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Maternal trait personality and breastfeeding duration: The importance of confidence and social support

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Abstract

Aim: To explore the relationship between maternal trait personality and breastfeeding duration

Background: Understanding influences on breastfeeding initiation and duration is critical to increasing breastfeeding rates and supporting new mothers. Maternal characteristics such as self efficacy, knowledge and confidence are known to enable women to breastfeed but little is known about the influence of maternal trait personality on breastfeeding.

Design. An exploratory cross-sectional survey

Method: 602 mothers with an infant aged 6 – 12 months old completed a self report questionnaire examining maternal trait personality, breastfeeding duration and attitudes and experiences of breastfeeding. Data was collected between March and June 2009

Results: Mothers who reported high levels of extraversion, emotional stability and conscientiousness were significantly more likely to initiate and continue breastfeeding for a longer duration. Attitudes and experiences significantly associated with these personality traits such as perceived difficulties and lack

of support may explain these patterns. For example, characteristics associated with introversion and anxiety may prevent women from seeking support or challenging negative attitudes of others at this critical time.

Conclusion: Understanding the influence of maternal personality may thus be a useful tool in antenatal support to recognise women who may need extra, directed support whilst facilitating discussion of potential barriers to breastfeeding.

Key words: Breastfeeding; Midwives; Nursing; Pediatrics; Trait Personality; Confidence; Self efficacy; Social support

Why is this research or review needed?

Interventions are needed to increase levels of breastfeeding in the UK and other countries.

Decision to initiate and continue breastfeeding is complex.

Social and psychological variables such as maternal confidence, self efficacy and social support play a critical role

What are the key findings?

Maternal trait personality is associated with breastfeeding duration. Mothers who are introverted or have high levels of trait anxiety are less likely to initiate and continue breastfeeding.

Maternal introversion and anxiety may affect women's ability to breastfeed successfully. These personality traits are associated with social and psychological variables known to predict low breastfeeding duration.

How should the findings be used to influence policy/ practice/ research/ education?

Considering maternal personality may be a useful tool to identify women who may need directed support

Although trait personality is considered fixed, exploring the impact of a mothers personality on her coping strategies may be useful.

Interventions could encourage for example more introverted women to think about how they can increase their social networks in relation to breastfeeding.

Introduction

Breastfeeding is established as beneficial to both infant and maternal health. Risk of gastroenteritis, respiratory infections, allergies and obesity are all increased amongst formula fed infants whilst mothers who formula feed have greater levels of reproductive cancers (Kramer & Kakuma, 2004; Ip et al 2009). However, despite World Health Organisations recommendations that infants are exclusively breastfed for the first six months postpartum with continued breastfeeding for up to two years and beyond (WHO, 2002), breastfeeding rates in the UK are low. Although 81% of mothers now initiate breastfeeding at birth (NHS, 2011), by six weeks rates have dropped to 48% with only 25% breastfeeding at all at six months (Bolling, Grant, Hamlyn & Thornton, 2007). Understanding influences upon breastfeeding duration is critical to designing appropriate and effective interventions to support mothers to reach their breastfeeding goals.

Background

The decision to breastfeed is complex with attitudes and concerns surrounding inconvenience, difficulty and embarrassment all influencing initiation (Wright, Parkinson & Scott, 2006; Brown, Raynor & Lee, 2011a). Amongst mothers who wish to breastfeed, both physical and psychological factors affect breastfeeding duration (Thulier & Mercer, 2009). Although true biological inability to breastfeed is rare (Huggins, 2000), physical difficulties including latching the infant on, pain from nipple trauma, maternal exhaustion and perceived poor milk supply are often cited (David, Emmett, Steer & Emond, 2007; Brown & Jordan, 2012). Wider social factors also play a role including poor support from family and peers (McFadden & Toole, 2006), negative partner attitudes (Li, Fein, Chen & Grummer-Strawn, 2008) and poor advice or conflict with health professionals (Brown, Raynor & Lee, 2011b).

Maternal characteristics have also been implicated in breastfeeding duration. Maternal knowledge and understanding correlates well with breastfeeding

duration (Spear, 2006) with mothers who are proactive in seeking support and education feeding for the longest (Mitra, Khouerty, Hinton & Carothers, 2004; Follett, Ishii, Kavanagh-Prochaska, Cohen & Panchula, 2006; Nelson, 2007). Confidence (belief in your ability to achieve) is also critical, particularly in overcoming difficulties or responding to the criticism of others (Brown, Raynor & Lee, 2011a). Self efficacy (belief in your ability to achieve a specific task at hand) also plays a central role (Otsuka, Dennis, Tatsuoka, & Jimba, 2008) as does self belief and determination to succeed (Avery, Zimmermann, Underwood & Magnus, 2009). Overall, maternal confidence and self efficacy to breastfeed may be effective as it can encourage women to believe that they are able to breastfeed, to seek further professional support and to adopt a proactive stance to overcoming any issues faced (Blyth et al, 2002), all of which are associated with a longer breastfeeding duration (Thulier & Mercer, 2008). Conversely high levels of anxiety (Brown, Raynor & Lee, 2011c), embarrassment (Andrew & Harvey, 2011) and shyness (Flood & Dodgson, 2010) appear to be associated with formula use.

Despite the known association between maternal characteristics and breastfeeding duration, there has been no empirical examination of the role of maternal personality upon infant feeding decisions. Typically measured using a five factor model of neuroticism, extraversion, agreeableness, conscientiousness and openness to experience (Costa & McCrae, 1992), personality is considered to be biologically based, genetic and stable once adulthood is reached ([Eysenck, 1963](#)). Personality inventories are widely used to explore and predict a variety of behaviours (Friedman, Kern & Reynolds, 2010). Indeed, personality has been related to a number of health issues including depression and anxiety (Cox, McWilliams, Enns & Clara, 2004) and behaviors such as smoking and weight gain (Hampson, Goldberg, Vogt & Dubanoski, 2006) and eating patterns (Hampson, Goldberg, Vogt, & Dubanoski, 2007). Personality has also been shown to be related to a number of personal characteristics such as self efficacy, confidence and locus of control which can in turn effect health outcomes (Vollrath, 2001; Schaefer, Williams, Goodie & Campbell, 2004; Connor-Smith & Flaschbart, 2007).

The wide literature examining influences on breastfeeding shows that decisions regarding infant feeding are complex, including biological, psychological and social variables (Thulier & Mercer, 2008). Given the association of personality with other health behaviours, maternal personality has the potential to play a role in influencing maternal infant feeding decisions, either directly or indirectly through personal characteristics. As this potential association between self efficacy and personality around breastfeeding attitudes, experiences and duration has not been explored in the literature, the aim of this study is to address this gap in our knowledge.

The Study

Aim

The aim of the current study was thus to explore associations between breastfeeding duration, maternal personality and maternal attitudes and experiences of breastfeeding. Understanding how maternal personality may play a role in affecting breastfeeding duration and experiences would further enable health professionals to identify and provide targeted support to new mothers.

Design

This is an exploratory cross-sectional survey.

Participants

Data was collected between March and June 2009. Six hundred and two mothers with an infant aged 6 - 12 months completed a self report questionnaire detailing maternal personality, breastfeeding duration and reasons for breastfeeding cessation if applicable. This age range was used to allow mothers to breastfeed for a significant duration as per World Health Organisation advice (e.g. potentially at least six months) but for recollection to be based on recent events (e.g. no longer than twelve months ago). Exclusion criteria included a low birth weight (<2500g) and premature birth (<37 weeks).

Participants were recruited via local mother and baby groups in the Swansea area. These groups were located in areas with varying degrees of social deprivation as measured by the Welsh Indices of Multiple Deprivation (WIMD, 2008). Posters were placed in venues advertising the study with details of how to contact the researcher for more details. In addition, questionnaires were distributed to mothers who attended groups via the group leader and returned to the centre or via post. Study adverts were also placed on online message boards on parenting forums based in the UK. Participants completed the questionnaire via an online link to the questionnaire.

218 (36.2%) completed the questionnaire using a paper copy with 386 (63.8%) using the online link. No significant difference was seen in mean age, years in education or breastfeeding duration between mothers who completed a paper or online version of the questionnaire.

Data Collection

Participants completed the Ten Item Personality Measure (Gosling, Rentfrow & Swann, 2003) to measure the 'Big-five' personality traits of Openness to Experience (Preference for novelty and variety and intellectual curiosity), Extraversion (Sociability, assertiveness and talkativeness), Agreeableness (Helpfulness, cooperation and sympathetic tendencies), Conscientiousness (Discipline, organisation and achievement orientation) and Emotional Stability (anxiety and impulse control) [(Goldberg, 1993)]. Although this questionnaire is a short format personality measure it shows strong convergence with more detailed versions, has high test-retest reliability and is considered a more valid measure than other short measures of personality (Furnham, 2008).

Breastfeeding data was also collected. Participants indicated whether they initiated breastfeeding at birth and duration of breastfeeding in days/weeks up to the current time point. Participants indicated whether they were still currently breastfeeding or not.

Participants also completed a series of items examining attitudes towards breastfeeding (19 items) exploring issues such as health benefits, convenience and difficulty (items validated and based on previous work [Brown et al, 2011c] [Table one]. Responses were based on five point likert scales (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree).

If participants ceased breastfeeding before six months postpartum they also completed a series of questions examining why (40 items) such as pain, embarrassment and exhaustion. This questionnaire had been previously used and validated in a previous study (Brown & Jordan, 2012) [Table two]. Responses were based on five point likert scales (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree).

The decision was made to use these inventories as no suitable similar validated questionnaires could be found in the literature to measure the specific themes. Both questionnaires had been used in previous research by Author A (Brown, Raynor & Lee, 2011b; Brown, Raynor & Lee, 2011c; Brown & Jordan, 2012). Development of the original questionnaires was based on previous work by author A using qualitative interviews to explore maternal experience of breastfeeding (Brown, Raynor & Lee, 2011a) and recurring themes in the current literature as to why women cease breastfeeding e.g. Li et al, 2008; Thulier & Mercer, 2009. Questionnaires were originally piloted prior to the main study (n = 20).

Demographic information was also collected including maternal age, education, marital status and occupation.

Ethical considerations

Full ethical approval was granted from a University Psychology research ethics committee. All applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed. Participant study information and debrief were provided on written and online versions of

the questionnaire with details of how to contact the researcher if more information was needed.

Data analysis

The Ten Item Personality Measure was scored as per instructions to give the five scales of Openness to Experience, Extraversion, Agreeableness, Conscientiousness and Emotional Stability. Data was found to be normally distributed.

For analyses using breastfeeding duration, a cut off was placed at six months (180 days) based on inclusion of participants in the sample with an infant age six months old. For these analyses, even if participants were still breastfeeding and their infant was aged over six months, only their breastfeeding duration up to six months old was considered.

Distribution of breastfeeding duration was abnormal (Kolmogorov-Smirnov = .238 = .000) with a high proportion of mothers ceasing breastfeeding in the first few days and weeks or breastfeeding for a longer duration. Therefore breastfeeding duration data was transformed and the natural logarithms computed used in order to correct for the skewed distribution.

To examine the data related to breastfeeding attitudes and cessation, exploratory factor analysis was conducted on the two sets of items to statistically group items into key themes. Although the questions had been used in previous research, this analysis was conducted to ensure greater reliability of grouping items. Factor analysis is a statistical technique that combines large numbers of variables together into a smaller number of factors based on similarities in the variables. Using SPSS, a principal components factor analysis using varimax rotation was performed, retaining factors with eigenvalues over 1. A threshold of 0.5 was used to determine which variables should be retained. Confirmatory analyses performed on split samples of the data found similar structures. The factor scores computed were saved as regression scores and used for the data analysis (Tabachnik and Fidell,

2006). Cronbach's alpha was computed for each factor to examine internal consistency of the factors produced.

MANCOVA were then used to examine differences in maternal personality for those who breast or formula fed at birth. Spearman's correlations were used to examine association between maternal personality, breastfeeding duration, attitudes towards breastfeeding and reasons for cessation. Once analyses had been performed breastfeeding duration data was back transformed in order to present logical mean duration scores. This approach was used rather than considering a non parametric measure as parametric tests are more powerful and elements such as effect size can be calculated (Tabachnik & Fidell, 2006).

Findings

Mean age of the respondents at childbirth was 29.16 years, (range from 16 to 45) and the mean number of years in education was 14.61. 72.3% of mothers were primiparous. Demographic spread of the data can be found in Table Three.

Breastfeeding and maternal personality

One hundred and one mothers formula fed from birth (16.7%) whilst 501 (83.3%) breastfed. Two hundred and seventeen mothers breastfed for at least six months postpartum (36.0%) whilst two hundred and eighty four mothers initiated breastfeeding but stopped before six months postpartum (range 2 days to twelve weeks). Of this sub group 58.5% of mothers stopped breastfeeding within the first week postpartum with 73.2% having stopped by two weeks. Thus data was transformed to correct skewed distributions.

A Multivariate ANCOVA was used to compare differences in maternal personality for mothers who breast or formula fed at birth controlling for maternal age, education and parity (Table 4). Significant differences were found for maternal extraversion [$F(1, 600) = 11.54, p = .001$], emotional stability [$F(1, 600) = 5.616, p = .018$] and conscientiousness [$F(1, 600) =$

3.855, $p = .048$]. Mothers who breastfed at birth reported significantly higher levels of all traits. No significant difference was found for openness to experience and agreeableness.

Differences in maternal personality traits were also examined for breastfeeding duration considering any breastfeeding at two, four, six, twelve and twenty six weeks (Table 4). Mothers who were still breastfeeding at each of these time points were rated significantly higher in extraversion and emotional stability. No significant difference was seen in openness to experience, conscientiousness or agreeableness was seen at any postnatal time point.

Maternal Personality and Attitudes towards breastfeeding

Principal components factor analysis was performed on all items examining attitudes towards breastfeeding producing five factors and explaining 56.13% of the variance (Table 1). Factors were labelled 'difficult' (painful, exhausting), inconvenient (interfering with maternal lifestyle, placing greater responsibility on the mother than formula feeding), 'formula fed infants are more content' (believing formula fed infants to be easier to settle and sleep for longer) and 'breastfeeding as healthier' (benefits for infant and maternal health). Regression scores for each factor were computed and used for comparison.

Partial spearman's rho correlations examined association between attitudes and maternal personality controlling for breastfeeding duration. Extraversion was significantly inversely with believing breastfeeding to be difficult (Spearman's rho = $-.109$, $p = .041$).

Emotional stability was significantly inversely associated with believing breastfeeding to be difficult (Spearman's rho = $-.581$, $p = 0.000$) but positively significantly associated with believing breastfeeding to be healthier (Spearman's rho = $.451$, $p = 0.00$).

Conscientiousness was significantly positively associated with believing breastfeeding to be healthier (Spearman's rho = $.672$, $p = .000$) and inversely

associated with believing breastfeeding to be inconvenient (Spearman's rho = .115, p = .008).

Maternal Personality and Reasons for breastfeeding cessation

Using the same method as described above, principle components analysis was performed on all items examining reasons for breastfeeding cessation. The model explained 49.93% of the variance with strong Cronbach's alpha (Table 3). Factors were labelled body image concerns (worries about appearance and leaking milk), Public Feeding (not wanting to feed in front of others or in public), difficulty (problems with latch and positioning), pain (from cracked nipples or mastitis), impact upon lifestyle (lack of routine and difficulties socialising), pressure from others to stop (from friends, family and partner), lack of support (difficulties getting advice or support with problems) and medical reasons (taking medication or advised to stop by a professional). Regression scores were computed and used for analysis.

As extraversion, emotional stability and conscientiousness were the three traits significantly associated with breastfeeding duration, examination of the relationship between these variables and reasons for cessation were examined. This section reports findings from mothers who initiated breastfeeding but stopped before six months postpartum

Extraversion was significantly inversely associated with ceasing breastfeeding due to issues with public feeding (Spearman's rho = $-.112$, p = .037) or feeling pressured by others to stop (Spearman's rho = $-.105$, p = .005). Thus mothers who were more introverted were more likely to have found breastfeeding embarrassing or felt pressured.

Emotional stability was significantly inversely associated with reporting stopping breastfeeding due to a lack of support with problems (Spearman's rho = $-.120$, p = .028) or difficulty (Spearman's rho = $-.155$, p = .006). Mothers who were more anxious reported greater difficulty and lack of support.

Conscientiousness was significantly inversely associated with reporting stopping breastfeeding due to body image concerns (Spearman's $\rho = -.109$, $p = .041$) and pain (Spearman's $\rho = -.085$, $p = .018$). Lower conscientiousness was therefore associated with greater issues with pain and body image.

Discussion

This paper examined associations between maternal personality and breastfeeding duration, considering the role of variations in attitudes and experiences in explaining any relationship. Mothers who reported higher levels of emotional stability, extraversion and conscientiousness were significantly more likely to initiate and continue breastfeeding, potentially due to being more confident in their approach to breastfeeding. Although maternal characteristics such as anxiety, confidence and self efficacy have been explored in relation to breastfeeding duration, as far as we are aware this is the first paper to examine the issue of understanding breastfeeding from a trait personality model. These findings are of interest as not only do they add to the literature exploring the public health issue of increasing breastfeeding duration but the simplicity of the measure used gives opportunity for the importance of maternal personality to be considered in an applied setting.

The main limitations of this study surround the self selecting sample which may have led to only the most motivated women participating e.g. a particular interest in breastfeeding or particular difficulties. Indeed a larger proportion of the sample did breastfeed for at least six months compared to other UK surveys such as the Infant Feeding Survey [e.g. 36% versus 25%]. However initiation and early continuation rates were similar (Bolling et al., 2007). Related to this, the sample was weighted towards an older, more educated demographic although the sample was varied in terms of demographic background due to targeted recruitment in more deprived areas. The sample

were also predominantly White British in ethnic origin (95.6%). Generalisability must however be undertaken with caution.

The retrospective design of the questionnaire is also a limitation. This approach was used due to the novel exploration of the area but criticism could be made that using maternal self reported recall of breastfeeding duration is inaccurate. However, a retrospective approach has been used successfully in a number of other studies exploring health outcomes (Brown & Lee, 2011; Felitti et al, 1998; Brunstrom, Mitchell & Baguley, 2005) and the time period for recall was short. Examination of the accuracy of retrospective reports also suggests they are reliable (Brewin, Andrews & Gotlieb, 1993). With regard to retrospective measures of personality, personality is generally considered to be a stable trait ([Furnham, 2008](#)) with suggestion that maternal personality traits are stable throughout the perinatal period (Grant, McMahon & Austin, 2008). However, further research might benefit from a prospective or even longitudinal approach.

Criticism could also be made of the short personality measure used. However the Ten Item Personality Measure shows strong reliability and validity and is comparable to outcomes of more detailed questionnaires (Furnham, 2008; Gosling et al, 2003). Further examination may wish to use a more detailed measure but this would increase the level of input needed from participants. It could also be argued that although trait personality is considered to be stable during adulthood (Ferguson, 2010), the perinatal period can have an impact upon maternal identity, purpose and networks (Nelson, 2003). Risk of mood disorders is also increased during this period (Cohen & Nonacs, 2005). However, women were not in the immediate perinatal period and there is growing evidence that maternal personality traits are stable through pregnancy and the postnatal period (Grant, McMahon & Austin, 2008). Indeed, trait measures have been used in a number of studies during the perinatal period (e.g. McMahon, Barnett, Kowalenko, Tennant & Don, 2001; Hart & McMahon, 2006).

Overall, significant associations were found between breastfeeding initiation and duration and maternal trait emotional stability, extraversion and conscientiousness. Mothers who displayed high levels of introversion and anxiety were less likely to initiate or continue breastfeeding. These traits were also significantly associated with patterns in attitudes towards breastfeeding and reasons for cessation. Breastfeeding has been linked to a wide variety of factors, with a notable emphasis on strong professional support and information, maternal confidence and self efficacy and being surrounded by others with a positive attitude to breastfeeding being predictive of success ([Thulier & Mercer, 2008](#); [Li et al, 2009](#); [Brown et al, 2011](#)). It is arguable that maternal beliefs and behaviours potentially associated with their personality are enabling or thwarting their likelihood of breastfeeding.

Specifically, mothers with a more introverted personality believed breastfeeding to be more difficult than those who had stronger extraverted tendencies. Breastfeeding, although natural, is a skill which can take time to master with many mothers ceasing breastfeeding due to difficulties getting the infant to latch on, pain from cracked nipples or concerns about milk supply ([Scott, Binns, Oddy & Graham, 2006](#); [Gatrell, 2007](#); [David, Emmett, Steer & Emond, 2007](#)). Mothers who seek support both from professionals and in terms of social support from those around them are more likely to succeed ([Berridge, McFadden, Abaymoi & Topping, 2005](#); [Gill, Reifsnider & Lucke, 2007](#)), something which extraverts are more likely to do ([Williams & Galihier, 2006](#)). In line with this, coping style has been linked to personality ([Connor-Smith & Flaschbart, 2007](#)). Extraverts are more likely to adopt a problem focussed coping response ([Connor-Smith & Flaschbart, 2007](#)) and feel they have the ability to cope with a situation ([Vollrath, 2001](#)). Potentially it is these extraverted mothers who are taking a proactive approach such as attending antenatal classes ([Donarth & Amiir, 2003](#)) or seeking specialist support and information ([Nelson, 2007](#)). Positive cognitive strategies in particular are associated with continuing to breastfeed. For example, increasing knowledge about breastfeeding if a problem occurs, trying to stay relaxed and looking after herself, mindfulness and positive self talk are all associated with continuing to breastfeed ([O'Brien, Buikstra, Fallon & Hegney, 2009](#)).

Higher levels of introversion were also associated with feeling pressurised by others to stop breastfeeding. Although breastfeeding is established as beneficial for infant and maternal health (Ip et al, 2008), experience and acceptance of formula feeding is very high in the UK. Many mothers feel that they live in a formula feeding culture, where breastfeeding is not the normative choice (McFadden & Toole, 2006). A lack of understanding from others or pressure to stop breastfeeding especially when problems occur is common (Thulier & Mercer, 2008). Overcoming this is however an important element to breastfeeding success ([Brown et al, 2011](#)). Examining the role of personality here, extraverts are more likely to display assertion (Rothbart & Hwang, 2005), self efficacy (Schaefer, Williams, Goodie & Campbell, 2004) and confidence (Keller, Siegrist, Earle & Gutscher, 2011) which may enable women to challenge the views of others who suggest they should stop breastfeeding. This in turn may lead to others becoming more supportive and accepting of their decision to breastfeed, furthering their support network ([Brown & Lee, 2011](#)).

Finally mothers who were more introverted were more likely to report that they stopped breastfeeding because they felt embarrassed. Feeling embarrassed about feeding in front of others is associated with a shorter breastfeeding duration (Khoury, Moazzem, Jarjoura, Carothers & Hinton, 2005; Nelson & Sethi, 2005). Again this is likely to be linked to feelings of confidence and self efficacy that are lower amongst introverts.

Breastfeeding duration was also associated with lower emotional stability. Anxiety has been implicated in a shorter breastfeeding duration in a number of studies. A general lack of confidence can lead to formula use (Forster et al, 2006) as can specific anxieties regarding low milk production (Li et al, 2008), slow weight gain (Sachs, Dykes & Carter, 2006) or concern that the infant is not receiving enough milk (Brown, Raynor & Lee, 2011). Anxiety can be categorised as either 'state anxiety' (transient and related to a particular time or situation) or 'trait anxiety' (a stable personality difference in anxiety proneness) ([Goldberg, 1993](#)). These findings suggest that stable trait anxiety

may also be playing a role alongside more specific transient concerns regarding milk supply and weight gain.

The associated attitudes with emotional stability may help explain this link. Mothers who were more anxious reported greater difficulty and lack of support. It would be interesting to explore the direction between these factors more clearly. Is maternal trait anxiety associated with actual higher levels of difficulties or rather a perception of more difficulties? Even mothers who breastfeed exclusively and for a longer duration report that breastfeeding is challenging (Brown & Lee, 2011). Is it simply that the more anxious mothers become more concerned that there is an issue or struggle with the baby-led nature of breastfeeding such as not being able to view amount consumed (Dewey, 2001)? In line with this are these mothers not receiving support from others or does their higher level of anxiety lead them to feel that they are not being supported to the degree they need? Neuroticism has been linked to increased pessimism (Williams, 1992), greater perceived threat (Suls & Martin, 2005), increased distress and fear (Rothbart & Hwang, 2005) and lower self efficacy (Ebstrup, Eplöv, Pisinger & Jorgensen, 2011) suggesting that mothers low in emotional stability may be at greater risk of the negative combination of becoming overwhelmed and not seeking support.

It is also possible that maternal anxiety has a clinical impact. Personality is considered to have a biological basis, particularly in terms of autonomic nervous system response ([Eysenck, 1963](#)). Trait anxiety is linked to stronger adrenocortical system (HPA) and sympathetic nervous system (SNS) reactions to stress with the consequence of increased levels of epinephrine and norepinephrine (Riese, Rosmalen, Ormel, Van Roon, Oldehinkel & Rijdsdijk, 2006). High levels of these catecholamines can however inhibit oxytocin which plays a critical role in milk production (Lau, 1999).

Finally individuals who were more conscientious were more likely to initiate but not continue to breastfeed. Taking breastfeeding as a positive health choice, this fits well with existing literature. Individuals who are high in conscientiousness are more likely to follow health guidance for example

abstaining from smoking, being at a healthy BMI and eating more healthily in general (Hampson, Goldberg, Vogt & Dubanoski, 2006, 2007). Indeed, conscientiousness was significantly linked to the belief that breastfeeding was healthiest, thus potentially increasing motivation to breastfeed. What may be happening here however is that high levels of conscientiousness increase mothers desire to breastfeed but may not enable them to continue. In line with this, conscientiousness appeared to be negatively associated with maternal centred reasons for stopping breastfeeding e.g. pain, inconvenience and body image. Potentially mothers who score exhibit this trait have such strong beliefs that breastfeeding is the 'right' thing to do that they do not stop for reasons based on their own perceived needs but continue for the infant. Perhaps awareness needs to be raised for these mothers that they do take their own needs into consideration and are not directed by high levels of guilt (Lee, 2011).

Overall the findings show a novel and interesting link between breastfeeding duration and maternal trait personality adding to the literature examining the role of personality and health behaviours and outcomes (Cox et al, 2004; Hampson et al, 2006, 2007). Potentially, this knowledge could enable health professionals and those working in breastfeeding support to provide more targeted support. The ten item personality questionnaire is a brief measure that could be used either individually in antenatal care or in group sessions as a discussion trigger for considering issues around breastfeeding and encouraging proactive support and information seeking.

However, wider consideration needs to be given to the complex social and psychological influences upon breastfeeding duration (Thulier & Mercer, 2008). Personality is certainly not the only influence upon infant feeding behaviour and considering it as such, in light of its biological construct, is a reductionist view. However, maternal personality measurement may play an important role in understanding a woman's wider experiences and social environment. Assessing maternal personality is a simple and brief tool which could alert health professionals to potential wider issues a woman might face.

For example, trait personality is typically considered to be a biologically based, genetic entity which remains stable once adulthood is reached (Eysenck, 1963). If breastfeeding duration is linked to this static trait, this information alone is of little use to health professionals working to support new mothers with breastfeeding. For example, if a mother presents as an introvert, which is considered to be a stable trait, and evidence suggests that introverts are less likely to breastfeed, this is of little applicable use. However, the findings of this study show that personality was associated with certain attitudes and experiences with regard to breastfeeding. For example mothers with lower emotional stability reported lower levels of emotional support and greater difficulty whilst introverts appeared to be more affected by the negative attitudes of others. These factors are modifiable and indeed interventions to increase maternal confidence, knowledge and support networks through peer support systems of self efficacy have been effective (e.g. Kramer et al, 2001; Stockdale, 2008). Thus a simple measure of personality may be useful in raising awareness of mothers who may need further psychosocial support in initiating and maintaining breastfeeding.

Conclusion

Limitations aside this study raises the issue for the first time that maternal personality may play a role in the complex array of factors influencing maternal infant feeding decisions. Understanding the relationship between maternal characteristics of extraversion, emotional stability and conscientiousness and the impact these may have on breastfeeding duration could enable health professionals to further target their support.

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Conflict of interest

No conflict of interest.

Author contributions

All authors meet at least one of the following criteria (recommended by the ICMJE: http://www.icmje.org/ethical_1author.html) and have agreed on the final version:

Substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
Drafting the article or revising it critically for important intellectual content.

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Table 1: Factor analysis of attitudes towards breastfeeding

	Difficult	Inconvenient	Formula content	Health
Breastfeeding is painful	.532	.265	.103	-.126
Lots of mums can't breastfeed	.721	.323	.127	-.222
Breastfeeding is difficult	.762	.185	.131	-.218
Lots of mums don't have enough milk	.734	.178	.231	-.127
Breastfeeding is exhausting	.621	.196	.117	-.312
You have to do all the feeds if you breastfeed	.324	.712	.167	.154
You can't go back to work if you breastfeed	.117	.684	.212	-.136
You can't have a social life if you breastfeed	.104	.721	.182	-.126
Only you can soothe the baby if you breastfeed	.222	.612	.210	.178
You are stuck in the house if you breastfeed	.191	.545	.331	-.218
Formula fed babies are more content	.397	.267	.555	-.110
Formula fed babies sleep better	.300	.231	.621	-.154
You have more of a routine if you formula feed	.275	.175	.634	-.113
Breastfed babies feed more often	.254	.152	.534	.114
Breastfeeding is best for babies health	.312	-.187	.345	.789
Breastfeeding is best for mothers health	-.339	-.275	.421	.667
Health professionals should encourage breastfeeding	-.151	-.138	.317	.663
% of variance	35.12	12.37	5.15	3.49
Cronbach's alpha	.792	.781	.702	.846

Table one shows regression scores for each item and how they load onto each factor produced. Items in bold signify items which group strongly on each factor

Table 2: Items and factor structure of questionnaire examining reasons for stopping breastfeeding:

	<i>Body image</i>	<i>Public Feeding</i>	<i>Difficulty</i>	<i>Pain</i>	<i>Lifestyle</i>	<i>Pressure</i>	<i>Support</i>	<i>Medical</i>
Breastfeeding was ruining my breasts	.64	.13	.05	.12	.23	.05	.01	.25
I wasn't losing weight	.62	.31	.32	.25	.15	-.06	.20	.29
My breasts kept leaking	.62	.32	.19	.14	.42	.20	.17	-.02
I wanted my body back for me	.58	.18	.03	.15	-.06	.06	-.01	-.06
I didn't like feeding in public	.10	.78	.22	.14	.20	-.04	-.01	-.08
I didn't like feeding in front of others	.01	.71	.09	.25	.06	-.07	.06	-.32
I was stuck in the house breast feeding	.30	.76	-.14	.05	.14	.06	.09	.04
I didn't know anyone else who breast fed	.04	.54	.47	.05	.06	.25	.19	.18
The baby wouldn't latch on properly	.24	.17	.69	.10	.04	.17	.13	.12
The baby was feeding all the time	.27	.05	.80	.26	.20	.25	.33	.10
My baby wasn't gaining enough weight	-.03	.03	.67	.12	.14	.24	.19	-.09
I didn't have enough milk	-.08	.07	.64	.06	.04	.09	.01	.06
I couldn't breastfeed	.08	.08	.54	.28	.06	.20	.22	.01
I had a very hungry baby	.27	.12	.51	.07	.07	.20	.12	.04
Baby didn't want to breastfeed anymore	-.07	.09	.62	-.03	.06	.09	.06	-.03
It was too painful	.05	.16	.02	.74	.25	.10	.07	-.10
My nipples were cracked	.11	-.18	.07	.69	.11	.69	.10	-.01
I got mastitis, thrush or another similar problem	.09	.09	.04	.72	.25	.80	.02	.06
It was too difficult	-.12	.20	.07	.84	.48	.22	.04	.05
I never knew when the baby was going to feed	-.01	.08	-.13	.31	.78	.23	.15	.10
I didn't like being responsible for all the feeds	.05	.20	.13	.08	.64	.23	.40	.05
I couldn't keep track of milk intake	.15	.10	.32	.29	.65	.40	.22	.01
I couldn't leave the baby	.04	-.10	.13	.18	.59	.16	.07	.01
I couldn't go out and socialise	.15	.26	-.05	.02	.88	-.08	.33	-.06
I couldn't drink alcohol	.20	.08	.05	-.04	.78	.10	.08	.03
I wanted a more predictable routine	.19	.18	.24	.29	.68	.28	.29	-.12
I had breast fed for long enough	.04	.07	.20	.08	.72	.01	.16	.40
My partner wanted me to stop	.02	.20	.08	.02	.20	.81	.39	.13
My mother wanted me to stop	.08	.09	.01	.41	.16	.76	.42	.23
Friends wanted me to stop	.02	.26	.19	.06	-.08	.66	.29	.10
Other people made negative comments	-.04	.15	-.05	.12	.10	.78	.45	.11
Other people felt excluded	.15	.24	.16	-.05	.04	.67	.25	.13
I couldn't get any help with problems	.10	.32	.22	-.05	.28	.02	.82	.01
I didn't have enough support	.47	.18	.19	.04	.28	.19	.56	.20
I couldn't get any professional advice	.08	.32	.54	.13	.11	-.18	.63	.37
I was exhausted	.40	.13	.72	.21	.03	.15	.54	.28
I wasn't well	.28	.12	.66	.0	.02	-.02	.22	.58
The baby wasn't well	.33	.08	.15	.15	.02	.20	.05	.78
I was taking medication	.05	.29	.18	.41	.19	-.13	.32	.62
A health professional advised me to stop	.22	.28	-.05	.22	.25	.15	-.11	.88
Percentage of variance explained	20.86	6.99	5.12	4.74	3.74	3.09	2.76	2.63
Cronbach's alpha	.81	.78	.72	.67	.65	.75	.65	.72

Table two shows regression scores for each item and how they load onto each factor produced. Items in bold signify items which group strongly on each factor

Table 3: Sample distribution by Demographic Factors

Indicator	Group	N	%
Age	≤ 19	14	2.2
	20 – 24	124	19.6
	25 – 29	173	27.2
	30 – 34	180	28.4
	$35 \geq$	142	22.6
Education	No formal	25	3.9
	School	175	27.5
	College	162	25.5
	Higher	271	42.8
Marital Status	Married	336	53.1
	Cohabiting	197	31.3
	Single	99	15.6
Home	Owned	349	55.1
	Rented	244	38.4
	Council	85	13.5
	Other	4	0.8
Maternal occupation	Professional & managerial	210	33
	Skilled	126	19.8
	Unskilled	80	12.6
	Other	29	4.6
	Stay at home mother	190	42.5

Table Four: Breastfeeding and personality traits: Showing mean personality scores (and standard deviation) at specific time points postpartum

Time post partum	Any Breastfeeding	N	Extraversion	Emotional Stability	Openness	Conscientiousness	Agreeableness
Birth	Yes	501	8.45 (2.44)**	7.56 (2.63)**	6.88 (2.58)	8.51 (2.32)*	9.12 (2.16)
	No	101	7.33 (2.49)**	6.79 (2.40)**	6.33 (2.56)	8.78 (2.34)*	8.78 (2.16)
Two weeks	Yes	320	8.41 (2.42)**	7.50 (2.63)**	6.94 (2.57)**	8.42 (2.47)	8.75 (2.47)
	No	228	7.39 (2.50)**	7.01 (2.56)**	6.62 (2.59)**	8.70 (2.14)	8.93 (2.03)
Six weeks	Yes	229	8.55 (2.29)*	7.79 (2.54)**	7.00 (2.61)	8.74 (2.45)	8.91 (2.23)
	No	373	7.77 (2.54)*	7.03 (2.62)**	6.66 (2.57)	8.44 (2.24)	8.79 (2.12)
Twelve weeks	Yes	169	8.03 (2.08)	7.69 (2.77)*	6.66 (2.51)	8.68 (2.47)	9.01 (2.15)
	No	433	8.25 (2.60)	6.88 (2.08)*	6.84 (2.61)	8.56 (2.26)	8.86 (2.16)
Twenty six weeks	Yes	155	8.25 (1.99)	7.51 (2.78)*	6.69 (2.53)	8.77 (2.46)	9.01 (2.18)
	No	447	8.00 (2.61)	6.87 (1.93)*	6.82 (2.60)	8.54 (2.26)	8.87 (2.15)

Shaded areas represent significant difference in personality trait between feeding groups. * = $p < 0.001$, ** = $p < 0.05$

Table Five: Correlations between personality factors, attitudes and experiences

		Extraversion	Emotional stability	Conscientiousness	Openness to experience	Agreeableness
Attitudes	Difficult	-.109**	-.581**	.036	.064	.060
	Inconvenient	-.006	.020	-.115*	-.046	-.043
	Content	.044	.011	-.052	.008	-.016
	Health	.032	.451**	.672**	-.004	-.012
Reasons for stopping	Difficult	.022	-.155**	-.012	-.019	.025
	Feeding in public	-.112*	.012	-.034	-.019	.060
	Body Image	.070	.044	-.109*	-.061	-.025
	Pain	.071	-.009	-.085*	.038	-.011
	Lifestyle	.013	.009	-.065	.088	.017
	Pressure from others	-.103*	-.120*	-.009	-.055	.035
	Lack of support	-.089	-.049	-.094	-.017	.040
	Medical reasons	.022	.083	-.033	.103	-.042

* = $p < 0.05$; ** = $p < 0.01$