

**The relationship between body image and mother to infant attachment in
the postpartum period.**

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Submitted in accordance with the requirements for the degree of Doctor of Clinical
Psychology (D. Clin. Psychol.)

The University of Leeds

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Academic Unit of Psychiatry and Behavioural Sciences

May 2019

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Acknowledgements

I would like to thank my husband, Thomas as well as my family and friends for offering their kind support and encouragement throughout the writing of this project. Thomas especially for making sure I had all the coffee and snacks required throughout the process! I would also like to thank my children, Jude and Seth, who have offered much needed light relief from work and helped me to put things into perspective at times of stress.

To my supervisors, Gemma and Louise, thanks for keeping me on track, you have helped me focus and supported me when I experienced the odd wobble(s). I really appreciate the time you have taken to help me see this through.

Most of all I would like to thank all of the women who took the time to fill out my surveys, without whom this study would not have been possible. Thank you.

Abstract

Evidence suggests that body image disturbance (BID) is common in the postpartum period and that a relationship between body image and mother-infant attachment exists. However, few studies have explored whether BID predicts the strength of the mother-infant attachment. This study aimed to explore the relationship between body image disturbance and perceived mother-infant attachment in the postpartum period. It was hypothesised that body image disturbance will increase over the course of the postpartum period and body image disturbance will predict perceived mother-infant attachment at 6-weeks and 6-months postpartum.

Data was collected from across the UK using both paper forms via GP surgeries and parent-baby groups as well as advertising through various online forums. The survey included the Body Shape Questionnaire- 14 (measuring body image disturbance) the General Health Questionnaire- 28 (measuring maternal mental health) the Maternal Attachment Inventory (measuring perceived mother-infant attachment) and demographic information. Surveys were administered at 6-weeks and 6-months postpartum.

A total of 180 participants completed surveys at T1 and 114 were completed at T2. A complete case sample of 114 was used for the analysis. The findings suggested that maternal mental health was predictive of perceived mother-infant attachment at both 6-weeks and 6-months postpartum. Analysis also found that body image and maternal mental health were correlated at both time points. Body image and feeding method as single predictors did not significantly predict the mother-infant attachment. It was concluded that body image disturbances are common in the postpartum period and are associated with poorer maternal mental health in the postpartum period. Distress experienced by mothers in the postpartum period can negatively impact upon the strength of the mother-infant attachment.

The clinical implications of the study are that mothers may benefit from additional support from health professionals in the postpartum period to assess and offer support with such issues with the aim of improving well-being. In turn this may positively impact upon the perceived mother-infant attachment. Considerations for future research based on the findings of this study are discussed.

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1. Introduction

A mother's attachment to her infant is recognised as being a vital factor in the healthy development of both mother and child. Whilst the majority of children develop a secure attachment, it is estimated that around 40% of children have an insecure attachment with their caregiver (Moullin, 2014) and that this has long term consequences for both mother and child (Moutsiana et al., 2014).

Terminology within the research on attachment can be changeable, for the purpose of this study, maternal attachment/maternal affectionate attachment will be termed 'perceived mother-infant attachment'. This chapter will discuss and evaluate the literature exploring the mother to infant attachment and why this is an important process for both mothers and children. In addition, factors that can interrupt or affect the mother-infant attachment will be explored. This chapter will specifically focus on body image concerns in the postpartum period (the period following childbirth) and consider how this can impact upon the mother and potentially the mother-infant attachment process.

In a systematic review exploring the experiences of women's body image during the postpartum period, it was concluded that women have unrealistic expectations of their body during this time, highlighting this as an area where women need better support (Hodgkinson, Smith & Wittkowski, 2014). Further research into women's narratives and experiences of their pregnant and postpartum body may identify at-risk women and provide an opportunity for health professionals to offer support and relevant interventions for people experiencing body image dissatisfaction. Furthermore, understanding what impact poor body image can have on mothers and in turn the relationship with their offspring can provide useful indicators about what support to offer and when.

1.1 Mother-Infant Attachment

1.1.1 Definition

Attachment is a specific outcome of early childhood experiences of care and is the unique, reciprocal relationship that is formed between a mother and her child. Bowlby, a leading theorist in this area, defines attachment behaviour as; "any form of behaviour which results in a person obtaining or retaining proximity to a

differentiated or preferred individual” (Bowlby, 1977). More specifically, attachment between mother and infant can be defined as;

“... the unique affectionate relationship that develops between a woman and her infant and persists over time” (Müller, 1994).

Early experiences of attachment form an ‘internal working model’ and a ‘secure base’ from which the child explores their environment (Bowlby, 1979; 1988). When a parent responds in a sensitive way to their child in distress, the child learns that their emotions can be contained, they then use this experience to help manage their emotions when the parent is not there, Bowlby termed this a ‘secure attachment’. Therefore, these early experiences between caregiver and infant are vital to future development.

Research suggests that attachment is a feeling state, which when felt, gives rise to a number of goal directed needs which may or may not be translated into overt behaviour (Condon & Corkindale, 1998). Therefore, the core experiences of mother-infant attachment are linked to the behaviours exhibited by the mother. Condon and Corkindale (1998) propose four key features that they deem as important when determining the quality of mother-infant attachment. These are; pleasure in proximity, the tolerance and acceptance of infant behaviour, a desire to identify and gratify the infant’s needs and a desire to want to understand the infant. The authors do not suggest that these are the only indicators of maternal-infant attachment but that the presence of these characteristics indicates a positive attachment.

Seeking proximity to an attachment object was central to Bowlby’s theories of attachment (1969), and this was further addressed with Ainsworth’s research (1982). Ainsworth suggested that not only does seeking proximity come from the infant, but that it is also present for the maternal aspect of attachment and that the pleasure felt by the mother when she is close to her infant is also indicative of a high mother-infant attachment (Ainsworth, 1982). Emde (1980) also suggested that ‘pleasure in parenting’ is a central dimension of the attachment process for mothers. The mother will feel a need to protect her infant from harm, pain or discomfort and the mother will recognise the dependency of the infant upon her (Condon & Corkindale, 1998).

Themes of protection, availability and responsiveness are all present within the literature on maternal-infant attachment (Condon & Corkindale, 1998) and these internal desires within the mother appear to be indicative of a positive maternal-infant attachment.

1.1.2 Development of attachment

Maternal-infant attachment is believed to develop from reciprocal behaviours that are elicited between mother and infant in response to a set of innate behaviours in the infant. Rubin describes maternal attachment as being a process that occurs over 12-15 months, beginning in pregnancy and continuing following birth (Rubin, 1977). Throughout pregnancy, women are working towards acceptance, involvement and commitment to being mothers and attaching to the foetus throughout the pregnancy and this process is continued into the postpartum period (Rubin, 1984). Klaus and Kennell (1976) introduced the term 'maternal bonding' to describe the idea that mothers are pre-disposed to form an affectionate bond to their baby prior to and during the period immediately following birth. Therefore attachment is a process that often begins for parents during pregnancy but also develops over time following the birth.

During pregnancy, an interaction between a mother and her unborn child develops at a cognitive level. This attachment continues to change as the mother progresses through pregnancy becoming stronger at the latter stages or in the final trimester (Rubin, 1984). Immediate physical contact with the baby following birth has been found to promote the attachment (Bialoskurski, Cox & Hayes, 1999). Most mothers attach to their newborn child during the first week, although for some the attachment is delayed until they have returned home (Bowlby, 1969). The attachment process is stimulated further when the baby begins to show behaviours such as crying, smiling and following the mother with their gaze (Bowlby, 1958).

Many mothers report feeling a special affection toward their child during pregnancy (41%); but for others this affection only appears in the presence of the infant or during the week following delivery (27%), and for some mothers, they report not feeling any particular affection regarding their baby a week after birth (MacFarlane, Smith & Garrow, 1978). In a similar study, it was found that almost all

mothers report feelings of affection toward the infant immediately after they begin to interact with him/her, either on the day of the birth or on the following day, only a small proportion of mothers reported an absence of these feelings some days after childbirth (Chalmers, Samarskaya, Tkatchenko & Wallington 1998). These findings suggest that there are unique differences in mother's initial experiences attachment with their baby in these early stages. Due to the sensitivity of the topic, some mothers may also be concerned about potentially reporting that they have a lack of emotional bond to their baby which may affect accurate reports of mother-infant attachment.

Several authors agree that bonding does not immediately establish for all mothers, and that it intensifies with time, this is confirmed in studies which have observed stronger bonding behaviours some months later as opposed to soon following childbirth (for example, Taylor, Atkins, Kumar, Adams, & Glover 2005). Results from Moehler, Brunner, Wiebel, Reck and Resch (2006) indicate the existence of a sensitive period for mother–infant bonding in the first months of life, with sensitivity increasing from 2 weeks and peaking at six weeks and decreasing again at four months. It was suggested that these changes coincided with increased periods of dependency on the mother placing additional strain on the mother-infant relationship.

Mother-infant attachment, most often, refers to a tie from the mother to the infant and a few authors have referred to mother-infant attachment as a reciprocal process (Crouch, 2002; Matthey & Speyer, 2008), and that maternal bonding and infant attachment as dependent upon each other (Figueiredo, Costa, Pacheco & Pais, 2009). Most explicit definitions of mother-infant attachment referred to the original work of Klaus and Kennell (1976). Madrid and colleagues describe mother-infant attachment as, “an intense emotional tie between mother and infant” (Madrid, Skolek & Shapiro, 2006).

It is important to note that the attachment relationship between mother and infant can change over time. For example, Egeland and Farber (1984) found that mothers who were initially unprepared for their new role and initially were rated as having poor attachments with their infants moved into the ‘secure’ attachment category over time. It is therefore important to consider that behaviours relating to

care giving and the potential impact upon attachment are vulnerable to changing over time. Therefore, when researching the mother-infant attachment and factors which may predict or impact upon this, multiple data collection points optimises the potential to see patterns or changes in attachment status and what may impact upon this. These findings suggest that if mother-infant attachment is poor in the early phases of the postpartum period that this can improve over time despite initial experiences for the mother and baby.

1.1.3 The importance of attachment for the child

A healthy (secure) mother-infant attachment is important for the physical and mental health of both mother and child. The brain is at its most adaptable for the first two years following birth, during which time the primary caregiver acts as an external psychobiological regulator of the growth of the infant's nervous system, this influence on the infant occurs via emotional communication between them and the mother/caregiver (Siegal, 1999). Early social events are imprinted into the neurobiological structures that are maturing during the growth of the brain over the first two years of life, which therefore has far-reaching effects for the child (Schoore, 2001). Schoore (1994; 1999) also highlights that the maturation of these brain capacities is experience dependent, and that this experience is embedded in the attachment relationship between the infant and primary caregiver.

If a child experiences their caregiver as a source of warmth and support, they are more likely to form a positive self-image and have more positive outcomes later in life (Moullin, 2014). Healthy attachment to caregivers is now seen as an integral component of the child's development (Oppenheim, Koren-Karie & Saig-Schwartz, 2007). Some parents can find responding to their child's needs overwhelming and frustrating and in response, may give inadequate reactions to their child resulting in a poor attachment. Insecure attachment is associated with poorer outcomes such as heightened risk for social and behavioural problems in later childhood (Belsky & Fearon, 2002). In addition, secure attachments at 12 and 18 months of age are associated with higher levels of autonomy and independence at ages three and five (Rutter, 1994).

Research has shown that mother-infant interactions such as playing, feeding, tenderness and engagement form positive building blocks of attachment and as a result, positive psychological well-being (Orbach & Rubin, 2014). A healthy attachment to their caregiver results in both internal security and the development of a psychic structure within the baby (Gerhardt, 2004). Misattunement between mother and infant can occur when the mother is unable to predict the infant's needs and feelings and behaves in an inconsistent way towards their child. Research suggests that this early attachment is vital to offering the infant a guide of how to relate to others and an unhealthy attachment with their primary caregiver can have negative consequences for the child in both how they see themselves and the world around them (Bowlby, 1995).

Studies of nonclinical samples (Cooper, Shaver & Collins, 1998; Howard & Medway, 2004) show that securely attached adolescents are less likely to engage in excessive drinking, drug use and risky sexual behaviour. Adolescents who have developed a secure attachment, also suffer fewer mental health problems such as anxiety, depression, inattention, thought problems, conduct disorder, delinquency and aggression (Cooper et al., 1998; Nada-Raja, McGee & Stanton, 1992; Nakash-Eisikovits, Dutra, & Westen, 2002; Sund & Wichstrom, 2002).

Attachment security in adolescence also predicts more constructive coping skills (Burge et al., 1997; Howard & Medway, 2004) and significant gains in social skills when measured between 16 to 18 years of age (Allen et al., 2002). Insecure attachment has been associated with suicidality (Lessard & Moretti, 1998), drug use (Lessard, 1994), and aggressive and delinquent behaviour (Moretti, DaSilva & Holland, 2004; Obsuth, Luedemann, Peled, & Moretti, 2002) in adolescence.

Poor attachment relationships with caregivers can have far reaching outcomes as children develop into adulthood with research suggesting long-term effects on emotion regulation and relationship difficulties (Moutsiana et al., 2014). It is therefore important to understand the potential factors that can affect the development of a healthy mother-infant attachment to help prevent health and well-being difficulties in future generations.

1.1.4 Importance of attachment for the mother

Much of the research into attachment has focused on defining and measuring the attachment status of the child and the outcomes on child development and future relationships. There is less research on the mother's experiences of the attachment she feels towards her infant and the impact on the mother when she views this as suboptimal. Poor maternal-foetal attachment (mother's attachment to the baby during pregnancy) is known to be associated with higher rates of maternal depression (Lindgren, 2001) and this is also true for mothers in the postpartum period. Women who struggle to bond with their babies once born (mother-infant attachment) were also found to have higher reported levels of depression (Moehler, Brunner, Wiebel, Reck, & Resch, 2006).

Other consequences of poor bonding for the mother can include a lack of maternal feelings, increased irritability and hostility, and in more severe cases, rejection of the infant, these behaviours may progress to avoidance and neglect if present over a prolonged period of time (Brockington, 1996). Mothers who have a higher quality attachment with their child are more likely to enjoy spending time with their baby (Pederson, Moran, Sitko, Campbell, Ghesquire, & Acton, 1990). This research suggests that the mother's emotional well-being and mental health are strongly associated with the quality of the attachment she is forming with her infant in the early moments following birth. Although the direction of the relationship between maternal mental health and attachment can be undetermined, the fact that maternal experiences (e.g. her mental health) impacts upon or is affected by the attachment with her infant is clear.

1.1.3 Factors affecting attachment

There are a number of conditions that can influence the attachment formed between mother and infant. These can be features that are related to the mother's experience and those of a more systemic nature, such as social and economic factors. It is important to note that the research suggests that attachment is a relational process, that it is not something that is formed within a vacuum. The child's behaviour stimulates the mother's attachment therefore this is not a unidirectional event but rather an interactive process (Figueiredo, 2003).

Social and Economic Factors

In a study on differences in sensitivity and attachment security in African-American and White American infants, it was found that poverty was a contributing factor to parental sensitivity and consequently on mother-infant attachment. Families that were more affected by low income and poor housing had more negative outcomes on infant security within the mother-infant attachment (Bakermans-Kranenburg, Van IJzendoorn, & Kroonenberg, 2004). In addition, Schmitt et al., (2004) found that across 54 countries, stress, economic hardship, and countries that were more resource limited, insecure (both preoccupied and dismissing) attachment styles were more prevalent. Furthermore, research has also suggested that degree of insecure attachment was significantly related not only to economic factors (lower social class and unemployment) but also to marital status for example being single or cohabiting (Bifulco et al., 2004).

The family stress model postulates that low income/poverty influences children's development through its impact on parenting practices (Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1992). This is in line with the conclusion of Zevalkink and Riksen-Walraven (2001) from their study on Dutch, Surinamese-Dutch, Japanese, and Sundanese-Indonesian mother–infant dyads, they found that socioeconomic factors have a stronger impact on the quality of parenting than cultural factors.

This study postulated that characteristics of the immediate caregiving context—such as availability of toys, quality of housing, and living space per person—may considerably affect the quality of a mother’s interaction with her child at home. The findings also suggested that the stress of difficult living conditions can significantly impact upon the mother’s interactions with her child. Low quality or frequency of interactions between mother and baby is likely to result in reduced quality in outward attachment behaviours from the mother and in turn, may reduce the perceived mother-infant attachment.

Research suggests that social support can impact upon the perceived mother-infant ‘bond’ and maternal depression (Ohara et al., 2017). In this study, the number of individuals who are available to provide social support and the degree of

satisfaction with the level of social support received during pregnancy were found to have an influence on mother-infant attachment and depression in the postpartum period.

Thompson (2000) summarised that socioeconomic factors present a risk to poor mother-infant attachment as discussed above with higher risk being consistent with less secure attachments. Thompson's study also proposed that these contextual factors are indirectly related to mother-infant attachment, that the socioeconomic experiences of the mother can affect her functioning and the way that she thinks about her child and in turn her attachment related behaviour towards the infant. Further exploration of the potential factors which can affect the mother's functioning and how this can impact upon attachment relationships are discussed below.

Depression

Extensive research has been done into the relationship between aspects of maternal mental health and the quality of the mother-infant attachment. For example, postnatal depression (Atkinson et al., 2000; Hornstein, Trautmann-Villalba, Hohm, Rave, Wortmann-Fleischer, & Schwarz, 2006; Kinsey & Hupcey, 2013; Martins & Gaffan, 2000; Müller, Teismann, Havemann, Michalak, & Seehagen, 2013) and depressive symptoms (Dubber, Reck, Müller, & Gawlik, 2014; Edhborg, Nasreen, & Nahar Kabir, 2011; Kinsey, Baptiste-Roberts, Zhu, & Kjerulff, 2014; Moehler, Brunner, Wiebel, Reck, & Resch, 2006; Müller et al., 2013, Ohoka et al., 2014; Reck et al., 2006; Tietz, Zietlow, & Reck, 2014) have frequently been shown to be associated with poorer mother-infant attachment quality. This also true for milder, sub-clinical depressive symptoms (Edhborg et al., 2011; Tietz et al., 2014; Wittkowski, Wieck, & Mann, 2007).

Comparisons have been drawn between the behaviours of depressed and psychologically 'healthy' mothers. It was found that mothers who were depressed were characterised as being less responsive, more helpless, hostile, critical, alternatively disengaged or intrusive, disorganized, less active and avoidant of confrontation (Gelfand & Teti, 1990; Goodman, 1992). Attachment theory suggests that for a secure bond to be formed between caregiver and infant, a sensitive, warm

and responsive environment is crucial to its development. Mothers who are depressed are likely to have problems maintaining such an environment due to issues engaging with their baby and struggling to manage their own emotional responses, as described above.

One factor that has been shown to mediate the effect of depression on attachment is maternal sensitivity (Campbell et al., 2004), which is described as the ability of the mother to respond promptly to the signals of the baby. Maternal sensitivity has a positive correlation with mother-infant attachment demonstrated in a meta-analysis conducted on a total of 66 studies into sensitivity and attachment (Wolff & Ijzendoorn, 1997). Furthermore maternal sensitivity during interactions with newborns was also correlated with greater attachment between mother and infant (Britton, Britton, & Gronwaldt, 2006). Ainsworth defines maternal sensitivity as an ability to accurately interpret the infant's attachment signals and respond to them adequately. A persistent lack of or inconsistent sensitivity towards the infant's needs have been found to stimulate an insecure bond between the infant and parent (Ainsworth, 1978).

As discussed, research into the impact of postnatal depression on mother-infant attachment is well documented however less research has been done into other aspects of maternal mental health on mother-infant attachment outcomes. Feldman, Greenbaum, Mayes and Schmel (1997) reported that maternal postnatal trait anxiety was one of the most central factors interfering with mother-infant interactions for children between the ages of 3 and 9 months. Whilst there is some evidence that depression may play a more prominent role than anxiety in the hindrance of mother-infant attachment, there is evidence to support the hypothesis that anxiety may also uniquely affect this relationship.

Eating disorders

Pregnancy is a time when the body changes significantly including weight, body shape and eating behaviour. Research suggests that mothers who have symptoms of disordered eating or a diagnosable eating disorder experience difficulties with general postpartum adjustment, infant feeding and mother-infant attachment (Astrachan-Fletcher, 2008). Their study suggests that mothers who have

an eating disorder were more likely to have difficulties with mother-infant attachment and that this may be contributed to by issues during times of feeding which in infancy, is known to have positive effects on the mother-infant attachment process.

Furthermore the psychosocial stressors of motherhood combined with body image concerns may predispose women with eating disorders to the development of postpartum mood disorders. Women experiencing an eating disorder in the postpartum period report much higher levels of postpartum depression compared with the general population (Cooper, Murray, Wilson & Romaniuk, 2003; O'Hara & Swain, 1996). Some theorists have suggested that increased rates of depression in this group can be understood by mother's experiencing high levels of guilt in relation to their eating disorder (Tiller & Treasure, 1998). As discussed previously, an abundance of research has explored the impact of postpartum mental health (mainly depression) on the mother-infant attachment and how this process can be interrupted by poor mental health in mothers.

The preoccupation with body image and eating/weight concerns are found to negatively impact upon the mother's capacity to pay attention to her child as well as respond sensitively to their infant's needs (Park, Senior & Stein, 2003). This can potentially lead mothers to being less responsive, inconsistent or rejecting of the infant- placing the attachment relationship at risk (Astrachan-Fletcher, 2008).

Concerns about their own insecurities, their self-esteem, their body image and in turn their own eating patterns can make it very difficult for the mother's instincts towards their baby to be prioritised (Orbach & Rubin, 2014). Women who fall below the threshold for a diagnosis of an eating disorder, but who have concerns about their weight, shape and eating may also be at risk of similar adversities to those that are diagnosed.

Feeding choice

Some aspects of breastfeeding have been inferred as having potentially positive effects on mother-infant attachment. Breastfeeding results in close bodily contact and direct feedback via nipple stimulation, some argue that this process may also be associated with more sensitive responsiveness between mother and baby, for

example by enhancing attunement of emotional and attentive states between infant and mother (Jansen, de Weerth & Riksen-Walraven, 2008). A large scale study using gold standard observational measures of infant-mother attachment found that a longer duration of breastfeeding was associated with more maternal sensitive responsiveness, as well as more attachment with a secure classification (Tharner et al., 2010). Studies have suggested that body image disturbance does mediate intention and duration of breastfeeding in mothers (Hauff & Demeraff, 2012). Therefore if mother-infant attachment is higher in breastfed infants, increased body image could be a predictive factor for the formation of a positive mother-infant attachment, if body image was the precipitating factor in the mother's decision to breastfeed.

However, the relationship between these factors are likely to be more complex than this research suggests and other mediating factors need to be carefully considered which may impact on the mothers feeding decision, such as social status, marital support, cultural influence, general mental health and physically being able to breastfeed to name a few. Distorted or low levels of body image has been found to be an independent predictor of the development of eating disorders and is an important component to the spectrum of clinical eating disorders (Olatunji, Kim, & Wall, 2015; Stice, 2002). As research has suggested that mothers who have an eating disorder are more likely to have problems with mother-infant attachment and that poor body image is a strong predictor for eating disorders, it is important to explore body image in the postpartum period and consider the potential impact this may also have upon mother-infant attachment.

Other Psychological Predictors of mother-infant attachment

Research has suggested that a history of childhood maltreatment and post-traumatic stress disorder as well as comorbidity with depression, predict the mother-infant attachment relationship (Seng, Sperlich, Low, Ronis, Muzik & Liberzon, 2013). This is further supported by findings which suggest that women with postpartum psychopathology (depression and posttraumatic stress disorder) showed consistently greater bonding impairment across multiple time-points in the postpartum period (Muzik, et al., 2013). These women also reported histories of childhood abuse and neglect.

Furthermore, PTSD as a result of experiencing a premature birth has been found to affect both mother–infant interactions and perceived mother-infant attachment. In particular, a “Controlling” pattern of attachment was associated with high maternal PTSD symptoms (Forcada-Guex, M., Borghini, A., Pierrehumbert, B., Anserme, F., Muller-Nix, C., 2011). As discussed early, depression has been found to be a significant predictor of poor mother-infant attachment, in addition to this high anxiety levels and substance abuse are associated with lower levels of maternal-foetal attachment (Alhusen, J.L., 2008). Although this study researched the mother-foetal attachment, studies have shown that mother-foetal attachment is also a strong predictor of mother-infant attachment in the postpartum period.

Mothers with unresolved trauma are found to have higher levels of insecure attachment themselves compared with mothers who did not and were more likely to have infants with insecure attachment (Iyengar, Kim, Martinez, Fonagy & Strathearn, 2014). The author’s previous study suggested a similar pattern of transmission between mothers and infants, with secure attachment classifications between mother and child matching 73.4% of the time (Shah, Fonagy & Strathearn, 2010). This research suggests a transgenerational pattern of attachment styles and experiences been passed on to infants as a result of their mothers experiences, potentially affecting the mother-infant attachment development in the postpartum period.

1.2 Body Image

1.2.1 Definition

Body image disturbance is a multifaceted construct, comprising of perceptual, affective, cognitive and behavioural aspects of body experience (Pook, 2008) as well as a broad range of phenomena such as body dissatisfaction, body image investment, and over-concern with body weight and shape (e.g. Cash and Pruzinsky, 1990; Thompson, 1990; Thompson et al., 1999).

The picture of our own body which we form in our mind, that is to say, the way in which the body appears to ourselves (Schilder, 1950: 11).

Perceptual body image is usually measured by investigating the accuracy of body size estimation relative to the person's actual size. Attitudinal body image is assessed by measuring four components: global subjective satisfaction, affect (feelings associated with the body) cognitions (beliefs about the body) and behaviours (such as avoidance of situations where the body will be exposed). Body dissatisfaction relates to negative evaluations of body size, shape muscularity/muscle tone and weight, and it usually involves a perceived discrepancy between a person's evaluation of his or her body and his or her ideal body (Grogan, 2016).

The phrase 'body image' encompasses many concepts; therefore terminology within the literature can be used interchangeably and body image is often termed body dissatisfaction when being discussed in relation to poor levels of body image. This study will use the term 'body image disturbance' and will measure this by using the Body Shape Questionnaire (BSQ-14). This is a self-report scale to assess body dissatisfaction caused by feelings of being fat and has been used in many studies on body image disturbance (e.g. Masheb & Grilo, 2003).

1.2.2 Prevalence of Body Image Disturbance

Body image disturbances have been found among females in western cultures of all ages, both within the general population and in eating disorder populations (Hausenblas, Campbell, Menzel, Doughty, Levine & Thompson, 2012; Marshall, Lengyel & Utioh, 2012) and has been found to predict the development of more disordered eating issues (Attie & Brooks-Gunn, 1989; Rosen, Cado, Silberg, & Srebnik, 1990, Strigel-Moore, Silberstein, Frensch & Rodin, 1989, Thompson, Altabe, Johnson, & Stormer, 1994) and can even precede and predict disorders (Killen et al., 1996).

Women in the postpartum period are at a heightened risk of developing body image disturbance, both weight concerns and dietary restriction are common in the postpartum period. For example Hisner (1986) reported that 75% of women were concerned about their weight in the first few weeks following childbirth and Baker and colleagues (Baker, Carter, Cohen, & Brownell, 1992) found that 70% of women were trying to lose weight at 4 months post-partum. Other studies have also

supported that weight concerns continue to increase over the post-partum period and weight gain after childbirth was reported to be particularly distressing for women and in some cases, precipitated a clinical eating disorder (Stein & Fairburn, 1996). These findings suggest that body image concerns are common in women during the postpartum period and the impact of this should therefore be carefully considered.

1.2.3 Predictors of Body Image Disturbance

Previous studies have shown that women have a strong desire to want to return to a normal weight after childbirth (Fairburn & Welch, 1990; Montgomery et al., 2013; Nash, 2012; Walker & Freeland-Graves, 1998) therefore these expectations in mothers in the postpartum period may contribute to feelings of dissatisfaction if women are unable to achieve a 'normal' weight. Considering that women in the postpartum period are at a higher risk of developing body image disturbances, it is important to explore the potential influences on this problem and what factors may increase the risk of difficulties so that clinical practices can be directed towards these areas to support mothers.

In their study of body image in the postpartum period Gjerdingen et al. (2009), found that overeating or poor appetite, higher current weight (at 9 months postpartum), poor mental health (SF-36 mental health scale), being single (vs. married), race (other than black), bottle feeding (vs. breastfeeding), and having fewer children were all associated with higher levels of body disturbance. Variables not related to body satisfaction were age, education, income, pre-pregnancy weight or depression scores (on PHQ-9). In summary, a combination of both internal experiences and contextual factors are found to contribute representations of body image. Considering that the postpartum period is one of physical shape changes and slower return to pre-pregnancy weight, alongside living in a culture where thinness is often idealised, women in the postpartum period are likely to be at a higher risk of developing body image disturbance than the general population.

A number of factors have been found to increase the prevalence of body image disturbance in the general population including media influence, age, family pressure and self-esteem (Green & Pritchard, 2003). In a meta-analytic review of 156 studies, social comparison was found to be a strong predictor of high body

dissatisfaction. Comparing oneself as unfavourable to another person on the basis of appearance negatively impacts on one's own body image and results in higher body dissatisfaction (Myers, & Crowther, 2009). This relationship was found to be stronger for women than men and was inversely related with age (e.g. younger women are more likely to be affected by social comparison).

The tripartite influence model is one that has been applied to a number of groups in western cultures to help explain the presence of body image disturbance (Thompson et al., 1999). The model suggests that two mediating variables, internalization of societal ideals of appearance and social comparison, jointly describe the mechanisms through which the socio-cultural variables are associated with body disturbance and disordered eating.

In the postpartum period, research using the tripartite influence model suggests that mothers also experience strong sociocultural pressures to attain unrealistic body shapes/sizes during the post-pregnancy period, which contributes to their body image disturbance and places them at high risk of developing more severe issues (Lovering, Rodgers, George, & Franko, 2018). Theories suggest that social comparison and internalised social ideals are often associated with body satisfaction, increased media coverage on the post-partum celebrity body and on the post-partum celebrity's ability to quickly return to the thin ideal are found to affect mother's expectations of their postpartum body (Cunningham 2002; Gentile 2011; Gow, Lydecker, Lamanna, & Mazzeo 2012). It can therefore be expected that women in the postpartum period are likely to be affected by this increased focus on depictions of pregnancy and postpartum bodies. Similar to women in the general population, media influence has also been found to have a detrimental effect on women's body image during pregnancy (Coyne, Liechty, Collier, Sharp, Davis & Kroff, 2018).

Cash (2002) developed a cognitive behavioural model of understanding body image. This suggests that cultural socialization, interpersonal characteristics, physical characteristics and personality attributes all play a role in the evaluation of one's body image. In particular the model recognises the interaction between environmental events, cognitive, affective and physical processes which impact upon the individual's behaviour in relation to their body image. The model has

gained supportive evidence for these concepts in addition to measuring and planning interventions in relation to body image.

Studies have found that when mothers perceived that they were not meeting others' weight gain expectations, either because they felt they were gaining too much or too little weight their anxiety increased (Chang 2006; Nash, 2012; Ogle, Tyner, Schofield-Tomschin, 2011; Wiles, 1994). In addition, when women viewed themselves as being unable to be in control of their weight and shape, they reported experiencing distress (Carter, 2010). This can be linked to Cash's cognitive behavioural model, which suggests that an integration of cultural influences and cognitive processes contribute to an individual's attitude towards their body image and in turn can have an effect upon their mood and behaviour (e.g. the ways in which they might attempt to control their bodies).

Another theoretical perspective on the development of body image is that of objectification theory. This theory focuses on the culture surrounding women and how their bodies can be objectified in certain situations. Women may experience objectification in two ways, self-objectification where attention is drawn to the woman's body (when others comment on the way they look) and trait self-objectification. This is when women develop a particularly enduring view of their body as an object leading to feelings of shame and anxiety as well as continued monitoring of their body. Trait self-objectification has been linked with body disturbance in women of all ages (Grippe & Hill, 2008).

Findings of studies exploring objectification theory during pregnancy have also demonstrated a significant relationship between body surveillance and negative mental and behavioural health variables (Rubin & Steinberg, 2011). For example, it was found that higher body surveillance was associated with depressive symptoms and tended to be associated with less engagement in prenatal health behaviours among pregnant women (Rubin & Steinberg, 2011). Given that social comparisons with regards to body image are also common for women in the postpartum period, it can be assumed that both women's views of their bodies and the monitoring of their outward appearance (Fredrickson & Roberts 1997) are relevant in postpartum populations. This theory helps us to understand the social construction of body image and how this may impact upon women's beliefs about

how their body 'should' look. As the research suggests, body image is a complex construct with various influences on this during pregnancy and the postpartum period.

1.3 Body Image concerns in mothers

1.3.1 Body Image during Pregnancy

Sociocultural perspectives suggest that societies have ideal body shapes which are communicated through media, social media, families and peers which are then internalised by the individual which can result in body disturbance (Tiggemann, 2011). Research has proposed that body ideals tend to be slenderness in women and muscularity in men (in western cultures), resulting in a reference point which is unrealistic leading to unhealthy perceptions of body image (van den Berg, Thompson, Obremski-Brandon, & Covert 2002).

Pregnancy and the period following childbirth (postpartum period) is a time when women face a number of transitions consisting of psychosocial, physiognomic and weight and shape changes over a short time frame (Rocco et al., 2005). Concerns about body image can often result from such physical changes following childbirth (Skouteris, Carr, Wertheim, Paxton, & Duncombe, 2005) and body image disturbances in women has been linked to several maladaptive behaviours during pregnancy. One example being extreme weight loss which has been found to have negative implications for the mother's well-being and in turn, posing a potential risk to the unborn child (Fuller-Tyszkiewicz, Skouteris, Watson & Hill, 2012). As it is unlikely that the body quickly returns to its pre-pregnancy state, it remains likely that these behaviours may continue into the postpartum period and pose further risks to the well-being of both mother and infant. The attachment relationship is potentially one factor that may continue to be affected by the mother's perception of her own body due to the strength of this relationship during the period of pregnancy.

Research into the trajectory of body image throughout pregnancy has found variable results. Some studies propose that body image remains stable across this period for example Goodwin, Astbury, and McMeekan (2000) found that while there were no significant changes in body dissatisfaction over the course of pregnancy, body image disturbance was greater at early pregnancy compared to pre-

pregnancy. In contrast to this, Boscaglia, Skouteris, and Wertheim (2003) found that women either became more positive about their body image over the course of pregnancy or remained stable in their evaluation of their bodies. The inconsistent findings make it difficult to draw conclusions about how body image changes over this period. However, further research into the predicting factors has found that depression, socio-cultural pressure and physical appearance comparison are key predictors of body image disturbance during pregnancy (Skouteris, Carr, Wertheim, Paxton & Duncombe, 2005).

In a systematic review of body image during pregnancy, it was found that research suggests that women are better able to negotiate changes to body image the further on in their pregnancy they are, and that this is due to the functionality of the body becoming clearer to mothers over time (Watson, Broadbent, Skouteris, & Fuller-Tyszkiewicz, 2016). Earlier studies proposed that women's pregnant body image was protected from the transgression of 'being fat as unacceptable' vs. being pregnant (Fox, 1997), and that women legitimised this through perceiving themselves as excused from adhering to the ideals or by reflecting on the functional and mothering identities of their body. This suggests that there is potentially a protective period for women with body image disturbances during and soon after pregnancy. However, once the mother has given birth and has physically recovered, then the question emerges around what resources are in place to protect the mother from her concerns about the dissatisfaction towards her post-pregnancy body.

1.3.2 Body Image during the postpartum period

The postpartum period presents women with a number of adjustments and challenges not only in a physical sense, but also in terms of the emotional demands of becoming a mother and adjusting to this role. The postpartum period presents a unique time of pressure to recover and for some, a desire of women to return to pre-pregnancy body weight (Montgomery et al., 2013, Nash, 2012), resulting in the postpartum period being a high risk phase for negative body image to potentially develop. In contrast, further studies have found higher levels of body satisfaction following birth (Strang & Sullivan, 1985 and Walker, 1998).

A qualitative study exploring women's perceptions of their body throughout pregnancy and the postpartum period found that women were more likely to experience body image disturbances in the postpartum period compared with during pregnancy (Clark, Skouteris, Wertheim, Paxton & Milgrom, 2009). During pregnancy, women reported several features that helped them adapt to their body shape changes (body functionality, foetus well-being, feeling the baby kick, positive social commentary) but that post-pregnancy, these features were no longer protective against body image disturbances.

The pressure new mothers face in terms of contradictory parenting advice and media messages around retrieving the pre-pregnancy body creates anxiety for many women (Orbach, 2009). Media attention and interest in celebrity culture in society can create an intense pressure for some women to lose weight gained during pregnancy (Gow, Lydecker, Lamanna, & Mazzeo, 2012). Roth, Homer and Fenwick (2012) suggested that the social messages from women's magazines is that women should be striving to gain back their pre-pregnancy body shape and if unsuccessful, this implies failure.

A systematic review of the experiences of postpartum body image, found that women felt the need to reclaim their postpartum body and that being pregnant was socially acceptable but 'being fat' was not (Meireles, Neves, Carvalho, & Ferreira, 2015). This makes the process of becoming an 'ordinary devoted mother' (Winnicott, 1960) and the natural bonding process women have with their infants more difficult as they deal with the pressures of the relationship they have with their own body in the midst of other external pressures.

Research has found that body image disturbance in women are significantly higher 9 months postpartum compared with 1 month postpartum, and this was associated with poorer mental health in mothers (Gjerdingen et al., 2009). Suggesting that the further away women are from the event of childbirth, the higher the likelihood of body image disturbances forming. This may be related to the diminishing protective factor of the function of their weight change the further away they are from having given birth which was suggested in the qualitative research conducted exploring women's perceptions of their post-pregnancy body (Clark, et al., 2009).

1.3.3 Impact of body image disturbance on maternal-infant bonding

Body image disturbances can impact on how women relate to their physical needs in pregnancy and the postpartum period, interrupting the focus on bonding with their baby in the crucial early months, when attachment behaviours are being established (Orbach et al., 2014). During pregnancy and the postpartum period, the body undergoes significant physical changes and, as discussed previously, it is common for women to experience negative feelings towards their bodies that affect their well-being. Around 11.5% of women report being dissatisfied with their bodies after giving birth and try to control their appetites in an attempt to manage these negative feelings (Larsson & Andersson-Ellström, 2003), which are believed to increase over the postpartum period (Gjerdingen et al., 2009; Rallis, Skouteris, Wertheim & Paxton 2007).

Risk factors for the mother-infant attachment can begin during pregnancy, Haedt and Keel (2007) found that high body disturbances in mothers negatively influenced mother-foetal attachment during pregnancy and they predicted that this would have negative consequences for both maternal health and foetal outcomes. Their study included multiple predictor variables in order to analyse the factors affecting mother-foetal attachment, however the sample were well educated, had good social support and from Caucasian backgrounds. The lack of diversity in the sample makes it difficult to compare the findings against the general population.

Muller also reported that body image could predict mother-foetal attachment as well as adaptive ability during pregnancy (Muller, 1993). This suggests that mothers with body image disturbance are at higher risk of poor mother-infant attachments, which is supported by Ward et al., (2001) who found that mothers with body image disturbance found it difficult to form healthy relationships with their infant.

In a systematic review of the literature exploring body image in the pre and postnatal period, it was found that body image significantly predicted postpartum depression and that this was consistent across the perinatal and postnatal period and for numerous aspects of body image (Silveira, Ertel, Dole & Chasan-Taber, 2015). This suggests that women who experience high level of body image disturbance in

the postpartum period, are at a higher risk of developing postpartum depression. As discussed earlier, extensive research has taken place concluding that mothers who experience postnatal depression are more likely to have insecure attachments with their children, therefore poor body image may indirectly predict mother-infant attachment.

Research suggests that when mothers are feeling dissatisfied about the interactions they have with their infants, the attachment security between mother and infant is lower (Coyl, Roggman, & Newland, 2002). This suggests that the mother's perception of the interactions she has with her child are an important indicator of overall mother-infant attachment. In addition, being able to gain further understanding of what factors may impact upon the mother's perceptions of the attachment she has with her infant is useful when knowing how best to support new mothers. Furthermore, optimal attachment in early infancy has been identified as an integral component in the future development of a child (Oppenheim, Koren-Karie, & Sagi-Schwartz, 2007).

Research carried out by Gjerdingen (2009) identifies a risk period for body image disturbance to return, or to form in the period following childbirth, in this study highest reported levels of body image disturbances were found at 9 months postpartum. Although eating disorders (ED) are a clinical diagnosis and a much more severe form of body image disturbance, EDs are related to a number of negative outcomes in the offspring (Astrachan-Fletcher, 2008). Around 40% of new mothers are dissatisfied with their weight and those with existing eating disorders remain at a high risk of resurgence of disordered eating following birth. In addition, poor mother-infant attachment was related to more severe eating disordered symptoms during the postpartum period (Walker, 1998). Suggesting that women who are experiencing body image disturbances (a common feature of those with eating disorders), are more at risk of developing a poor mother-infant attachment in the postpartum period.

Research suggests that it is common to experience body image disturbance in the postpartum period and that this can often exist in conjunction with poorer emotional wellbeing, such as increased anxiety and low mood (Brewerton, 1995; Cooper, 1995; & Grubb, Sellers, & Waligroski, 1993). One longitudinal study found

that as the postpartum period progressed, measures of eating attitudes and both depression and anxiety symptoms were associated with one another (Carter, Baker, & Brownell, 2000). Therefore the presence of these experiences within the mother may create more difficulties for her to be emotionally available, which in turn may impact upon the attachment development between mother and infant and evidence has suggested that for a healthy attachment to be formed between mother and baby, the mother's emotional availability is an important factor (Bornstein, Suwalsky, & Breakstone, 2012).

The mother-foetal attachment has been found to be mediated in some way by the mother's perception of her own body (Huang, Wang & Chen, 2004), this study found that body image disturbance was negatively associated with maternal-foetal attachment ratings. Huang et al. (2004) explored the relationship between mother's body image and the attachment she reported with her foetus during pregnancy, this study did not continue to explore the interaction between body image and mother-infant attachment in the postpartum period.

However, Huang et al., (2004) focused on analysing the factors that contributed to mother's feeding choice (i.e. intention to breastfeed/not) with body image being one factor that was analysed. They found that maternal-foetal attachment was negatively correlated with body image during pregnancy and that choice of feeding method was predicted by maternal-foetal attachment. Although their study's main focus was to determine predictors of feeding intention postpartum, a strong correlation was found between body image in pregnancy and mother-foetal attachment. These findings are important when considering whether the relationship between these variables continues into the postpartum period.

As research has suggested that body image can deteriorate in the postpartum period, it would have been interesting to see whether the mother's perception of the attachment with her new-born continued to be affected by this. A high proportion of the sample in the study conducted by Huang et al., (2004) were either rated as having high or medium levels of socioeconomic status, therefore the representability of the findings to the general population are limited. Understanding how the mother's perception of her body changes over the postpartum period and whether

this continues to affect the mother-infant attachment is therefore of continued interest.

Lai, Tsang and Tse (2006) measured body image, mother- infant attachment and mood during pregnancy and at 6 months postpartum. Results showed that both a weak maternal-foetal attachment and a poor mother-infant attachment were associated with body image disturbances (Lai et al., 2006). They also found that just over 19% of the sample reported disordered eating (DE) patterns at time 2 (postpartum) and that the frequency of DE was related to the mother's perception of the mother-infant attachment, depressive symptoms and a weak mother-foetal attachment.

In Lai's research (Lai et al., 2006) data was collected during pregnancy and 6 months postpartum. Research has suggested that mother-infant attachment begins forming in the period soon after childbirth, no data was collected in the early period following childbirth to capture the relationship between body image and mother-infant attachment in this study. Having a baseline measurement of body image in the postpartum period would provide useful when making comparisons to body image ratings at 6 months postpartum. T1 in this study was described as 'pregnancy', considering that participants are likely to be at various points in their pregnancy when outcome measures were completed, being able to compare the findings between participants may not yield accurate results.

Another potential shortfall of Lai's study is the way in which mother-infant attachment was measured. A self-constructed outcome measure consisting of four questions following focus groups with mothers was designed and administered. As a result, this measure has no normative data and therefore does not provide any reliability or validity scores making it difficult to draw firm conclusions from the data that has been collected on the mother-infant attachment. Considering the complexity of the mother-infant attachment, it could be argued that this method of measurement may not be the most valid. Lai's study took place in Hong Kong and it is important to note that there are likely to be cultural differences in perceptions of factors relating to eating pathology and body image, as is demonstrated in research exploring cultural differences in this area (Jung & Lee, 2006; Kowner, 2002 and Rucker & Cash, 1992).

There are often differences amongst cultures in perceptions of desirable body shape and appearance as well as body esteem more generally. It is therefore important that research into postpartum body image is conducted across cultures to enable conclusions to be made about potential differences. This study will be taking place in the United Kingdom and will aim to include women from various ethnic backgrounds to enable any potential relationships to be examined. In order to address one of the key weaknesses of Lai's work, the current study will assess mother-infant attachment, body image and mood at both 6 weeks and 6 months postpartum and analyse any changes that occur between these two-time periods.

Egeland, & Farber (1984) found that mothers of securely attached infants tended to feel more positively towards themselves and consequently had more to give their infants. They were also found to be more skilled in feeding and playing situations and were more sensitive to their infant's needs compared with mothers of anxious or avoidant infants. Ethological attachment theory (Bowlby, 1969) suggests that attachment is formed between mother and infant as a consequence of one another's behaviour. It can be theorised that the mother's behaviour is likely to be influenced by the feelings that she has towards herself including any issues relating to her own body image.

Research remains unclear about the relationship between body image and mother-infant attachment although many would argue that the months following the birth of the baby are when multiple attachment experiences begin for the mother and child. There are some studies that suggest a predictive relationship between body image and the mother-infant attachment although there is counter evidence to this argument where no relationship between these variables has been found. One conclusion being that the attachment between mother and infant forms regardless of the relationship that a woman has with her body, socio-demographic status, or the course of pregnancy (Malus, Chlewicka, Galinska-Skok, Konarzewska, & Szulc, 2014). However, this particular research did not continue to explore the relationship between these factors into the postpartum period when body image concerns are known to increase, therefore it cannot be concluded whether similar results would be found following childbirth.

It is recognised that the mother plays a vital part in the attachment relationship that is formed between herself and her infant as a result of how she responds to her baby's cues (Ainsworth, 1978; Britton, Britton, & Gronwaldt, 2006) Therefore, understanding what factors may impact upon the mother's perception of her attachment with her infant is vital when considering the longer-term outcomes for both mother and child. Research into body image disturbance of women in the postpartum period suggests that such concerns increase following childbirth and that this was associated with poorer mental health in mothers (Gjerdingen et al., 2009). Understanding the potential impact of body image disturbance on the mother-infant attachment is important to identify potential risk factors to this relationship.

1.4 This study

This study aims to explore body image disturbance and perceived mother-infant attachment in a community/non-clinical sample of women over the postpartum period (6 weeks and 6 months after the birth). Existing studies exploring these concepts have taken place in countries outside of the UK where there are likely to be various cultural, social and economic differences which may impact on these outcomes. Therefore conducting this study within the UK will add to the research base on the relationship between body image and perceived mother-infant attachment in the postpartum period. This study will also address the issues raised in previous research that has lacked measurement of body image and mother-infant attachment at multiple time points during the postpartum period, a time when most change occurs between these concepts. The aims are to ascertain whether body image disturbance changes over the postpartum period from 6 weeks to 6 months postpartum and if this is associated with mother's perceived attachment with her infant.

1.4.1 Research Questions

1. Does body image change from 6 weeks to 6 months postpartum?
2. Does body image at 6 weeks postpartum predict perceived mother-infant attachment at 6 weeks and 6 months postpartum?

1.4.2 Hypotheses

Based on findings from existing literature it is hypothesised that:

- Body image disturbance will increase over the postpartum period.
- Higher levels of body image disturbance will predict poorer perceived mother-infant attachment at 6-weeks and 6-months postpartum.

2. Method

2.1 Design

A within participants, repeated measures design was used to investigate the change in body image and potential predictors of perceived mother-infant attachment in a sample of non-clinical, postpartum women. The primary outcome was perceived mother-infant attachment with body image, mental health and feeding identified as potential predictors at 6 weeks and 6 months postpartum.

2.2 Participants

2.2.1 Inclusion Criteria

- Women aged 18 or over and who had given birth between 6 and 8 weeks prior to completing the questionnaire.

2.2.2 Exclusion Criteria

- Mothers younger than 18 years of age were not considered for the study due to increased vulnerabilities within this group.
- Fluency with English language was required in order to understand the consent, participant information and questionnaire.

2.3 Sample size

Data were analysed using multiple linear regression. Harrell (2001) suggested that 10 subjects per variable (SPV) was the minimum required sample size for regression models to ensure accurate prediction in subsequent subjects. Following a review of the literature, it was indeed the consensus that a minimum of 10 events per variable are required for estimating these regression models (Peduzzi, Concato, Feinstein, Holford, 1995 & Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996). For the purpose of this study the predictor variables are body image maternal mental health and feeding method, using the value of 10 SPV, a total of 30 participants would be required in order to have an adequate sample size for this method of analysis.

In addition to calculating an adequate sample using the above guidance, information about sample sizes that had been achieved in similar studies to this one

was explored. This was to see whether it was possible to achieve a similar or larger sample size than existing studies in order to make more accurate estimates about the population being explored. Reviewing three key papers which measured mother-infant attachment and body image in the postpartum period revealed a variation in sample sizes, the average of the three studies was 135 participants which included 131 from Lai et al., (2006) 196 from Haedt and Keel (2007) and a final 79 from Rallis ad Skouteris (2008).

However not all of the studies collected data at multiple time points meaning there was less risk of participant drop-out, as this study was collecting data at multiple time points this was also something which needed to be considered when planning for an adequate sample size. In this study, data was collected at two time points (6 weeks and 6 months postpartum) therefore it was necessary to calculate estimated attrition rates so that drop-out rates could be accounted for. Research into drop-out rates in the postpartum population are calculated to be between 9% (Andersson, Sundström-Poromaa, Wulff, Åström, & Bixo, 2006) and 34% (Flanagan, Gordon, Moore, & Stuart, 2015). Using the upper conservative prediction of potential drop-out rates, a final sample size of 40 would be required to ensure an adequate sample size was achieved at both time points following potential drop-out.

2.4 Ethical Approval

2.4.1 Ethical Clearance

Ethical approval was granted by the Leeds Research Ethics Committee (17/YH/0178, 25/07/2017). This allowed the researcher to contact GP surgeries across the Leeds Care Commissioning Groups (South, West and North Leeds) as well as using online forums to advertise the project. An amendment was later approved which enabled recruitment to take place from a number of parent and baby groups across the city of Leeds. Confirmation of ethical approval can be found in the appendices.

2.5 Recruitment

Women who met the inclusion criteria were invited to take part in the study when mothers attended their 6-week postnatal health check with their GP. Initially

recruitment took place within the Leeds (West Yorkshire) area in order to collect data from the locality in which the research was taking place. In addition, due to initial low participant numbers, a national sample was obtained by using online methods to recruit from more widespread areas. A more detailed description of the recruitment methods are described below.

2.5.1 Recruitment via GP surgeries

As part of standard healthcare, all mothers and their babies have an appointment for a health check at their GP practice 6 weeks following birth. The researcher approached eleven practices within Leeds via telephone, email and face to face meetings, these eleven surgeries were selected as potential recruitment sites based on having large numbers of registered patients in order to reach a large number of potential participants in addition to being located across various geographical areas of the city in order to try and achieve representation from various ethnic and social backgrounds.

The potential research sites were provided with information about the study and what their role would be as a research site. The researcher then met face to face with five practices who expressed an interest in taking part in the study, these five practices agreed to be research sites for this study. Questionnaire packs were delivered to the research sites and left with a the practice manager with whom the researcher communicated with on a monthly basis during the recruitment phase to ensure enough copies were available and to respond to any issues that arose.

The deprivation index of the GP surgeries that acted as recruitment sites were explored, this revealed that the recruitment sites represented a range of socio-economic backgrounds of potential participants, which is important when trying to achieve a representative sample of the general population. Across the five surgeries involved, the number of appointments offered by GP practices for 6-week post-natal checks was an average of 8 per week, some appointments were made on an ad hoc basis so were not able to provide exact appointments offered. It was calculated that approximately 160 mothers could be eligible to take part in the study during a 3-month recruitment period. This method of recruitment was trialled for 6 weeks within which time, five surveys had been returned to the researcher. This indicated

that the method of recruitment would need to be adjusted in order to achieve the sample size required for the planned analysis. Therefore, at the end of the trial period alternative recruitment methods were considered.

2.5.2 Recruitment via parent and baby groups

An amendment to the original ethics application was granted which enabled recruitment to also take place via parent and baby groups running in the Leeds area. The researcher sourced three groups in different locations across the city, again to increase the demographic diversity of mothers attending the groups. The researcher contacted group facilitators and asked permission to attend the groups and hand out questionnaire packs to mothers who met the inclusion criteria. An average of 10 mothers attended each of these groups, due to time constraints; it was only possible to attend each of the groups once. During the groups, the researcher introduced the project and made mother's aware of the inclusion criteria. If mother's expressed an interest in taking part, they took the questionnaire packs away with them and if they chose to participate, sent them back to the researcher in the pre-paid envelope provided. The aim of attending the parent-baby groups was to increase the control the researcher had with handing out questionnaire packs directly to women who were eligible to take part in the study.

2.5.3 Recruitment via an online survey

An online version of the paper questionnaire was created using the Bristol Online Survey (BOS) system (now Online Surveys) to enable recruitment to take place using the internet to reach a larger number of potential participants. This method of recruitment was approved in the original ethics application. The researcher utilised various online platforms to advertise the study, a link to the survey was posted using a number of social media sources. These were: two parent Facebook groups, Mumsnet, Netmums and the Baby Centre Community. The National Childbirth Trust (NCT) posted the link on their Facebook page as well as a local breastfeeding charity FAB (families and babies). In each case, relevant permissions were gained from administrators of the forum or social media sites to post a short description of the study and the link to an electronic version of the survey. Participant numbers continued to be monitored following the use of online

forums and this proved to be successful at increasing the amount of completed surveys returned.

Utilising social media enabled the researcher to have more control over advertising the project at numerous time points to reach a wider group of potential participants. The research was posted into a number of online forum discussions multiple times, this was more time effective compared with travelling to research sites in person. However this approach does exclude those who do not use the internet or certain groups of people who are not members of the social media platforms used in the recruitment.

2.6 Procedure

2.6.1 Time 1

Mothers were either a) provided with a questionnaire pack at their 6-week postnatal health check at their GP practice, b) were provided with a questionnaire pack at a parent and baby group or c) saw the link to the survey (<https://leeds.onlinesurveys.ac.uk/thesis-survey-part1>) through online advertising. T1 data was collected as close to 6 weeks postpartum as possible as this coincided with mother's being in contact with their GP for their 6-week postnatal check and was therefore used as a baseline for data collection.

2.6.2 Paper Surveys

The questionnaire packs contained a participant information sheet, consent form and the battery of surveys. Participants were asked to provide their name and contact details on the consent form in order for the researcher to be able to send out follow-up questionnaires for T2 data collection, this could be a postal address, telephone number or email address. The participant returned the consent form and questionnaire back to the researcher. All surveys were then assigned a unique participant number, which was marked on the paper questionnaire and logged in a secure word document. This allowed the researcher to identify a participant if they requested to be withdrawn from the study.

Questionnaires and consent forms were then stored separately to ensure study data could not be associated with personal data. Details of the date in which

participant surveys were received were also recorded along with contact details. This was so the researcher was able to contact participants after the agreed time frame for the second stage of data collection. Questionnaires and consent forms were stored separately in a locked cabinet at the University of Leeds, which will be for a total of 3 years following the completion of the study.

2.6.3 Online Surveys

Mothers who responded to the survey advertised online were taken straight to the questionnaire on the Bristol Online Survey (BOS) system when clicking the link. This platform was used as it stores all data within the EEA (European Economic Countries) and complies with the Data Protection Act. A username and password are used to access the account where questionnaires are stored, only the researcher was able to access the BOS account. BOS uses robust security measures but recommends not asking for highly sensitive information from participants; this was limited as far as possible for the purposes of the study.

The first part of the survey was the participant information sheet and if participants had ticked they had read this information they were required to complete the consent form in order to be taken to the self-report questions. When completed, the participant submitted their survey which was then stored on the BOS system. At the end of the recruitment period, the data collected was downloaded from BOS into an excel spreadsheet. Name and contact details were separated from the response data and participants were allocated a participant number to ensure that study data was separated from personal data and was completely anonymous. All electronic documents were stored on the University of Leeds N: drive which is a secure network server. Electronic documents were only accessed by the researcher using a unique username and password, electronic data will be stored in this way for 3 years following the completion of the study.

2.6.4 Time 2

The date at which the participant completed the time 1 survey was recorded along with contact details. Participants were contacted at 6 months postpartum (this was calculated using the date of birth of the mother's baby) using the specified contact method on their T1 survey. Paper surveys were pre-labelled with the

participant number in advance so that returned surveys could be identified for risk purposes or if the participant requested their data to be withdrawn. This process also helped identify participants who had not responded to follow-up requests so that reminders could be sent 2-weeks later in order to reduce data loss.

For participants who had used the online survey, an email was sent with details of how to complete the second survey at the appropriate follow-up date. A copy of the email sent to participants can be found in the appendix, included in the email was the participant number and participants were asked to input this at the beginning of the survey. This enabled the researcher to identify which participants were retained for both reminder and risk purposes. Participants were provided with the link to the second survey, the participant information sheet was provided as a reminder of the study and then participants were then taken to the second survey. An email reminder was sent after a period of 2 weeks to provide a final opportunity to complete the survey. The same risk protocol was adhered to following the return of time 2 surveys.

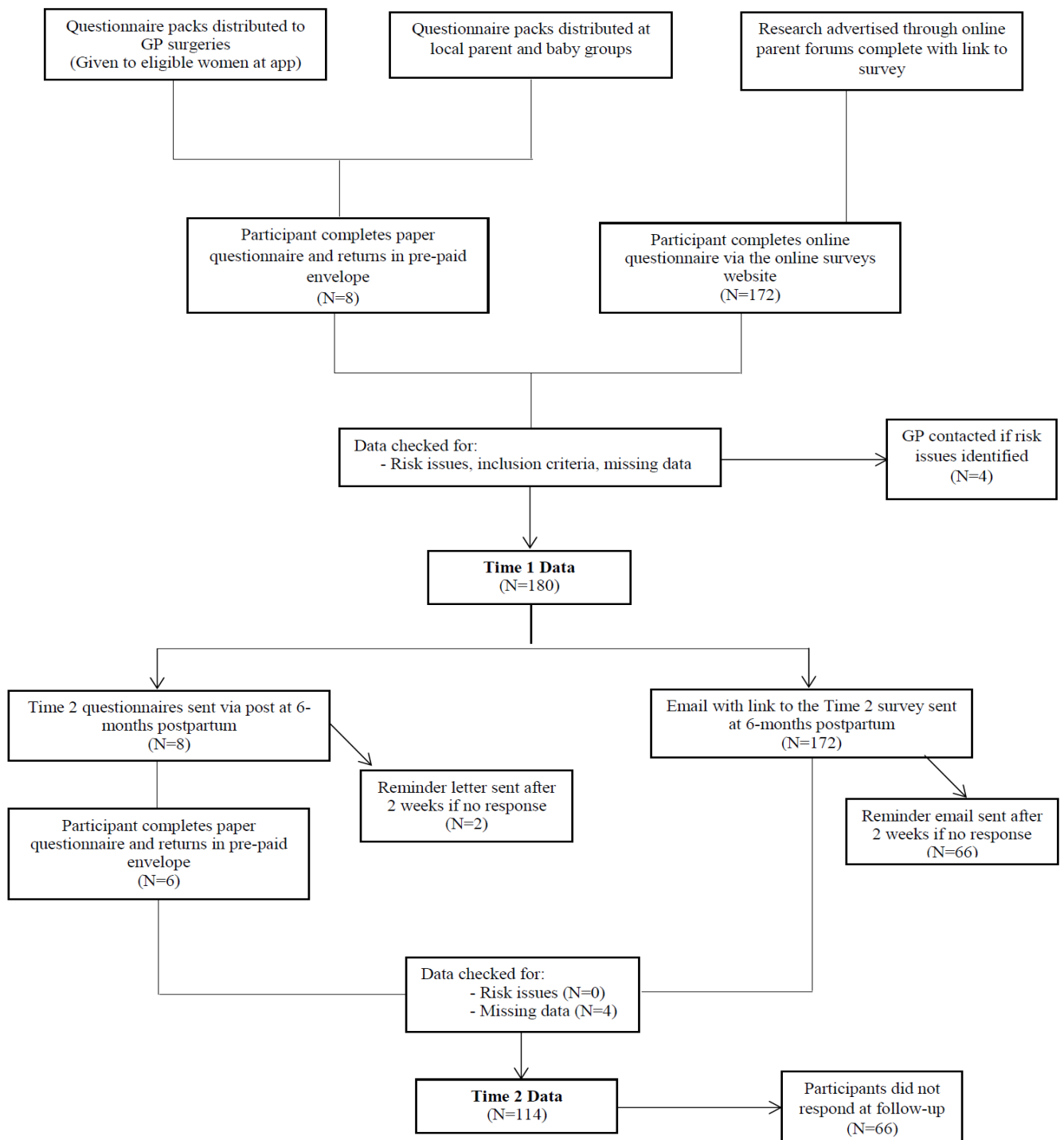


Figure 2. Recruitment and risk procedure

2.7 Measures

2.7.1 Time 1 Measures

Mothers were asked to complete three self-report measures that were presented within one questionnaire, this assessed mother's perceived attachment with her baby, maternal mental health and body image. Demographic information was also gathered at T1. The validity and reliability of each measure was assessed, copies of each of the measure can be found in the appendix.

2.7.2 Time 2 Measures

The measures were repeated again at 6 months postpartum with the exception of the demographic information. The Table below summarises which measures were administered at both T1 and T2.

Table 1. A summary of the measures used at each data collection point.

Variable	Name of Measure	Time 1	Time 2
Age	Demographics	✓	
Marital Status		✓	
Ethnicity		✓	
Education		✓	
Mental Health problems		✓	
Eating Disorder		✓	
Health during pregnancy		✓	
Childbirth delivery		✓	
Birth experience		✓	
Feeding method		✓	
Mother-Infant Attachment	MAI	✓	✓
Maternal Mental Health	GHQ (28)	✓	✓
Body Image	BSQ-14	✓	✓

2.7.3 Demographics

A range of demographic information were gathered for the study. Marital status can be an indicator of social support (Hung, & Chung, 2001) and education level provided a marker of potential socioeconomic status of participants. As research suggests that body image concerns are high in people who have experienced an eating disorder, it was important to determine what proportion of the sample may identify as having such a diagnosis as this may affect the results. Also, experiences of the birth may impact upon the mental health of women following childbirth therefore it was important to capture this. The categories within ‘feeding

method' included breastfeeding, bottle feeding or combination feeding, which was used as a predictor variable to measure the relationship with mother-infant attachment.

2.7.4 Maternal Attachment Inventory (MAI)

Observation methods are sometimes used in order to measure and define the attachment relationships between mother and infant and this can reduce some of the response biases when completing self-report measures on certain attributes, beliefs or behaviours (Stone et al., 2000). Due to time constraints and the number of participants required to yield a sufficient effect size, it was not possible to conduct observational assessment of mother-infant attachment. This study was concerned with how the mother felt about her baby and their relationship as a way of measuring mother-infant attachment rather than categorising people into different attachment 'styles'. Therefore, a self-report questionnaire of mother's perceived attachment with her infant was valid way of measuring this construct.

Several self-report questionnaires have been developed to assess the perceived bond between mother and infant. The Maternal Attachment Inventory (MAI) consists of 26 items representing maternal activities and feelings that indicate affection (Muller, 1996). Although the self-report feelings about their infants are not considered sufficient to define and measure the complexity of mother-infant attachment, they are thought to be indicators of the probable presence of attachment (Condon & Corkindale, 1998). The questionnaire consists of 26 short statements related to feelings a mother may have towards her baby. The response options are a 4 point scale which ranges from 1- 4 with 1 signifying a low level of agreement to 4 which is a strong agreement with the statement resulting in possible total scores from 26-104.

To ensure perceived mother-infant attachment was being measured within the scale, the authors assessed construct validity by a thorough review of the literature and comparison with existing measures (How I Feel About the Baby Now Scale, Maternal Separation Anxiety Scale, Postpartum Maternal Attitudes and Maternal Adjustment Scale). Content validity, which is the how much the measure represents every single element of mother-infant attachment, was achieved through review by a

panel of expert nurse clinicians, theorists and new mothers. The reliability of the scale was found to have an acceptable level of internal consistency ($\alpha = 0.85$ - 4 week babies, $\alpha = 0.76$ - 4-month babies and $\alpha = 0.85$ - 8 month babies, Muller, 1994). However, a further two studies have found levels of $\alpha > 0.90$ (Damato, 2004 and Shin & Kim, 2007). It can therefore be concluded that the MAI is a reliable and valid tool for measuring perceived mother-infant attachment in the postpartum period.

2.7.5 General Health Questionnaire- 28 (GHQ)

There is currently no 'gold standard' measurement of postnatal depression with measures being unable to detect with accurate sensitivity presence of depression (Ukatu, Clare, & Brulja, 2018). The most widely used measure of postnatal depression is the Edinburgh Scale for postnatal Depression (EPDS) (Kroenke et al., 2010), however it was decided that an alternative measure of distress would be used for this study. One of the research aims for this study is to analyse factors which may predict mother to infant attachment in the postpartum period and NICE guidelines published in 2007 (updated in 2014) suggest that mothers experience various mental health difficulties in the postpartum period not just depression. Therefore, in order to gather data on the variety of mental health experiences women may have in the postpartum period, the GHQ-28 was decided upon as a measure appropriate for this aim.

The GHQ-28 is a screening device used in health settings to assess for minor psychiatric disorders in the general population and within community or non-psychiatric clinical settings. It is considered suitable from age 18 upwards and assesses the respondent's current state asking whether that differs from his or her usual state, it has been found to be sensitive to identifying short-term psychiatric disorders. It is a self-administered questionnaire that focuses on two major areas, the inability to carry out normal function and the appearance of new and distressing phenomena. The questionnaire has 28 items and covers four domains, somatic symptoms (items 1-7), anxiety/insomnia (items 8-14), social dysfunction (items 15-21) and severe depression (items 22-28). The subscales allow the researcher to examine a profile of scores from one questionnaire as well as an overall number.

For the purpose of this study, total scores will be reported and analysed in order to measure presence of distress and emotional well-being of the sample. The respondent is asked to rate on a scale of 0-3 how much they agree with the statement with 0 being no agreement to 3 being a high level of agreement (not at all, no more than usual, rather more than usual and much more than usual). It can be scored from 0 to 3 for each response with a total possible score ranging from 0 to 84. Using this method, a total score of 23/24 is the threshold for the presence of distress.

Numerous studies have reported the psychometric properties of the GHQ-28 with various clinical populations. Test-retest reliability has been reported to be high (0.78 to 0.90) (Robinson & Price, 1982) and inter-rater and intra-rater reliability have both been shown to be excellent (Cronbach's α 0.9–0.95) (Failde & Ramos, 2000). High internal consistency has also been reported (Failde & Ramos 2000).

2.7.6 Body Shape Questionnaire-14 (BSQ)

The Body Shape Questionnaire was originally a 34 item self-report measure (Cooper et al, 1989), this has now been shortened into a number of different forms. It was designed to measure body image disturbance and has been used in clinical and non-clinical populations. The BSQ asks various questions about feelings towards one's shape and weight and offers a 6 point likert scale of how much the respondent has experienced the problem, 1 signifies never having experienced it and 6 being a regular/constant feeling (1-never, 2-rarely, 3-sometimes, 4-often, 5-very often, 6-always).

A 14-item version of the BSQ was introduced by Dowson and Henderson (2001). The authors reported sound psychometric properties when examining the 14-item version in a small clinical sample. Ghaderi and Scott (2004) evaluated the same version in a representative sample of Swedish females, a student sample and a clinical sample and in all three samples, the psychometric properties were found to be excellent. A further study comparing all the published shortened versions of the BSQ found that the BSQ 14 had favourable psychometric properties (Pook, Tuschen-Caffier, & Brähler, 2008). The advantage of the BSQ over other instruments measuring concern with weight and shape is the inclusion of questions that aim to acknowledge other important body image symptoms, such as

preoccupation with weight and shape, embarrassment in public and avoidance of activity or exposure of the body due to self-consciousness and excessive feelings of fatness after eating. Each item is scored to create a total score ranging from 14-84, a higher score indicates higher levels of body shape/weight concern.

2.8 Risk Protocol

There are a number of questionnaires included in the survey that ask the participant about experiences concerning self-harm or suicidal ideation. All questionnaires received were reviewed using a risk protocol. If participants scored anything other than zero against the following questions on the GHQ-28, the risk protocol was followed:

- ‘Found yourself wishing you were dead and away from it all?’
- ‘Found the idea of taking your own life kept coming into your mind?’
- ‘Thought of the possibility that you might make away with yourself?’

Participants were either recruited via or were required to provide their GP details as part of the study, therefore if a potential risk or concern about a participant’s well-being was identified, their GP was contacted with this information and were asked to contact the individual. All questionnaires received whether by post or online were reviewed once a week during the data collection period. A copy of the letter sent to GPs in this instance can be found in the appendix. Supervisors of the study were asked to follow this risk protocol if the researcher was absent for any reason.

2.9 Data Preparation

Data from paper copies of the questionnaire were input into a database using Statistical Package for the Social Sciences version 22 (SPSS 22). Electronic surveys using BOS (now Online Surveys) were downloaded into an excel spreadsheet and then copied into the same SPSS database. During this process, questionnaires were re-checked for any missing data or risk concern and necessary protocols were adhered to if required. Paper questionnaires were then stored in locked cabinets in the Clinical Psychology office at the University of Leeds. All electronic documents were stored on the University of Leeds secure drive.

2.9.1 Complete case sample

Some participants did not complete T2 questionnaires which therefore resulted in a number of cases with missing data. Regression models are highly flexible in modelling outcomes with a variety of predictors and covariates (independent variables) but they also require all observations to have complete data in every variable in order to be included in the model (Katz, 2011). This means that any cases where there is not complete data at both time points would be dropped from the regression model. Only cases where there was complete data at both time-points were retained for analysis. As a result, there was continuity across all models regarding the number and characteristics of the sample that enabled comparisons between models.

An alternative to using a complete case sample methods require extensive pre-existing data in order to carry out inverse probability weighting and multiple imputation as a way of managing missing data (Seaman & White, 2013). In this study, the information regarding non-responders was not available in order to carry out this analysis. In total 114 participants completed questionnaires at both T1 and T2, this resulted in a total of 66 sets of data being excluded from the study.

2.9.2 Incorrect or Missing data in the complete case sample

Demographics

A very small proportion of demographic information was missing from the dataset, a total of 3 participants left one category blank across the whole data set (for example marital status, ethnicity, educations etc.). As this was such a small proportion of the sample (3/180), it was assumed that this would not affect the overall results therefore if demographic data was incomplete then this was excluded from the analysis. A total of 4 participants failed to record their age on the questionnaire, in these cases missing age was replaced with the mean of the sample.

Missing data within measures

Authors of the GHQ recommend that missing items should be replaced with low scores (GL Assessment, 2017) and this was replaced in two cases. For the BSQ, it is recommended that if less than 10% of responses are missing, missing items are to be replaced with mean scores (Schafer & Graham, 2002) and this was done for

one item. There was no guidance available for the MAI questionnaire on managing missing data, therefore the above principle used with the BSQ missing data was adopted, an average score was replaced for one item due to missing data on the MAI.

2.10 Data Analysis

Data was analysed using IBM SPSS Version 22. Initially, the data was explored using descriptive statistics (means, standard deviations, maximum and minimum values). Demographic data (e.g. ethnic origin, marital status) were examined using percentages to evaluate the proportion of the sample within each category. The total sample at T1 (N=180) was compared with the sample at T2 (N=114) to see whether there were any significant differences between the two groups on demographic and clinical variables. For continuous variables such as age, *t*-test for independent samples was used. Pearson's Chi-square test was used to test for significant differences between the two groups on categorical demographic variables.

2.10.1 Paired Samples t-Test

The Paired Samples *t*-test is commonly used to test the statistical difference between two time points when the same group of individuals take part in both conditions. Questionnaires were administered at T1 (6 weeks postpartum) and T2 (6 months postpartum), a *t*-test was used to compare the means of participants who completed both T1 and T2 questionnaires to see if there were any differences across the postpartum period in attachment and/or body image. Cases which had not complete both questionnaires were excluded from this analysis. As data on the MAI, the GHQ-28 the BSQ-14 were not normally distributed, a Wilcoxon Signed-Ranks Test for nonparametric data was used to compare the means.

2.11.1 Multiple Linear Regression

Linear regression is a commonly used as a way of modelling the relationships between variables and has uses in a large number of fields including social and behavioural science (Montgomery, Peck & Vining, 2012). Multiple regression is an extension of linear regression, it is used when there are more than one independent

variables (predictors). Continuous and categorical predictor variables were input simultaneously to assess the overall amount of variance in the dependant variable explained by the combined independent variables (R² value). The dependant variable is perceived mother-infant attachment. Predictor variables were selected based on the existing literature and included body image (BSQ-14), maternal mental health (GHQ-28) and method of infant feeding. For purposes of the regression, infant feeding was dichotomised as 'breastfeeding' or 'not'.

To test the study hypotheses, multivariable linear regression was used to determine the amount of variance in mother-infant attachment explained by maternal mental health, body image and feeding method for Time 1 and Time 2. Prior to conducting regression analysis, there are a number of assumptions that the data needs to meet in order to reduce the chances of error occurring of the assumptions and whether the data from this study met them are explored below.

Firstly there is required to be an appropriate number of participants per variable being entered into the regression model. The second assumption of regression models is that the residuals must be normally distributed. The residuals in this study were body image (measured by BSQ) and maternal mental health (measured by GHQ). The normal distribution of both the residuals were checked using PP plots.

The next assumption to check is homoscedasticity, this is done by reviewing the scatterplot of the residuals (body image and maternal mental health) against the outcome variable (mother-infant attachment). This assumption means that if the data is homoscedastic, the variance around the regression line is the same for all values of the predictor variable.

The final assumption to check within the data is multicollinearity. This is the occurrence of high inter-correlations among independent variables in a multiple regression model. If there is a high level of multicollinearity between variables, this means that the variables are too highly related to one another be able to accurately predict the outcome variable with accuracy.

Two regression models were created to look at the relationship between the predictive variables and the outcome at T1 (6 weeks postpartum) and T2 (6 months

postpartum). In order to carry out linear regression, the data being analysed must be continuous, therefore a total score was created on all three outcome measures used in the study by creating a sum variable for each measure. Data were checked for normal distribution of residuals using QQ plots, homoscedasticity that is, the variance of the outcome (attachment) is the same at each value of each predictor was checked using scatterplots of residuals vs. the predictor variable. Finally, I checked whether the relationship between the outcome and any continuous predictor variables was linear by creating scatterplots of residuals vs. fitted values.

2.11.2 Sample Size

A power calculation to determine the sample size needed to detect an effect at a reasonable power level requires information about the expected prevalence of the outcome in a population (e.g., prevalence of mother-infant attachment) and the estimated effect size of the exposure (e.g., weight/shape concerns, maternal mental health) (Katz, 2011). For this study, estimates of these variables are unknown in the literature therefore, an *a priori* sample size calculation was not conducted. Peduzzi, Concato, Kemper, Holford, and Feinstein (1996) suggest that a conservative estimate of the sample size required for a linear regression model is: $10 \times (k/p)$.

Where k = the number of predictors (independent variables in the model) and p = the prevalence of the outcome in the sample. The results of the post-hoc are reported in the *Results* section.

3. Results

In this chapter the results of quantitative analysis are presented. The socio-demographic and clinical characteristics of participants who completed the survey exploring mother-infant attachment, body image and maternal mental health at 6 weeks and 6 months postpartum can be found below. The relationships between each of the variables at both time points are explored using a number of statistical analyses.

3.1 Participants

A total of 180 participants completed the survey at T1 (6 weeks postpartum) 12 were paper surveys (6.7%) and 168 (93.3%) were completed using the online survey. Of the original 180 participants, 114 provided follow up data at T2 (6 months postpartum). The retention rate was 63.3%. Not all women provided contact details to enable follow-up data to be collected (10) and a proportion of participants did not to respond to invitations to complete the questionnaires at T2 (66). In order for a robust linear regression model to be developed and tested, a complete case sample was used. Therefore only participants who had completed both T1 and T2 questionnaires were included in the final analysis i.e. a total of 114 participants. The sample size achieved in this study exceeded the minimum number of cases required to carry out multivariable regression and to detect an effect at a good level of power.

3.1.1 Demographics of sample at T1 & T2

The demographics of the sample at T1 and T2 are shown in Table 2. The majority of the sample at T1 were White British, married and educated to A-level or above, this remained similar at T2. A very small proportion of both samples identified as having had an eating disorder and having mental health difficulties. The majority of participants across both samples experienced a vaginal birth; slightly more women described having a somewhat distressing birth in the completed group compared to non-completers. Over half of the sample for both groups reported breastfeeding compared to bottle or combination and this was similar across the groups. 58.3% of the sample at T1 reported having one child, 37.2% reported two children and 4.4% of the sample stated that had 3 children. The results of chi

squared analysis show no differences between the number of children participants had on their level of perceived mother-infant attachment (T1 $p=.651$, T2 $p=.860$).

Table 2. Demographics of the sample at T1 (6 weeks) and T2 (6 months postpartum)

	T1 (N= 180) %	T2 (N= 114) %
Average Age (years)	30.7	31.4
Marital Status		
Married	57.3	52.3
Living with Partner	38.2	46.2
Single	4.5	1.5
Education		
College (A-Level) or above	27.4	32.3
Professional Degree (e.g. Nursing/Social work)	29.6	18.5
Bachelors Degree	29.6	33.8
High School (GCSE)	9.5	10.8
Other	3.9	4.6
Ethnicity		
British (English / Welsh / Scottish / Northern Irish)	91.1	91.2
Pakistani	1.1	1.8
Mixed / Multiple ethnic groups	1.7	2.7
Black / African / Caribbean / Black British	1.2	0
White and Asian	1.1	0.9
European	0.6	0
Indian British	0.6	0
Any other white background	2.8	3.5
Eating Disorder		
Yes	1.7	1.5
No	98.3	98.5
Mental Health		
Yes	10.1	13.8
No	89.9	86.2

Delivery		
Normal Vaginal	56.7	56.9
Vaginal with assistance (forceps/ventouse)	18.0	13.8
Caesarean Section Planned	10.1	12.3
Caesarean Section Unplanned	15.2	16.9
Pregnancy Health		
No health problems/concerns	54.7	46.2
Some concerns requiring input	35.8	43.1
High risk health issues impacting on pregnancy	9.5	10.8
Birth Experience		
As expected/no issues	47.8	43.1
Somewhat distressing	37.6	44.6
A traumatic experience	14.6	12.3
Feeding		
Breastfeeding	64.8	60
Bottle Feeding	26.8	26.2
Combination Feeding	8.4	13.8

3.1.2 Demographics of Completers and non-completers

As described earlier, there were 66 participants who did not complete follow up surveys at T2. Statistical analysis was conducted in order to infer whether there were any differences between the group of people who completed or did not complete both parts of the survey. No significant differences were found between completers and non-completers on any of the demographic variables. As displayed in Table 1, all p values obtained by either t-test or chi-squared tests were higher than 0.05, therefore the null hypothesis was accepted and it was concluded that the two groups presented with similar characteristics across all domains.

Table 3: Demographics of the completers and non-completers

	Completer (N-114)	Non- completer (N-66)	<i>p</i> value
Average Age (years)	31.5	29.3	.319 ^a
Average Parity (no of children)	1.4	1.4	
Marital Status			
Married	60.2	52.3	.127 ^b
Living with Partner	33.6	46.2	
Single	6.2	1.5	
Education			
College (A-Level) or above	23.7	32.3	.141 ^b
Professional Degree (e.g. Nursing/Social work)	36.0	18.5	
Bachelors Degree	27.2	33.8	
High School (GCSE)	8.8	10.8	
Other	4.4	4.6	
Ethnicity			
British (English / Welsh / Scottish / Northern Irish)	91.2	90.8	.304 ^b
Pakistani	1.8	0	
Mixed / Multiple ethnic groups	2.7	1.5	
Black / African / Caribbean / Black British	0	3.0	
White and Asian	.9	1.5	
Any other white background	3.5	3.0	
Eating Disorder			
Yes	1.8	1.5	.914 ^b
No	98.2	98.5	
Mental Health			
Yes	7.9	13.8	.203 ^b
No	92.1	86.2	

Delivery			
Normal Vaginal	56.6	56.9	.644 ^b
Vaginal with assistance (forceps/ventouse)	20.4	13.8	
Caesarean Section Planned	8.8	12.3	
Caesarean Section Unplanned	14.2	16.9	
Pregnancy Health			
No health problems/concerns	59.6	46.2	.214 ^b
Some concerns requiring input	31.6	43.1	
High risk health issues impacting on pregnancy	8.8	10.8	
Birth Experience			
As expected/no issues	50.4	43.1	.339 ^b
Somewhat distressing	33.6	44.6	
A traumatic experience	15.9	12.3	
Feeding			
Breastfeeding	67.5	60	.134 ^b
Bottle/ Combination Feeding	32.5	40	

^a *p* values were derived from *t*-tests for paired samples.

^b *p* values were derived from Pearson's Chi-square tests.

3.2 Differences across the postpartum period

The results of the differences across the postpartum period can be found in Table 4. Perceived mother-infant attachment was measured using the Maternal Attachment Inventory (MAI), higher scores on the MAI indicate higher levels of perceived mother-infant attachment and the highest total score that can be achieved is 104. Body Image was measured using the Body Shape Questionnaire (BSQ-14), higher scores indicate increased body image disturbance and the highest score which can be measured is 84. Maternal Mental Health was measured using the General Health Questionnaire (GHQ-28), higher scores indicate increased distress, the highest possible score that can be achieved is 84, scores above 23/24 indicate 'caseness' or clinical levels of distress. Wilcoxon signed ranks test was used to

analyse the difference in scores at T1 and T2 for the three variables, a p value below .05 indicates a statistically significant difference in scores.

Table 4. Scores on outcome measures at T1 and T2 postpartum.

Variable	T1 (N= 114)	T2 (N= 114)	Z Value	P Value
	Mean (SD)	Mean (SD)		
Mother-Infant Attachment	99.29 (7.46)	99.53 (8.59)	-.661	.509
Body Image	38.65 (17.45)	44.99 (18.42)	-4.490	.000
Maternal Mental Health	20.58 (8.62)	20.71 (7.51)	-.252	.801

3.2.1 Body Image

It was hypothesised that body image disturbance would increase over the postpartum period. The results of the analysis found that there was a significant difference in the scores on body image at T1 (M= 38.65, SD= 17.45) and T2 (M=44.99, SD=18.42). This suggests that body image disturbance increased from 6 weeks to 6 months postpartum. Clinical cut off scores for the BSQ-14 are currently unavailable. There are clinical cut off scores for the BSQ full scale, it is possible to convert scores from the short form (BSQ-14) to full scale scores however as the items which are included on the short form will be different this changes the probability of items being scored positively even at the same level of body shape preoccupation. A score on an item on the full scale is not necessarily equivalent to a score on an item on the short version (BSQ-14). As this process would not provide accurate calculations of clinical cut off scores, it was decided that comparison of the shortened form scores would be sufficient.

3.2.2 Perceived Mother-Infant Attachment

Results showed that there were no significant differences in perceived mother-infant attachment between T1 and T2. This suggests that perceived mother-infant attachment did not change between 6 weeks and 6 months postpartum. The MAI is a

measure of perceived mother-infant attachment and is not used to provide a clinical diagnosis; therefore clinical cut-off scores are not calculated. Higher scores are indicative of greater levels of perceived mother-infant attachment, mean scores calculated at both T1 and T2 reflect high levels of perceived attachment. The majority of the sample at both time points scored in the top quartile of scores (97.8% and 98.3%). Scores on the MAI ranged from 52-104 at T1 and at T2 scores ranged from 26-104. A summary of perceived mother-infant attachment scores can be found below in Table 4.

Table 5: A summary of MAI scores represented in quartiles

Score on the MAI:	T1 (N-180)	%	T2 (N- 114)	%
0-26	0	0	1	0.87
26-52	1	0.55	0	0
53-78	3	1.65	1	0.87
78-104	176	97.7	112	98.3

3.2.3 Maternal Mental Health

Results show that there were no significant differences in maternal mental health on the GHQ-28 at T1 and T2. The results suggest that maternal distress did not change significantly from 6 weeks to 6 months postpartum and remained stable over the course of the postpartum period.

Scoring guidelines for the GHQ suggest that a score of 23/24 or above is indicative of distress. Using this as a guide the results suggest that the average scores from both T1 and T2 do not fall into the ‘distressed’ category. However both T1 and T2 scores are at the higher end of the ‘normal’ range of scores. At T1 39.4% of the sample met the criteria for the distressed category, similarly at T2 38.6% of the sample met the criteria indicative of ‘distress’.

3.2.4 Feeding Choice

Using chi-squared analysis, there were no significant differences between breastfeeding and non-breastfeeding at T1 and T2 ($p = .134$). At T1 64.8% of the sample reported breastfeeding as the feeding choice and at T2 the proportion of the sample breastfeeding was 60%. This suggests that feeding choice remained similar at 6 weeks and 6 months postpartum. Rates of bottle feeding also remained similar across the two time points (T1=26.8%, T2= 26.2%), there was a small increase in the amount of mothers combination feeding at T2 (13.8%) compared with T1 (8.4%).

3.3 Correlations between variables

Correlation analysis was used to look at the relationships each of the variables, the results can be found in table 6 and 7 below. Results found that body image and maternal distress had a moderate and significant relationship with one another both at T1 ($r = .304, p = .000$) and T2 ($r = .252, p = .007$). This suggests that the more concerned one is with their body image, the higher their maternal distress. Results also found that there was a moderate significant relationship between maternal distress and perceived mother-infant attachment at both T1 ($r = -.220, p = .019$) and T2 ($r = -.238, p = .011$). This suggests that the higher the maternal distress one experiences results in a lower perceived mother-infant attachment.

Table 6: Correlation between variables at T1

	Mother-Infant Attachment	Maternal Distress	Body Image
Mother-Infant Attachment	1	-.220*	.065
Maternal Distress	-.220*	1	.304**
Body Image	.065	.304**	1

*Correlation is significant at the .005 level

**Correlation is significant at the .001 level

Table 7: Correlation between variables at T2

	Mother-Infant Attachment	Maternal Distress	Body Image
Mother-Infant Attachment	1	-.238*	.014
Maternal Distress	-.238*	1	.252**
Body Image	.014	.252**	1

*Correlation is significant at the .005 level

**Correlation is significant at the .001 level

3.4 Predictors of perceived Mother-Infant Attachment

3.4.1 Assumptions for Multivariable Linear Regression

An appropriate sample size needs to be achieved in order to reduce error in regression analysis. Participants who completed both T1 and T2 questionnaires were included in the final analysis, participants who only completed T1 questionnaires were removed and this created a complete case sample of a 114 participants in total. The sample size achieved in this study exceeded the minimum number of cases required to carry out multivariable regression and to detect an effect at a good level of power.

The normal distribution of both the residuals were checked using PP plots. The outcome for both variables was that they followed the line of normal distribution and therefore met the assumptions for normal distribution. Results of the scatterplots for both residuals show that the data had a tight distribution at the top of the plots and was not well distributed and the data therefore did not meet the criteria for homoscedasticity. However, multivariable models with large samples are sufficiently robust to handle departures from assumptions (Katz, 2011). Therefore multivariable regression analysis was used to explore the relationships between

predictor and outcome variables in this study. All SPSS outputs related to checking the assumptions for regression can be found in the appendix.

Finally, results of the multicollinearity checks revealed that both maternal mental health and body image variables had a VIF score of 1, a score below 10 is acceptable therefore the independent variables were not related and this satisfied the final assumption of conducting regression analysis.

3.4.2 Predictors of perceived attachment at Time 1 (6 weeks postpartum)

It was hypothesised that body image would predict the level of perceived mother-infant attachment, the following regression analysis was conducted in order to test this. The first regression model (model 1) included maternal distress, body image and feeding choice (breastfeeding/not breastfeeding) as the predictor variables and perceived mother-infant attachment as the dependant variable at T1 (6 weeks postpartum). The results of model 1 can be found in Table 5. The standardised coefficients (β), level of significance (Sig) and confidence intervals are presented along with the R^2 and adjusted R^2 values.

Table 5: Results of multivariable linear regression at T1

Variable		β	Sig	95% Confidence Interval	
				Lower	Upper
Feeding method		.071	.450	-1.816	4.068
Maternal Distress		-.267	.007	-.396	-.065
Body Image		.160	.107	-.015	.151
R^2	.072				
Adjusted R^2	.047				

The results indicated that model 1 which included all three predictor variables, significantly predicted perceived mother-infant attachment at T1 ($F(3,110) = 2.863$, $p = .040$). The R^2 of the model was .072 meaning that 7.2% of the variance in perceived mother-infant attachment was explained by maternal distress, body image and feeding method together.

Table 5 shows that feeding method and body image at T1 did not predict perceived mother-infant attachment, however maternal distress did significantly predict perceived mother-infant attachment at T1 ($p = .007$). For each unit increase on GHQ score, maternal attachment decreased by 26.7. It was therefore decided that maternal distress would be entered into the model as a single predictor. However this did not improve the model fit. While the overall model was significant, the amount of variance explained remains relatively low suggesting that other variables are likely to explain perceived mother-infant attachment at 6 weeks postpartum.

3.4.3 Predictors of perceived attachment at Time 2 (6 months postpartum)

The second regression model (model 2) included maternal distress, body image and feeding choice at T2 as the predictor variables and perceived mother-infant attachment as the outcome variable at T2 (6 months postpartum). The results of model 2 can be found in Table 6 below.

Table 6: Results of multivariable linear regression at T2

Variable		β	Sig	95% Confidence Interval	
				Lower	Upper
Feeding method		.130	.172	-1.047	5.788
Maternal Distress		-.252	.009	-.504	-.074
Body Image		.109	.264	-.039	.140
R^2	0.078				
Adjusted R^2	.053				

The results of regression model 2 which included all three predictors at T2 showed a low level of predictive value for perceived mother-infant attachment ($F(3,110)=3.108, p=.029$). For each unit increase in the GHQ score, maternal attachment decreased by 25.2. The R^2 of the model is 0.078 meaning that 7.8% of the variation in mother-infant attachment at 6 months postpartum can be explained by maternal distress, body image and feeding choice together.

Similar to the results at T1, maternal distress significantly predicted mother to infant attachment at T2 ($p=.009$). For each unit increase in GHQ score, perceived mother-infant attachment decreased by 25.2. To see whether the predictive value of the model could be increased, feeding choice and body image were removed from the model. Similarly this did not improve the model fit. The single predictor model explained 5.6% of the variance in perceived mother-infant attachment, slightly less than when all the predictor variables were included. As there had been no change in perceived attachment scores at T1 and T2, the effect of body image, maternal mental health and feeding at T1 on perceived attachment at T2 were not explored individually.

4. Discussion

This chapter provides an overall summary of the findings and how perceived mother-infant attachment and body image change over the postnatal period and any additional factors that contribute to perceived attachment. Findings will be compared to the existing literature and a discussion of the strengths and limitations of this study in addition to clinical implications and areas for future research will be explored.

The aims of this study were to ascertain whether body image disturbance changed over the postpartum period, from 6 weeks to 6 months postpartum, and if this is associated with perceived mother-infant attachment. These aims were addressed by using regression analysis to observe whether perceived mother-infant attachment could be predicted by variables that were derived from the relevant literature. The study analysed whether body image, maternal mental health and feeding choice (breastfeeding/not breastfeeding) predicted perceived mother-infant attachment at 6 weeks and 6 months postpartum.

4.1 Exploration of the Findings

The study yielded a good sample size for analysis to take place and the demographics of the sample are explored further in order to draw conclusions in comparison to normative data. According to the 2011 census records, the ethnic breakdown of the population of Leeds was: White: 85.0%, Asian: 7.7%, Black: 3.5%, Mixed race: 2.7%, Arab: 0.5% and Other ethnic group: 0.6%. Comparing the sample from this study to the census, results suggest that this study did not reflect a representative sample of the Leeds population in terms of ethnic background. Due to low participant numbers, recruitment was expanded to the rest of the UK using online platforms where it was not possible to accurately monitor the demographic norms for each area.

Breastfeeding rates at T1 for this study were 64.8% exclusively breastfeeding and a total of 73.2% when including those who reported using combination feeding methods. In comparison with national statistics on breastfeeding rates, 46.4% of babies were totally or partially breastfed (32% exclusively breastfeeding) in the most recent survey of breastfeeding statistics across the UK (Public Health England,

2019). The results suggest that the sample in this study reported much higher rates of breast/combination feeding compared to the national average. However, as feeding method was not found to be a significant predictive factor of mother-infant attachment, the data did not affect the overall outcomes found in the study.

In summary, increased representation from non-white ethnic backgrounds, single parents and people with differing levels of education would increase the representation within the sample and enable further comparisons to findings from other communities.

The findings of the study suggest that body image disturbance, as measured by the BSQ-14, was significantly higher in the sample at 6 months postpartum compared with ratings at 6 weeks. This is consistent with the findings from similar studies exploring body image in the postpartum period. Gjerdingen (2009) found that body image disturbance significantly increased between 1 and 9 months into the postpartum period. In addition, the findings also reflect the conclusions made by Rallis et al. (2007) who stated that body image disturbance was highest at 6 months postpartum compared with ratings taken earlier in the postnatal period. This is an important finding as mothers have very little contact with health care professionals further into the postpartum period and is therefore less opportunity to identify mothers who may be developing or already struggling with their body image. In addition, there are no current routine standards related to asking women specific questions about the feelings they have about their body and whether these concerns are impacting upon their mood.

Comparison to other studies that have used the BSQ-14 as a measure of body image found varied results. Results from a non-clinical sample using the BSQ-14 reported a mean score of 35.89 on the BSQ-14 (Kapstad, Nelson, Øverås, & Rø, 2015), these results were slightly lower than the results found at T1 for this study. In a study that administered the BSQ-14 with a clinical sample of women participants who were being assessed for admission to 'low weight clinics' (participants reported a history of anorexia and low weight), mean scores of 44.1 were reported (Dowson, & Henderson, 2001). The findings from the sample are similar to the results of body image ratings at T2 of this study. These findings are of interest considering that the results from a non-clinical group from of postpartum women from the general

population are similar to women with significant body concerns who are seeking clinical intervention.

The tripartite influence model suggests that mothers in the postpartum period experience strong sociocultural pressures to achieve an unrealistic body shape and sizes (Lovering, Rodgers, George, & Franko, 2018). This model helps to understand why this sample experienced a significant increase in body image disturbance over the course of the postpartum period. Due to increased social media coverage associated with celebrity post-partum bodies, women in the postpartum period are vulnerable to social comparison and in turn may internalised these social ideals. Media coverage can often centre on celebrity's ability to return to the thin ideal in a short space of time that can negatively impact upon women's expectations of their postpartum body (Gentile, 2011; Gow, Lydecker, Lamanna, & Mazzeo 2012). Based on these findings it is therefore unsurprising that the results from this study confirmed that body image disturbance in the postpartum period is a concern for many women.

The effect of poor body image in the postpartum period can be far reaching. Research into the psychological impact of body image disturbances suggests that people with such problems are more likely to have poor mental health and lower levels of quality of life (Scheffers, van Busschbach, Aerts, Bosscher, Wiersma, & Schoevers, 2014). It is concerning that a large proportion of the sample reported body image concerns when the secondary concerns which are associated with this are so evident.

Perceived mother-infant attachment, as measured by the MAI was consistently high at 6 weeks and 6 months (99.29, T1 & 99.23, T2), there were no significant changes in perceived attachment over the course of the postpartum period. It was expected that as body image disturbance increased, perceived mother-infant attachment would decrease. Therefore, given that body image concerns significantly increased over the postpartum period, it was anticipated that perceived mother-infant attachment would be lower at T2.

Lai's research suggested a correlation between disordered eating in the postpartum period and poor mother-foetal and mother-infant attachment. Although

disordered eating is not the same construct as body image disturbance, the two variables do share some features and research has suggested a high correlation between the two (Lai et al., 2006). However, this study did not report specifically whether perceived mother-infant attachment scores changed over the postpartum period. It is possible that because perceived mother-infant attachment was already strong at T1, that other factors affecting the well-being of the mother are less likely to impact upon the perceived mother-infant attachment.

Responding to babies' cues in a sensitive and timely way is an essential component of the development of the mother-infant attachment (Britton, Britton, & Gronwaldt, 2006; Ainsworth, 1978). Research suggests that when mothers have concerns about their own insecurities, their self-esteem and their body image it can interrupt the mother's instincts towards their baby (Orbach & Rubin, 2014). It is these instincts that drive the desire and in turn the behaviours of mothers towards their babies, which allows the mother-infant attachment to grow and develop (Rubin, 1977). Ainsworth suggests that poor maternal sensitivity, the ability to accurately interpret their infant's attachment signals and respond to them adequately, can stimulate an insecure bond between the infant and parent (Ainsworth, 1978).

Research has suggested that mothers who experience body image disturbance can find it difficult to form a health relationship with both their unborn baby (Haedt and Keel, 2007, Muller, 1993) and with their infant during in the postpartum period (Ward et al, 2001). It was hypothesised that women who have a preoccupation with their body image in the postpartum period may have reduced maternal sensitivity towards their infant. If mothers are experiencing distressing thoughts about their bodies, their capacity for prioritising their baby's needs and responding to them adequately may be reduced and turn would impact upon the development of the perceived mother-infant attachment. It was therefore predicted that increased body image concerns would be related to lower levels of perceived mother-infant attachment.

Findings from the demographic and clinical characteristics found that the sample were generally well educated, were experiencing stable mental health and most were in relationships and therefore not single parents. Research has suggested

that poor social support of mothers, increased poverty/poor socioeconomic status and mental health all impact upon the development of perceived mother-infant attachment. Therefore it can be suggested that these characteristics protect or mediate the perceived mother-infant attachment, this may explain the findings from this study suggesting that mother-infant attachment remained high across the postpartum period and was not affected by poor body image. Alternatively, it can be hypothesised that that body image is just one aspect that might affect women's ability to bond with their baby and that this may be more likely to affect women who are vulnerable to eating disorders more so than those who are less vulnerable. Further research into other potential contributing variables would help to understand these findings better.

The findings of comparable studies that measured perceived mother-infant attachment using the MAI revealed similar outcomes to this study. Results from a community sample of mothers reported average scores of 100.1 and 98.5 at 12 weeks postpartum from a control and experimental group also using the MAI (Serçekus & Başkale, 2016). In this study the experimental group were mothers who received antenatal education, there were no differences between the two groups on demographic variables. In an Australian study, average MAI scores in a community sample were reported to be 99.31 (Wilkinson & Mulcahy, 2010). Findings from a community sample of women in Korea reported an average score of 94.26 at 6 weeks postpartum which is slightly lower than the findings from this study (Shin & Kim, 2007). These findings suggest that perceived mother-infant attachment scores are similar across cultures and general high.

Mothers reported high levels of distress in the postpartum period with over a third of mothers scoring above clinical cut-off for the GHQ at both 6 weeks and 6 months postpartum (T1=39.4% T2=38.6%). In comparison to a pregnant sample of women, the results from this study yielded similar results. Swallow, Lindow, Masson, & Hay (2003) explored maternal mental health in a group of pregnant women from the general population and reported average scores on the GHQ to be 22.0 with 39.6% of the sample scoring above clinical cut-off which is similar to the findings of this study. In another study exploring maternal distress during

pregnancy, average GHQ scores of 22.5 (9.84) were reported (Traviss, Meer, West, & House, 2013).

Interestingly in a separate study comparing mental health in pregnancy with 6 months postpartum, results suggested a marked improvement in mental health in the postpartum period with 47% meeting the criteria for caseness in pregnancy and 19% at 6 months postpartum (Traviss, West & House, 2012). Similarly another study reported that 14.2% of the sample met the criteria for 'caseness' at 6-8 weeks postpartum, which is much lower than this study (Aderibigbe, Gureje, & Omigbodun, 1993). The authors suggest that the low level of distress reported in their sample may be related to the reduction in anxiety about parenthood and somatic symptoms which were significant during the prenatal period but which were likely to subside following the birth. It is likely that these difficulties would also reduce in the sample from this study so therefore does not explain the much higher levels of distress from this study.

Aderibigbe, Gureje, and Omigbodun (1993) also suggest cultural differences may be factor in the lower levels of distress reported. This study took place in Nigeria where it is common for parents to move in with the family to provide support and this additional input during the postnatal period may protect mothers from experiencing distress compared. In a German study exploring depression and post-traumatic stress disorder in postpartum women (Zaers, Waschke, & Ehlert, 2008), between 21-22% of the sample reached the threshold for distress on the GHQ. Again, in comparison to both of the studies which explored maternal mental health in the postpartum period, the results suggest that the sample from this study were experiencing higher levels of distress.

All of the above findings are lower than the levels of caseness found in this study. The characteristics of the sample in this study do not suggest particular risk factors for experiencing higher levels of distress, a very small proportion of the sample reported having experienced mental health issues, most were well-educated and were not single parents. These findings suggest that mental health concerns and distress may be more common in the postpartum period than currently anticipated. Further analysis found that body image and maternal mental health were highly correlated both at T1 ($p=.001$) and T2 ($p=.007$). This suggests that there is a

relationship between body image and maternal mental health in this sample that may explain the high levels of distress reported. Women in this study experienced an increase in body image concerns across the postpartum period and research has suggested the poor body image in the postpartum period often occurs in conjunction with poorer mental health such as increase in symptoms of depression (Silveira, Ertel, Dole & Chasan-Taber, 2015) as well as anxiety (Carter, Baker, & Brownell, 2000). It is therefore likely that the high level of distress reported in this study can be explained by body image disturbance experienced in the postpartum period.

Results from multivariate regression analysis found that body image disturbance was not a significant predictor of mother-infant attachment at 6 weeks or 6 months postpartum. Body image disturbance were lower at T1 therefore it was not expected that body image would predict perceived mother-infant attachment, however, body image disturbance was significantly higher at 6 months postpartum and it was hypothesised that this may have a predictive relationship with perceived mother-infant attachment. Although higher body image disturbance was correlated with higher maternal distress in this sample, the results of the regression suggest that body image is not a predictive factor of the perceived mother-infant attachment. Perceived mother-infant attachment ratings were consistently high over the course of the postpartum period and are therefore less likely to be affected by this variable.

4.2 Alternative Explanations of the Findings

As discussed earlier, it is possible that the sample had a number of protective factors that mediated the effect of body image on perceived mother-infant attachment such as socioeconomic status, relationship status, and low ratings of clinical diagnoses of mental health issues or eating disorders. If recruitment had yielded a more varied group in terms of clinical and demographic variables, there might be more variance seen in the relationships between perceived mother-infant attachment and body image. The findings also suggest there are other variables which protect and predicts the perceived mother-infant attachment which aren't measured in this study.

A review of the literature suggested that both breastfeeding and maternal mental health were potential predictors of perceived mother-infant attachment,

therefore this study also aimed to measure these variables to enable more accurate conclusions to be drawn about the factors that affect this outcome. Breastfeeding (as opposed to combination or bottle feeding) did not predict perceived mother-infant attachment at either time point in the postpartum period.

However, maternal mental health did significantly predict perceived mother-infant attachment at both time points. Although body image did not significantly predict perceived mother-infant attachment, correlational analysis revealed a positive relationship between body image and maternal mental health. This suggests that although body image alone was not able to predict the strength of the perceived mother-infant attachment, maternal mental health was and body image was also found to be correlated with distress. Therefore, body image may have some impact upon the perceived mother-infant relationship, if only indirectly.

The regression models at both time points explained only a small amount of variance within the data making it difficult to draw precise projections about the factors that predict perceived mother-infant attachment from those which were measured in this study. Given the complexity of the mother-infant attachment and the number of various conditions in which this relationship relies upon, it is understandable that the results from measuring only three potential influencing variables would yield a high level of accounted variance on perceived mother-infant attachment. It is important to note that the study did not aim to identify multiple potential predictors of perceived mother-infant attachment but the unique relationship between body image in the postpartum period and this outcome.

Cognitive and behavioural theories of body image suggest two important elements, these are *evaluation* and *investment* (Cash, 2002a). Evaluation refers to the self-appraisal of one's appearance, which entails body-image satisfaction or dissatisfaction in relation to one's internalised physical ideals. Investment refers to the cognitive and behavioural importance placed on one's appearance, resulting in self-schemas which are generalizations about the self, derived from past experience, that guide the processing of information related to the self, contained in an individual's social experience (Markus, 1977p. 64). In the context of body image, self-schemas "reflect one's core assumptions or beliefs about the influence of one's

appearance in life, including the importance of appearance to one's sense of self (Cash, 2002a, p. 42).

Cognitive theorists such as Beck (e.g., Beck, Rush, Shaw, & Emery, 1979) and Ellis (e.g. Ellis & Dryden, 2007) have outlined thinking errors or cognitive distortions related to various emotional disorders. Such distortions include catastrophising, arbitrary inference, dichotomous thinking, “shoulds,” magnification/minimization, etc. Research concerning cognitive biases or distortions related to body image has been done in the field of eating disorders (Lee & Shafran, 2004; Williamson, Stewart, White, & York-Crowe, 2002). It is proposed that those with body image disturbance have maladaptive beliefs and faulty interpretations related to appearance, which influence attention and memory processes (Olivardia, 2004; Veale, 2004; Wilhelm & Neziroglu, 2002). Reduced levels of attention may impact upon the mother’s perceived ability to prioritise her role as a mother and respond appropriately to her baby’s needs and alter her attachment behaviour towards her infant, therefore impacting upon the perceived mother-infant attachment.

The findings of this study suggest that body image disturbances can be present without this directly impacting upon the perceived mother-infant attachment. It could be hypothesised that the participants in this sample did not experience high levels of cognitive distortions or biases despite increased body image disturbance across the postpartum period which may impact upon their levels of attention.

One aspect of the theories proposed by cognitive researchers is that core beliefs and the way in which information about the self is processed is effected by past experiences. It is possible that the sample in this study had less negative experiences in their past regarding body image or other values and beliefs related to self-esteem and therefore were less likely to have developed distorted thinking regarding this issue and as a result, higher levels of body image disturbance did not reach a level which impacted upon the perceived mother-infant attachment reported.

Particular interactions between mother and baby are vital for the development of a positive mother-infant attachment to form. Playing, feeding, tenderness and engagement form positive building blocks of attachment (Orbach & Rubin, 2014).

Difficulties in mother-infant attachment can occur when the mother is unable to predict the infant's needs and feelings and behaves in an inconsistent way towards their child (Gerhardt, 2004). If mothers are experiencing elevated symptoms of distress (as measured by the GHQ) then it is unsurprising that the mother-infant relationship may also be affected.

The GHQ measures various aspects of mental health by asking people to rate how much they have been distressed by particular thoughts and feelings. Some example topics covered within the GHQ are: feeling under strain, feeling scared/panicky, feeling on edge, feeling capable, feel like a useful part of things and being able to enjoy day to day life. If mothers are reporting that the above activities and feelings are causing distress, then this may be having a negative effect on them being able to prioritise their baby's needs. Responding to their new-borns may be more difficult for women experiencing these concerns, who may be lacking motivation (due to low mood) or feeling overwhelmed by their own feelings of distress. The mother-infant attachment is promoted in part by a secure bond between mother and child, research suggests that the mother is disposed to react sensitively and quickly to the child's expressed needs which promotes this bond (Ainsworth, 1978). Factors which may impact upon mother's capacity to respond sensitively to their baby's needs, including mental health, may reduce mother's ability to bond with their baby and in turn may affect the attachment between mother and infant (NHS Scotland, 2011).

Despite the regression models having a high level of variability, there remains a statistically significant relationship between maternal mental health and perceived mother-infant attachment, which is an important finding of the study. Maternal mental health was a strong predictor of perceived mother-infant attachment and although body image was not, there was a relationship between high levels of body image disturbance and distress. The low level of variance explained by the predictor variables suggest that there are other factors present which may predict perceived mother-infant attachment in the postpartum period. Research into perceived mother-infant attachment both pre and postnatally have found that a number of factors can impact upon this relationship.

Adapting to the new role of motherhood is affected by many variables, some of these are previous experience with infants, physical contact and early interaction with their infant, mother's perception of support and her self-concept (Curry, 1983; Mercer & Ferketich, 1990; Norr et al., 1989). Furthermore, self-esteem is found to predict parental competence, which in turn predicted parental attachment to their infant (Mercer & Ferketich, 1990). A planned pregnancy also appears to be a protective factor for prenatal attachment development (Damato, 2004). The temperament of the infant, such as the amount of smiling compared to distress (as reported by parents) have also been found to be related to the level of bonding reported by mothers (Nolvi, Karlsson, Bridgett, Pajulo, Tolvanen, & Karlsson, 2016).

Although it would have been interesting to measure multiple factors that may impact upon perceived mother-infant attachment, this study was designed to specifically measure the relationship between body image and perceived attachment across the postpartum period and whether body image was a significant predictor of perceived mother-infant attachment in the postpartum period.

4.1 Strengths and Limitations

4.1.1 Design

To the knowledge of the author, this is the first UK study to explore the relationship between body image and perceived mother to infant attachment in the postpartum period. A key advantage of this study is that self-report, perceived mother-infant attachment and body image was measured at two time points across the postpartum period in order to capture changes in these ratings over time. This enabled the researcher to draw conclusions about the factors that can affect the perceived mother-infant attachment across the postpartum period. Previous research has concluded that body image disturbances continue to increase as women progress through the postpartum period (Gjerdingen et al, 2009). In their study, follow-up data was collected until 9-months postpartum however due to time constraints for this study, the maximum follow-up period was 6 months postpartum.

Rallis (2007) found that body image began improving post 9-months postpartum, it would therefore be interesting to monitor the relationship between

body image and perceived mother-infant attachment for a more prolonged period in order to make further comparisons and conclusions regarding the nature of this relationship. Further research may identify a 'sensitive' period for body image concerns to develop. Being able to understand in more detail the potential high risk periods for body image disturbance to develop would be beneficial when considering the timing of appropriate support to be offered with the aim of increasing body image in the postpartum period.

Other limitations of the study were the variables that were not measured which may also effect perceived mother-infant attachment. Literature suggests multiple potential influences on the relationship formed between a mother and her infant, this study was interested in measuring whether maternal body image predicted mother-infant attachment in the postpartum period, however others factors are known to influence this relationship. For example economic hardship (Bakermans-Kranenburg, Van IJzendoorn, & Kroonenberg, 2004), social support (Ohara et al., 2017), childhood history of abuse and trauma (Muzik, et al., 2013) and mothers own attachment style/experiences (Iyengar, Kim, Martinez, Fonagy & Strathearn, 2014) are just a few examples of other potential influencing factors. Due to the additional stresses and time constraints specific to postpartum women, the number of questionnaires administered to participants was carefully considered and minimised where possible. It was not within the scope of this project to have a large battery of surveys to administer if a large group of women were to be reached in order for appropriate statistical analysis to take place.

In addition, some of the potentially influencing variables mentioned above are complex and very sensitive in nature and therefore it would not have been appropriate to attempt to contain these in a questionnaire format which was the overall design of the study. Experiences of trauma, childhood abuse and adult attachment styles are not something which can be easily measured and analysed in short questionnaires. These topics may cause distress when explored and in order to discuss these in a sensitive and ethical way, would require one to one time with the researcher which due to the nature of the project was not feasible. There was also a risk of creating a much lengthier and detailed survey, which may have potentially

discouraged potential participants from taking part and would therefore have reduced the overall sample size.

4.1.2 Participants

An observed strength of the study was the sample size achieved in order for statistical analysis to take place. A complete case sample of 114 was achieved which exceeds the recommended 10 participants per variable offered by (Peduzzi et al, 1995 and 1996) and was also comparable to a similar study conducted in Hong Kong which had a sample size of 131 (Lai, Tang & Tse, 2006).

The original sample of 180 participants reduced to 114 at T2 which is a 36.67% drop out rate, this is slightly higher than the predicted upper level drop-out rate of 34% (Flanagan, Gordon, Moore, & Stuart, 2015). A small number of participants failed to provide contact details in order to send follow-up questionnaires to (2.2% of the sample), other reasons for none-response for the study are unknown. This study recruited mothers during the postpartum period which is a time of high demand on mothers. It could therefore be hypothesised that filling out questionnaires were a low priority for potential participants in addition to limited time available to complete and return the questionnaires.

4.1.3 Recruitment

There are a number of improvements that could be made to the recruitment of participants within this study. In order to maintain a high level of confidentiality, there was no option included on the questionnaires to monitor which method of recruitment the participant had been part of (via GP, parent-baby groups, social media advert etc.). Therefore, it was not possible to provide further breakdown about which advertisement/recruitment methods were most successful. Mothers may have been provided with a paper copy of the survey at their GP surgery or baby group but then have chosen to follow the web address and complete the survey online. Therefore analysing data regarding method of recruitment was not possible and would have been interesting to explore.

As discussed previously the study yielded poor representation across a variety of ethnicities. It is difficult to accurately calculate exactly who will have been

exposed to the advertisement of this study and if ethnic minorities were well represented in the various recruitment forums used for this study. Part of the recruitment for this study took place via local GP surgeries which were found to have a good representation of the ethnic diversity of the local population, therefore people of different ethnic backgrounds will have had the opportunity to take part in the study if they received an information pack when attending their post-natal health check with their GP. However, recruitment via GP surgeries was found to be poor in this study.

Online platforms were also used to advertise and circulate the survey. Research suggests that social media sites such as Facebook (one of the sites used for advertising) have a diverse group of users and that the population of users is representative of the overall population (Chang, Rosenn, Backstrom & Marlow, 2010, a study in the USA). However, less is known specifically about the ethnic diversity of mothers who may join and read posts that are distributed in parenting forums on Facebook.

Mumsnet was another social networking site utilised for advertisement of the study. The site completed a census of their users in 2009 and found that the majority of its users identified as white (94%), most were married or living with a partner (94%) and were educated to high level (75%) (Mumsnet Census, 2009). These findings suggest that the site is not accessed by a particularly diverse group of people therefore the distribution of this survey may not have reached as wide a group of ethnic diversity as hoped.

Some researchers recommend a more personalised approach in order to increase participation in research from under-represented groups and people from all communities (Gill, Plumridge, Khunti & Greenfield S, 2012 & Rooney, Bhopal, Halani, Levy, Partridge, Netuveli, & Sheikh, 2011). Increasing involvement of minority groups in research helps to gather vital information about the health and well-being of our population in order to design and implement health practices. In an effort to increase participation from ethnic minority groups for this study, more guidance could have been sought from service user research groups about how and where to advertise the study in order to reach a more ethnically diverse sample.

Increased presence and in reach by the researcher at GP surgeries and parent-baby groups may have helped to yield a more diverse sample. With the support from service-user groups, a more targeted recruitment strategy could have been planned to reach wider communities and increase participation in the survey from people of different ethnic and social backgrounds. It would have been interesting to compare body image ratings between different ethnic groups to see whether body image in the postpartum period is a concept that mothers from various communities struggle with, or if this is more specific to white or western cultures.

4.1.4 Measures

The GHQ has been widely used within the general population to detect and screen for mental health problems and is found to have good reliability and validity (Kitamura, Shima, Sugawara, Toda, 1994), less research in postpartum samples have reported reliability coefficients. Of those that have, the measure (in its various forms) has been found to be of good reliability to use within postpartum mothers (Kitamura et al., 1994; Lee, Yip, Chiu, Leung, & Chung, 2001; Nott and Cutts, 1982). Nott and Cutts, (1982) recommended the use of the GHQ-30 as a screening tool to detect postpartum depression as well as assessing the severity of such symptoms.

The Edinburgh Postnatal Depression Scale (EPDS) is more widely used in research with postpartum populations when exploring distress in this group. In order to draw further conclusions from this study compared with existing research, the EPDS could have been used to measure maternal distress in this study. However, there is a body of evidence from many prospective studies that antenatal (postpartum) stress is associated with adverse neurobehavioral outcomes, including social/emotional and cognitive functioning during childhood. Although various outcome measures were adopted in these studies, the results were consistent in finding an association between antenatal stress and neurobehavioral development (O'Connor, Heron, Golding, Beveridge, & Glover, 2002; Van den Bergh et al., 2005 & Van den Bergh & Marcoen, 2004).

Therefore, being able to measure other factors that are likely to contribute to 'stress' experienced in women in the postpartum period is of high importance.

Depression was not the only mental state of interest in this study. Anxiety, social issues and physical health (somatic symptoms) all have an impact upon general well-being, therefore being able to include these factors when measuring distress results in a more accurate reflection individual's experiences, the GHQ-28 provides a useful way of measuring distress by capturing such concepts.

Body image disturbance was measured in this study using the BSQ-14 whereas comparable studies have used alternative forms of this measure. The BSQ in its other shortened forms such as the BSQ-10 (Haedt & Keel, 2007) and the BSQ-8 have been utilised (Gjergingen, 2009 & Dolejsova, 2018) in addition to the Body Attitudes Questionnaire (Rallis, 2007 and Skouteris, et al, 2005). In a study exploring body image experiences of women from ethnically diverse and low income communities, the Body Cathexis Scale was used (Walker, Timmerman, Kim, & Sterling, 2002). It would have been beneficial if this study had used a measure that had also been adopted in similar studies exploring the same concepts in order to make more direct comparisons. However as research suggests, the use of outcome measures to measure body image is variable and therefore it was not possible to adopt a similar strategy.

In a review of the literature, Silveira, Ertel, Dole, Chasan-Taber (2015) concluded that body image disturbance measures need to be developed and validated for use specifically with pregnant and postpartum women to capture attitudes toward the unique changes associated with pregnancy.

4.1.5 Analysis

The present study used multivariable linear regression to explore the predictors of perceived mother-infant attachment at two time points, few studies have specifically explored whether body image disturbance in the postpartum period are predictive of perceived mother-infant attachment. An advantage of using this method of analysis is that multiple variables can be input into the regression model and individual contributions to the strength of the predictive value can be analysed. This ensures that clear conclusions can be made from the data and further analysis can be done to include the most significant predictive factors ensuring that the regression model is as accurate as possible.

4.2 Clinical Implications

The findings of this study suggest that body image disturbance increased significantly further into the postpartum period in addition to body image being related higher levels of maternal distress. Regression analysis found that maternal distress significantly predicted perceived mother-infant attachment across the postpartum period. As discussed earlier in the study, a healthy perceived mother-infant attachment has a number of benefits for both mother and infant, especially for the emotional, cognitive and social development of the infant through childhood. And research suggests that responses from the caregiver towards the infant or child's behaviour are the precursor to attachment style and quality. This caregiving is thought to be more important than the child's temperament in the development of attachment (Prior and Glaser, 2006; Sroufe, 2006). The results from this study suggest that mothers with higher levels of body image disturbance have poorer maternal mental health and that mental health does significantly predict the perceived mother-infant attachment, therefore the benefits of being able to address these issues are two-fold. Improving the body image of women in the postpartum will not only results in lower levels of distress in mothers but may also positively impact upon the perceived mother-infant attachment.

Assessment of Body Image Disturbance Postpartum

Being able to effectively assess the body image of women in the postpartum period would mean that those women who are struggling with this issue could gain access to the most appropriate support in a timely manner. If mothers are able to feel less anxious, have improved mood and increased social functioning, these factors will all positively impact upon the mothers capacity to enjoy interacting with her baby, which is known to have far reaching benefits for mother and child.

Mothers have access to a number of health care professionals following childbirth in order to offer advice and support with both the health and well-being of mother and baby. General questions are asked regarding the mental health of the mother during such appointments in order to assess for the presence of distress, however research has suggested that conversations about body weight or shape concerns are not frequently initiated with mothers (Watson et al, 2016). Due to the

suggestion that body image concerns are prominent in the postpartum population and that this can have potentially negative effects upon mother-infant attachment, the contact with health care professionals offers an opportunity to discuss body image concerns and refer women for further support if this is causing distress.

Assessment of Perceived Mother-Infant Attachment

There are increasing health promotions which focus on the early moments between mother and baby and how the attachment process can be nurtured, this has led to important changes in clinical practices for mothers and their children immediately after childbirth. For example, increasing skin to skin contact immediately after birth (Institute of health visiting, 2016), increased accessibility for mothers to spend time with their babies if they are admitted to neonatal care and general guidance on the importance of early interactions between parents and newborn babies (NHS, Education for Scotland, 2016).

There are less health practices that are promoted further into the postpartum period related to the attachment between mother and baby unless difficulties have been highlighted previously. The findings from this study suggest that mothers struggle more with body image disturbance as they progress through the postpartum period, and that this indirectly can impact upon perceived mother-infant attachment due to a relationship between body image and maternal mental health. Therefore, mothers may benefit from additional support to work through body image issues with the aim of improving their well-being and in turn which may positively impact upon the perceived mother-infant attachment.

Interventions for Body Image Disturbance

Studies exploring the effectiveness of interventions aimed at reducing body image disturbance have yielded various outcomes. Some research suggests that therapy aimed at analysing the factors that maintain body dissatisfaction in each individual will help to highlight specific behaviours, cognitions, and perceptions that should be targeted. This suggests that a cognitive behavioural approach to match the needs of the patient may maximize treatment outcomes (Paxton & McLean, 2010). This is supported by findings from a separate review solely focussing on the

effectiveness of CBT interventions which found large, positive effects on body image disturbance across 19 studies (Jarry & Ip, 2005).

Some efficacy has also been found in group therapy for body image problems conducted in small groups, this format has been shown to be effective for adolescent girls, young women and women in midlife (e.g., Paxton, McLean, Gollings, Faulkner, & Wertheim, 2007). In a review of the literature of body image interventions, small to medium effect sizes were found across a total of 62 studies researching the outcomes for body image interventions (Alleva, Sheeran, Webb, Martijn & Miles, 2015). The conclusions from this review was that future studies needed to be more specific about the techniques used to initiate psychological change in order to better understand this process.

It may be beneficial to educate mothers about body image disturbance in the postpartum period as a way of preparing women for this potential change. Although this study found that body image disturbance was higher later into the postpartum period, offering some information and guidance to women about the changes to their bodies either during pregnancy or early postpartum may help to prevent issues developing in this area and support women to have realistic expectations of this change over the postpartum period.

The Role of Clinical Psychologists

In the 2016 British Psychological Society report reviewing perinatal services (BPS, 2016), the role of the clinical psychologist in this area was reviewed. It was concluded that the skills which a Clinical Psychologist holds in clinical leadership, supervision, teaching, training and service development, alongside direct therapeutic skills can all be beneficial in supporting perinatal services. Initial assessments of women's mental health will be conducted by healthcare professionals such as midwives and health visitors. Offering training and supervision to these professionals may be of benefit when considering the assessment of body image disturbance and mental health of women in the postpartum period.

4.3 Future Research and Conclusions

Future studies would benefit from increased longitudinal data exploring the perceived mother-infant attachment in relation to body image both during pregnancy and further into the postpartum period to draw further conclusions about this unique relationship. Given the presence of a relationship between body image disturbance and distress in addition to distress predicting the perceived mother-infant attachment, interventions aimed at improving body image in the postpartum period may positively impact upon the perceived mother-infant attachment. This would have potential clinical importance in both mother's experiences postpartum in addition to the perceived mother-infant attachment. As this is an issue that may affect a large proportion of new mothers, finding effective approaches aimed at reducing distress, increasing a positive body image and in turn, a healthy perceived mother-infant attachment would be of great benefit to the postpartum population and their offspring.

This study was unable to accurately explain the variance between the predicative variables and perceived mother-infant attachment in the postpartum period. Therefore there is further need to be able to explore other potential predictive factors of perceived mother-infant attachment to be able to draw more precise conclusions about what variables have most impact upon this outcome. In addition it would be important to be able to achieve more representative sample across a variety of demographics in order to be able to relate the findings to a wider group of people and to explore any potential differences in body image and perceived mother-infant attachment in the postpartum period outcomes across groups.

The findings from this study add to existing literature that maternal mental health is particularly important considering that this significantly predicted the strength of the perceived mother-infant attachment, a relationship that has multiple positive outcomes for both the mother and child. In addition, the study confirmed that body image disturbance is particularly high in the postpartum period and that this is associated with higher levels of distress in mothers. These findings have potential clinical implications with regards to the way that postpartum body image is addressed considering that this can have potential negative outcomes on maternal mental health.

In conclusion, the perceived mother-infant attachment relationship is one of unique importance to both the well-being of mothers and a variety of aspects of child development. Body image disturbance increases over the course of the postpartum period, which is correlated to maternal distress and distress is linked with perceived mother-infant attachment. Therefore research exploring the potential risk factors that can impact upon both of these concepts and interventions aimed at increasing body image and perceived mother-infant attachment would offer further value to the research base in this area.

5. References

- Aderibigbe, Y. A., Gureje, O., & Omigbodun, O. (1993). Postnatal emotional disorders in Nigerian women: a study of antecedents and associations. *The British Journal of Psychiatry*, *163*(5), 645-650.
- Ainsworth, M.D.S. (1982). Attachment: retrospect and prospect. In: Parkes, C.M. and Stevenson-Hinde, J. (Eds), *The Place of Attachment in Human Behaviour*. Tavistock, London.
- Allen, J. P., Marsh, P., McFarland, C., McElhaney, K. B., Land, D. J., Jodl, K. M., & Peck, S. (2002). Attachment and autonomy as predictors of the development of social skills and delinquency during mid-adolescence. *Journal of consulting and clinical psychology*, *70*(1), 56.
- Alhusen, J.L. (2008). A literature update on maternal-fetal attachment. *Journal of Obstetric Gynaecology Neonatal Nursing*, *37*:315–28.
- Atkinson, L., Paglia, A., Coolbear, J., Niccols, A., Parker, K. C., & Guger, S. (2000). Attachment security: A meta-analysis of maternal mental health correlates. *Clinical psychology review*, *20*(8), 1019-1040.
- Attie, I., & Brooks-Gunn, J. (1989). Development of eating problems in adolescent girls: A longitudinal study. *Developmental Psychology*, *25*: 70 – 9.
- Astrachan-Fletcher, E., Veldhuis, C., Lively, N., Fowler, C., & Marcks, B. (2008), The reciprocal effects of eating disorders and the postpartum period: a review of the literature and recommendations for clinical care. *Journal of Women's Health*, *17* (2), 227-239.
- Baker, C.W., Carter, A.S., Cohen, L.R. & Brownell, K.D. (1992). Eating attitudes and behaviors in pregnancy and postpartum: global stability versus specific transitions. *Ann Behav Med*, *21*:143–8.
- Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., & Kroonenberg, P. M. (2004). Differences in attachment security between African-American and white children: Ethnicity or socio-economic status? *Infant Behavior and Development*, *27*, 417–433.
- Beck, A. T., Rush, A.J., Shaw, B.F., Emery, G. (Ed.). (1979). *Cognitive therapy of depression*. Guilford press.
- Belsky, J., & Fearon, R. (2002). Infant-Mother attachment security, contextual risk, and early development: A moderational analysis. *Development and Psychopathology*, *14*, 293-310

- Bialoskurski, M., Cox, L.C. & Hayes, A.J. (1999). The nature of attachment in a neonatal intensive care unit. *Journal of Perinatal and Neonatal Nursing*, 13: 66–77.
- Bifulco, A., Figueiredo, B., Guedeney, N., Gorman, L. L., Hayes, S., Muzik, M., Glatigny-Dallay, E., Valoriani, V., Kammerer, M. H., & Henshaw, C.A. (2004). Maternal attachment style and depression associated with childbirth: preliminary results from a European and US cross-cultural study. *The British Journal of Psychiatry*, 184(S46).
- Bornstein, M. H., Suwalsky, J. T., & Breakstone, D. A. (2012). Emotional relationships between mothers and infants: Knowns, unknowns, and unknown unknowns. *Development and psychopathology*, 24(1), 113-123.
- Boscaglia, N., Skouteris, H., & Wertheim, E. (2003). Changes in body image satisfaction during pregnancy: A comparison of high and low exercising women. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 43, 41–45.
- Bowlby, J. (1969). *Attachment and Loss. Basic Books, New York.*
- Bowlby, J. (1958) Natureza da ligação da criança à mãe, in: L. Soczka (Ed.) *As ligações infantis* (Lisboa, Livraria Bertrand), 105–153.
- Bowlby, J. (1977). The making and breaking of affectionate bonds. Aetiology and psychopathology in the light of attachment theory. *British Journal of Psychiatry*, 130, 201-210.
- Bowlby, J. (1988). *A Secure Base: Clinical Applications of Attachment Theory.* London: Routledge.
- Brockington IF (1996) *Motherhood and mental health.* Oxford University Press, Oxford.
- Britton, J. R., Britton, H. L., & Gronwaldt, V. (2006). Breastfeeding, sensitivity, and attachment. *Pediatrics*, 118(5).
- Britton, J. R., Britton, H. L., & Gronwaldt, V. (2006). Breastfeeding, sensitivity, and attachment. *Pediatrics*, 118(5).
- Brewerton, T.D. (1995). Toward a unified theory of serotonin dysregulation in eating and related disorders. *Psychoneuroendocrinology*, 20:561–90.
- Burge, D., Hammen, C., Davila, J., Daley, S. E., Paley, B., Lindberg, N, Herzberg, D., & Rudolph, K. D. (1997). The relationship between attachment cognitions and psychological adjustment in late adolescent women. *Development and Psychopathology*, 9(1), 151-167.
- Campbell, S. B., Brownell, C. A., Hungerford, A., Spieker, S. J., Mohan, R., & Blessing, J. S. (2004). The course of maternal depressive symptoms and maternal

- sensitivity as predictors of attachment security at 36 months. *Development and psychopathology*, 16(2), 231-252.
- Carter, S.K. Beyond control: body and self in women's childbearing narratives. *Sociology of Health and Illness*, 32(7):993-1009.
- Carter, A. S., Baker, C. W., & Brownell, K. D. (2000). Body mass index, eating attitudes, and symptoms of depression and anxiety in pregnancy and the postpartum period. *Psychosomatic Medicine*, 62(2), 264-270.
- Cash, T.F., Pruzinsky, T. (Eds.), 1990. *Body Images: Development, Deviance, and Change*. Guilford, New York.
- Cash, T.F. (2002) Cognitive-Behavioural Perspectives on Body Image, in T.F. Cash and T. Pruzinsky (Eds). *Body Image: A handbook of theory, research and clinical practice* (pp. 38-46), New York: Guilford.
- Chalmers, B., Samarskaya, M. E., Tkatchenko, E. & Wallington, T. (1998) Women's experiences of birth in St. Petersburg, Russian Federation, *Journal of Reproductive and Infant Psychology*, 16, 243-258.
- Chang, S.R., Chao, Y.M.Y., Kenney, N.J. (2006). I am a woman and I'm pregnant: body image of women in Taiwan during the third trimester of pregnancy. *Birth*, 33(2):147-153.
- Chang, J., Rosenn, I., Backstrom, L., & Marlow, C. (2010). Ethnicity on social networks. In *Fourth International AAAI Conference on Weblogs and Social Media*.
- Clark, A., Skouteris, H., Wertheim, E. H., Paxton, S. J., & Milgrom, J. (2009). The relationship between depression and body dissatisfaction across pregnancy and the postpartum: a prospective study. *Journal of Health Psychology*, 14(1), 27-35.
- Condon, J. T., & Corkindale, C. J. (1998). The assessment of parent-to-infant attachment: Development of a self-report questionnaire instrument. *Journal of Reproductive and Infant Psychology*, 16(1), 57-76.
- Conger, R. D., Conger, K. J., Elder Jr, G. H., Lorenz, F. O., Simons, R. L., & Whitbeck, L. B. (1992). A family process model of economic hardship and adjustment of early adolescent boys. *Child development*, 63(3), 526-541.
- Cooper, M.L., Shaver, P.R., & Collins, N.L. (1998). Attachment styles, emotion regulation and adjustment in adolescence. *The Journal of Personality and Social Psychology*, 74:1380-97.
- Cooper, P.J., Murray, L., Wilson, A., Romaniuk, H. (2003). Controlled trial of the short and long-term effect of psychological treatment of post-partum depression. Impact on maternal mood. *Br J Psychiatry*; 182:412.

- Cooper, P.J. (1995). Eating disorders and their relationship to mood and anxiety disorders. In: Brownell KD, Fairburn CG, editors. *Eating disorders and obesity: a comprehensive handbook*. New York: Guilford Press, p. 159–64.
- Coyl, D. D., Roggman, L. A., & Newland, L. A. (2002). Stress, maternal depression, and negative mother–infant interactions in relation to infant attachment. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 23(1-2), 145-163.
- Coyne, S. M., Liechty, T., Collier, K. M., Sharp, A. D., Davis, E. J., & Kroff, S. L. (2018). The effect of media on body image in pregnant and postpartum women. *Health communication*, 33(7), 793-799.
- Crockenberg, S. B. (1981). Infant irritability, mother responsiveness, and social support influences on the security of infant-mother attachment. *Child development*, 857-865.
- Crouch M. (2002). Bonding, postpartum dysphoria, and social ties: A speculative inquiry. *Human Nature*, 13(3):363–382.
- Cunningham, H. (2002). Prodigal bodies: Pop culture and post-pregnancy. *Michigan Quarterly Review*, 41, 428–454. Retrieved from: <http://hdl.handle.net/2027/spo.act2080.0041.314>.
- Curry, M. (1983). Variables related to adaptation to motherhood in “normal” primiparous women. *Journal of Obstetric, Gynaecological and Neonatal Nursing*, 12, 115-121.
- Damato, E. (2004). Prenatal attachment and other correlates of postnatal maternal attachment to twins. *Advances in Neonatal Care*, 4, 5, p274-291.
- Dolejsova, B. (2018). Predictors of Body Image Dissatisfaction in Postpartum Women.
- Dowson, J., & Henderson, L. (2001). The validity of a short version of the Body Shape Questionnaire. *Psychiatry Research*, 102(3), 263-271.
- Dubber, S., Reck, C., Müller, M., & Gawlik, S. (2015). Postpartum bonding: the role of perinatal depression, anxiety and maternal–fetal bonding during pregnancy. *Archives of women's mental health*, 18(2), 187-195.
- Edhborg, M., Nasreen, H. E., & Kabir, Z. N. (2011). Impact of postpartum depressive and anxiety symptoms on mothers’ emotional tie to their infants 2–3 months postpartum: a population-based study from rural Bangladesh. *Archives of women's mental health*, 14(4), 307.
- Egeland, B., & Farber, E. A. (1984). Infant-mother attachment: Factors related to its development and changes over time. *Child development*, 753-771.

- Ellis, A., & Dryden, W. (2007). *The practice of rational emotive behavior therapy*. Springer publishing company.
- Emde, R. N. (1980). Emotional availability: A reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In P. M. Taylor (Ed.), *Parent–infant relationships* (pp. 87–115). Orlando, FL: Grune & Stratton.
- Fairburn, C. G., and Welch, S. L. (1990). The impact of pregnancy on eating habits and attitudes to shape and weight. *International Journal of Eating Disorders*, 9:153–60.
- Feldman, R., Greenbaum, C. W., Mayes, L. C., & Erlich, S. H. (1997). Change in mother-infant interactive behavior: Relations to change in the mother, the infant, and the social context. *Infant Behavior and Development*, 20(2), 151-163.
- Figueiredo B, Costa R, Pacheco A, Pais (2009). A. Mother-to-infant emotional involvement at birth. *Maternal Child Health Journal*, 13(4):539–549.
- Forcada-Guex, M., Borghini, A., Pierrehumbert, B., Ansermet, F., & Muller-Nix, C. (2011). Prematurity, maternal posttraumatic stress and consequences on the mother–infant relationship. *Early human development*, 87(1), 21-26.
- Fox, P., & Yamaguchi, C. (1997). Body image change in pregnancy: a comparison normal weight and overweight primigravidas. *Birth*, 24(1):35–40.
- Fredrickson, B. L., & Roberts, T. A. (1997). Objectification theory: Toward understanding women's lived experiences and mental health risks. *Psychology of women quarterly*, 21(2), 173-206.
- Fuller-Tyszkiewicz, M., Skouteris, H., Watson, B., Hill, B. (2012). Body image during pregnancy: an evaluation of suitability of the body attitudes questionnaire. *BMC Pregnancy Childbirth*, 12:91.
- Gelfand, D. M., & Teti, D. M. (1990). The effects of maternal depression on children. *Clinical Psychology Review*, 10, 329- 353.
- Gentile, K. (2011). What about the baby? The new cult of domesticity and media images of pregnancy. *Studies in Gender and Sexuality*, 12, 38–58.
- Gerhardt, S., (2004) *Why Love Matters: how affection shapes a baby’s brain*. Routledge, London.
- Gill, P.S., Plumridge, G., Khunti, K., & Greenfield, S. (2012) Under-representation of minority ethnic groups in cardiovascular research: a semi-structured interview study. *Family Practice*; 30(2): 233–241.
- Gjerdingen, D., Fontaine, P., Crow, S., McGovern, P., Center, B., & Miner, M. (2009). Predictors of mothers' postpartum body dissatisfaction. *Women & health*, 49(6-7), 491-504.

- GL Assessments, (2017). Retrieved on 18th April 2019 from: <https://www.gl-assessment.co.uk/products/general-health-questionnaire-ghq/>
- Goldberg, D. P. (1972). *The Detection of Psychiatric Illness by Questionnaire*. Oxford University Press: London.
- Goodman, S. (1992). Understanding the effects of depressed mothers on their children. In E. F. Walker, B. Cornblatt, & R.
- Goodwin, A., Astbury, J., & McMeeken, J. (2000). Body image and psychological well-being in pregnancy. A comparison of exercisers and non-exercisers. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 40, 442–447.
- Gow, R. W., Lydecker, J. A., Lamanna, J. D., & Mazzeo, S. E. (2012). Representations of celebrities' weight and shape during pregnancy and post-partum: A content analysis of three entertainment magazine websites. *Body Image*, 9, 172–175.
- Green, S. P., & Pritchard, M. E. (2003). Predictors of body image dissatisfaction in adult men and women. *Social Behavior and Personality: an international journal*, 31(3), 215-222.
- Grippio, K. P., & Hill, M. S. (2008). Self-objectification, habitual body monitoring, and body dissatisfaction in older European American women: Exploring age and feminism as moderators. *Body Image*, 5(2), 173-182.
- Grogan, S. (2016). *Body image: Understanding body dissatisfaction in men, women and children*. Routledge.
- Grubb, H.J., Sellers, M.I., & Waligroski, K. (1993). Factors related to depression and eating disorders: self-esteem, body image, and attractiveness. *Psychological Reports*;72:1003–10.
- Hausenblas, H.A., Campbell, A., Menzel, J.E., Doughty, J., Levine, M., Thompson, J.K. (2012). Media effects of experimental presentation of the ideal physique on eating disorder symptoms: A meta-analysis of laboratory studies . *Clinical Psychology Review*; 33: 168 – 81.
- Hisner, P. (1986). Concerns of multiparas during the second postpartum week. *Journal of Obstetrics & Gynecology Neonatal Nursing*; 16:195–203.
- Hodgkinson, E. L., Smith, D. M., & Wittkowski, A. (2014). Women's experiences of their pregnancy and postpartum body image: a systematic review and meta-synthesis. *BMC pregnancy and childbirth*, 14(1), 330.
- Hornstein, C., Trautmann-Villalba, P., Hohm, E., Rave, E., Wortmann-Fleischer, S., & Schwarz, M. (2006). Maternal bond and mother–child interaction in severe postpartum psychiatric disorders: Is there a link?. *Archives of women's mental health*, 9(5), 279-284.

- Howard, M.S. & Medway, F.J. (2004). Adolescents' attachment and coping with stress. *Psychology in the Schools*, 41:391-402.
- Hung, C. H., & Chung, H. H. (2001). The effects of postpartum stress and social support on postpartum women's health status. *Journal of advanced nursing*, 36(5), 676-684.
- Huth-Bocks, A. C., Levendosky, A. A., Bogat, G. A., & Von Eye, A. (2004). The impact of maternal characteristics and contextual variables on infant–mother attachment. *Child Development*, 75(2), 480-496.
- Huxley, C.J., Halliwell, E., & Clark, V. (2015). An examination of the tripartite influence model of body image: Does women's sexual identity make a difference? *Psychology of Women Quarterly*, 39, pp. 337-348,
- Institute of Health Visiting (2016). Skin to skin contact with your baby leaflet. Available online: <https://ihv.org.uk/for-health-visitors/resources-for-members/resource/ihv-tips-for-parents/transition-to-parenthood-and-the-early-weeks/skin-skin-contact-baby/>. Accessed March 2019.
- Iyengar, U., Rajhans, P., Fonagy, P., Strathearn, L., & Kim, S. (2019). Unresolved Trauma and Reorganization in Mothers: Attachment and Neuroscience Perspectives. *Frontiers in psychology*, 10.
- Jacobson, S. W., & Frye, K. F. (1991). Effect of maternal social support on attachment: Experimental evidence. *Child development*, 62(3), 572-582.
- Janke, J.R. (1994). Development of the breast-feeding attrition prediction tool. *Clinical Nursing Research*, 43:100–104.
- Jansen, J., de Weerth, C., Riksen-Walraven, J.M. (2008). Breastfeeding and the mother-infant relationship—a review. *Dev Rev*, 28:503–521.
- Jarry, J. L., & Ip, K. (2005). The effectiveness of stand-alone cognitive-behavioural therapy for body image: A meta-analysis. *Body image*, 2(4), 317-331.
- Kapstad, H., Nelson, M., Øverås, M., & Rø, Ø. (2015). Validation of the Norwegian short version of the Body Shape Questionnaire (BSQ-14). *Nordic journal of psychiatry*, 69(7), 509-514.
- Killen, J.D., Taylor, C.B., Hayward, C., Haydel, K.F., Wilson, D.M., Hammer, L., Kraemer, H., Blair-Greiner, A., & Strachowski, D. (1996). Weight concerns influence the development of eating disorders: A 4-year prospective study. *Journal of Consulting and Clinical Psychology*, 64: 936 – 40.
- King, M. and Bruner, G. (2000). Social desirability bias: a neglected aspect of validity testing. *Psychology and Marketing*, 17(2):79–103.

- Kinsey, C. B., & Hupcey, J. E. (2013). State of the science of maternal–infant bonding: A principle-based concept analysis. *Midwifery*, *29*(12), 1314-1320.
- Kinsey, C.B., Baptiste-Roberts, K., Zhu, J., & Kjerulff, K. H. (2014). Birth-related, psychosocial, and emotional correlates of positive maternal–infant bonding in a cohort of first-time mothers. *Midwifery*, *30*(5), e188-e194.
- Kitamura, T., Shima, S., Sugawara, M., Toda, M.A. (1994) Temporal variation of validity of self-rating questionnaires: repeated use of the general health questionnaire and Zung's self-rating depression scale among women during antenatal and postnatal periods. *Acta Psychiatrica Scandinavica*, *20*: 446–450.
- Klaus, M. & Kennell, J. Maternal-infant bonding. (1976). St.Louis: The C.V Mosby Company.
- Lai, B. P. Y., Tang, C. S. K., & Tse, W. K. L. (2006). A longitudinal study investigating disordered eating during the transition to motherhood among Chinese women in Hong Kong. *International Journal of Eating Disorders*, *39*(4), 303-311.
- Larsson G, Andersson-Ellstron A. (2003). Experiences of pregnancy-related body shape changes and of breast-feeding in women with a history of eating disorders. *European Eating Disorders Review*; *11*:116-24.
- Lee, D.T.S., Yip, A., Chiu, H., Leung, T., & Chung, T. (2001) Screening for postnatal depression: are specific instruments mandatory? *Journal of Affect Disorders*, *63*: 233–238.
- Lee, M., & Shafran, R. (2004). Information processing biases in eating disorders. *Clinical psychology review*, *24*(2), 215-238.
- Lessard, J.C. (1994). The role of psychological distress and attachment in adolescent substance use. Unpublished master's thesis, Simon Fraser University, Vancouver, British Columbia.
- Lessard, J.C. & Moretti, M.M (1998). Suicidal ideation in an adolescent clinical sample: Attachment patterns and clinical implications. *Journal of Adolescence*, *21*:383-95
- Lidgren, K. (2001). Relationships among maternal–fetal attachment, prenatal depression, and health practices in pregnancy. *Research in nursing & health*, *24*(3), 203-217.
- Losch, M., Dungy, C.I., Russell, D., Dusdieker, L.B. (1995). Impact of attitudes on maternal decisions regarding infant feeding. *Journal of Paediatrics*, *126*:507–514.
- Lovering, M. E., Rodgers, R. F., George, J. E., & Franko, D. L. (2018). Exploring the Tripartite Influence Model of body dissatisfaction in postpartum women. *Body image*, *24*, 44-54.

- MacFarlane, J. A., Smith, D. M. & Garrow, D. H. (1978) The relationship between mother and neonate, in: S. Kitzinger & J. A. Davis (Eds) *The place of birth* (New York, Oxford University Press).
- Madrid A, Skolek S, Shapiro F. Repairing failures in bonding through emdr. (2006). *Clinical Case Studies*, 5(4):271–286.
- Maloni, J.A, Kutil, R.M. (2000). Antepartum support group for women hospitalized on bed rest. *The American Journal of Maternal/Child Nursing*. 25(4):204–10.
- Malus, A., Chlewicka, J., Galinska-Skok, B., Konarzewska, B., & Szulc, A. (2014). Body image and maternal fetal attachment. *Progress in Health Sciences*, 4(2), 157.
- Mangelsdorf, S. C., McHale, J. L., Diener, M., Goldstein, L. H., & Lehn, L. (2000). Infant attachment: Contributions of infant temperament and maternal characteristics. *Infant Behavior and Development*, 23(2), 175-196.
- Mariam, K. A., & Srinivasan, K. (2009). Antenatal psychological distress and postnatal depression: A prospective study from an urban clinic. *Asian journal of psychiatry*, 2(2), 71-73.
- Marshall, C., Lengyel, C., & Utioh, A. (2012). Body dissatisfaction among middle-aged and older women. *Canadian journal of dietetic practice and research*, 73: 241 – 7.
- Martins, C., & Gaffan, E. A. (2000). Effects of early maternal depression on patterns of infant–mother attachment: A meta-analytic investigation. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41(6), 737-746.
- Masheb, R., Grilo, C., 2003. The nature of body image disturbance in patients with binge eating disorder. *International Journal of Eating Disorders* 33, 333–341.
- Matthey S, Speyer J. (2008). Changes in unsettled infant sleep and maternal mood following admission to a parent craft residential unit. *Early Human Development*., 84(9):623–629.
- Meireles, J. F. F., Neves, C. M., Carvalho, P. H. B. D., & Ferreira, M. E. C. (2015). Body dissatisfaction among pregnant women: an integrative review of the literature. *Ciência & Saúde Coletiva*, 20(7), 2091-2103.
- Mercer, R., & Ferketich, S. (1990). Predictors of parental attachment during early parenthood. *Journal of Advanced Nursing*, 15, 268-280.
- Moehler, E., Brunner, R., Wiebel, A., Reck, C., & Resch, F. (2006). Maternal depressive symptoms in the postnatal period are associated with long-term impairment of mother–child bonding. *Archives of women's mental health*, 9(5), 273-278.

- Montgomery, D.C. and Peck, E.A.& Vining, G.G. (2012). Introduction to Linear Regression Analysis. John Wiley and Sons, Inc., 5th edition.
- Montgomery, K. S., Aniello, T. D., Phillips, J. D., Kirkpatrick, T., Catledge, C., Braveboy, K., & Parker, C. (2013). Experiences accompanying postpartum weight loss: benefits, successes, and well-being. *Health care for women international*, 34(7), 577-591.
- Moretti, M.M., DaSilva, K., Holland, R (2004). Aggression and violence from an attachment perspective: Gender issues and therapeutic implications. In: Moretti M Odgers C, Jackson M, eds. *Girls and Aggression: Contributing Factors and Intervention Principles. American Psychological Law Society Series. New York: Kluwer Academic Press.*
- Oppenheim, D., Koren-Karie, N., & Sagi-Schwartz, A. (2007). Emotion dialogues between mothers and children at 4.5 and 7.5 years: Relations with children's attachment at 1 year. *Child Development*, 78(1), 38-52.
- Markus, H. (1977). Self-schemata and processing information about the self. *Journal of personality and social psychology*, 35(2), 63.
- Morley-Hewitt, A. G., & Owen, A. L. (2019). A systematic review examining the association between female body image and the intention, initiation and duration of post-partum infant feeding methods (breastfeeding vs bottle-feeding). *Journal of Health Psychology*.
- Moullin, S., Waldfogel, J., & Washbrook, E. (2014). *Baby Bonds: Parenting, Attachment and a Secure Base for Children. Sutton Trust.*
- Moutsiana, C., Fearon, P., Murray, L., Cooper, P., Goodyer, I., Johnstone, T., & Halligan, S. (2014). Making an effort to feel positive: insecure attachment in infancy predicts the neural underpinnings of emotion regulation in adulthood. *Journal of child psychology and psychiatry, and allied disciplines*, 55(9), 999-1008.
- Müller, M.E. (1994). A questionnaire to measure mother-to-infant attachment. *Journal of Nursing Measures*, 2, 129-141.
- Müller, D., Teismann, T., Havemann, B., Michalak, J., & Seehagen, S. (2013). Ruminative thinking as a predictor of perceived postpartum mother–infant bonding. *Cognitive therapy and research*, 37(1), 89-96.
- Mumsnet Census (2009) [online] available at: <http://www.mumsnet.com/info/media/census2009> (accessed March 2019).
- Muzik, M., Bocknek, E. L., Broderick, A., Richardson, P., Rosenblum, K. L., Thelen, K., & Seng, J. S. (2013). Mother–infant bonding impairment across the first 6

- months postpartum: the primacy of psychopathology in women with childhood abuse and neglect histories. *Archives of women's mental health*, 16(1), 29-38.
- Myers, T. A., & Crowther, J. H. (2009). Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of abnormal psychology*, 118(4), 683.
- Nada-Raja, S., McGee, R. & Stanton, W.R. (1992) Perceived attachments to parents and peers and psychological well-being in adolescence. *Journal of Youth and Adolescence*, 21:471-85.
- Nakash-Eisikovits, O., Dutra, L. & Westen, D (2002). Relationship between attachment patterns and personality pathology in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry* , 41:1111-23.
- Nash, M. (2012). Weighty matters: negotiating 'fatness' and 'in-betweenness' in early pregnancy. *Feminism and Psychology*, 22(3):307–323.
- Nash, M. (2012). *Making 'postmodern' mothers: pregnant embodiment, baby bumps and body image*. Springer.
- NHS, Education for Scotland, (2016). Infant Mental Health- Developing positive early attachments. Available online:
https://www.nes.scot.nhs.uk/media/3552795/final_imh_interactive_pdf_3_.pdf.
 Accessed March 2019.
- NHS Scotland (2011). Briefing on attachment Dr Eileen Scott Public Health Adviser, Evidence for Action, NHS Health Scotland November 2011.
http://www.healthscotland.com/uploads/documents/18212-A_brief_guide_to_attachment.pdf
- NICE (2014). Antenatal and Postnatal mental health Clinical Management and Service Guidance. Updated edition. (No.192) Leicester (UK): British Psychological Society.
- Nolvi, S., Karlsson, L., Bridgett, D. J., Pajulo, M., Tolvanen, M., & Karlsson, H. (2016). Maternal postnatal psychiatric symptoms and infant temperament affect early mother-infant bonding. *Infant Behavior and Development*, 43, 13-23.
- Norr, K., Roberts, J., & Freese, U. (1989). Early postpartum rooming-in and maternal attachment behaviors in a group of medically indigent primiparas. *Journal of Nursing and Midwifery*, 34(2), 85-91.
- Nott, P. N., & Cutts, S. (1982). Validation of the 30-item General Health Questionnaire in postpartum women. *Psychological Medicine*, 12(2), 409-413.
- Obsuth, I., Luedemann, M., Peled, M. & Moretti, M.M. (2002). Aggression and attachment in a clinical adolescent sample [Poster]. Vancouver Conference on

- Aggressive & Violent Girls: Contributing Factors and Intervention Strategies. Vancouver.
- O'Hara, M.H., Swain, A.M. (1996). Rates and risks of postpartum depression—A meta-analysis. *International Review of Psychiatry*; 8:37.
- Ohara, M., Okada, T., Aleksic, B., Morikawa, M., Kubota, C., Nakamura, Y., Shiino, T., Yamauchi, A., Uno, Yota., Murase, S., Goto, S., Kanai, A., Masuda, T., Nakatochi., Ando, M., & Ozaki, N. (2017). Social support helps protect against perinatal bonding failure and depression among mothers: a prospective cohort study. *Scientific reports*, 7(1), 9546.
- Ohoka, H., Koide, T., Goto, S., Murase, S., Kanai, A., Masuda, T., Aleksic, B., Ishikawa, N., Furumura, K. & Ozaki, N. (2014). Effects of maternal depressive symptomatology during pregnancy and the postpartum period on infant–mother attachment. *Psychiatry and clinical neurosciences*, 68(8), 631-639.
- O'Connor, T.G., Heron, J., & Glover, V. (2002). Antenatal anxiety predicts child behavioral/emotional problems independently of postnatal depression. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 1470–1477.
- Ogle, J.P., Tyner, K.E., Schofield-Tomschin, S. (2011). Jointly navigating the reclamation of the “woman I used to Be”: negotiating concerns about the postpartum body within the marital dyad. *Clothing and Textiles Research Journal*, 29(1):35–51.
- Olatunji, B. O., Kim, S. K., & Wall, D. (2015). Extracting body image symptom dimensions among eating disorder patients: The Profile Analysis via Multidimensional Scaling (PAMS) approach. *Body image*, 15, 16-23.
- Olivardia, R. (2001). Reading about... self-help books for body dysmorphic disorder. *The Psychiatrist*, p 278-280.
- Oppenheim, D., Koren-Karie, N., & Sagi-Schwartz, A. (2007). Emotion dialogues between mothers and children at 4.5 and 7.5 years: Relations with children's attachment at 1 year. *Child Development*, 78(1), 38-52.
- Orbach, S., & Rubin, H. (2014). TWO FOR THE PRICE OF ONE. The impact of body image during pregnancy and after birth. *Department for Culture, Media and Sport and Government Equalities Office, London*.
- Park, R.J., Senior, R., Stein, A. (2003). The offspring of mothers with eating disorders. *European Child and Adolescent Psychiatry*;12:110.
- Paxton, S. J. McLean, S. A. Gollings, E. K., Faulkner, C. & Wertheim, E. H. (2007). Comparison of face-to-face and internet interventions for body image and eating problems in adult women: an RCT. *International Journal of Eating Disorders*, 40, 692-704.

- Paxton, S. J., & McLean, S. A. (2010). Treatment for body-image disturbances. In C. M. Grilo & J. E. Mitchell (Eds.), *The treatment of eating disorders: A clinical handbook* (pp. 471-486). New York, NY, US: Guilford Press.
- Pederson, D. R., Moran, G., Sitko, C., Campbell, K., Ghesquire, K., & Acton, H. (1990). Maternal sensitivity and the security of infant-mother attachment: A Q-sort study. *Child development*, 1974-1983.
- Pook, M., Tuschen-Caffier, B., & Brähler, E. (2008). Evaluation and comparison of different versions of the Body Shape Questionnaire. *Psychiatry research*, 158(1), 67-73.
- Public Health England (2019). *Breastfeeding at 6 to 8 weeks after birth: 2018 to 2019 quarterly data*. PHE publications gateway number 2018764. Available online at: <https://www.gov.uk/government/statistics/breastfeeding-at-6-to-8-weeks-after-birth-2018-to-2019-quarterly-data>. Accessed March 2019.
- Rallis, S., H. Skouteris, E. H. Wertheim, and S. J. Paxton (2007). Predictors of body image during the first year postpartum: A prospective study. *Women Health* 45:87–104.
- Reck, C., Klier, C. M., Pabst, K., Stehle, E., Steffenelli, U., Struben, K., & Backenstrass, M. (2006). The German version of the Postpartum Bonding Instrument: psychometric properties and association with postpartum depression. *Archives of women's mental health*, 9(5), 265-271.
- Rocco, P., Orbitello, B., Perini, L., Pera, V., Ciano, R., & Balestrieri, M. (2005). Effects of pregnancy on eating attitudes and disorders: A prospective study. *Journal of Psychosomatic Research*, 59, 175–179.
- Rodgers, R., Chabrol, H., Paxton, S.J. (2011). An exploration of the tripartite influence model of body dissatisfaction and disordered eating among Australian and French college women. *Body Image*, 8, pp. 208-215.
- Rooney, L. K., Bhopal, R., Halani, L., Levy, M. L., Partridge, M. R., Netuveli, G., & Sheikh, A. (2011). Promoting recruitment of minority ethnic groups into research: qualitative study exploring the views of South Asian people with asthma. *Journal of Public Health*, 33(4), 604-615
- Rosen, J.C., Cado, S., Silberg, N.T., & Srebnik, D. (1990). Cognitive behaviour therapy with and without size perception training for women with body image disturbance. *Behavioural Therapy*, 21: 481 – 98.

- Roth, H., Homer, C., & Fenwick, J. (2012). Bouncing back”: How Australia's leading women's magazines portray the postpartum ‘body. *Women and Birth*, 25(3), 128-134.
- Rubin, L. R., & Steinberg, J. R. (2011). Self-objectification and pregnancy: are body functionality dimensions protective? *Sex Roles*, 65(7-8), 606-618.
- Rubin R. (1984). *Maternal Identity and the Maternal Experience*. Springer, New York.
- Rubin, R. (1977). Binding-in in the postpartum period. *Maternal-Child Nursing Josrrizal*, 6, 67-75.
- Rutter, M. (1994). Family discord and conduct disorder: Cause, consequence, or correlate?. *Journal of family psychology*, 8(2), 170.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods*, 7(2), 147-177.
- Schilder, P. (1950). *The image and appearance of the human body*. New York: International Universities Press.
- Schore, A. N. (2001). Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal: Official Publication of The World Association for Infant Mental Health*, 22(1-2), 7-66.
- Schore, A.N. (1999). Parent–infant communication and the neurobiology of emotional development. Unpublished symposium, Zero to Three 14th Annual Training Conference. Los Angeles, CA, December.
- Schore, A.N. (1994). *Affect regulation and the origin of the self: The neurobiology of emotional development*. Mahwah, NJ: Erlbaum.
- Schmitt, D. P., Alcalay, L., Allensworth, M., Allik, J., Ault, L., Austers, I., et al. (2004). Patterns and universals of adult romantic attachment across 62 cultural regions: Are models of self and of other pancultural constructs? *Journal of Cross-Cultural Psychology*, 35, 367–402.
- Seng, J. S., Sperlich, M., Low, L. K., Ronis, D. L., Muzik, M., & Liberzon, I. (2013). Childhood abuse history, posttraumatic stress disorder, postpartum mental health, and bonding: a prospective cohort study. *Journal of midwifery & women’s health*, 58(1), 57-68.
- Serçekuş P, Başkale H. (2016). Effects of antenatal education on fear of childbirth, maternal self-efficacy and parental attachment. *Midwifery*, 34:166–72
- Shah P. E., Fonagy P., Strathearn L. (2010). Is attachment transmitted across generations? *The Plot Thickens*. *Clin. Child Psychol. Psychiatry* 15, 329–346

- Shin, H., & Kim, Y. H. (2007). Maternal Attachment Inventory: psychometric evaluation of the Korean version. *Journal of Advanced Nursing*, 59(3), 299-307.
- Siegel, D. J. (1999). *The developing mind: How relationships and the brain interact to shape who we are*. New York: Guilford Press
- Silveira, M. L., Ertel, K. A., Dole, N., & Chasan-Taber, L. (2015). The role of body image in prenatal and postpartum depression: a critical review of the literature. *Archives of women's mental health*, 18(3), 409-421.
- Skouteris, H., Carr, R., Wertheim, E. H., Paxton, S. J., & Duncombe, D. (2005). A prospective study of factors that lead to body dissatisfaction during pregnancy. *Body image*, 2(4), 347-361.
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*, 128, 825-848.
- Stein, A., & Fairburn, C. G. (1996). Eating habits and attitudes in the postpartum period. *Psychosomatic Medicine*, 58(4), 321-325.
- Stone, A.A., Turkkan, J.S., Bachrach, C.A., Jobe, J.B., Kurtzman, H.S. and Cain, V.S. (2000). *The science of self-report: Implications for research and practice*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Strang, V. R., & Sullivan, P. L. (1985). Body image attitudes during pregnancy and the postpartum period. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 14(4), 332-337.
- Strigel-Moore, R.H., Silberstein, L.R., Frensch, P., & Rodin, J. (1989). A prospective study of disordered eating among college students. *International Journal of Eating Disorders*, 8: 499 – 50.
- Swallow, B. L., Lindow, S. W., Masson, E. A., & Hay, D. M. (2003). The use of the General Health Questionnaire (GHQ-28) to estimate prevalence of psychiatric disorder in early pregnancy. *Psychology, health & medicine*, 8(2), 213-217.
- Sund, A.M. & Wichstrom, L (2002). Insecure attachment as a risk factor for future depressive symptoms in early adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41:1478-85
- Taylor, M. (1987). *The Nature and Significance of Body Image Disturbance*. *Wolfson College Cambridge*.
- Taylor, A., Atkins, R., Kumar, R., Adams, D., & Glover, V. (2005). A new Mother-to-Infant Bonding Scale: links with early maternal mood. *Archives of Women's Mental Health*, 8(1), 45-51.

- Tharner, A., Luijk, M. P., Raat, H., IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Moll, H., Henriette, A., Jaddoe, V., Hofman, A., Verhulst, F.C., Tiemeier, H. (2012). Breastfeeding and its relation to maternal sensitivity and infant attachment. *Journal of Developmental & Behavioral Pediatrics*, 33(5), 396-404.
- Thompson, R. A. (2000). The legacy of early attachments. *Child Development*, 71, 145 – 152.
- Thompson, J.K., Heinberg, L.J., Altabe, M., Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. American Psychological Association, Washington (DC).
- Thompson, J.K., Altabe, M., Johnson, S., & Stormer, S.M. (1994). Factor analysis of multiple measures of body image disturbance: Are we all measuring the same construct? *International Journal of Eating Disorders*, 16: 311 – 15.
- Tietz, A., Zietlow, A. L., & Reck, C. (2014). Maternal bonding in mothers with postpartum anxiety disorder: the crucial role of subclinical depressive symptoms and maternal avoidance behaviour. *Archives of women's mental health*, 17(5), 433-442.
- Tiggemann, M. (2011). Sociocultural perspectives on human appearance and body image. *Body image: A handbook of science, practice, and prevention*, 2, 12-501.
- Tiller, J. & Treasure, J. (1998) Eating disorders precipitated by pregnancy. *European Eating Disorders Review*; 6:178.
- Traviss, G. D., Meer, S., West, R. M., & House, A. O. (2013). Life events and difficulties and their association with antenatal distress in White and South Asian women in the UK. *Social psychiatry and psychiatric epidemiology*, 48(5), 725-734.
- Traviss, G. D., West, R. M., & House, A. O. (2012). Maternal mental health and its association with infant growth at 6 months in ethnic groups: results from the Born-in-Bradford birth cohort study. *PloS one*, 7(2), e30707.
- Ukatu, N., Clare, C. A., & Brulja, M. (2018). Postpartum Depression Screening Tools: A Review. *Psychosomatics*, 59(3), 211-219.
- Van den Bergh, B.E.H., & Marcoen, A. (2004). High antenatal maternal anxiety is related to ADHD symptoms, externalizing problems, and anxiety in 8 and 9 year olds. *Child Development*, 13, 1085–1097.
- Van den Bergh, B.R.H., Mennes, M., Oosterlaan, J., Stevens, V., Stiers, P., Marcoen, A., & Lagae, L. (2005). High antenatal maternal anxiety is related to impulsivity during performance on cognitive tasks in 14- and 15-year-olds. *Neuroscience and Biobehavioral Reviews*, 29, 259–269.
- Veale, D. (2004). Advances in a cognitive behavioural model of body dysmorphic disorder. *Body image*, 1(1), 113-125.

- Walker, L. O., and Freeland-Graves, J. (1998). Lifestyle factors related to postpartum weight gain and body image in bottle- and breastfeeding women. *Journal of Obstetrics, Gynaecology & Neonatal Nursing*, 27:151–60.
- Walker, L., Timmerman, G. M., Kim, M., & Sterling, B. (2002). Relationships between body image and depressive symptoms during postpartum in ethnically diverse, low income women. *Women & Health*, 36(3), 101-121.
- Ward, A., Ramsay, R., Turnbull, S., Steele, M., Steele, H., & Treasure, J. (2001). Attachment in anorexia nervosa: a transgenerational perspective. *The British journal of medical psychology*, 74(Pt 4), 497-505.
- Watson, B., Broadbent, J., Skouteris, H., & Fuller-Tyszkiewicz, M. (2016). A qualitative exploration of body image experiences of women progressing through pregnancy. *Women and Birth*, 29(1), 72-79.
- Wilhelm, S., & Neziroglu, F. (2002). Cognitive theory of body dysmorphic disorder. In *Cognitive approaches to obsessions and compulsions* (pp. 203-214). Pergamon.
- Williamson, D. A., Stewart, T. M., White, M. A., & York-Crowe, E. (2002). An information-processing perspective on body image. *Body image: A handbook of theory, research, and clinical practice*, 47-54.
- Wittkowski, A., Wieck, A., & Mann, S. (2007). An evaluation of two bonding questionnaires: a comparison of the Mother-to-Infant Bonding Scale with the Postpartum Bonding Questionnaire in a sample of primiparous mothers. *Archives of women's mental health*, 10(4), 171-175.
- Wilkinson, R. B., & Mulcahy, R. (2010). Attachment and interpersonal relationships in postnatal depression. *Journal of Reproductive and Infant Psychology*, 28(3), 252-265.
- Wiles, R. (1994). 'I'm not fat, I'm Pregnant': The Impact of Pregnancy on fat women's Body Image. In *Women and Health: Feminist Perspectives*. Edited by Wilkinson S, Kitzinger C. UK: Routledge.
- Winnicott, D. W. (1960). The theory of the parent-infant relationship. *International Journal of Psycho-Analysis*, 41, 585-595.
- Wolff, M. S., & Ijzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child development*, 68(4), 571-591.
- Zaers, S., Waschke, M., & Ehlert, U. (2008). Depressive symptoms and symptoms of post-traumatic stress disorder in women after childbirth. *Journal of Psychosomatic Obstetrics & Gynecology*, 29(1), 61-71.

Zevalkink, J., & Riksen-Walraven, J. M. (2001). Parenting in Indonesia: Inter- and intracultural differences in mothers' interactions with their young children. *International Journal of Behavioral Development*, 25, 167–175

6. Appendix

1. Participant Information Sheet
2. Consent Form
3. Questionnaire used for both T1 & T2
4. HRA Approval Letter
5. Email (and reminder) for survey completion at T2
6. Risk Letter to GP surgery
7. SPSS outputs: Changes across postpartum period
8. SPSS outputs: Correlation between maternal mental health & body image
9. SPS output: Multivariate Linear Regression

Appendix 1



Participant Information Sheet

Study title: Body image following childbirth and mother-infant attachment

I would like to invite you to take part in a research study on new mums, how they feel about their body and their relationship with their baby. Before you decide whether you would like to take part, please read the following information about the project and what it will involve. If you would like to take part, please complete the consent form enclosed and return in the envelope provided.

What is the purpose of the study?

I am a student at the University of Leeds and am undertaking this study as part of my qualification to become a Clinical Psychologist. The bonding process babies have with their mother is important for the well-being of both the mother and baby and it is important to know what can affect the development of this bond so that the best possible support can be offered to mothers during this time. This study is interested in exploring the relationship that women have with their bodies after having a baby and if this impacts upon the bond with their new-born.

Why have I been invited?

You have been invited to take part as you have recently had a baby, possibly not for the first time. This study is interested in finding out how you are experiencing the bond with your baby and the feelings you have towards your body and how this might change over time.

What will I have to do?

There will be a set of questionnaires to complete which will take around 20 minutes. These should be completed around the time your baby is 6 weeks old and then the same questionnaires will be repeated around 6-months later. There are several ways that you can complete the questionnaires. You can complete the paper copies included in this pack and return them in the prepaid envelope. The researcher can arrange a telephone interview at a convenient time if you return the consent form with your telephone number. Or you can complete the questionnaire online by going to the following website:

<https://leeds.onlinesurveys.ac.uk/thesis-survey-part1>



You will then be contacted 6-months later using the details you have provided to complete the questionnaires for a second time. This is so we can track changes over time.

What are the possible risks of taking part?

The questionnaires will be asking about how you feel towards your body in addition to the bond you feel you have with your baby. This process may make you feel concerned in some way. If this does happen, I would recommend that you discuss this with your health visitor or GP who will be able to offer you support. The researcher has a duty of care to all people who take part in the study. Therefore, if I am concerned about you, your GP will be contacted by telephone or writing and made aware of this. They may want to arrange to see you to discuss these with you and ensure you receive appropriate support. If you are feeling vulnerable or low at present, please consider whether this is the best time to fill out the questionnaires. There are several support services available if you are feeling distressed, please find these below:

Samaritans: Telephone- 116 123 or email jo@samaritans.org

SANEline offers emotional support and information from 6pm–11pm, 365 days a year. Their national number is 0300 304 7000.

For mental health information, Mind's infoline is open from 9am–6pm weekdays. You can contact this on 0800 123 3393, text 86463 or email info@mind.org.uk

What are the possible benefits of taking part?

You may not directly benefit from this research, however by taking part in this study, you will be contributing to what we understand about how women experience the bonding with their baby and the feelings towards their bodies after childbirth. This study may help to identify risk periods for mothers following childbirth with the aim of leading to more support for mothers who may be struggling with these issues. Once the study has been completed, your contact details will be used to send you a summary of the study and its findings.

Will my taking part in the study be kept confidential?

Yes. All information you provide will be kept confidential. Once you have returned the consent sheet to the researcher, you will be allocated a number which will be placed on the questionnaires. This means that the questionnaires you provide will not have your name on them, only the researcher will be able to identify whose questionnaire it belongs to. All paper questionnaires and consent forms that are returned will be stored in a locked filing cabinet at the University of Leeds. Surveys completed online will be saved on the Bristol Online Survey system



until all data has been collected. Only the researcher will have access to these and will use a username and password to log in. Once all data has been collected, data from online surveys and paper questionnaires will be input into a database. Only your personal number will be used here so that your responses are completely confidential. The researcher will be able to identify you by using this number in case you decide to withdraw from the study and your responses can be deleted from the data. All physical data will be saved for 3 years at the University of Leeds and will then be destroyed.

What if there is a problem?

If you decide that you no longer want to take part, please contact the researcher. They will remove your questionnaires from the data and this will not be included in the study. If you have any concerns at any point during the project, please contact the researcher and they will be happy to answer and questions you have.

If you wish to make a complaint

If you are unhappy about any part of the research project, please contact the researcher's supervisor using the following details: Dr Louise Bryant- Leeds Institute of health sciences, Level 10, Worsley Building, Clarendon Way, Leeds LS2 9NL, 0113 3431882, email: l.d.bryant@leeds.ac.uk

Contact Details

If you wish to get in touch with the researcher, please use the details below:

Katie Williams

Email: umkwi@leeds.ac.uk

Phone: 0113 3430815

Address: Clinical Psychology Programme, Leeds Institute of health sciences,
Level 10, Worsley Building, Clarendon Way, Leeds LS2 9NL

Appendix 2



CONSENT FORM

Project Title: Body image following childbirth and mother-infant attachment

Name of Researcher: Katie Williams (umkwi@leeds.ac.uk)

	Please initial
I confirm I have read and understand the participant information (version 2 dated 28/06/2017) for the above study. I have had the opportunity to consider the information and ask questions	
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason	
I understand that my GP will be contacted if the researcher is concerned about me (details in the participant information sheet Version 1 dated 03/04/2017)	
I understand that relevant sections of the data collected during the study, may be looked at by individuals from the University of Leeds or from regulatory authorities where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.	
I am happy to be contacted about further involvement in this research	
I agree to take part in the above study	

Name of Participant (print)

Date

Signature

If you wish to complete paper questionnaires when contacted in 6-months, please place your address adjacent:	_____ _____ _____
If you would prefer to take part in the research via telephone interview please fill in this section & return	Mobile number: _____ Convenient days/times: _____
The online survey can be found at: https://leeds.onlinesurveys.ac.uk/thesis-survey-part1	

Please return this form with your completed questionnaires in the envelope provided

Thank You

Appendix 3



Thank you for taking part in this study.

Please find below some questions about your background and recent experiences.

ADMIN ONLY		GP Code _____	P No _____
Your Age:		DOB of youngest child:	Total number of children:
Please tick which applies:			
Married <input type="checkbox"/> Living with partner <input type="checkbox"/> Single <input type="checkbox"/> Separated/Divorced <input type="checkbox"/>			
What is the highest level of education you have completed?			
High school <input type="checkbox"/> Professional Degree <input type="checkbox"/> Bachelor's Degree <input type="checkbox"/> Vocational/technical school <input type="checkbox"/>			
College <input type="checkbox"/> Other <input type="checkbox"/> Please specify: _____			
Please circle one option that best describes your ethnic group or background:			
White 1. English / Welsh / Scottish / Northern Irish / British 2. Irish 3. Gypsy or Irish Traveller 4. Any other White background, please describe Mixed / Multiple ethnic groups: _____ 5. White and Black Caribbean 6. White and Black African 7. White and Asian 8. Any other Mixed / Multiple ethnic background, please describe (Asian /Asian British) _____ 9. Indian		10. Pakistani 11. Bangladeshi 12. Chinese 13. Any other Asian background, please describe Black / African / Caribbean / Black British 14. African 15. Caribbean 16. Any other Black / African / Caribbean background, please describe: _____ 17. Arab 18. Any other ethnic group, please describe	
Have you ever been diagnosed with an eating disorder?		Do you identify as having a mental health problem?	
Yes <input type="checkbox"/> If yes please specify: _____		Yes <input type="checkbox"/> If yes please specify: _____	
No <input type="checkbox"/>		No <input type="checkbox"/>	
Please tick the following which best describes your delivery:		Please tick which best describes your pregnancy:	
Normal vaginal <input type="checkbox"/> Vaginal with assistance (forceps/ventouse) <input type="checkbox"/>		No health problems/concerns <input type="checkbox"/>	
C-section planned <input type="checkbox"/> C-section unplanned <input type="checkbox"/>		Some concerns requiring input <input type="checkbox"/>	
		High risk health issues impacting on pregnancy <input type="checkbox"/>	
How would you describe your birthing experience?		Are you currently breastfeeding?	
As expected/no issues <input type="checkbox"/>		Yes <input type="checkbox"/>	
Somewhat distressing <input type="checkbox"/>		No <input type="checkbox"/>	
A traumatic experience <input type="checkbox"/>		Combination (breast and bottle) <input type="checkbox"/>	

This study is interested in finding out what can affect the bond that is formed between mother and baby. Please find below some questions about how you feel towards your baby. If you are feeling particularly low today, please consider whether now is the best time to complete the survey.



		Almost Never			Almost Always
1.	I feel love for my baby	1	2	3	4
2.	I feel warm and happy with my baby	1	2	3	4
3.	I want to spend special time with my baby	1	2	3	4
4.	I look forward to being with my baby	1	2	3	4
5.	Just seeing my baby makes me feel good	1	2	3	4
6.	I know my baby needs me	1	2	3	4
7.	I think my baby is cute	1	2	3	4
8.	I'm glad this baby is mine	1	2	3	4
9.	I feel special when my baby smiles	1	2	3	4
10.	I like to look into my baby's eyes	1	2	3	4
11.	I enjoy holding my baby	1	2	3	4
12.	I watch my baby sleep	1	2	3	4
13.	I want my baby near me	1	2	3	4
14.	I tell others about my baby	1	2	3	4
15.	It's fun being with my baby	1	2	3	4
16.	I enjoy having my baby cuddle with me	1	2	3	4
17.	I'm proud of my baby	1	2	3	4
18.	I like to see my baby do new things	1	2	3	4
19.	My thoughts are full of my baby	1	2	3	4
20.	I know my baby's personality	1	2	3	4
21.	I want my baby to trust me	1	2	3	4
22.	I know I am important to my baby	1	2	3	4
23.	I understand my baby's signals	1	2	3	4
24.	I give my baby special attention	1	2	3	4
25.	I comfort my baby when he/she is crying	1	2	3	4
26.	Loving my baby is easy	1	2	3	4

Below are some questions about your emotional well-being which may impact upon the bond between you and your baby. Please read the instructions below:



HAVE YOU RECENTLY:

		Not at all	No more than usual	Rather more than usual	Much more than usual
1.	Been feeling perfectly well and in good health?	0	1	2	3
2.	Been feeling in need of a good tonic?	0	1	2	3
3.	Been feeling run down and out of sorts?	0	1	2	3
4.	Felt that you are ill?	0	1	2	3
5.	Been getting any pains in your head?	0	1	2	3
6.	Been getting a feeling of tightness or pressure in your head?	0	1	2	3
7.	Been having hot or cold spells?	0	1	2	3
8.	Lost much sleep over worry?	0	1	2	3
9.	Had difficulty in staying asleep once you are off?	0	1	2	3
10.	Felt constantly under strain?	0	1	2	3
11.	Been getting edgy and bad-tempered?	0	1	2	3
12.	Been getting scared or panicky for no good reason?	0	1	2	3
13.	Found everything getting on top of you?	0	1	2	3
14.	Been feeling nervous and strung-up all the time?	0	1	2	3
15.	Been managing to keep yourself busy and occupied?	0	1	2	3
16.	Been taking longer over the things you do?	0	1	2	3
17.	Felt on the whole you were doing things well?	0	1	2	3
18.	Been satisfied with the way you've carried out your task?	0	1	2	3
19.	Felt that you are playing a useful part in things?	0	1	2	3
20.	Felt capable of making decisions about things?	0	1	2	3



HAVE YOU RECENTLY:		Not at all	No more than usual	Rather more than usual	Much more than usual
21.	Been able to enjoy your normal day-to-day activities?	0	1	2	3
22.	Been thinking of yourself as a worthless person?	0	1	2	3
23.	Felt that life is entirely hopeless?	0	1	2	3
24.	Felt that life isn't worth living?	0	1	2	3
25.	Thought of the possibility that you might make away with yourself?	0	1	2	3
26.	Found at times you couldn't do anything because your nerves were too bad?	0	1	2	3
27.	Found yourself wishing you were dead and away from it all?	0	1	2	3
28.	Found that the idea of taking your own life kept coming into your mind?	0	1	2	3

Please turn over

This study is interested in looking at the relationship between having concerns about your body and the bond between you and your baby. Below are some questions about your body image.



	Never	Rarely	Sometimes	Often	Very Often	Always
1. Have you been so worried about your shape that you have been feeling you ought to diet?	1	2	3	4	5	6
2. Has being with thin women made you feel self-conscious about your shape?	1	2	3	4	5	6
3. Have you noticed the shape of other women and felt that your own shape compared unfavourably?	1	2	3	4	5	6
4. Has being naked, such as when taking a bath, made you feel fat?	1	2	3	4	5	6
5. Has eating sweets, cakes, or other high calorie food made you feel fat?	1	2	3	4	5	6
6. Have you felt excessively large and rounded?	1	2	3	4	5	6
7. Have you felt ashamed of your body?	1	2	3	4	5	6
8. Have you thought that you are in the shape you are because you lack self-control?	1	2	3	4	5	6
9. Has worry about your shape made you diet?	1	2	3	4	5	6
10. Have you worried about other people seeing rolls of fat around your waist or stomach?	1	2	3	4	5	6
11. Have you felt that it is not fair that other women are thinner than you?	1	2	3	4	5	6
12. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?	1	2	3	4	5	6
13. Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming baths)?	1	2	3	4	5	6
14. Has worry about your shape made you feel you ought to exercise?	1	2	3	4	5	6

Please turn over



Thank you for taking the time to complete this questionnaire.

**You will be contacted again in 6 months-time for the second part of the survey.
If you have any questions or concerns, please email: umkwi@leeds.ac.uk or
call 0113 3430815 and leave a message for Katie Williams and I will get back to you.**

Appendix 4



Health Research Authority

Mrs Katie Williams
Clinical Psychology Programme
Leeds Institute of Health Sciences
Level 10 Worley Building, Clarendon Way, Leeds
LS2 9NL

Email: hra.approval@nhs.net

25 July 2017

Dear Mrs Williams,

Letter of HRA Approval

Study title: Body image concerns in the postpartum period and the bonding process between mothers and their babies.
IRAS project ID: 219077
REC reference: 17/YH/0178
Sponsor University of Leeds

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. **Please read *Appendix B* carefully**, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Further information on funding, HR processes, and compliance with HRA criteria and standards is also provided.

It is critical that you involve both the research management function (e.g. R&D office) supporting each organisation and the local research team (where there is one) in setting up your study. Contact details

and further information about working with the research management function for each organisation can be accessed from www.hra.nhs.uk/hra-approval.

Appendices

The HRA Approval letter contains the following appendices:

- A – List of documents reviewed during HRA assessment
- B – Summary of HRA assessment

After HRA Approval

The document “*After Ethical Review – guidance for sponsors and investigators*”, issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

The HRA website also provides guidance on these topics, and is updated in the light of changes in reporting expectations or procedures.

In addition to the guidance in the above, please note the following:

- HRA Approval applies for the duration of your REC favourable opinion, unless otherwise notified in writing by the HRA.
- Substantial amendments should be submitted directly to the Research Ethics Committee, as detailed in the *After Ethical Review* document. Non-substantial amendments should be submitted for review by the HRA using the form provided on the [HRA website](http://www.hra.nhs.uk), and emailed to hra.amendments@nhs.net.
- The HRA will categorise amendments (substantial and non-substantial) and issue confirmation of continued HRA Approval. Further details can be found on the [HRA website](http://www.hra.nhs.uk).

Scope

HRA Approval provides an approval for research involving patients or staff in NHS organisations in England.

If your study involves NHS organisations in other countries in the UK, please contact the relevant national coordinating functions for support and advice. Further information can be found at <http://www.hra.nhs.uk/resources/applying-for-reviews/nhs-hsc-rd-review/>.

If there are participating non-NHS organisations, local agreement should be obtained in accordance with the procedures of the local participating non-NHS organisation.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: <http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>.

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HRA Training

We are pleased to welcome researchers and research management staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

Your IRAS project ID is **219077**. Please quote this on all correspondence.

Yours sincerely

Miss Lauren Allen
Assessor

Copy to: Mrs Rosmary Dewey, NHS Leeds West CCG – (Lead NHS R&D contact)

Appendix A - List of Documents

The final document set assessed and approved by HRA Approval is listed below.

<i>Document</i>	<i>Version</i>	<i>Date</i>
Copies of advertisement materials for research participants [Advertising poster]	Version 1	08 May 2017
Covering letter on headed paper [Covering Letter]	Version 1	28 June 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Indemnity Confirmation]		
IRAS Application Form [IRAS_Form_19052017]		19 May 2017
Non-validated questionnaire [Survey]	Version 2	28 June 2017
Other [GP Agreement]	Version 1	08 May 2017
Other [Statement of Activities]	1.1	31 May 2017
Other [Schedule of Events]	1.1	31 May 2017
Other [GP information Sheet]	Version 2	28 June 2017
Participant consent form [Consent Form]	Version 2	28 June 2017
Participant information sheet (PIS) [Participant Information Sheet]	Version 2	28 June 2017
Research protocol or project proposal [Protocol]	Version 1	08 May 2017
Summary CV for Chief Investigator (CI) [CV for CI]	Version 1	04 April 2017
Summary CV for supervisor (student research) [Supervisor CV]	Version 2 (2nd supervisor)	03 April 2017
Summary CV for supervisor (student research) [Supervisor CV]	Version 1	03 April 2017

Appendix B - Summary of HRA Assessment

This appendix provides assurance to you, the sponsor and the NHS in England that the study, as reviewed for HRA Approval, is compliant with relevant standards. It also provides information and clarification, where appropriate, to participating NHS organisations in England to assist in assessing and arranging capacity and capability.

For information on how the sponsor should be working with participating NHS organisations in England, please refer to the *participating NHS organisations, capacity and capability and Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* sections in this appendix.

The following is the sponsor contact for the purpose of addressing participating organisation questions relating to the study:

Tel: 01133437587

Email: governance-ethics@leeds.ac.uk

HRA assessment criteria

Section	HRA Assessment Criteria	Compliant with Standards?	Comments
1.1	IRAS application completed correctly	Yes	No comments
2.1	Participant information/consent documents and consent process	Yes	No comments
3.1	Protocol assessment	Yes	No comments
4.1	Allocation of responsibilities and rights are agreed and documented	Yes	The Statement of Activities and Schedule of Events will act as the agreement between the sponsor and site. GP practices will also be asked to sign the GP practice agreement form. Minor changes were made to the Statement of Activities and Schedule of Events documents.

Section	HRA Assessment Criteria	Compliant with Standards?	Comments
4.2	Insurance/indemnity arrangements assessed	Yes	Where applicable, independent contractors (e.g. General Practitioners) should ensure that the professional indemnity provided by their medical defence organisation covers the activities expected of them for this research study
4.3	Financial arrangements assessed	Yes	No funding will be provided to sites.
5.1	Compliance with the Data Protection Act and data security issues assessed	Yes	The applicant has confirmed that staff at Bristol Online survey will not have access to participant identifiable information; the permissions will be set so that only the administrator of the account (CI) can access the responses which are submitted.
5.2	CTIMPS – Arrangements for compliance with the Clinical Trials Regulations assessed	Not Applicable	No comments
5.3	Compliance with any applicable laws or regulations	Yes	No comments
6.1	NHS Research Ethics Committee favourable opinion received for applicable studies	Yes	No comments
6.2	CTIMPS – Clinical Trials Authorisation (CTA) letter received	Not Applicable	No comments
6.3	Devices – MHRA notice of no objection received	Not Applicable	No comments
6.4	Other regulatory approvals and authorisations received	Not Applicable	No comments

Participating NHS Organisations in England

<i>This provides detail on the types of participating NHS organisations in the study and a statement as to whether the activities at all organisations are the same or different.</i>
<p>There is one site type. Sites will be GP practices within Yorkshire and Humber CRN. GP practice staff will be responsible for handing out study information packs to potential participants. Posters advertising the study may be displayed in GP practice waiting areas.</p> <p>The Chief Investigator or sponsor should share relevant study documents with participating NHS organisations in England in order to put arrangements in place to deliver the study. The documents should be sent to both the local study team, where applicable, and the office providing the research management function at the participating organisation. For NIHR CRN Portfolio studies, the Local LCRN contact should also be copied into this correspondence. For further guidance on working with participating NHS organisations please see the HRA website.</p> <p>If Chief Investigators, sponsors or Principal Investigators are asked to complete site level forms for participating NHS organisations in England which are not provided in IRAS or on the HRA website, the Chief Investigator, sponsor or Principal Investigator should notify the HRA immediately at hra.approval@nhs.net. The HRA will work with these organisations to achieve a consistent approach to information provision.</p>

Confirmation of Capacity and Capability

<i>This describes whether formal confirmation of capacity and capability is expected from participating NHS organisations in England.</i>
<p>Participating NHS organisations in England will be expected to formally confirm their capacity and capability to host this research.</p> <ul style="list-style-type: none"> • The sponsor should ensure that participating NHS organisations are provided with a copy of this letter and all relevant study documentation, and work jointly with NHS organisations to arrange capacity and capability whilst the HRA assessment is ongoing. • Further detail on how capacity and capability will be confirmed by participating NHS organisations, following issue of the Letter of HRA Approval, is provided in the <i>Participating NHS Organisations</i> and <i>Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)</i> sections of this appendix. <p>The Assessing, Arranging, and Confirming document on the HRA website provides further information for the sponsor and NHS organisations on assessing, arranging and confirming capacity and capability.</p>

Principal Investigator Suitability

<i>This confirms whether the sponsor position on whether a PI, LC or neither should be in place is correct for each type of participating NHS organisation in England and the minimum expectations for education, training and experience that PIs should meet (where applicable).</i>
A Local Collaborator should be identified to facilitate access arrangements for the external research

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team (where needed).

GCP training is not a generic training expectation, in line with the [HRA statement on training expectations](#).

HR Good Practice Resource Pack Expectations

This confirms the HR Good Practice Resource Pack expectations for the study and the pre-engagement checks that should and should not be undertaken

External staff from the University will only be expected to obtain Letters of Access where there is indirect contact with participants (for example when conducting surveys by telephone). Disclosure and Barring Service and Occupational Health checks will not need to be confirmed. No access arrangements are needed when external staff will not have contact with participants (when surveys are completed online or by post).

Other Information to Aid Study Set-up

This details any other information that may be helpful to sponsors and participating NHS organisations in England to aid study set-up.

- The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

Appendix 5

Email for T2:

Dear PARTICIPANT,

I am contacting you as you completed a survey approximately 5-months ago for a study regarding body image following childbirth. It is now time to complete the second survey. Please follow the link below which will take you directly to the questions, you will be asked to put your participant number in before completing the questionnaire. **Your participant number is:_____**

If you have any questions please contact me on this email address. Thank you for taking part in the study,

Katie Williams

Reminder email:

Dear PARTICIPANT,

This is an email to remind you about the opportunity to complete the follow-up survey. Please click on the link below to be taken to the questionnaire. You will be asked to insert your unique participant number. **This is:_____** You will then be taken to the questions, this should take approximately 15 minutes.

Thank you in advance for taking part in this research.

Katie Williams

<https://leeds.onlinesurveys.ac.uk/thesis-survey-part-2>

Appendix 6

GP Practice Address

Clinical Psychology Programme
Leeds Institute of Health Sciences
Level 10 Worsley Building
Clarendon Way
Leeds LS2 9NL
umkwi@leeds.ac.uk

DATE

Re: Participant Name

To whom this may concern,

The above patient has recently taken part in a research study and has detailed this practice as their GP. The patient has completed a survey as part of a Clinical Psychology Doctoral research project, as part of this survey patients are asked to comment on their current mental health and well-being.

Please find below the response that the patient has given which is a cause for concern:

Question	Response
Thought of the possibility that you might make away with yourself?	
Found yourself wishing you were dead and away from it all?'	
Found the idea of taking your own life kept coming into your mind?	

I would therefore encourage you to contact this patient to discuss this further and ensure they have access to appropriate support. If you have any further questions, please contact me on 0113 3430829. Please leave a message for Katie Williams (Psychologist in Clinical Training) and I will get back to you as soon as possible.

Yours Sincerely,

Katie Williams, Psychologist in Clinical Training

Appendix 7

Mother-Infant Attachment

T-Test:

	N	Mean	Std. Deviation	Minimum	Maximum
T1MAITOTAL	114	99.2895	7.46286	52.00	104.00
T2MAITOTAL	114	99.5263	8.59328	26.00	104.00

a. Completer = completer

Wilcoxon Signed Ranks Test:

	N	Mean Rank	Sum of Ranks
T2MAITOTAL - T1MAITOTAL			
Negative Ranks	38 ^b	46.28	1758.50
Positive Ranks	49 ^c	42.23	2069.50
Ties	27 ^d		
Total	114		

	T2MAITOTAL - T1MAITOTAL
Z	-.661 ^c
Asymp. Sig. (2-tailed)	.509

Maternal Mental Health

T-Test:

	N	Mean	Std. Deviation	Minimum	Maximum
T1GHQTOTAL	114	20.5789	8.62379	8.00	42.00
T2GHQTOTAL	114	20.7105	7.50542	6.00	37.00

Wilcoxon Signed Ranks Test:

		N	Mean Rank	Sum of Ranks
T2GHQTOTAL -	Negative Ranks	49 ^a	57.31	2808.00
T1GHQTOTAL	Positive Ranks	58 ^b	51.21	2970.00
	Ties	7 ^c		
	Total	11		
		4		

	T2GHQTOTAL - T1GHQTOTAL
Z	-.252 ^b
Asymp. Sig. (2-tailed)	.801

Body Image

T-test:

	N	Mean	Std. Deviation	Minimum	Maximum
T1BSQTOTAL	114	38.6491	17.44878	14.00	84.00
T2BSQTOTAL	114	44.9912	18.42925	14.00	84.00

Wilcoxon Signed Ranks Test:

		N	Mean Rank	Sum of Ranks
T2BSQTOTAL -	Negative Ranks	33 ^b	45.85	1513.00
T1BSQTOTAL	Positive Ranks	76 ^c	58.97	4482.00
	Ties	5 ^d		
	Total	11		
		4		

	T2BSQTOTAL - T1BSQTOTAL
Z	-4.490 ^c
Asymp. Sig. (2-tailed)	.000

Appendix 8

Maternal Mental Health (GHQ) & Body Image (BSQ): Correlation

Time 1

		T1GHQTOTAL	T1BSQTOTAL
T1GHQTOTAL	Pearson Correlation	1	.304**
	Sig. (2-tailed)		.001
	N	114	114
T1BSQTOTAL	Pearson Correlation	.304**	1
	Sig. (2-tailed)	.001	
	N	114	114

** . Correlation is significant at the 0.01 level (2-tailed).

Time 2

		T2GHQTOTAL	T2BSQTOTAL
T2GHQTOTAL	Pearson Correlation	1	.252**
	Sig. (2-tailed)		.007
	N	114	114
T2BSQTOTAL	Pearson Correlation	.252**	1
	Sig. (2-tailed)	.007	
	N	114	114

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix 9

Multivariate Regression:T1 (All Predictor Variables)

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	T1BSQTOTAL, Feeding, T1GHQTOTAL ^b		Enter

a. Dependent Variable: MAI1

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.119 ^a	.014	-.003	.40095

a. Predictors: (Constant), T1BSQTOTAL, Feeding, T1GHQTOTAL

ANOVA^a

Model		Sum of Squares	df	Mean Square	Sig.
1	Regression	.403	3	.134	.836
	Residual	28.133	175	.161	
	Total	28.536	178		

a. Dependent Variable: MAI1

b. Predictors: (Constant), T1BSQTOTAL, Feeding, T1GHQTOTAL

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.819	.107		35.538	.000
	Feeding	.011	.064	.013	.175	.861
	T1GHQTOTAL	-.003	.004	-.057	-.715	.476
	T1BSQTOTAL	.003	.002	.127	1.563	.120

a. Dependent Variable: MAI1

Multivariate Regression: T2 (All predictor variables)

Variables Entered/Removed^a

Model	Variables	Variables	Method
	Entered	Removed	
1	T2BSQTOTAL, Feeding2, T2GHQTOTAL ^b	.	Enter

a. Dependent Variable: T2MAITOTAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.280 ^a	.078	.053	8.36247

a. Predictors: (Constant), T2BSQTOTAL, Feeding2, T2GHQTOTAL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	652.026	3	217.342	3.108	.029 ^b
	Residual	7692.395	110	69.931		
	Total	8344.421	113			

a. Dependent Variable: T2MAITOTAL

b. Predictors: (Constant), T2BSQTOTAL, Feeding2, T2GHQTOTAL

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	101.625	3.203		31.724	.000
	Feeding2	2.370	1.725	.130	1.375	.172
	T2GHQTOTAL	-.289	.108	-.252	-2.667	.009
	T2BSQTOTAL	.051	.045	.109	1.122	.264

a. Dependent Variable: T2MAITOTAL

Multivariate Regression: T1 (Maternal Mental health only)

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	T1GHQT OTAL ^b	.	Enter

a. Dependent Variable: T1MAITOTAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.220 ^a	.048	.040	7.31264

a. Predictors: (Constant), T1GHQTOTAL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	304.284	1	304.284	5.690	.019 ^b
	Residual	5989.163	112	53.475		
	Total	6293.447	113			

a. Dependent Variable: T1MAITOTAL

b. Predictors: (Constant), T1GHQTOTAL

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
(Constant)	103.205	1.779		58.022	.000	99.681	106.730
T1GHQTOTAL	-.190	.080	-.220	-2.385	.019	-.348	-.032

a. Dependent Variable: T1MAITOTAL

Multivariate regression: T2 (Maternal Mental health only)

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	T2GHQTOTAL ^b	.	Enter

a. Dependent Variable: T2MAITOTAL

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.238 ^a	.056	.048	8.38438

a. Predictors: (Constant), T2GHQTOTAL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	471.066	1	471.066	6.701	.011 ^b
	Residual	7873.355	112	70.298		
	Total	8344.421	113			

a. Dependent Variable: T2MAITOTAL

b. Predictors: (Constant), T2GHQTOTAL

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error				Lower Bound	Upper Bound
(Constant)	105.160	2.314		45.450	.000	100.576	109.745
T2GHQTOTAL	-.272	.105	-.238	-2.589	.011	-.480	-.064

a. Dependent Variable: T2MAITOTAL