes or having an effect on other psychosocial factors, further research is warrant given its strong theoretical basis. Locus of control theory states that individuals have a tendency to attribute events that occur as the result of either their own personal actions (internal), external forces beyond their control (external) or the result of other people (powerful others; Rotter, 1966). Individuals with an internal locus of control are more likely to attribute outcomes to their own ability or energy expended on the task, are more likely to engage in a problem focused coping style, to work hard for achievements, set long
term goals and are more likely to tolerate delays in reward (Rotter, 1966). As such, women with a strong internal locus of control are theorized to take more personal responsibility for the health and development of their infant and more likely to hold the belief that the actions that they engage in influence their infant's health outcomes (Labs & Wurtele, 1986). There has been a small amount of research examining locus of control and breastfeeding intention. For example, Haslam, Lawrence and Haefeli (2003) showed that women who were planning to breastfeed had significantly higher internal locus of control than women who did not intend to breastfeed (70% versus 30%).

According to locus of control theory, a woman’s locus of control should also influence her experience of breastfeeding difficulties and her likelihood to persevere despite challenging experiences (Labs & Wurtele, 1986; Rotter, 1966). Having perceived control over a situation is theorized to reduce the associated stress (Haslam et al., 2003; Rotter, 1966). For example, women with an internal locus of control are more likely to hold the belief that they can take steps to reduce the stressfulness of a particular stressor, such as breastfeeding difficulties. Rather than interpreting breastfeeding difficulties as something that is out of their own control, women with high internal locus of control would be more likely to take the steps to receive help or advice and pursue through the difficulties longer because they have the belief that they can influence the health outcomes of their infant. Accordingly, identifying women’s locus of control beliefs may help to identify those at risk of early cessation of exclusive breastfeeding and those who may need additional support or education. Although there is some limited evidence of the relationship between locus of control and breastfeeding intention (Haslam et al., 2003) to date there have been no other published studies examining locus of control and
breastfeeding *duration* and specifically, exclusive breastfeeding duration. Further research would be beneficial to understand this relationship.

Both Study Two and Study Three explored the effect of maternal coping style on exclusive breastfeeding duration. It hypothesized that women who engage in problem focused coping strategies in contrast to emotion focused or maladaptive coping strategies would be more likely to have positive exclusive breastfeeding outcomes. This relationship has not, to the author’s knowledge, been examined in the breastfeeding literature and as such the mechanism of this effect is not clear, however was predicted to be through locus of control. Women with a higher internal locus of control engage in more effective, problem focused coping strategies to deal with breastfeeding difficulties and as such may have more positive breastfeeding outcomes. Longitudinally, this relationship was supported; women with an internal locus of control were more likely to engage in problem focused coping strategies however, neither of these factors were significantly related to any other psychosocial factor or exclusive breastfeeding outcome. This further emphasizes the need to advance current literature around the interrelationship between locus of control and other psychosocial factors and the indirect effect on breastfeeding outcomes.

**Practical Implications**

The findings of this thesis has highlighted the importance of psychosocial factors for the maintenance of exclusive breastfeeding. Maternal and Child Health Nurses, General Practitioners, Psychologists and other health professionals working with women antenatally need to be aware of the impact that factors such as self-efficacy, psychological adjustment and body image have on women’s exclusive breastfeeding outcomes. The findings of this thesis support previous findings, which suggest that
self-efficacy in particular is important to identify as early as possible in the postpartum to intervene and improve women’s success at breastfeeding. The findings here extended this knowledge through finding that increasing women’s breastfeeding self-efficacy during the later stages of pregnancy also improves their exclusive breastfeeding outcomes.

Self-efficacy has previously been identified as a modifiable psychosocial factor (Semenic et al. 2008), which can be increased through appropriate intervention to improve breastfeeding outcomes. The current practice in Australia is for Maternal and Child Health Nurses to conduct home visits at four time points across the first six months postpartum; two weeks, four weeks, eight weeks and four months postpartum. These home visits currently have a focus on infant feeding and maternal wellbeing. It would be beneficial for clinicians to incorporate an assessment of breastfeeding self-efficacy into these visits in order to identify women with low self-efficacy. Once women are identified, self-efficacy can be enhanced through the use of Bandura’s mechanisms of enhancing self-efficacy, in particular, mastery of experience. This thesis showed strong evidence for the effect of mastery of experience on self-efficacy over time; women who experienced fewer difficulties with breastfeeding, reporting higher breastfeeding self-efficacy. Longitudinally, breastfeeding self-efficacy becomes stronger over time to six months postpartum as women have experience in succeeding at exclusive breastfeeding.

Further, existing antenatal breastfeeding education and support groups may be strengthened by incorporating strategies which increase breastfeeding self-efficacy. Group based antenatal support is unique in that all four of Bandura’s ways of enhancing self-efficacy can be targeted. Maternal self-efficacy can be increased in a group environment through vicarious experience (watching other women succeed
at breastfeeding and at overcoming breastfeeding difficulties); verbal persuasion (positive reinforcement about their breastfeeding ability from other mothers and group facilitators); physiological states (learning to understand and interpret normal physiological responses in their body e.g. tiredness or stress as not meaning they cannot breastfeed) and mastery of experience (overcoming obstacles and building confidence through experiencing success).

It is also important that clinicians working with women antenatally, understand the interrelationship between self-efficacy and postnatal depression. It is important clinicians identify women who are struggling psychologically to prevent a decrease in their breastfeeding self-efficacy, which leads to reduced exclusive breastfeeding duration for these women as seen longitudinally in study three. For women who are experiencing postnatal depression, the early cessation of breastfeeding is likely to contribute to their characteristic sense of failure as a mother. This may be even more apparent for women who had a strong intention to exclusively breastfeeding their infant. As seen longitudinally at both 32 weeks gestation and six months postpartum, women who have a stronger intention to exclusively breastfeed, place more importance on maintaining exclusive breastfeeding to six months postpartum. If clinicians have this knowledge and understand the interrelationship between these factors, then early identification and referral to the appropriate psychological services may improve the breastfeeding outcomes for these women.

The findings of this thesis also highlighted the importance of body image in women’s exclusive breastfeeding outcomes. Longitudinally, women’s perception of their ‘feelings of fatness’ at six months postpartum directly predicted their exclusive breastfeeding duration. This finding was consistent with previous literature (Clark et
al. 2009) and suggests that increasing positive maternal body image throughout the postpartum would enhance breastfeeding outcomes. Antenatal health education, assisting women with information about normal weight loss after pregnancy and health body image after pregnancy may be effective for reducing the impact that poor body image has on breastfeeding outcomes.

**Limitations**

Within Study Two and Study Three there were some limitations that were specific to the design and some limitations that are more inherent in exclusive breastfeeding research. Study two was significantly limited by its retrospective design. Although maternal recall of the antenatal period is considered to be valid and reliable due to the significance of this time (Tomeo et al., 1999) previous antenatal experiences are likely to influence or bias a women’s recall. However as 76% of this sample (n = 142) were first time mothers, this limitation was somewhat contained. Despite this limitation, the exploratory nature of the study was achieved and a wide range of psychosocial variables was assessed and importantly, informed the design of the subsequent longitudinal study.

The main limitation of Study Three was the small sample size. This study had a high attrition rate of 36%. One of the main aims of the thesis was to examine the relationship between multiple psychosocial factors, rather than just one or two in isolation, which has been common practice in previous research. As such, each model being evaluated contained a number of pathways. Although this study had a sample size adequate for path analysis (N = 125; Klein, 1998), the amount of pathways examined resulted in reduced statistical power. This resulted in some variables being omitted from the main path analyses (e.g. locus of control, coping
styles and perceived social support). Reduced statistical power increases the likelihood that the null hypothesis (no effect between variables) would be supported (Ellis, 2010). Given this, it is likely that some of the non-significant results may have reached statistical significance had the sample size been larger. This is particularly disappointing due to the exploratory nature and novel aspect of some of the variables, which may have made important contributions and extended our understanding of the factors that affect women during the antenatal period.

Finally, there are limitations of breastfeeding research in general which this thesis attempted to address and future studies should carefully consider. Firstly, there is inconsistency across the literature in the definition of ‘exclusive breastfeeding’ and further, many studies do not specifically explain how ‘exclusive’ was operationalized in their design. The two main definitions used in the literature are the World Health Organizations (WHO, 2011) and the Interagency Group for Action against Breastfeeding (IGAB; Labbok & Krasovec, 1990). There are slight differences in these definitions, which may impact on the interpretation of research findings. For example, the specificity with the IGAB definition of exclusive breastfeeding (see Table 2.4) has meant most studies that adhere to these definitions tend to combine ‘exclusive’ and ‘almost exclusive’ as ‘fully breastfeeding’. This results in a higher proportion of women being classified as ‘fully breastfeeding’ (and possible interpreted as exclusively breastfeeding) due to the less stringent criteria having to be met. This may also bias research findings as it may categorize women incorrectly as having exclusively breastfed when they have not. Other studies state that they are measuring exclusive breastfeeding, however do not follow the WHO or the IGAB guidelines and define their own criteria of ‘exclusive’ breastfeeding (Kools et al., 2006; Mok et al., 2008; Taveras et al., 2003). For example, Taveras et
al. (2003) defined exclusive breastfeeding as giving no more than one and a half cups or 50% of the infants daily calories of formula per day. This means that the infant may only be breastfed 50% of the time and still be considered to be exclusively breastfed. In this thesis, exclusive breastfeeding was defined and operationalized according to the WHO definition of exclusive breastfeeding. At each time point that participants were asked about their breastfeeding behaviours or current exclusive breastfeeding status, the question was worded to include the key elements of the WHO definition (refer to Appendix B and C). Future studies need to adopt either the WHO or IGAB definitions and need to be clear and provide detail in their method of how this information was collected.

A further limitation of the breastfeeding literature in general is the self-report nature that nearly all studies adopt. Using self-report measures for breastfeeding outcomes as well as psychosocial variables such as breastfeeding intentions, attitude, depression, anxiety, and stress may lead to biased responses due to social pressures and cultural expectations placed on women for this to be a happy time in their life. Previous authors have explored the dilemma in breastfeeding research, that women may feel a moral obligation to uphold the view of a ‘good mother’, despite their true intentions or experiences (Crossley, 2009; Knaak, 2006). This is a difficult limitation to address when designing research in this area and is linked with the final limitation of the small sample sizes in research in this area. It is common across the breastfeeding literature for studies to have considerably small sample sizes. Although most studies start off with adequate sample sizes, there tends to be a high attrition rate. Therefore, developing studies which are not too time consuming for women to participate in during what is already a time of change and adjustment is vital for maintaining adequate sample across the course of the study.
Conclusions and Future Research

The overall aim of this thesis was to explore the associations between psychosocial factors and exclusive breastfeeding duration. There were three specific aims; firstly, to specifically examine which psychosocial factors are implicated in a woman’s ability to successfully maintain exclusive breastfeeding (in contrast to any level of breastfeeding) to six months postpartum. Secondly, to examine a range of psychosocial factors, their interrelationships and their direct and indirect effects on exclusive breastfeeding duration. The final aim was to examine these relationships longitudinally. All three studies in this thesis have highlighted the importance of some psychosocial factors on exclusive breastfeeding outcomes and the need for others to be further examined in order to improve the exclusive breastfeeding rates in Australia.

Consistent with previous literature, all three studies demonstrated that self-efficacy was the psychosocial factor, most reliably implicated in exclusive breastfeeding outcomes. This is quite promising as self-efficacy is modifiable and has been shown empirically to independently improve exclusive breastfeeding outcomes when modified through appropriate interventions (Semenic et al., 2008). Additionally, psychological adjustment (depression, anxiety and stress), attitude towards pregnancy and body image are all important either directly or indirectly in influencing a woman’s ability to maintain exclusive breastfeeding to six months postpartum.

Importantly, this thesis highlighted the interrelationships between psychosocial factors contributing to exclusive breastfeeding outcomes. Examining the interrelationship between psychosocial factors is important for two main reasons. Firstly, the influence of psychosocial factors on exclusive breastfeeding duration is
complex and multifactorial. Secondly, examining psychosocial factors in isolation is likely to result in a false indication of which psychosocial factors are important at which time points. For example, body image had previously been identified in breastfeeding literature as associated with breastfeeding outcomes. However, when examined in the context of other psychosocial factors the direct relationship was not significant. In this thesis, the interrelationship between psychological adjustment, body image and attitude towards pregnancy was highlighted. The interaction between this triad was consistent cross sectionally and longitudinally and warrants further attention in the exclusive breastfeeding literature to identify the mechanism of the relationship and its influence on exclusive breastfeeding outcomes.

This thesis has contributed to the breastfeeding literature a series of studies examining the relationships between psychosocial factors and exclusive breastfeeding duration. These studies endeavored to address some of the limitations that have been identified in the existing literature. In particular, Study Three contributed a rigorously designed longitudinal study, which followed women from 32 weeks gestation to six months postpartum and specifically examined a range of psychosocial factors and exclusive breastfeeding outcomes. This longitudinal study demonstrated how important it is for clinicians to understand how psychosocial factors relate to one another across time. This is particularly important for the development of effective interventions and knowing when in the antenatal period to target particular variables. To our knowledge this has not been done previously. Future research is needed to expand on the findings of this thesis, to develop psychometrically validated tools to use within this population and further investigate the role that modifiable psychosocial factors have on exclusive breastfeeding duration to six months postpartum.
References


Appendix A

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hse@deakin.edu.au

Memorandum

To
Associate Professor Helen Skouteris
School of Psychology

From
Secretary – HEAG-H
Faculty of Health

Date
20 June, 2011

HEAG-H 70_2011: Determinants of Infant Feeding after Birth

Approval has been given for Associate Professor Helen Skouteris, School of Psychology, to
undertake this project for a period of 3 years from 20 June, 2011.

The approval given by the Deakin University HEAG-H is given only for the project and for
the period as stated in the approval. It is your responsibility to contact the Secretary
immediately should any of the following occur:
• Serious or unexpected adverse effects on the participants
• Any proposed changes in the protocol, including extensions of time
• Any events which might affect the continuing ethical acceptability of the project
• The project is discontinued before the expected date of completion
• Modifications that have been requested by other Human Research Ethics Committees

In addition you will be required to report on the progress of your project at least once every
year and at the conclusion of the project. Failure to report as required will result in suspension
of your approval to proceed with the project.

HEAG-H may need to audit this project as part of the requirements for monitoring set out in the
Form can be found at http://www.deakin.edu.au/research/admin/ethics/human/forms/ which
you will be required to complete in relation to this research. This should be completed and
returned to the Administrative Officer to the HEAG-H, Dean’s office, Faculty of Health,
Burwood campus by Tuesday 22nd November, 2011 and when the project is completed.

Good luck with the project!

Steven Sawyer
Secretary
HEAG-H
Memorandum

To: A/Prof Helen Skouteris
School of Health & Social Development

B

From: Deakin University Human Research Ethics Committee (DUHREC)
Date: 02 July, 2012
Subject: 2009-036
Maternal and infant wellbeing: Pre and post birth

Please quote this project number in all future communications

The modification to this project, submitted on 29/06/2012, has been approved by the committee executive on 2/07/2012.

Approval has been given for A/Prof Helen Skouteris, School of Psychology, to continue this project as modified to 31/12/2014.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

- Serious or unexpected adverse effects on the participants
- Any proposed changes in the protocol, including extensions of time.
- Any events which might affect the continuing ethical acceptability of the project.
- The project is discontinued before the expected date of completion.
- Modifications are requested by other HRECs.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DUHREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Telephone: 03 9251 7123
Dear Participants,

This letter is to invite you to participate in a research project which will examine the factors that might be associated with successful breastfeeding. This research is being undertaken as part of a Doctorate of Psychology (Health) degree.

1. Your Consent

This Plain Language Statement contains detailed information about the research project. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project so that you can make a fully informed decision whether you are going to participate.

Please read this Plain Language Statement carefully. Feel free to ask questions about any information in the document. You may also wish to discuss the project with a relative or friend or your local health worker. Feel free to do this.

Once you understand what the project is about and if you agree to take part in it, you will be asked to complete the online questionnaire. Submitting the questionnaire is considered to be your consent for participating in this research.
2. **Purpose and Background**

This study aims to investigate the factors that are associated with the method of infant feeding after birth. You are invited to participate in this research project because you are 18 years or above and you have given birth within the last five years.

The results of this research may be used to help researcher Emily de Jager to obtain a Doctorate of Psychology (Health).

3. **Procedures**

Participating in this research project will involve you completing an online questionnaire. The questionnaire can be completed at your own convenience and will take no longer than 30 minutes to complete. By completing the questionnaire you are provide consent to do so.

The questionnaire will ask you questions about your experiences pre-pregnancy, during pregnancy and post-pregnancy. You will be asked questions regarding body image, breast feeding intentions and experiences as well as your experiences of depression, anxiety and stress. For example, you may be asked questions such as to what extent you agree with the statement: ‘Thinking about the shape of my body stops me from concentrating’ or ‘My baby’s health is in the hands of health professionals’ or ‘I felt self-conscious and embarrassed with the changes in my body shape’ or I felt down-hearted and blue or ‘ I felt that I had nothing to look forward to’.

4. **Possible Benefits**

Possible benefits of participating in this study will be to increase our understanding of the factors which both enable and prevent women from breastfeeding their baby. Your personal experiences will help advance the knowledge in this area and may help to improve this experience for women in the future.

5. **Possible Risks**

There are no anticipated risks outside the normal day-to-day activities. However, given that the questionnaires will include questions regarding issues such as anxiety and stress, there is a slight possibility that you may experience some concern about your responses. Thus, you are invited to examine the questionnaire material before agreeing to participate. If you do participate and find that you are uncomfortable or overly worried about your responses to any of the questionnaire items, or if you find participation in the project distressing, you should contact Lifeline on 13 11 14 or the Australian Psychological Society Referral Service on 1800 333 497.

6. **Privacy, Confidentiality and Disclosure of Information**

The data in this study you provide will be unidentifiable. Therefore, only aggregated data will be reported in a thesis.
The information collected during the study will be stored in hard-copy and computer files in secure storage for a minimum of 6 years, in accordance with Deakin University guidelines. Following this period the hard copy files will be destroyed and the computer files deleted. A report of the study may be submitted for publication to a psychological journal, however individual participants will not be identifiable in such a report as only aggregate data will be reported.

7. Results of Project

You are encouraged to contact the researcher at the completion of the study to be informed of the aggregate research findings. Aggregate results will be published in a thesis and it is anticipated that they will also form part of a publication in a psychology journal.

8. Participation is Voluntary

Participation in any research project is voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any time. Any information obtained from you to date will not be used. Please note, that due to the anonymity of this research, once you have submitted the questionnaire, you are unable to withdraw your submission. Please carefully consider your participation before submitting your questionnaire.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with Deakin University or through which you have been invited to participate.

Before you make your decision, a member of the research team will be available to answer any questions you have about the research project. You can ask for any information you want.

If you decide to withdraw from this project, please do not submit your questionnaire.

9. Ethical Guidelines

This project will be carried out according to the National Statement on Ethical Conduct in Human Research (2007) produced by the National Health and Medical Research Council of Australia. This statement has been developed to protect the interests of people who agree to participate in human research studies.

The ethics aspects of this research project have been approved by the Human Research Ethics Committee of Deakin University.

10. Complaints

Should you have any concern about the conduct of this research project, please contact the Secretariat, Deakin University Human Ethics Advisory Group, Health, Medicine, Nursing and Behavioural Sciences. Phone: 03 9251 7175. Email: steven.sawyer@deakin.edu.au

Please quote project number ************

11. Reimbursement for your costs

You will not be paid for your participation in this project.
12. **Further Information, Queries or Any Problems**

If you require further information, wish to withdraw your participation or if you have any problems concerning this project you can contact the principal researcher, Associate Professor Helen Skouteris.

The researchers responsible for this project are:

Associate Professor Helen Skouteris (principal researcher), Deakin University, Faculty of Health, School of Psychology, 221 Burwood Hwy, Burwood, 3125, Ph.: 9251 7699.

Emily de Jager (student researcher), Deakin University, Faculty of Health, School of Psychology, 221 Burwood Hwy, Burwood, 3125,
Study 1 – Determinants of Infant Feeding after Birth
Emily de Jager, 2011
Questionnaire

Demographic Information

Today’s date: _______________________________________

First name of your preschool child: ________________________________

What is the age of your child in years: ____________________________

What is your age in years: ___________________

1. How many children do you have?
   - One
   - Two
   - Three
   - Four
   - Five
   - 6 or more

2. Where is *ARTHUR* positioned?
   - First born
   - Second born
   - Third born
   - Fourth born
   - Fifth born
   - Other ___________________________________________

3. How old were you when you gave birth to *ARTHUR*:
   ____________________________ years

4. What was the method of delivery of *ARTHUR*:
   - Vaginal
   - Caesarean

5. What is your marital status
   - Single
   - Defacto
   - Married
   - Divorced

6. What is your highest level of education attained?
   - Secondary school
   - Diploma qualification
   - University undergraduate
7. In what country were you born?

___________________________________________________

8. In what country were your parents born?

____________________________________________________

9. What is your total annual household income
   - Less than $30,000
   - $31,000 - $50,000
   - $51,000 - $70,000
   - $71,000 - $90,000
   - $91,000 - $110,000
   - $110,000 - $130,000
   - More than $131,000

10. Were you working while you were pregnant? (If no, go to pre-pregnancy q’s)
    - Yes
    - No

11. Were you working
    - Full time
    - Part time
    - Casual

12. Did you return to work after the birth of *ARTHUR? 
    - Yes
    - No

13. Did you go back to work
    - Full time
    - Part time
    - Casual

14. Why did you return to work
    - Financial reasons
    - Career opportunities
    - Other

15. When you returned to work, who looked after *ARTHUR
Pre-pregnancy

For the next group of questions, I would like you to think back to before you were ever pregnant with *ARTHUR!*

Think back to before you were pregnant. Use the scale to indicate how much you agree/disagree with each statement, in relation to how you felt at that time about your pre-pregnancy body.

1 = definitely disagree
2 = mostly disagree
3 = neither disagree nor agree
4 = mostly agree
5 = agree

1. I usually feel physically attractive
2. People hardly ever find me sexually attractive.
3. I get so worried about my shape that I feel I ought to diet
4. I feel fat when I can't get clothes over my hips.
5. I feel satisfied with my face.
6. I worry that other people can see rolls of fat around my waist and stomach
7. I think I deserve the attention of the opposite sex.
8. I hardly ever feel fat.
9. There are more important things in life than the shape of my body
10. I feel fat when I wear clothes that are tight around the waist.
11. I quickly get exhausted if I overdo it.
12. Wearing loose clothing makes me feel thin.
13. I hardly ever think about the shape of my body.
14. I am proud of my physical strength.
15. Eating sweets, cakes or other high calorie food, makes me feel fat.
16. I have a strong body.
17. I feel fat when I have my photo taken.
18. I try and keep fit.
19. Thinking about the shape of my body stops me from concentrating.
20. I am preoccupied with the desire to be lighter.
21. I often feel fat.
22. I spend a lot of time thinking about my weight.
24. I feel fat when I am lonely.
25. People often compliment me on my looks.
26. I feel fat when I can no longer get into clothes that used to fit me.
27. I have never been strong.
28. I try to avoid clothes which make me feel especially aware of my shape.
29. I felt self conscious that my breasts were too small.
30. I felt self conscious that my breasts were too large.

What is your Height (in centimetres)? _____________________________

What was your pre-pregnancy weight (1 month prior to pregnancy) in kilograms? _______________________

How confident are you that you have noted your pre-pregnancy weight accurately?

0 = not at all confident
9 = extremely confident

---

For the following set of questions, I would like you to think about how you would normally react in a stressful situation.

---
Use the scale below to indicate to what extent you agree with each of the following statements:

1 = I usually don’t do this at all  
2 = I usually do this a little bit  
3 = I usually do this a medium amount  
4 = I usually do this a lot

1. I turn to work or other activities to take my mind off things  
2. I concentrate my efforts on doing something about the situation I’m in  
3. I say to myself “this isn’t real”  
4. I use alcohol or other illicit drugs to make myself feel better  
5. I get emotional support from others  
6. I give up trying to deal with it  
7. I try taking action to try to make the situation better  
8. I refuse to believe that has happened  
9. I say things to let my unpleasant feelings escape  
10. I get help and advice from other people  
11. I use alcohol or other illicit drugs to help me get through it  
12. I try to see things in a different light, to make it seem more positive  
13. I criticise myself  
14. I try to come up with a strategy about what to do  
15. I get comfort and understanding from someone  
16. I give up the attempt to cope  
17. I look for something good in what is happening  
18. I make jokes about it
19. I do something else to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping or shopping

20. I accept the reality of the fact that it has happened

21. I express my negative feelings

22. I try to find comfort in my religion or spiritual beliefs

23. I try to get advice or help from other people about what to do

24. I learn to live with it

25. I think hard about what steps to take

26. I blame myself for the things that happened

27. I pray or meditate

28. I make fun of the situation
During pregnancy

Now I would like you to think as though you are currently pregnant with *ARTHUR

Please respond using the scale below, to what extent you agree with the following statements:

0 = strongly disagree
9 = strongly agree

1. By attending prenatal classes taught by competent health professionals, I can greatly increase the odds of having a healthy, normal baby

2. Even if I take excellent care of myself when I am pregnant, fate will determine whether my child will be normal or abnormal

3. My baby will be born healthy only if I do everything my doctor tell me to do during pregnancy

4. If my baby is unhealthy or abnormal, nature intended it to be that way.

5. The care I receive from health professionals is what is responsible for the health of my unborn baby

6. My unborn child’s health can be seriously affected by my dietary intake during pregnancy

7. Health professional are responsible for the health of my unborn child

8. If I get sick during pregnancy, consulting my doctor is the best thing I can do to protect the health of my unborn child

9. No matter what I do when I am pregnant, the laws of nature determine whether or not my child will be normal

10. Doctors and nurses are the only ones who are competent to give me advice concerning my behaviour during pregnancy

11. God will determine the health of my unborn child

12. Learning how to care for myself before I become pregnant helps my child to be born healthy
13. My baby’s health is in the hands of health professionals

14. Fate determines the health of my unborn child

15. What I do right up to the time that my baby is born can affect my baby’s health

16. Having a miscarriage means to me that my baby was not destined to live

17. Before becoming pregnant, I would learn what specific things I should do and not do during pregnancy in order to have a healthy, normal baby

18. Only qualified health professionals can tell me that I should and should not do when I am pregnant

Please answer the following questions, using the scale below to indicate to what extent the following statements applied to you and how you felt about your body during your pregnancy.

1 = definitely disagree
2 = mostly disagree
3 = neither disagree nor agree
4 = mostly agree
5 = agree

1. I usually feel physically attractive
2. People hardly ever find me sexually attractive.
3. I get so worried about my shape that I feel I ought to diet
4. I feel fat when I can't get clothes over my hips.
5. I feel satisfied with my face.
6. I worry that other people can see rolls of fat around my waist and stomach
7. I think I deserve the attention of the opposite sex.
8. I hardly ever feel fat.
9. There are more important things in life than the shape of my body
10. I feel fat when I wear clothes that are tight around the waist.
11. I quickly get exhausted if I overdo it.
12. Wearing loose clothing makes me feel thin.
13. I hardly ever think about the shape of my body.
14. I am proud of my physical strength
15. Eating sweets, cakes or other high calorie food, makes me feel fat.
16. I have a strong body.
17. I feel fat when I have my photo taken.
18. I try and keep fit.
19. Thinking about the shape of my body stops me from concentrating.
20. I am preoccupied with the desire to be lighter.
21. I often feel fat.
22. I spend a lot of time thinking about my weight.
24. I feel fat when I am lonely.
25. People often compliment me on my looks.
26. I feel fat when I can no longer get into clothes that used to fit me.
27. I have never been strong
28. I try to avoid clothes which make me feel especially aware of my shape.

Please answer the following questions, using the scale below to indicate to what extent the following statements applied to you and how you felt about your body during your pregnancy.

1 = definitely disagree
2 = mostly disagree
3 = neither disagree nor agree
4 = mostly agree
5 = agree

1. I was happy with my growing body during pregnancy
2. I enjoyed watching my body shape change
3. My breasts grew larger and looked great
4. The changes in my body shape were necessary for my baby to grow
5. Pregnancy is a special time that women are lucky to experience
6. I enjoyed being pregnant
7. I felt self-conscious and embarrassed with the changes in my body shape
8. I felt fat during pregnancy
9. I did not enjoy being pregnant
10. Pregnancy is a terrible stage women have to endure in order to have a baby
11. I was embarrassed by the size of my breasts
12. My breasts looked swollen and sore
13. I did not enjoy being pregnant

Breastfeeding intention

1. Before giving birth, did you intend on exclusively breastfeeding your baby? (if No go to Q.3)
   - Yes
   - No
   - Wasn’t completely sure

2. If yes, for what duration did you intend on exclusively breastfeeding for? (skip Q.3)
   - Less than 1 month
   - 1-2 months
   - 2-4 months
   - 4-6 months
   - 6-12 months

3. For what reason did you not intend to exclusively breastfeed?
   - Health reasons
   - Breastfeeding would be inconvenient
   - I wanted to return to work
   - I was not comfortable with the idea of breastfeeding
   - Other
Post-pregnancy

You have now given birth to *ARTHUR*

Please answer the following questions as if you have just given birth to *ARTHUR*

1. When you were in hospital, were you in a private or shared room?
   - Private room (GO TO QUESTION 3)
   - Shared room

2. If in a shared room, were the other women in your room breastfeeding?
   - Yes
   - No
   - Some, but not all
   - Can’t remember

3. Were there complications with the birth of your baby, which prevented you from initiating breastfeeding?
   - Yes there were complications with the health of my baby
   - Yes there were complications with my health
   - No

4. How soon after the birth of your baby did you intend on returning to work?
   - Less than 1 month
   - 3 – 6 months
   - 6 – 9 months
   - 9 – 12 months
   - More than 12 months
   - I had no intention of returning to work

5. How soon after the birth of your baby did you return to work?
   - Less than 1 month
   - 3 – 6 months
   - 6 – 9 months
   - 9 – 12 months
   - I have not returned to work

Please use the following scale to answer the following questions regarding your experiences in hospital following the birth of __________:

1 = Never
2 = Rarely
3 = Sometimes
4 = Often
5 = Very often
6 = Always
1. The nursing staff helped me to initiate breastfeeding my baby

2. The nursing staff offered continuous support to encourage the continuation of me breastfeeding my baby

3. I experienced difficulties with the initiation of breastfeeding

4. I found breastfeeding to be painful

1. After giving birth, did you breastfeed *ARTHUR?  
   - Yes (GO TO QUESTION 4 & 5)  
   - No (GO TO QUESTION 2 & 3 & 5)

2. For what reason did you not breast feed *ARTHUR  
   - Health reasons  
   - Breastfeeding would be inconvenient  
   - I wanted to return to work  
   - I was not comfortable with the idea of breastfeeding  
   - Other

3. For how long did you exclusively feed *ARTHUR formula? (i.e. no solids or liquids other than formula)  
   - Less than 1 month  
   - 1-2 months  
   - 2-4 months  
   - 4-6 months  
   - 6-12 months  
   - More than 12 months

4. For how long did you exclusively breastfeed *ARTHUR (i.e. no solids or liquids other than breast milk)  
   - Less than 1 month  
   - 1-2 months  
   - 2-4 months  
   - 4-6 months  
   - 6-12 months  
   - More than 12 months

5. For what reason did you introduce solids to *ARTHUR’S diet  
   - I felt that he/she was ready  
   - I was following the recommended guidelines  
   - He/she started showing an interest in other foods
- Friends with baby’s the same age were
- Other

(NON BREAST FEEDERS SKIP NEXT SCALE & GO TO DASS)

Please think back to when you were first breastfeeding ________________

Answer the following statements using the scale below to indicate how confident you were in the following situations:

1 = not confident at all
5 = always confident

“I could always…."

1. Determine that my baby is getting enough milk
2. Successfully cope with breastfeeding like I have with other challenging tasks
3. Breastfeed my baby without using formula as a supplement
4. Ensure that my baby is properly latched on for the whole feeding
5. Manage the breastfeeding situation to my satisfaction
6. Manage to breastfeed even if my baby is crying
7. Keep wanting to breastfeed
8. Comfortably breastfeed with my family members present
9. Be satisfied with my breastfeeding experience
10. Deal with the fact that breastfeeding can be time-consuming
11. Finish feeding my baby on one breast before switching to the other breast
12. Continue to breastfeed my baby for every feeding
13. Manage to keep up with my baby’s breastfeeding demands
14. Tell when my baby is finished breastfeeding
EVERYONE COMPLETES THIS
Please think back to the first few weeks after the birth of *ARTHUR

Please read each statement and indicate using the scale below how much the statement applied to you in the first few weeks after the birth of *ARTHUR

0 = did not apply to me at all
1 = applied to me to some degree, or some of the time
2 = applied to me a considerable degree or a good part of time
3 = applied to me very much, or most of the time

1. I found it hard to wind down
2. I was aware of dryness of my mouth
3. I couldn’t seem to experience any positive feeling at all
4. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)
5. I found it difficult to work up the initiative to do things
6. I tended to over-react to situations
7. I experienced trembling (e.g. in the hands)
8. I felt that I was using a lot of nervous energy
9. I was worried about situations in which I might panic and make a fool of myself
10. I felt that I had nothing to look forward too
11. I found myself getting agitated
12. I found it difficult to relax
13. I felt down-hearted and blue
14. I was intolerant of anything that kept me from getting on with what I was doing
15. I felt I was close to panic
16. I was unable to become enthusiastic about anything

17. I felt I wasn’t worth much as a person

18. I felt that I was rather touchy

19. I was aware of the action of my heart of the absence of physical exertion
   (e.g. sense of heart rate increase, heart missing a beat etc.)

20. I felt scared without any good reason

21. I felt that life was meaningless

Please think back to the first six to twelve months after the birth of *ARTHUR
Use the scale below to indicate how you felt about your body during this time.

1 = definitely disagree
2 = mostly disagree
3 = neither disagree nor agree
4 = mostly agree
5 = agree

1. I usually feel physically attractive
2. People hardly ever find me sexually attractive.
3. I get so worried about my shape that I feel I ought to diet
4. I feel fat when I can't get clothes over my hips.
5. I feel satisfied with my face.
6. I worry that other people can see rolls of fat around my waist and stomach
7. I think I deserve the attention of the opposite sex.
8. I hardly ever feel fat.
9. There are more important things in life than the shape of my body
10. I feel fat when I wear clothes that are tight around the waist.
11. I quickly get exhausted if I overdo it.
12. Wearing loose clothing makes me feel thin.
13. I hardly ever think about the shape of my body.
14. I am proud of my physical strength
15. Eating sweets, cakes or other high calorie food, makes me feel fat.
16. I have a strong body.
17. I feel fat when I have my photo taken.
18. I try and keep fit.
19. Thinking about the shape of my body stops me from concentrating.
20. I am preoccupied with the desire to be lighter.
21. I often feel fat.
22. I spend a lot of time thinking about my weight.
24. I feel fat when I am lonely.
25. People often compliment me on my looks.
26. I feel fat when I can no longer get into clothes that used to fit me.
27. I have never been strong
28. I try to avoid clothes which make me feel especially aware of my shape.

What was your post birth weight (6 months after giving birth) in kilograms?
__________________

How confident are you that you have noted your post-pregnancy weight accurately?

0 = not at all confident
9 = extremely confident

Please answer the following questions, using the scale below to indicate to what extent the following statements applied to you and how you felt about your body in the first 6-12 months after the birth of *ARTHUR

1 = definitely disagree
2 = mostly disagree
3 = neither disagree nor agree
4 = mostly agree
5 = agree

1. I was confident that my body would return to its previous shape by 12 months after the birth
2. It is perfectly natural for women to have excess body fat even up to 12 months post birth
3. My breasts looked good
4. I felt very self-conscious and embarrassed about my body shape after giving birth
5. I found it really hard to lose the weight gained during pregnancy
6. My breasts were embarrassingly large and swollen
7. My breasts were always sore and uncomfortable

Feeding practices and experience

1. Did you have friends or family who were pregnant/breastfeeding at the same time as you?
   - Yes, I had one other
   - Yes, I had lots of others
   - No, I had no others

2. Did other members of your family (mum, sisters etc.) breastfeed their babies?
   - Yes
   - No
   - Some, but not all

3. Was it common among your friends to breastfeed?
   - Yes
   - No
   - Some, but not all

(PARTICIPANTS NOT BREASTFEEDING FINISH HERE)
Please use the scale below to indicate to what extent the following statements applied to during the first six months of feeding ______________

1 = definitely disagree
2 = mostly disagree
3 = neither disagree nor agree
4 = mostly agree
5 = agree

1. I felt comfortable breastfeeding in public?
2. I felt comfortable bottle-feeding in public?
3. I felt self-conscious that other people may be looking at me while I was breastfeeding my baby
4. I felt self-conscious that people may be looking at me while I was bottle-feeding my baby
5. My breasts became uncomfortably large, sore or swollen during pregnancy and postpartum

Is there anything else that you would like to contribute about your breastfeeding experiences?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Thank you for your time and contribution to this research ☺️
PLAIN LANGUAGE STATEMENT

Date:  June 2012

Full Project Title: Maternal and Infant Wellbeing: Pre and Post Birth

Principal Researcher: Associate Professor Helen Skouteris (School of Psychology, Deakin University, Burwood)

Student Researchers: Miss Sofia Rallis, Ms Briony Hill, Miss Emily De Jager (School of Psychology, Deakin University, Burwood), and Ms Jo Phillips (School of Psychology, Deakin University, Geelong)

Associate Researchers: Professor Marita McCabe, (School of Psychology, Deakin University, Burwood) and Professor Jeannette Milgrom (School of Psychology, The University of Melbourne).

1. Your Consent
You are invited to take part in this research project being conducted by Deakin University.

This Plain Language Statement contains detailed information about the research project. Its purpose is to explain to you as openly and clearly as possible all the procedures involved in this project so that you can make a fully informed decision about whether you are going to participate.

Once you understand what the project is about and if you agree to take part in it, you will be asked to sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project. Please do this prior to completing the questionnaires.

You will be given a copy of the Plain Language Statement and Consent Form to keep as a record.

2. Purpose and Background
The purpose of this project is to investigate women’s general experiences during pregnancy and the first 12 months following birth. This includes issues associated with general mood as well as experiences related to self-esteem, body image, relationship quality and parental stress.
The project aims to provide some insight into questions regarding the level and type of distress experienced by women across pregnancy and the first postpartum year, and whether any ‘critical periods’ can be identified where early intervention may be most effective. The identification of risk factors and consequences to maternal distress during pregnancy and the postpartum will also be explored.

As part of investigation into mood and body image changes during and after pregnancy, body weight is assessed; this is because pregnancy is a time of significant physical and emotional change in a woman’s life.

In order to obtain accurate and meaningful results, we aim to recruit 600 women into the project who will complete a series of questionnaires on a monthly basis throughout pregnancy and the first postpartum year. You are invited to participate in this research project because you are currently in your first trimester of pregnancy.

3. Funding

This project is being funded through two student PhD budgets provided by the School of Psychology, Deakin University, as well as a National Health and Medical Research Council (NHMRC) PhD scholarship budget.

4. Procedure

If you agree to participate, you will be required to complete a short series of questionnaires once a month for approximately 18 months (6 months across pregnancy and 12 months following birth). While this may sound like a lot, most of the questionnaires will take approximately 5-10 minutes to complete. Once every 3 months the questionnaire pack may take approximately 30-40 minutes to complete and will include questions about maternal and infant health and wellbeing, weight and height, as well as demographic information such as age and family income.

Examples of questions that will be asked are “I found it difficult to relax” and “In the past 7 days I have been able to laugh and see the funny side of things”. Participants will receive all the questionnaires in the mail and will be asked to return these to the University using the reply paid envelopes which will be provided.

You will also be invited to attend a 15-minute appointment at 16 weeks’ gestation, and 12 months post birth. The appointment will take place in a private room at Deakin University Burwood campus, or alternatively, in the comfort of your own home. At the 16 weeks’ gestation and 12 months post birth appointment, your height, weight, and waist circumference will be measured by a trained researcher.

If you live too far from the research Centre in Melbourne, you will be required to ask your GP/obstetrician/midwife to take your height and weight measurements as close to 16 weeks’ gestation as possible.

You will also be required to ask your GP/obstetrician/midwife to measure your weight at each antenatal visit and on the day of delivery if possible. You can record these measures on the questionnaires that will be sent to you monthly.

5. Possible Benefits

By participating in this project, you will be making an invaluable contribution to a very important area of research concerning maternal and infant health and wellbeing. The results obtained at the conclusion of the study will potentially have
implications for numerous health professions, expectant mothers as well as the general community.

Attaining a thorough and comprehensive understanding into women’s experiences in the first postpartum year can potentially indicate when early intervention would be most helpful so as to alleviate, or at least lessen, the distress experienced by a significant number of women both in Australia and overseas.

6. Possible Risks

There are no anticipated risks outside the normal day-to-day activities. However, given that the questionnaires will include questions regarding issues such as anxiety and stress, there is a slight possibility that you may experience some concern about your responses. Thus, you are invited to examine the questionnaire material before agreeing to participate. If you do participate and find that you are uncomfortable or overly worried about your responses to any of the questionnaire items, or if you find participation in the project distressing, you should contact the Principal Researcher (Sofia Rallis on: 03 9244-6538) as soon as convenient. You will have the opportunity to discuss your concerns in a confidential manner and appropriate follow-up will be suggested if necessary. You may also like to contact a government or community organization specializing in dealing with distress. You can contact Beyond Blue on 1300 22 4636 or the Post and Ante Natal Depression Association (PANDA) on 1300 726 306.

If considerable distress is revealed in the data obtained by the Principal Researcher during the course of the study, you will be contacted by the Principal Researcher and referred to someone who can be of assistance.

7. Privacy, Confidentiality and Disclosure of Information

You can be assured that you will not be identified by name in any way in the reporting of our results in publications and conference presentation. Any information we collect from you that can identify you will remain confidential and will be stored in a locked cabinet within the School of Psychology at Deakin University for a minimum of 5 years from the date of publication.

8. Results of Project

A summary of the findings will be provided to the school and available for any interested participants to read at the completion of the study. Please email briony.hill@deakin.edu.au if you would like to receive a copy of this report.

9. Participation is voluntary

Participation in any research project is voluntary. If you do not wish to take part you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. Any information obtained from you to date will not be used and will be destroyed. Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with Deakin University in any way.

Before you make your decision, a member of the research team will be available to answer any questions you have about the research project. You can ask
for any information you want. Sign the Consent Form only after you have had a chance to ask your questions and have received satisfactory answers.

If you decide to withdraw from this project, please notify a member of the research team so they can inform you if there are any special requirements linked to withdrawing.

10. Ethical Guidelines
The study will be carried out in accordance with the National Statement on Ethical Conduct in Human Research (2007). This statement has been developed to protect the interests of people who agree to participate in human research studies.

The ethical aspects of this research project have been approved by the Human Research Ethics Committee of Deakin University. The research will be carried out in the School of Psychology Deakin University, 221 Burwood Highway, Burwood Victoria.

11. Complaints
Should you have any concerns about the conduct of this research project, please contact the Manager, Research Integrity, Research Services Division, Deakin University, 221 Burwood Highway, Burwood Victoria, 3125. Telephone: (03) 9251-7129, Facsimile: (03) 9244-6581; research-ethics@deakin.edu.au Please quote project number EC 36- 2009.

12. Reimbursement for your costs
You will not be paid for your participation in this project. However, if you remain a participant in this study you will receive a $30 Coles Group Gift Card after the return of your first post-birth questionnaire, and another $30 Coles Group Gift Card after the return of your final questionnaire at 12 months post birth, as a small token of appreciation for your participation.

13. Further Information:
Contact Ms. Briony Hill in the School of Psychology, Deakin University, 221 Burwood Highway, Burwood, Victoria, 3125, on (03) 9244-6538 or email: briony.hill@deakin.edu.au
TO: Participants

Consent Form
Participant’s Copy

Date: June 2012

Full Project Title: Maternal and Infant Wellbeing: Pre and Post Birth

Researchers: Miss Sofia Rallis, Ms Briony Hill, Ms Jo Phillips, Miss Emily De Jager, Associate Professor Helen Skouteris, Professor Marita McCabe, (School of Psychology, Deakin University, Burwood) and Professor Jeannette Milgrom (School of Psychology, The University of Melbourne).

I have read and I understand the attached Plain Language Statement.

I freely consent to participate in this project according to the conditions in the Plain Language Statement.

I have been given a copy of the Plain Language Statement and Consent Form to keep.

The researchers have agreed not to reveal my identity and personal details, including where information about this project is published, or presented in any public form.

Participant’s Name (Printed)
...........................................................................................................................................

Participant’s Signature ........................................................................................................Date..........
.....

Participant’s Contact Details
Address:
.............................................................................................................................................
.....
.............................................................................................................................................
 ..........

Home Phone: ............................................................................................................................
The researchers will be applying for further funding to continue their research longer term. If you agree to be contacted for research studies of this type in the future please sign below.

I consent to the researchers named here contacting me for future research studies that I am not obliged to take part in.

Participant’s name: ............................................  Signature: ............................................

Please keep this signed form for your records.
TO: Participants

Consent Form
Researcher’s Copy

Date: April 2012

Full Project Title: Maternal and Infant Wellbeing: Pre and Post Birth

Researchers: Miss Sofia Rallis, Ms Briony Hill, Ms Jo Phillips, Miss Emily De Jager, Associate Professor Helen Skouteris, Professor Marita McCabe, (School of Psychology, Deakin University, Burwood) and Professor Jeannette Milgrom (School of Psychology, The University of Melbourne).

I have read and I understand the attached Plain Language Statement.
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I have been given a copy of the Plain Language Statement and Consent Form to keep.
The researchers have agreed not to reveal my identity and personal details, including where information about this project is published, or presented in any public form.

Participant’s Name (Printed)

Participant’s Signature

…..

Participant’s Contact Details
Address:

Home Phone:

Mobile:
Email Address: 

The researchers will be applying for further funding to continue their research longer term. If you agree to be contacted for research studies of this type in the future please sign below.

I consent to the researchers named here contacting me for future research studies that I am not obliged to take part in.

Participant’s name: ........................................... Signature: ...........................................

Please return the signed form to: Ms Briony Hill, School of Psychology, Deakin University, 221 Burwood Highway, Burwood, Victoria 3125
3 July 2014

Dear ,

Thank you for your continued participation in our study “Maternal and Infant Wellbeing: Pre and Post Birth”. Your time and support is very much appreciated.

Pregnancy can be a joyful time for future parents, but it can also be a difficult and stressful time due to the physical and emotional changes that take place. If you are experiencing any of the following: guilt, hopelessness, helplessness, anxiety and stress, irritability, insomnia, restlessness, tearfulness, inability to enjoy things you used to enjoy and/or wanting to harm yourself, we recommend you consult your GP, Midwife or other healthcare professional.

If you are currently experiencing distress and would like to talk to someone, you are also able to contact:

- PANDA (Post and Antenatal Depression Association)
  Ph: 03 9481-3377 or 1300 726 306
  http://www.panda.org.au

- The Infant Clinic
  C/O Parent Infant Research Institute
  Ph: (03) 9496-4496

- Beyondblue
  Ph: 1300 224 636
  http://www.beyondblue.org.au

- Lifeline
  Ph: 13 11 14
  www.lifeline.org.au

- The Australian Psychological Society
  Ph: (03) 8662 3300 or 1800 333 497
  http://www.psychology.org.au/FindaPsychologist

Kind regards,

The Maternal and Infant Wellbeing Study Project Team
Thank you for taking the time to complete the following information.
Your responses will remain strictly confidential.

Today’s date is: ...................................................

How many weeks pregnant are you at present? .................................................................

Estimated due date .................................................................
General Information

4. Current marital status: (please circle one)
   (1) Married           (2) Divorced           (3) De Facto
   (4) Separated         (5) Widowed           (6) Never Married/Single

6. Location of your birth:
   (1) Australia         (2) New Zealand       (3) United Kingdom
   (4) Europe            (5) North America     (6) South America
   (7) Africa            (8) Middle East       (9) Asia

7. Where were your parents born? (Name of country please):
   Father: .......................................................  Mother: .......................................................

8. Main language spoken at home:
   (1) English           (2) Other (please specify): .................................................................

9. Please indicate the highest level of education you have completed.
   (1) Still at secondary school (2) Did not finish secondary school
   (3) Year 12 or equivalent    (4) Certificate Level
   (5) Advanced Diploma/Diploma (6) Graduate Diploma/ Graduate Certificate
   (7) Bachelor Degree          (8) Postgraduate Degree

10. Are you currently in paid employment?  (1) Yes    (2) No  (If No, please go to Q13)
    If Yes, do you work full time/part time? ..............................................................
    What is your occupation? .....................................................................................

11. Do you intend to return to work after the birth of your baby?  (1) Yes    (2) No
    If Yes, what length of maternity leave do you intend to take? ......................... (number of weeks)
12. Does your employer provide work-based child care?  
(1) Yes  (2) No

13. Please indicate your approximate annual family income:  
(1) Under 25,000  (2) 25,001- 45,000  (3) 45,001- 65,000  
(4) 65,001- 85,000  (5) 85,001- 105,000  (6) 105,001- 125,000  
(7) 125,001- 145,000  (8) Over 145,001

14. Is this your first pregnancy?  
(1) Yes  (2) No

15.

16. Number of children you have, not including current pregnancy (please circle)  
(0) zero  (1) one  (2) two  (3) three  (4) four  (5) five or more
# Depression Anxiety and Stress Scale (DASS-21)

Please read each statement and place a tick in the appropriate bracket to indicate how much the statement applied to you **over the past 7 days**. There are no right or wrong answers. Please do not spend too much time on any statement.

**The rating scale is as follows:**
- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of the time
- 3 Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th>Over the past 7 days...</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found it hard to wind down</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. I was aware of dryness of my mouth</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3. I couldn't seem to experience any positive feeling at all</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>5. I found it difficult to work up the initiative to do things</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>6. I tended to over-react to situations</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>7. I experienced trembling (e.g., in the hands)</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>8. I felt that I was using a lot of nervous energy</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>9. I was worried about situations in which I might panic and make a fool of myself</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>10. I felt that I had nothing to look forward to</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>11. I found myself getting agitated</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12. I found it difficult to relax</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>13. I felt down-hearted and blue</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>14. I was intolerant of anything that kept me from getting on with what I was doing</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>15. I felt I was close to panic</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>16. I was unable to become enthusiastic about anything</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>17. I felt I wasn't worth much as a person</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>18. I felt that I was rather touchy</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20. I felt scared without any good reason</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21. I felt that life was meaningless</td>
<td>( )</td>
<td>( )</td>
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</tr>
</tbody>
</table>
Body Attitude Questionnaire (BAQ)

Please tick **ONE** set of brackets to indicate how much you agree/disagree with each statement in relation to how you have felt **over the past month**.

<table>
<thead>
<tr>
<th></th>
<th>Definitely Disagree (1)</th>
<th>Mostly Disagree (2)</th>
<th>Neutral (3)</th>
<th>Mostly Agree (4)</th>
<th>Definitely Agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I usually felt physically attractive</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2.</td>
<td>People hardly ever found me sexually attractive.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3.</td>
<td>I got so worried about my shape that I felt I ought to diet</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>4.</td>
<td>I felt fat when I couldn't get clothes over my hips.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>5.</td>
<td>I felt satisfied with my face.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>6.</td>
<td>I worried that other people could see rolls of fat around my waist and stomach.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7.</td>
<td>I thought I deserved the attention of the opposite sex.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8.</td>
<td>I hardly ever felt fat.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9.</td>
<td>There were more important things in life than the shape of my body.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10.</td>
<td>I felt fat when I wore clothes that were tight around the waist.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>11.</td>
<td>I quickly became exhausted if I overdid it.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>12.</td>
<td>When I wore loose clothing it made me feel thin.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>13.</td>
<td>I hardly ever thought about the shape of my body.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>14.</td>
<td>I was proud of my physical strength</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>15.</td>
<td>When I ate sweets, cakes or other high calorie food, it made me feel fat.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>16.</td>
<td>I had a strong body.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>17.</td>
<td>I felt fat when I had my photo taken.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>18.</td>
<td>I tried to keep fit.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>19.</td>
<td>When I thought about the shape of my body, it stopped me from concentrating.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20.</td>
<td>I was preoccupied with the desire to be lighter.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21.</td>
<td>I often felt fat.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>22.</td>
<td>I spent a lot of time thinking about my weight.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>23.</td>
<td>I was a bit of an ‘Iron-Woman’.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>24.</td>
<td>I felt fat when I was lonely.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>25.</td>
<td>People often complimented me on my looks.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
26. I felt fat when I could no longer get into clothes that used to fit me.

27. I was never strong.

28. I tried to avoid clothes that make me feel especially aware of my shape.
Exclusive Breastfeeding Intentions

1. Do you intend to breastfeed your infant?
   a) Yes  b) No (If No, please go to the next page.)  c) Undecided

2. If yes, for how long do you intend to breastfeed your infant?
   a) less than 1 month  d) 4-6 months
   b) 1-2 months  e) 6-12 months
   c) 2-4 months  f) more than 12 months

3. Do you intend to exclusively breastfeed your infant (i.e. nothing but breast milk)?
   (1) Yes  b) No  c) Undecided

4. If so, for how long do you intend to exclusively breastfeed your infant (i.e. nothing but breast milk)?
   a) less than 1 month  d) 3-4 months
   b) 1-2 months  e) 4-5 months
   c) 2-3 months  f) 6 months
## Attitude Towards Pregnancy

Please answer the following questions regarding how you feel during your pregnancy.

<table>
<thead>
<tr>
<th></th>
<th>Definitely Disagree</th>
<th>Mostly Disagree</th>
<th>Neither Disagree nor Agree</th>
<th>Mostly Agree</th>
<th>Definitely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I am happy with my growing body during pregnancy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2.</td>
<td>I enjoy watching my body shape change</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>3.</td>
<td>My breasts have grown larger and look great!</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4.</td>
<td>The changes in my body shape are necessary for my baby to grow</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>5.</td>
<td>Pregnancy is a special time that women are lucky to experience</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>6.</td>
<td>I enjoy being pregnant</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>7.</td>
<td>I feel self-conscious and embarrassed with the changes in my body shape</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>8.</td>
<td>I feel fat during pregnancy</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>9.</td>
<td>I do not enjoy being pregnant</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>10.</td>
<td>Pregnancy is a terrible stage women have to endure in order to have a baby</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>11.</td>
<td>I am embarrassed by the size of my breasts</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>12.</td>
<td>My breasts look swollen and sore</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
Exclusive Breastfeeding Motivation, Importance & Confidence

Please answer the following questions by circling a number from 0 to 10 on each scale below.

1. I am motivated to initiate exclusive breastfeeding (breast milk only) after the birth.

(Please circle one number on the motivation scale below)

<table>
<thead>
<tr>
<th>Not at all Motivated</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Motivated</th>
</tr>
</thead>
</table>

2. I feel that initiating exclusive breastfeeding (breast milk only) after the birth is important.

(Please circle one number on the importance scale below)

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Important</th>
</tr>
</thead>
</table>

3. I am confident that I can initiate exclusive breastfeeding (breast milk only) after birth.

(Please circle one number on the confidence scale below)

<table>
<thead>
<tr>
<th>Not at all Confident</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Confident</th>
</tr>
</thead>
</table>

4. I am motivated to maintain exclusive breastfeeding (breast milk only) until my baby is six months of age.

(Please circle one number on the motivation scale below)

<table>
<thead>
<tr>
<th>Not at all Motivated</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Motivated</th>
</tr>
</thead>
</table>
5. I feel that maintaining exclusive breastfeeding (breast milk only) to six months is important.

(Please circle one number on the importance scale below)

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Important</th>
</tr>
</thead>
</table>

6. I am confident that I will be able to maintain exclusive breastfeeding (breast milk only) until my baby is 6 months of age.

(Please circle one number on the confidence scale below)

<table>
<thead>
<tr>
<th>Not at all Confident</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Confident</th>
</tr>
</thead>
</table>
COPE Scale

The following questions ask you to indicate what you **generally do and feel** when you experience stressful events. Obviously, different events can bring out different responses, but please think about what you have usually done **over the past month** when you have been under a lot of stress. Please respond to each of the following items by **placing a tick in the appropriate set of brackets**. Please try to respond to each item separately in your mind from each other, and answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for you—not what you think "most people" would say or do.

<table>
<thead>
<tr>
<th>Item</th>
<th>I usually don't do this at all (1)</th>
<th>I usually do this a little bit (2)</th>
<th>I usually do this a medium amount (3)</th>
<th>I usually do this a lot (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I try to grow as a person as a result of the experience.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>2. I turn to work or other activities to take my mind off things.</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>3. I get upset and let my emotions out.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>4. I try to get advice from someone about what to do.</td>
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<td>( )</td>
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</tr>
<tr>
<td>5. I concentrate my efforts on doing something about it.</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>6. I say to myself &quot;this isn't real&quot;</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>7. I put my trust in God.</td>
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<tr>
<td>8. I laugh about the situation.</td>
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</tr>
<tr>
<td>9. I admit to myself that I can't deal with it, and quit trying.</td>
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</tr>
<tr>
<td>10. I restrain myself from doing anything too quickly.</td>
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<td>( )</td>
</tr>
<tr>
<td>11. I discuss my feelings with someone.</td>
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</tr>
<tr>
<td>12. I use alcohol or drugs to make myself feel better.</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>13. I get used to the idea that it happened.</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>14. I talk to someone to find out more about the situation.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>15. I keep myself from getting distracted by other thoughts or activities.</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>16. I daydream about other things.</td>
<td>( )</td>
<td>( )</td>
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<td>( )</td>
</tr>
<tr>
<td>17. I get upset, and am really aware of it.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>18. I seek God's help.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>19. I make a plan of action.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>20. I make jokes about it.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>21. I accept that this has happened and that it can't be changed.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>22. I hold off doing anything about it until the situation permits.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
<tr>
<td>23. I try to get emotional support from friends or relatives.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
</tr>
</tbody>
</table>
24. I just give up trying to reach my goal. ( ) ( ) ( ) ( )
25. I take additional action to try to get rid of the problem. ( ) ( ) ( ) ( )
26. I try to lose myself for a while by drinking alcohol or taking drugs. ( ) ( ) ( ) ( )
27. I refuse to believe that it has happened. ( ) ( ) ( ) ( )
28. I let my feelings out. ( ) ( ) ( ) ( )

29. I try to see it in a different light, to make it seem more positive. ( ) ( ) ( ) ( )
30. I talk to someone who can do something concrete about the problem. ( ) ( ) ( ) ( )
31. I sleep more than usual. ( ) ( ) ( ) ( )
32. I try to come up with a strategy about what to do. ( ) ( ) ( ) ( )
33. I focus on dealing with this problem, and if necessary let other things slide a little. ( ) ( ) ( ) ( )
34. I get sympathy and understanding from someone. ( ) ( ) ( ) ( )
35. I drink alcohol or take drugs, in order to think about it less. ( ) ( ) ( ) ( )
36. I kid around about it. ( ) ( ) ( ) ( )
37. I give up the attempt to get what I want. ( ) ( ) ( ) ( )
38. I look for something good in what is happening. ( ) ( ) ( ) ( )
39. I think about how I might best handle the problem. ( ) ( ) ( ) ( )
40. I pretend that it hasn't really happened. ( ) ( ) ( ) ( )
41. I make sure not to make matters worse by acting too soon. ( ) ( ) ( ) ( )
42. I try hard to prevent other things from interfering with my efforts at dealing with this. ( ) ( ) ( ) ( )
43. I go to movies or watch TV, to think about it less. ( ) ( ) ( ) ( )
44. I accept the reality of the fact that it happened. ( ) ( ) ( ) ( )
45. I ask people who have had similar experiences what they did. ( ) ( ) ( ) ( )
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot. ( ) ( ) ( ) ( )
47. I take direct action to get around the problem. ( ) ( ) ( ) ( )
48. I try to find comfort in my religion. ( ) ( ) ( ) ( )
49. I force myself to wait for the right time to do something. ( ) ( ) ( ) ( )
50. I make fun of the situation. ( ) ( ) ( ) ( )
51. I reduce the amount of effort I put into solving the problem. ( ) ( ) ( ) ( )
52. I talk to someone about how I feel. ( ) ( ) ( ) ( )
53. I use alcohol or drugs to help me get through it. ( ) ( ) ( ) ( )
<p>| | | | | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>54.</td>
<td>I learn to live with it.</td>
<td></td>
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<tr>
<td>55.</td>
<td>I put aside other activities in order to concentrate on this.</td>
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<tr>
<td>56.</td>
<td>I think hard about what steps to take.</td>
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<tr>
<td>57.</td>
<td>I act as though it hasn't even happened.</td>
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<tr>
<td>58.</td>
<td>I do what has to be done, one step at a time.</td>
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<tr>
<td>59.</td>
<td>I learn something from the experience.</td>
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<tr>
<td>60.</td>
<td>I pray more than usual.</td>
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</table>
Fetal Health Locus of Control Scale

The following statements relate to the way you feel about your unborn baby. Read each statement and then place a tick in the bracket that corresponds to how strongly you agree with the statement.

<table>
<thead>
<tr>
<th>Strongly</th>
<th>Moderately</th>
<th>Slightly</th>
<th>Slightly</th>
<th>Moderately</th>
<th>Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>Agree</td>
<td>Agree</td>
<td>Disagree</td>
<td>Disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td>(6)</td>
<td>(5)</td>
<td>(4)</td>
<td>(3)</td>
<td>(2)</td>
<td>(1)</td>
</tr>
</tbody>
</table>

1. By attending prenatal classes taught by competent health professionals, I can greatly increase the odds of having a healthy, normal baby
   
   ( ) ( ) ( ) ( ) ( ) ( )

2. Even if I take excellent care of myself when I am pregnant, fate will determine whether my child will be normal or abnormal
   
   ( ) ( ) ( ) ( ) ( ) ( )

3. My baby will be born healthy only if I do everything my doctor tell me to do during pregnancy
   
   ( ) ( ) ( ) ( ) ( ) ( )

4. If my baby is unhealthy or abnormal, nature intended it to be that way
   
   ( ) ( ) ( ) ( ) ( ) ( )

5. The care I receive from health professionals is what is responsible for the health of my unborn baby
   
   ( ) ( ) ( ) ( ) ( ) ( )

272
6. My unborn child’s health can be seriously affected by my dietary intake during pregnancy

7. Health professional are responsible for the health of my unborn child

8. If I get sick during pregnancy, consulting my doctor is the best thing I can do to protect the health of my unborn child

9. No matter what I do when I am pregnant, the laws of nature determine whether or not my child will be normal

10. Doctors and nurses are the only ones who are competent to give me advice concerning my behaviour during pregnancy

11. God will determine the health of my unborn child
12. Learning how to care for myself before I become pregnant helps my child to be born healthy

13. My baby’s health is in the hands of health professionals

14. Fate determines the health of my unborn child

15. What I do right up to the time that my baby is born can affect my baby’s health

16. Having a miscarriage means to me that my baby was not destined to live

17. Before becoming pregnant, I would learn what specific
things I should do and not do during pregnancy in order to have a healthy, normal baby

18. Only qualified health professionals can tell me that I should and should not do when I am pregnant

( ) ( ) ( ) ( ) ( ) ( )

Thank you for your time and effort.
Thank you for taking the time to complete the following information.
Your responses will remain strictly confidential.

Today’s date is: .................................................

How many weeks post-birth are you at present?.................................
Current Exclusive Breastfeeding Practices

1. What feeding practices have you been using over the past month? (please circle one)

   (1) Exclusively Breastfeeding   (2) Breastfeeding & Formula   (3) Exclusively Formula
Depression Anxiety Stress Scale (DASS-21)

Please read each statement and place a tick in the appropriate bracket to indicate how much the statement applied to you over the past 7 days. There are no right or wrong answers. Please do not spend too much time on any statement.

The rating scale is as follows:

0  Did not apply to me at all
1  Applied to me to some degree, or some of the time
2  Applied to me to a considerable degree, or a good part of time
3  Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th>Over the past 7 days...</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found it hard to wind down</td>
<td></td>
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<tr>
<td>2. I was aware of dryness of my mouth</td>
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<tr>
<td>3. I couldn't seem to experience any positive feeling at all</td>
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<td>4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
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<td>5. I found it difficult to work up the initiative to do things</td>
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<td>6. I tended to over-react to situations</td>
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<td>7. I experienced trembling (e.g., in the hands)</td>
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<td>8. I felt that I was using a lot of nervous energy</td>
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<td>9. I was worried about situations in which I might panic and make a fool of myself</td>
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<td>10. I felt that I had nothing to look forward to</td>
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<tr>
<td>11. I found myself getting agitated</td>
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<tr>
<td>12. I found it difficult to relax</td>
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<tr>
<td>13. I felt down-hearted and blue</td>
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<tr>
<td>14. I was intolerant of anything that kept me from getting on with what I was doing</td>
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<tr>
<td>15. I felt I was close to panic</td>
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<td>16. I was unable to become enthusiastic about anything</td>
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<tr>
<td>17. I felt I wasn't worth much as a person</td>
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<td>18. I felt that I was rather touchy</td>
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<td>19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)</td>
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<td>20. I felt scared without any good reason</td>
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<tr>
<td>21. I felt that life was meaningless</td>
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</tbody>
</table>
**Body Attitudes Questionnaire (BAQ)**

*Please tick **ONE** set of brackets to indicate how much you agree/disagree with each statement in relation to how you have felt *over the past month.*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Definitely Disagree</th>
<th>Mostly Disagree</th>
<th>Neutral</th>
<th>Mostly Agree</th>
<th>Definitely Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I usually felt physically attractive</td>
<td>(   )</td>
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<tr>
<td>2. People hardly ever found me sexually attractive.</td>
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<tr>
<td>3. I got so worried about my shape that I felt I ought to diet</td>
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<td>4. I felt fat when I couldn't get clothes over my hips.</td>
<td>(   )</td>
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<tr>
<td>5. I felt satisfied with my face.</td>
<td>(   )</td>
<td>(   )</td>
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</tr>
<tr>
<td>6. I worried that other people could see rolls of fat around my waist and stomach.</td>
<td>(   )</td>
<td>(   )</td>
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<tr>
<td>7. I thought I deserved the attention of the opposite sex.</td>
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<tr>
<td>8. I hardly ever felt fat.</td>
<td>(   )</td>
<td>(   )</td>
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<tr>
<td>9. There were more important things in life than the shape of my body.</td>
<td>(   )</td>
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<tr>
<td>10. I felt fat when I wore clothes that were tight around the waist.</td>
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<tr>
<td>11. I quickly became exhausted if I overdid it.</td>
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<tr>
<td>12. When I wore loose clothing it made me feel thin.</td>
<td>(   )</td>
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</tr>
<tr>
<td>13. I hardly ever thought about the shape of my body.</td>
<td>(   )</td>
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<tr>
<td>14. I was proud of my physical strength</td>
<td>(   )</td>
<td>(   )</td>
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<tr>
<td>15. When I ate sweets, cakes or other high calorie food, it made me feel fat.</td>
<td>(   )</td>
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<tr>
<td>16. I had a strong body.</td>
<td>(   )</td>
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<tr>
<td>17. I felt fat when I had my photo taken.</td>
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<tr>
<td>18. I tried to keep fit.</td>
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<tr>
<td>19. When I thought about the shape of my body, it stopped me from concentrating.</td>
<td>(   )</td>
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<tr>
<td>20. I was preoccupied with the desire to be lighter.</td>
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<tr>
<td>21. I often felt fat.</td>
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<tr>
<td>22. I spent a lot of time thinking about my weight.</td>
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<tr>
<td>23. I was a bit of an ‘Iron-Woman’.</td>
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</tbody>
</table>
24. I felt fat when I was lonely.
25. People often complimented me on my looks.
26. I felt fat when I could no longer get into clothes that used to fit me.
27. I was never strong.
28. I tried to avoid clothes that make me feel especially aware of my shape.
Current Exclusive Breastfeeding Practices

Please answer the following questions about your feeding practices with your new baby by circling the appropriate response.

1. Did you initiate breastfeeding your infant?
   (1) Yes, I initiated breastfeeding exclusively (i.e. nothing but breast milk)
   (2) Yes, I initiated breastfeeding but not exclusively
   (3) No, I did not initiate breastfeeding

2. Are you currently breastfeeding your infant?
   (a) Yes
   (b) No

3. If yes, are you currently exclusively breastfeeding your infant (i.e., nothing but breast milk)?
   (a) Yes, I am feeding my infant only breast milk (If Yes, please go to page 12)
   (b) No, I am feeding my infant both breast milk and formula

4. If you are not currently exclusively breastfeeding did you exclusively breastfeed your infant at any time?
   (1) Yes, I did exclusively breastfeed my infant
   (2) No, I have never exclusively breastfed my infant
   (3) No, I never breastfed
   (If No, please go to page 12)

5. If you have previously exclusively breastfed your infant, for how long did you exclusively breastfeed (i.e., fed your baby nothing but breast milk)?
   (a) Less than 1 week
   (b) 1-2 weeks
   (c) 3-4 weeks
   (d) 5-6 weeks
Breastfeeding Self-Efficacy Scale

The following statements refer to how confident you are feeding your baby. Please read the following statements and tick the set of brackets that corresponds to how confident you are in that situation.

If you are NOT breastfeeding at all, please tick this box. ☐

If you ARE breastfeeding, please respond to the questions below.

Each statement begins with: “I can always…”

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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Determine that my baby is getting enough milk</td>
<td>( )</td>
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<tr>
<td>2.</td>
<td>Successfully cope with breastfeeding like I have with other challenging tasks</td>
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<td>3.</td>
<td>Breastfeed my baby without using formula as a supplement</td>
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<td>4.</td>
<td>Ensure that my baby is properly latched on for the whole feeding</td>
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<td>5.</td>
<td>Manage the breastfeeding situation to my satisfaction</td>
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<tr>
<td>6.</td>
<td>Manage to breastfeed even if my baby is crying</td>
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<tr>
<td>7.</td>
<td>Keep wanting to breastfeed</td>
<td>( )</td>
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<tr>
<td>8.</td>
<td>Comfortably breastfeed with my family members present</td>
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<tr>
<td>9.</td>
<td>Be satisfied with my breastfeeding experience</td>
<td>( )</td>
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<tr>
<td>10.</td>
<td>Deal with the fact that breastfeeding can be time-consuming</td>
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<tr>
<td>11.</td>
<td>Finish feeding my baby on one breast before switching to the other breast</td>
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<tr>
<td>12.</td>
<td>Continue to breastfeed my baby for every feeding</td>
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<tr>
<td>13.</td>
<td>Manage to keep up with my baby’s breastfeeding demands</td>
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<tr>
<td>14.</td>
<td>Tell when my baby is finished breastfeeding</td>
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</table>
COPE Scale

The following questions ask you to indicate what you generally do and feel when you experience stressful events. Obviously, different events can bring out different responses, but please think about what you have usually done over the past month when you have been under a lot of stress. Please respond to each of the following items by placing a tick in the appropriate set of brackets. Please try to respond to each item separately in your mind from each other, and answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for you—not what you think "most people" would say or do.

<table>
<thead>
<tr>
<th></th>
<th>I usually don't do this at all (1)</th>
<th>I usually do this a little bit (2)</th>
<th>I usually do this a medium amount (3)</th>
<th>I usually do this a lot (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I try to grow as a person as a result of the experience.</td>
<td>( )</td>
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<tr>
<td>2.</td>
<td>I turn to work or other activities to take my mind off things.</td>
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<tr>
<td>3.</td>
<td>I get upset and let my emotions out.</td>
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<tr>
<td>4.</td>
<td>I try to get advice from someone about what to do.</td>
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<tr>
<td>5.</td>
<td>I concentrate my efforts on doing something about it.</td>
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<tr>
<td>6.</td>
<td>I say to myself &quot;this isn't real&quot;</td>
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<tr>
<td>7.</td>
<td>I put my trust in God.</td>
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<tr>
<td>8.</td>
<td>I laugh about the situation.</td>
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<tr>
<td>9.</td>
<td>I admit to myself that I can't deal with it, and quit trying.</td>
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<tr>
<td>10.</td>
<td>I restrain myself from doing anything too quickly.</td>
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<tr>
<td>11.</td>
<td>I discuss my feelings with someone.</td>
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<tr>
<td>12.</td>
<td>I use alcohol or drugs to make myself feel better.</td>
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<tr>
<td>13.</td>
<td>I get used to the idea that it happened.</td>
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</tr>
<tr>
<td>14.</td>
<td>I talk to someone to find out more about the situation.</td>
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<tr>
<td>15.</td>
<td>I keep myself from getting distracted by other thoughts or activities.</td>
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<tr>
<td>16.</td>
<td>I daydream about other things.</td>
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<tr>
<td>17.</td>
<td>I get upset, and am really aware of it.</td>
<td>( )</td>
<td>( )</td>
<td>( )</td>
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<tr>
<td>18.</td>
<td>I seek God's help.</td>
<td>( )</td>
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<td>( )</td>
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<tr>
<td>19.</td>
<td>I make a plan of action.</td>
<td>( )</td>
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<tr>
<td>20.</td>
<td>I make jokes about it.</td>
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<tr>
<td>21.</td>
<td>I accept that this has happened and that it can't be changed.</td>
<td>( )</td>
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<tr>
<td>22.</td>
<td>I hold off doing anything about it until the situation permits.</td>
<td>( )</td>
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<tr>
<td>23.</td>
<td>I try to get emotional support from friends or relatives.</td>
<td>( )</td>
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</tbody>
</table>
24. I just give up trying to reach my goal. ( ) ( ) ( ) ( )
25. I take additional action to try to get rid of the problem. ( ) ( ) ( ) ( )
26. I try to lose myself for a while by drinking alcohol or taking drugs. ( ) ( ) ( ) ( )
27. I refuse to believe that it has happened. ( ) ( ) ( ) ( )
28. I let my feelings out. ( ) ( ) ( ) ( )
29. I try to see it in a different light, to make it seem more positive. ( ) ( ) ( ) ( )
30. I talk to someone who can do something concrete about the problem. ( ) ( ) ( ) ( )
31. I sleep more than usual. ( ) ( ) ( ) ( )
32. I try to come up with a strategy about what to do. ( ) ( ) ( ) ( )
33. I focus on dealing with this problem, and if necessary let other things slide a little. ( ) ( ) ( ) ( )
34. I get sympathy and understanding from someone. ( ) ( ) ( ) ( )
35. I drink alcohol or take drugs, in order to think about it less. ( ) ( ) ( ) ( )
36. I kid around about it. ( ) ( ) ( ) ( )
37. I give up the attempt to get what I want. ( ) ( ) ( ) ( )
38. I look for something good in what is happening. ( ) ( ) ( ) ( )
39. I think about how I might best handle the problem. ( ) ( ) ( ) ( )
40. I pretend that it hasn't really happened. ( ) ( ) ( ) ( )
41. I make sure not to make matters worse by acting too soon. ( ) ( ) ( ) ( )
42. I try hard to prevent other things from interfering with my efforts at dealing with this. ( ) ( ) ( ) ( )
43. I go to movies or watch TV, to think about it less. ( ) ( ) ( ) ( )
44. I accept the reality of the fact that it happened. ( ) ( ) ( ) ( )
45. I ask people who have had similar experiences what they did. ( ) ( ) ( ) ( )
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot. ( ) ( ) ( ) ( )
47. I take direct action to get around the problem. ( ) ( ) ( ) ( )
48. I try to find comfort in my religion. ( ) ( ) ( ) ( )
49. I force myself to wait for the right time to do something. ( ) ( ) ( ) ( )
50. I make fun of the situation. ( ) ( ) ( ) ( )
51. I reduce the amount of effort I put into solving the problem. ( ) ( ) ( ) ( )
52. I talk to someone about how I feel. ( ) ( ) ( ) ( )
53. I use alcohol or drugs to help me get through it. ( ) ( ) ( ) ( )
54. I try to see it in a different light, to make it seem more positive. ( ) ( ) ( ) ( )
55. I talk to someone who can do something concrete about the problem. ( ) ( ) ( ) ( )
56. I sleep more than usual. ( ) ( ) ( ) ( )
57. I try to come up with a strategy about what to do. ( ) ( ) ( ) ( )
58. I focus on dealing with this problem, and if necessary let other things slide a little. ( ) ( ) ( ) ( )
59. I get sympathy and understanding from someone. ( ) ( ) ( ) ( )
60. I drink alcohol or take drugs, in order to think about it less. ( ) ( ) ( ) ( )
61. I kid around about it. ( ) ( ) ( ) ( )
62. I give up the attempt to get what I want. ( ) ( ) ( ) ( )
63. I look for something good in what is happening. ( ) ( ) ( ) ( )
64. I think about how I might best handle the problem. ( ) ( ) ( ) ( )
65. I pretend that it hasn't really happened. ( ) ( ) ( ) ( )
66. I make sure not to make matters worse by acting too soon. ( ) ( ) ( ) ( )
67. I try hard to prevent other things from interfering with my efforts at dealing with this. ( ) ( ) ( ) ( )
68. I go to movies or watch TV, to think about it less. ( ) ( ) ( ) ( )
69. I accept the reality of the fact that it happened. ( ) ( ) ( ) ( )
70. I ask people who have had similar experiences what they did. ( ) ( ) ( ) ( )
71. I feel a lot of emotional distress and I find myself expressing those feelings a lot. ( ) ( ) ( ) ( )
72. I take direct action to get around the problem. ( ) ( ) ( ) ( )
73. I try to find comfort in my religion. ( ) ( ) ( ) ( )
74. I force myself to wait for the right time to do something. ( ) ( ) ( ) ( )
75. I make fun of the situation. ( ) ( ) ( ) ( )
76. I reduce the amount of effort I put into solving the problem. ( ) ( ) ( ) ( )
77. I talk to someone about how I feel. ( ) ( ) ( ) ( )
78. I use alcohol or drugs to help me get through it. ( ) ( ) ( ) ( )
54. I learn to live with it.

55. I put aside other activities in order to concentrate on this.

56. I think hard about what steps to take.

57. I act as though it hasn't even happened.

58. I do what has to be done, one step at a time.

59. I learn something from the experience.

60. I pray more than usual.

Thank you for your time and effort.
Maternal and Infant Wellbeing Study
(T12 – 6 months PP)

Thank you for taking the time to complete the following information.
Your responses will remain strictly confidential.

Today’s date is: .............................................

How many weeks post-birth are you at present? .............................................
Current Exclusive Breastfeeding Practices

1. What feeding practices have you been using over the past month? (please circle one)
   (2) Exclusively Breastfeeding       (2) Breastfeeding & Formula       (3) Exclusively Formula

Return to Work

6. Do you intend to work OR have you returned to work since the birth of your baby?
   (1) YES – I have already returned to work [please go to 6(a) below]
   (2) YES – I intend to return to work [please go to 6(a) below]
   (3) NO – I do not intend to return to work [please go to the Question 8]
   
   (a) If YES, will you be working (OR are you currently working) fulltime, part time or casual?
      (1) Full-time       (2) Part-time       (3) Casual
   (b) What length of maternity do you intend to (OR did you) take? …………………

7. If you have returned to work, please answer the following questions. If you have not returned to work, please go to question 8.

   a. Why did you return to work?
      - Financial reasons
      - Career opportunities
      - Other (please describe)
      …………………………………………………………………………………………………………………

   b. When you returned to work, who looked after your new baby?
      - Partner
      - Grandparents
      - Day care or paid carer
      - Combination of partner & grandparents
Return to Work Intention/Actual

8. How soon after the birth of your baby did you intend on returning to work?
   - Less than 1 month
   - 3 – 6 months
   - 6 – 9 months
   - 9 – 12 months
   - More than 12 months
   - I had no intention of returning to work

9. How soon after the birth of your baby did you return to work?
   - Less than 1 month
   - 2 - 3 months
   - 4 - 5 months
   - 5 – 6 months
   - I have not yet returned to work
Exclusive Breastfeeding Motivation, Importance & Confidence

Please answer the following questions by circling a number from 0 to 10 on each scale below.

1. I was motivated to initiate exclusive breastfeeding (breast milk only) after the birth.

(Please circle one number on the motivation scale below)

<table>
<thead>
<tr>
<th>Not at all Motivated</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Motivated</th>
</tr>
</thead>
</table>

2. I was motivated to maintain exclusive breastfeeding (breast milk only) until my baby was six months of age.

(Please circle one number on the motivation scale below)

<table>
<thead>
<tr>
<th>Not at all Motivated</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Motivated</th>
</tr>
</thead>
</table>

3. I felt that initiating exclusive breastfeeding (breast milk only) after the birth was important.

(Please circle one number on the importance scale below)

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Important</th>
</tr>
</thead>
</table>

4. I felt that maintaining exclusive breastfeeding (breast milk only) until my baby was six months of age was important.

(Please circle one number on the importance scale below)

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Important</th>
</tr>
</thead>
</table>
5. I was confident that I could initiate exclusive breastfeeding (breast milk only) after the birth.

(Please circle one number on the confidence scale below)

<table>
<thead>
<tr>
<th>Not at all Confident</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Confident</th>
</tr>
</thead>
</table>

6. I was confident that I could maintain exclusive breastfeeding (breast milk only) until my baby was six months of age.

(Please circle one number on the confidence scale below)

<table>
<thead>
<tr>
<th>Not at all Confident</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Extremely Confident</th>
</tr>
</thead>
</table>
Depression Anxiety Stress Scale (DASS-21)

Please read each statement and place a tick in the appropriate bracket to indicate how much the statement applied to you over the past 7 days. There are no right or wrong answers. Please do not spend too much time on any statement.

The rating scale is as follows:
0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

<table>
<thead>
<tr>
<th>Over the past 7 days...</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I found it hard to wind down</td>
<td>( )</td>
<td>( )</td>
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</tr>
<tr>
<td>2. I was aware of dryness of my mouth</td>
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<tr>
<td>3. I couldn't seem to experience any positive feeling at all</td>
<td>( )</td>
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<tr>
<td>4. I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)</td>
<td>( )</td>
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<tr>
<td>5. I found it difficult to work up the initiative to do things</td>
<td>( )</td>
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<tr>
<td>6. I tended to over-react to situations</td>
<td>( )</td>
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<tr>
<td>7. I experienced trembling (e.g., in the hands)</td>
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<tr>
<td>8. I felt that I was using a lot of nervous energy</td>
<td>( )</td>
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<tr>
<td>9. I was worried about situations in which I might panic and make a fool of myself</td>
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<tr>
<td>10. I felt that I had nothing to look forward to</td>
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<tr>
<td>11. I found myself getting agitated</td>
<td>( )</td>
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<tr>
<td>12. I found it difficult to relax</td>
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<tr>
<td>13. I felt down-hearted and blue</td>
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<tr>
<td>14. I was intolerant of anything that kept me from getting on with what I was doing</td>
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<tr>
<td>15. I felt I was close to panic</td>
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<tr>
<td>16. I was unable to become enthusiastic about anything</td>
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<tr>
<td>17. I felt I wasn't worth much as a person</td>
<td>( )</td>
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<tr>
<td>18. I felt that I was rather touchy</td>
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<tr>
<td>19. I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)</td>
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<tr>
<td>20. I felt scared without any good reason</td>
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<tr>
<td>21. I felt that life was meaningless</td>
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</tbody>
</table>
**Body Attitudes Questionnaire (BAQ)**

*Please tick **ONE** set of brackets to indicate how much you agree/disagree with each statement in relation to how you have felt **over the past month.***

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th>Definitely Agree (5)</th>
<th>Mostly Agree (4)</th>
<th>Mostly Disagree (2)</th>
<th>Neutral (3)</th>
<th>Definitely Disagree (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I usually felt physically attractive</td>
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<tr>
<td>2.</td>
<td>People hardly ever found me sexually attractive</td>
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<tr>
<td>3.</td>
<td>I got so worried about my shape that I felt I ought to diet</td>
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<tr>
<td>4.</td>
<td>I felt fat when I couldn't get clothes over my hips</td>
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<tr>
<td>5.</td>
<td>I felt satisfied with my face</td>
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<tr>
<td>6.</td>
<td>I worried that other people could see rolls of fat around my waist and stomach</td>
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<tr>
<td>7.</td>
<td>I thought I deserved the attention of the opposite sex</td>
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<tr>
<td>8.</td>
<td>I hardly ever felt fat</td>
<td></td>
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<tr>
<td>9.</td>
<td>There were more important things in life than the shape of my body</td>
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<tr>
<td>10.</td>
<td>I felt fat when I wore clothes that were tight around the waist</td>
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<tr>
<td>11.</td>
<td>I quickly became exhausted if I overdid it</td>
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<tr>
<td>12.</td>
<td>When I wore loose clothing it made me feel thin</td>
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<tr>
<td>13.</td>
<td>I hardly ever thought about the shape of my body</td>
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<tr>
<td>14.</td>
<td>I was proud of my physical strength</td>
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<tr>
<td>15.</td>
<td>When I ate sweets, cakes or other high calorie food, it made me feel fat</td>
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<tr>
<td>16.</td>
<td>I had a strong body</td>
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<tr>
<td>17.</td>
<td>I felt fat when I had my photo taken</td>
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<td>( )</td>
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<tr>
<td>18.</td>
<td>I tried to keep fit</td>
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<tr>
<td>19.</td>
<td>When I thought about the shape of my body, it stopped me from concentrating</td>
<td></td>
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<tr>
<td>20.</td>
<td>I was preoccupied with the desire to be lighter</td>
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<tr>
<td>21.</td>
<td>I often felt fat</td>
<td></td>
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<tr>
<td>22.</td>
<td>I spent a lot of time thinking about my weight</td>
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<td>( )</td>
<td>( )</td>
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<tr>
<td>23.</td>
<td>I was a bit of an ‘Iron-Woman’</td>
<td></td>
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<td>( )</td>
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</tr>
</tbody>
</table>
24. I felt fat when I was lonely.

25. People often complimented me on my looks.

26. I felt fat when I could no longer get into clothes that used to fit me.

27. I was never strong.

28. I tried to avoid clothes that make me feel especially aware of my shape.
Current Exclusive Breastfeeding Practices

Please answer the following questions about your feeding practices with your baby by circling the appropriate response.

1. Are you currently breastfeeding your infant?
   (a) Yes
   (b) No

   If No, how old was your baby when you stopped breastfeeding? .................. weeks
   ☐ I never breastfed my infant
   (If No, please go to Question 3a)

2. If yes, please circle which of the following apply to you.
   (1) I am exclusively breastfeeding my infant (i.e., nothing but breast milk)
   (2) I am breastfeeding and formula feeding my infant
   (3) I am breastfeeding and feeding my infant solids
   (4) I am breastfeeding and formula feeding my infant and also feeding my infant solids

3a. If you are not currently exclusively breastfeeding, did you exclusively breastfeed your infant at any time?
   (1) Yes, I did exclusively breastfeed my infant for a period of time
   (2) No, I have never exclusively breastfed my infant
   (3) No, I never breastfed
   (If No, please go to Question 3c)

   b. If Yes, for how long did you exclusively breastfeed your infant (i.e. nothing but breast milk)?
      (a) Less than 6 weeks
      (b) Less than 2 months
      (c) Less than 3 months
      (d) Less than 4 months
      (e) Less than 5 months
      (f) 5 - 6 months
c. Have you introduced your infant to solid foods?
   (a) Yes
   (b) No

d. If Yes, at what age did you introduce solid foods into your infant’s diet?
   (a) Less than 1 month
   (b) Less than 2 months
   (c) Less than 3 months
   (d) Less than 4 months
   (e) Less than 5 months
   (f) 5 - 6 months
Breastfeeding Self-Efficacy Scale (BFSE-SF)

The following statements refer to how confident you are feeding your baby. Please read the following statements and tick the set of brackets that corresponds to how confident you are in that situation.

If you are NOT breastfeeding at all, please tick this box. □
If you ARE breastfeeding, please respond to the questions below.

Each statement begins with: “I can always…”

<table>
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<tr>
<th>Statement</th>
<th>Always Confident</th>
<th>Not at all confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Determine that my baby is getting enough milk</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>2. Successfully cope with breastfeeding like I have with other challenging tasks</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>3. Breastfeed my baby without using formula as a supplement</td>
<td>(     )</td>
<td>(       )</td>
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<tr>
<td>4. Ensure that my baby is properly latched on for the whole feeding</td>
<td>(     )</td>
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<tr>
<td>5. Manage the breastfeeding situation to my satisfaction</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>6. Manage to breastfeed even if my baby is crying</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>7. Keep wanting to breastfeed</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>8. Comfortably breastfeed with my family members present</td>
<td>(     )</td>
<td>(       )</td>
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<tr>
<td>9. Be satisfied with my breastfeeding experience</td>
<td>(     )</td>
<td>(       )</td>
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<tr>
<td>10. Deal with the fact that breastfeeding can be time-consuming</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>11. Finish feeding my baby on one breast before switching to the other breast</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>12. Continue to breastfeed my baby for every feeding</td>
<td>(     )</td>
<td>(       )</td>
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<tr>
<td>13. Manage to keep up with my baby’s breastfeeding demands</td>
<td>(     )</td>
<td>(       )</td>
</tr>
<tr>
<td>14. Tell when my baby is finished breastfeeding</td>
<td>(     )</td>
<td>(       )</td>
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Multidimensional Health Locus of Control Scale

The following statements relate to beliefs you have about your health. Read each statement and then place a tick in the bracket that corresponds to how strongly you agree with the statement.

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<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
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<tr>
<td></td>
<td>(6)</td>
<td>(5)</td>
<td>(4)</td>
<td>(3)</td>
<td>(2)</td>
<td>(1)</td>
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</table>

1. Often I feel that no matter what I do if I am going to get sick I will get sick
   ( ) ( ) ( ) ( ) ( ) ( )

2. If I see an excellent doctor regularly, I am less likely to have health problems
   ( ) ( ) ( ) ( ) ( ) ( )

3. It seems that my health is greatly influenced by accidental happenings
   ( ) ( ) ( ) ( ) ( ) ( )

4. I can only maintain my health by consulting health professionals
   ( ) ( ) ( ) ( ) ( ) ( )

5. I am directly responsible for my health
   ( ) ( ) ( ) ( ) ( ) ( )

6. Other people play a big part in whether I
   ( ) ( ) ( ) ( ) ( ) ( )
7. Whatever goes wrong with my health is my own fault

8. When I am sick, I just have to let nature run its course

9. Health professionals keep me healthy

10. When I stay healthy, I’m just plain lucky

11. My physical well-being depends on how well I take care of myself

12. When I feel ill, I know it is because I have not been taking care of myself properly

13. The type of care I receive from other people is what is responsible for how well I recover from an illness

14. Even when I take care of myself, it’s easy to get sick
Thank you for your time and effort.
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