An online questionnaire study investigating the impact of psychosocial factors on the duration of breastfeeding

**Abstract**

**Objective**: To examine the psychosocial factors of intention to breastfeed, perceived stress, social support, self-efficacy and their ability to predict the duration of breastfeeding in first-time mothers up to six months postnatally.

**Design:** Cross-sectional,quantitativestudy using a retrospective online survey.

**Setting:** Women across West Yorkshire, in the north of the United Kingdom.

**Participants:** First-time mothers (n=98) who had given birth in the past six months.

**Measures:** An online survey included three established survey instruments measuring the main study variables: The Perceived Stress Scale (Cohen et al., 1983), the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988) and the General Self-Efficacy Scale (Schwarzer and Jerusalem, 1995). The fourth variable was Intention to breastfeed and was measured using a single question. The survey was structured into five main sections 1) During pregnancy, 2) Once the baby was born, 3) Support to feed my baby, 4) Psychosocial factors and 5) Demographics. Open text responses allowed women to elaborate on their infant feeding experiences.

**Findings:** 80% of the sample said they had intended to breastfeed their baby. Although 96% initiated breastfeeding while in hospital, this decreased to 82% at one week and 75% at six weeks. By six months, the rate had dropped to below 50%. Survival Analysis using Cox’s Regression found no significant predictors of duration of breastfeeding at one week and six weeks. However, a significant negative correlation between perceived stress and self-efficacy suggests that greater perceived stress is linked to lower self-efficacy. Other findings included 91% of mothers decided how they would feed their baby before they were pregnant (57%) or during pregnancy (34%) and the majority answered that breastfeeding support was most useful straight after the birth and up to one week.

**Key conclusions:** The findings from this sample of new mothers showed that although many intended to breastfeed, a considerable number of them had stopped by the time their baby was six weeks old. The content analysis highlighted the multiple challenges new mothers can experience with breastfeeding and furthers understanding of the support needs of this group of women.

**Implications for practice:** Many of the mothers had already decided how to feed their baby before the baby was born. In this sample, a quarter of those who intended to breastfeed or thought they might breastfeed had stopped by six weeks. In order to increase breastfeeding duration, new mothers with high intention to breastfeed need to be better prepared for potential breastfeeding challenges and given more support with breastfeeding shortly after their baby is born.

**Keywords**: Breastfeeding, psychosocial factors, first-time mothers, survey, postnatal, online

**Introduction**

Breastfeeding is an important health behaviour that has substantial health benefits for both mother and baby (World Health Organisation, 2021). These include protection against infections for the baby, and a reduction in the risk of ovarian cancer and breast cancer in the mother (Victora et al., 2016; World Health Organisation, 2021). Recommendations are that women initiate breastfeeding within one hour of birth, breastfeed exclusively for the first six months of life and continue to breastfeed alongside complementary solid food up to two years of age and beyond (World Health Organisation, 2021).

The duration of breastfeeding refers to the amount of time a mother continues to breastfeed (Noel-Weiss et al., 2012). Currently, the most common measure of this in the UK is breastfeeding prevalence at 6-8 weeks after birth (Office for Health Improvement & Disparities, 2021; Public Health England, 2019). Findings from the last Infant Feeding Survey in 2010 showed that exclusive breastfeeding rates at birth were 69% in the UK (McAndrew et al., 2012). However, at one week, less than half of all mothers (46%) were exclusively breastfeeding and this figure dropped to under a quarter (23%) by six weeks (McAndrew et al., 2012). This indicates that mothers are likely to stop breastfeeding before the 6-8 week measure has taken place and that few women continue to breastfeed to the WHO and unicef recommedations (World Health Organisation, 2021). Only collecting prevalence at 6-8 weeks means means data on exactly when the mother stopped breastfeeding within this period and importantly, any reasons that led to this decision to stop, is missed. Given the importance of breastfeeding and the documented low uptake, and even lower continuation, of exclusive breastfeeding (Royal College of Paediatrics and Child Health, 2021), it is necessary for high-quality research to be conducted to explore factors that can predict the duration of breastfeeding.

According to the Theory of Planned Behaviour (TPB) (Ajzen, 1991), attitude towards the behaviour, subjective norms and perceived behaviour control are determinants of behavioural intentions. The TPB has been successfully applied to breastfeeding (Giles et al., 2014; Ismail et al., 2016; Kronborg and Vaeth, 2004; Meedya et al., 2010; Wilhelm et al., 2008; Zhang et al., 2018). Intention, when applied as the extent to which the individual plans to breastfeed once their baby is born, is predictive of breastfeeding duration (Bai et al., 2010; Blyth et al., 2004; Grano et al., 2022; Guo et al., 2015). As behavioural intention is seen as the strongest predictor of breastfeeding duration, this is the focus of this study.

**Psychosocial Factors:**

Many psychosocial factors have been found to be modifyable (De Jager et al., 2013), therefore, if found to have an ability to predict breastfeeding, they would be an important starting point for interventions to increase duration. For example this would strengthen the evidence base for stress management, social support or self-efficacy based breastfeeding interventions.

Perceived behavioural control when applied to breastfeeding is the amount that the individual believes they have control over whether they will be able to breastfeed. It has been compared to Bandura’s concept of self-efficacy (Mcmillan et al., 2008) which refers to how confident an individual is in their perceived ability to perform a specific behaviour (Bandura, 1978). Previous research investigating modifiable psychosocial factors (Corby et al., 2021; De Jager et al., 2014, 2013; Meedya et al., 2010) found that self-efficacy can predict the duration of exclusive breastfeeding. Self-efficacy has consistently been found to have a positive effect on breastfeeding duration (Blyth et al., 2004, 2002; Kronborg and Vaeth, 2004; Semenic et al., 2008; Wallenborn et al., 2019). Therefore, self-efficacy is an important variable for inclusion in the current study as it can predict: (a) whether a mother chooses to breastfeed or not; (b) how much effort she will expend; (c) whether she will have self-enhancing or self-defeating thought patterns; and (d) how she will respond emotionally to breastfeeding difficulties (Dennis, 1999). These factors combined are said to lead to increased behavioural performance which suggests that women with higher self-efficacy are more likely to breastfeed for longer.

Due to already being established in previous research and supported by behaviour change theory, intention to breastfeed before the baby was born and maternal level of self-efficacy were investigated. However, the proposed research adds to this model by including two further psychosocial factors: social support and perceived stress. A link between social support and perceived stress has already been established in previous research, where the presence of social support has been associated with decreased stress responsiveness (Cohen et al., 1983; Cohen and Wills, 1985; Zimet et al., 1988).Social support has been explored with breastfeeding (Akman et al., 2008; Bai et al., 2010; Blyth et al., 2004; Kronborg and Vaeth, 2004; Ngo et al., 2019; Semenic et al., 2008). However, it remains unclear how this variable relates to breastfeeding outcomes, with two studies (Bai et al., 2010; Ngo et al., 2019) reporting strong predictive power of perceived social support from family, friends and health professionals on exclusive breastfeeding duration but other studies finding no relationship (Akman et al., 2008; Blyth et al., 2004; Kronborg and Vaeth, 2004; Semenic et al., 2008). Due to social support having mixed evidence for its usefulness in predicting the duration of breastfeeding it will be investigated further in this study.

Perceived stress is less commonly explored with breastfeeding duration. Previous studies have investigated the protective effects of breastfeeding on stress and found that mothers who breastfeed reported being calmer, less anxious, and less stressed (Gila-Díaz et al., 2020). However, many of the scales used to measure this only contained one item and were un-validated (Mezzacappa, 2004). It has been reported that compared with those who did not breastfeed, those who breastfed reported less perceived stress in the last month (Mezzacappa et al., 2000; Mezzacappa and Katkin, 2002). It has also been found that the frequency of bottle-feeding was positively associated with perceived stress (Mezzacappa and Katkin, 2002). Due to the potential protective function of breastfeeding upon stress, the proposed research aimed to investigate whether perceived stress can predict the duration of breastfeeding.

Given the importance of understanding barriers and facilitators to breastfeeding, the primary aim of the present study was to examine the relationships among intention to breastfeed, self-efficacy, social support and perceived stress and their ability to predict the duration of breastfeeding in first-time mothers up to six months postnatally. This combination of psychosocial factors does not appear to have been researched widely until this point. secondary aim was to gain insight into what would have helped first-time mothers to breastfeed for longer by analysing the responses from the open text survey questions using content analysis (Bengtsson, 2016). It was anticipated that the findings would provide valuable information to further understanding of the psychosocial factors that influence the duration of breastfeeding in first-time mothers.

Due to the ongoing issues with rates across the UK, research that could potentially increase our knowledge on the duration of breastfeeding and issues related to breastfeeding is extremely important. Research needs to continue to investigate the issues and complexity around the breastfeeding relationship so health professionals can learn how best to support mothers.The Infant Feeding Survey was last run in 2010 and has since been replaced with an Annual Statistical Release providing data on breastfeeding prevalence and 6-8 weeks after birth (Office for Health Improvement & Disparities, 2021). Although this data tells us whether mothers are still breastfeeding at this point, it is unable to tell us why this might be the case. The current research goes beyond this data to provide an updated holistic picture of the first time mothers experience of feeding their babies, which is much needed by infant feeding services. Therefore, an exploration of the predictors of breastfeeding duration can help to identify contributors to cessation that can be targeted by intervention in order to improve uptake and duration.

Methods

**Design:** The research design of this online questionnaire study was non-experimental and correlational. The predictor variables were intention to breastfeed, self-efficacy, social support, perceived stress. The dependent variables were the duration of breastfeeding at one and six weeks based on the information calculated as the number of days that the mother reported having breastfed her baby. Demographic information such as ethnic group, education level, martial status and age was also collected.

**Participants:** According to Fritz and MacKinnon (Fritz and MacKinnon, 2007) the sample size necessary to provide a power of .8 (with an alpha of .05) with a medium effect size (r-squared = .13) and four predictor variables is 90. Participants were first time mothers who had their babies in the last six months. These criteria were set because previous experience of infant feeding can influence the decision to breastfeed future babies (Bartle and Harvey, 2017) and to aid memory recall of the infant feeding experience (Bland, 2003).

A total of 98 respondents completed the survey; seven responses were excluded due to the babies being over six months old, leaving an overall sample size of 91. The mean age for the mothers that took part was 30 (SD=5.54). The mean age of the babies was 111 days old (3.6 months old) (SD = 58.64). 95% of the sample were from a white ethnic group. The majority of the sample had university-level education or higher (62%) and were either in a relationship (13%), living with their partner (19%) or married (57%). The number of mothers with an intention to breastfeed within this sample was 73 (80%) followed by 11(12%) who thought they might breastfeed, giving a sample of 84 who showed intention to breastfeed (table 1). The duration of breastfeeding at birth, one week and six weeks is shown in figure 1. At six months, 58% of the babies had stopped being breastfed, with 38% being breastfed after six months old.

**Table 1**: *Intention to Breastfeed in the sample*

|  |  |  |
| --- | --- | --- |
| Intention to breastfeed | Number of Mothers | % |
| I wanted to breastfeed  I thought I might breastfeed  I didn’t want to breastfeed  I hadn’t decided | 73  11  6  1 | 80  12  7  1 |

Figure 1: Percentages of the Duration of Breastfeeding

**Measures:** A questionnaire was designed to gather the required data for the study aims and replicated several questions from the previous Infant Feeding Survey (McAndrew et al., 2012). Demographic variables such as the age of mother (measured as a continuous variable in single years), level of education (measured as a categorical variable where the participant chose the highest level of education they attained) and relationship status (measured as a categorical variable) were also collected. The questionnaire included five sections to measure the study variables: 1) During pregnancy, 2) Once the baby was born, 3) Support to feed my baby, 4) Psychosocial factors and 5) Demographic questions. The online questionnaire included three established instruments measuring the main study variables: The Perceived Stress Scale (scores are between 0 = low perceived stress and 40 = high perceived stress) (Cohen et al., 1983), the Multidimensional Scale of Perceived Social Support (scores are between 1= low perceived social support and 7 = high perceived social support) (Zimet et al., 1988) and the General Self-Efficacy Scale (scores are between 10 = low self-efficacy and 40 = high self-efficacy) (Schwarzer and Jerusalem, 1995). The three scales used in this study are free of charge and are available in the public domain. The intention to breastfeed variable was replicated from previous research (Colaizy et al., 2012) and was measured with a single item containing four options: I wanted to breastfeed (definite intention); I thought I might breastfeed (tentative intention); I didn't want to breastfeed (no intention); I hadn't decided (uncertain).

To meet the secondary aim, information was gathered about infant feeding experiences using the following open-ended questions: “What could have helped you? [mothers] to feel more prepared?” “What were the reasons for stopping breastfeeding?” “What were the reasons for giving your baby formula?” “What would have helped you to breastfeed for longer?” and “What was the most and least useful support or information?”

**Procedure:**

Ethical approval was granted by “X” Ethics Committee. The questionnaire was developed in collaboration with the local Midwives, Health Visitors and Council Infant Feeding Leads. It was also checked by maternity peer volunteers who confirmed that the wording was suitable and relevant to first-time mothers. Participants were recruited via advertising the web link to the survey on social media sites such as Facebook and Twitter. Infant feeding peer support services, children’s centres and Health Visitors also advertised the link to the survey on their websites, via a flyer and provided paper copies of the survey as required. The first page of the survey explained the purpose of the study and what was required. Participants checked a box to give their informed consent before being presented with the questionnaire. Participants were allowed to skip any questions they did not want to answer and could quit the survey at any time by leaving the website. Once the responses had been submitted, participants were directed to an exit page containing useful links for further support and information regarding infant feeding. The exit page contained debriefing information explaining the purpose of the study and provided the first author’s email address if they would like a copy of the results of the study.

**Analysis**

Statistical analysis was performed in Statistical Package for the Social Sciences (SPSS) for Windows software, version 27. The significance level was set at 5% for all tests. Two participants were removed from the dataset. Survival analysis was conducted using Cox’s regression rather than logistic regression because, in logistic regression, mothers who have not ceased to breastfeed and thus do not have an end date would be treated as missing data, whereas in Cox's regression they can be treated as censored data and are still included in the analysis (Lucijanic and Petrovecki, 2012).

Demographic Variables were explored first. Following this the predictor variables included the intention to breastfeed, self-efficacy, social support and perceived stress. The outcome variables, for two separate analyses, were the duration of breastfeeding at one and six weeks, respectively. As some women were continuing to breastfeed at the time of the survey, a censoring variable was included to indicate whether breastfeeding had stopped or continued past the one or six-week time point. The survival analysis included a series of models to investigate the predictive power of each variable separately and the c2 was obtained.

Intention to breastfeed was added to Cox’s regression as a categorical variable with four levels; ‘I wanted to breastfeed’, ‘I thought I might breastfeed’, ‘I had not decided’ and ‘I didn’t want to breastfeed’. The variables were converted to dummy variables for use in the analysis. Due to low numbers of participants in the ‘I didn’t want to breastfeed’ and ‘I hadn’t decided’ categories they were not used in the analysis, thus reducing the sample to 81.

To provide insight into the experiences of first-time mothers, the open text survey questions were analysed using quantitative content analysis (Bengtsson, 2016). The responses were coded initially before developing categories of responses within each of the questions. The analysis provided the total number of responses referred to in each category along with the percentage.

**Results**

***Investigating demographic information and the duration of breastfeeding.***

Before conducting the main analysis, Cox’s regression was conducted to allow for any contribution to the variance that maternal age, qualification and marital status may be making to the duration of breastfeeding. Variables were added to the regression in one step. None of the variables were significant at one or six weeks suggesting that the variance in the duration of breastfeeding was not being explained by maternal age, marital status or qualification level. Table 2 shows the regression statistics for each covariate at one week and table 3 at six weeks.

Table 2

*Cox’s Regression statistics for the demographic factors on breastfeeding duration at one week.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariate | Coefficient  (β) | Standard  Error | Wald  c2 | *P*  Value | Exp (B) | 95% CI for  Exp (B) |
| Marital Status  Married or civil partnership  In a relationship  Living together | -.24  -.97  .37 | 1.05  1.41  1.10 | .05  .47  .11 | .82  .49  .74 | .79  .38  1.44 | .10 to 6.24  .02 to 6.07  .17 to 12.36 |
| Qualification Level  Postgraduate  Undergraduate  Post-secondary | -.46  -.45  -.13 | .82  .87  .87 | .32  .27  .02 | .57  .61  .88 | .63  .64  .88 | .13 to 3.12  .12 to 3.49  .16 to 4.81 |
| Maternal age | -.03 | .04 | .46 | .50 | . 97 | .84 to 1.06 |

Table 3

*Cox’s Regression statistics for the demographic factors on breastfeeding duration at six weeks.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariate | Coefficient  (β) | Standard  Error | Wald  c2 | *P*  Value | Exp (B) | 95% CI for  Exp (B) |
| Marital Status  Married or civil partnership  In a relationship  Living together | -.68  -.36  -.36 | .76  .87  .84 | .79  .17  .18 | .37  .68  .67 | .51  .70  .70 | .11 to 2.27  .13 to 3.82  .14 to 3.62 |
| Qualification Level  Postgraduate  Undergraduate  Post-secondary | -1.06  -.25  .07 | .73  .69  .69 | 2.09  .13  .01 | .15  .72  .92 | .35  .78  1.07 | .08 to 1.46  .20 to 3.01  .28 to 4.14 |
| Maternal age | -.03 | .04 | .85 | .36 | .97 | .91 to 1.04 |

**Investigating the psychosocial factors and duration of breastfeeding.**

Preliminary Cox’s regression survival analysis was conducted to investigate the direct relationships between each of the variables (intention to breastfeed, self-efficacy, social support and perceived stress) and duration of breastfeeding (at one week and six weeks) without the influence of the other predictors by running four separate regressions accounting for each of the predictor variables. None of the variables significantly predicted the duration of breastfeeding at either time point. Table 4 shows the regression statistics for each predictor at one week and Table 5 at six weeks.

Post-hoc power analysis (Clark-Carter, 2004) was conducted for both time points and suggested that if the sample size was increased to 190 participants, self-efficacy would reach sufficient power (.80). Social support and perceived stress were unlikely to reach adequate power unless the sample size was increased to around 800 participants.

Table 4

*Cox’s Regression statistics for the individual psychosocial factors on breastfeeding duration at one week.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariate | Coefficient  (β) | Standard  Error | Wald  c2 | *P*  Value | Exp (B) | 95% CI for  Exp (B) |
| Intention to breastfeed | -.42 | 1.05 | .16 | .69 | .66 | .09 to 5.08 |
| Self-efficacy | -.081 | .06 | 1.76 | .19 | .92 | .82 to 1.04 |
| Perceived stress | .02 | .04 | .25 | .62 | 1.02 | .94 to 1.11 |
| Total social support | .06 | .21 | .08 | .78 | 1.06 | .71 to 1.59 |

Table 5

*Cox’s Regression statistics for the individual psychosocial factors on breastfeeding duration at six weeks.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariate | Coefficient  (β) | Standard  Error | Wald  c2 | *P*  Value | Exp (B) | 95% CI for  Exp (B) |
| Intention to breastfeed | -.12 | .75 | .03 | .87 | .88 | .20 to 3.84 |
| Self-efficacy | -.07 | .05 | 1.74 | .19 | .94 | .85 to 1.03 |
| Perceived stress | .01 | .03 | .05 | .83 | 1.01 | .94 to 1.08 |
| Total social support | -.11 | .14 | .58 | .45 | .90 | .68 to 1.19 |

The next stage of the analysis was to group the variables into a model investigating the influence of each of the psychosocial variables when added at the same time. This model consisted of intention to breastfeed, self-efficacy, social support and perceived stress entered all together in one step. The overall model was not significant at either one week (c2(4) = 2.081, p =.72) or at six weeks (c2(4) = 3.13, p =.54). Table 6 shows the regression statistics for each covariate at one week and Table 7 at six weeks.

As neither self-efficacy nor perceived stress were significant predictors of breastfeeding duration at either time point, the criteria for conducting mediation analysis were not fulfilled and so it cannot be concluded that perceived stress affects the role of perceived behavioural control in predicting the duration of breastfeeding. A one-tailed test was used to test the prediction that those with greater perceived stress would have lower self-efficacy. There was a significant negative correlation between perceived stress and self-efficacy (r(79) =-.184, p = .05, one-tailed test) suggesting that greater perceived stress is linked to lower self-efficacy.

**Table 6**

*Cox’s regression statistics for a model investigating the psychosocial variables and duration of breastfeeding at one week.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariate | Coefficient  (β) | Standard  Error | Wald  c2 | *P*  Value | Exp (B) | 95% CI for  Exp (B) |
| Intention to breastfeed | -.54 | 1.11 | .24 | .63 | .58 | .07 to 5.08 |
| Self-efficacy | -.08 | .06 | 1.59 | .21 | .93 | .82 to 1.04 |
| Perceived stress | .02 | .05 | .23 | .64 | 1.02 | .93 to 1.13 |
| Total social support | .03 | .24 | .02 | .89 | 1.04 | .65 to 1.65 |

**Table 7**

*Cox’s regression statistics for a model investigating the psychosocial variables and duration of breastfeeding at six weeks.*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Covariate | Coefficient  (β) | Standard  Error | Wald  c2 | *P*  Value | Exp (B) | 95% CI for  Exp (B) |
| Intention to breastfeed | -.20 | .80 | .07 | .80 | .82 | .17 to 3.87 |
| Self-efficacy | -.08 | .05 | 2.14 | .14 | .93 | .84 to 1.03 |
| Perceived stress | -.01 | .04 | .12 | .73 | .99 | .91 to 1.07 |
| Total social support | -.20 | .16 | 1.62 | .20 | .82 | .60 to 1.12 |

***Content analysis of the open text survey responses:***

The secondary aim of this study was to gain insight into what influences infant feeding using content analysis of the free-text responses. Table 8 contains the findings of the content analysis along with the count and percentages for each of the codes.

*What would have helped to feel more prepared:* 14% said that they would have felt more prepared if they had attended antenatal classes, had more ‘hands on’ support and if they could interact with a mother currently breastfeeding. A further 14% mentioned that being more aware of some of the more common breastfeeding difficulties would help them be prepared for these:

‘*If there was more information about the difficulties. More realistic information might help people be more prepared i.e. the fact that it can hurt initially even with a good latch but it does ease’.*

*Reasons for stopping breastfeeding/starting formula milk:* An interesting finding was that the reasons for stopping breastfeeding were different to the reasons given for starting to use formula milk. The former tended to be due to health or medical issues related to experiencing pain (29%), milk supply (24%) and difficulty latching on (12%):

*‘Despite hours and hours and hours of help from hospital midwives, community midwives, breastfeeding specialists, it was beyond painful. My nipples were bleeding, blistered, cracked. I tried everything. I used a breast pump but often just pumped blood and never more than 1ml of milk even after 20 minutes’.*

Whereas, the latter tended to be due to more practical or social issues such as to get some sleep (18%), to fit in with lifestyle (12%), or to share feeding with a partner (12%):

*‘Allow more people to feed her and take some of the stress away from me’.*

*‘I felt he was hungry and my milk hadn't come in and I felt he would benefit from a top-up and it allowed us to get some rest’.*

*What would have helped to breastfeed for longer:* The new mothers reported several aspects of their experience that would have helped them to breastfeed for longer. One of these suggestions was more ‘hands on’ practical support once the baby had arrived (29%). However, the other most common responses were related to the impact that having a traumatic birth had on breastfeeding (17%) and around better pain management after birth (13%):

*I was very poorly after the birth which was an emergency elective C-section (baby was breech and previous 3rd-degree tear) and we were in hospital for almost two weeks after the birth. Feeding was incredibly painful also because of an infected wound, several infected cannula sites on both arms, a chest infection*.

*What was the most useful source of support:* The new mothers were able to provide insight into which sources of support they found the most useful to them. Getting the latch right (17%) and being shown breastfeeding positions (14%) were the highest-rated categories. Following this was the support they received while in the hospital (8%) and someone visiting their home to help them with breastfeeding (6%):

*‘Been shown physically how to hold and position the baby to latch on and how to find it comfortable for me* *and baby’.*

*‘I was in the hospital for a week after my baby was born so I received great one to one care when I was struggling to feed especially after my milk came in’.*

*What was the most unhelpful source of support:* In terms of unhelpful sources of support, 15% said that contradictory messages from health professionals left them feeling confused and uncertain about how to feed their baby:

*‘Straight after birth, I had various pieces of conflicting advice from midwives about how often he should be feeding which left me feeling confused and uncertain’*.

12% felt that handing out leaflets rather than discussing feeding with them directly was not helpful, especially if the material did not cover how to deal with common issues around initiating breastfeeding.

*‘Leaflets really can't prepare you as you need hands-on practical advice when baby is here. Nothing can prepare you beforehand’.*

9% of mothers felt that there are unrealistic expectations of breastfeeding and they would prefer to know about the challenges and how to overcome these with some practical solutions.

*‘While pregnant, breastfeeding is pushed in your face and you are constantly reminded that it's the best milk for your baby and baby health, helps you lose weight and free! So you think great. But no one tells you how hard it actually is and how you have to keep at it and how it can be painful. No-one explains that every baby is different’.*

***\*\*Insert Table 8 here\*\****

**Discussion**

The first aim of this study was to explore factors that predict breastfeeding duration. Specifically, whether self-efficacy, intention to breastfeed, social support and perceived stress predicted exclusive breastfeeding at one and six weeks post-birth. Findings suggested that there were no significant predictors of duration of breastfeeding at one week and six weeks. The second aim was to gain insight into what would have helped first-time mothers to breastfeed for longer. The vast majority of participants wanted to breastfeed but breastfeeding rates at six weeks were still low. Several reasons were put forwards for this, including a lack of practical breastfeeding support. Other notable qualitative findings included that women had decided on feeding method before the baby was born, and that breastfeeding support was most needed in the week following the birth. Both key pieces of information for designing breastfeeding interventions.

Finding no predictors of breastfeeding duration was unexpected and not in line with findings of previous research (Bai et al., 2010; Blyth et al., 2004; Guo et al., 2015; Kronborg and Vaeth, 2004). The finding that self-efficacy did not reach significance in this study, was unexpected due to the strength of research evidence in support of this finding. Post-hoc power analysis (Clark-Carter, 2004) was conducted for both time points and suggested that if the sample size was increased to 190 participants, self-efficacy would reach sufficient power (.80). Alternatively, there may have been an issue with the chosen scale of self-efficacy and its suitability to measure self-efficacy related to breastfeeding. The current study used the GSE scale to gain a measure of self-efficacy which was comparable across the whole sample whether they were breastfeeding or not. If future research concentrates on a sample of women who have all breastfed then they could replicate this study using Breastfeeding Self-Efficacy Scale (BSES) (Dennis, 2003) as the questions in this scale have been specifically designed to measure the self-efficacy of women who are breastfeeding. Previous evidence for social support as a predictor of duration of breastfeeding was not conclusive as found in the current study (Akman et al., 2008; Blyth et al., 2004; Kronborg and Vaeth, 2004; Semenic et al., 2008) and limited research has studied the impact on perceived stress in the past. The present study did not find that these two psychosocial variables predicted the duration of breastfeeding at either time point.

This study found a significant negative correlation between perceived stress and self efficacy suggesting that higher levels of perceived stress were linked to lower self-efficacy, as found in previous research (Aziziz et al., 2018). This is especially important in the early days of breastfeeding when women may be experiencing higher levels of stress (due to recovering from birth, concerns about their baby, establishing feeding, change happening in their lives), which then reduces their self-efficacy to breastfeed. If interventions were designed to recognise these needs and reduce stress, this could improve confidence to breastfeed and therefore increase duration. It is understandable that if women have other issues following the birth, they may not have the capacity to focus on breastfeeding especially if also faced with the known challenges of establishing breastfeeding. Stopping or not trying to breastfeed could to them be one less thing to worry about. This suggests that targeted interventions to reduce maternal stress could have a positive influence on levels of self-efficacy.

Despite efforts to recruit a broad sample, in the current study the majority of women who took part intended to breastfeed meaning that it was not possible to fully explore this variable. They were also predominantly white and highly educated. Previous research has also found the similarity in terms of the majority of respondents being white, around 30 years old and married (Dagher et al., 2016), this also fits with the general profile of women who are most likely to breastfeed (McAndrew et al., 2012). The variance in the current study was not found to be predicted by demographic variables. Similarly, previous research (Amiel Castro et al., 2017; O’Brien et al., 2008) found that psychosocial factors were more predictive of breastfeeding than demographic characteristics.

Our quantitative analysis did not differentiate between women who planned to breastfeed and those who thought they might breastfeed in terms of their actual breastfeeding duration. However, the content analysis of free-text responses given by the participants provides an explanation for this.The findings mirror previous research (Burton et al., 2021; Graffy and Taylor, 2005) which suggests that the mothers wanted to breastfeed but to do this successfully they need more ‘hands on’ support with latching on and positioning once their baby has arrived. Information on the potential difficulties associated with breastfeeding along with practical solutions would empower mothers in difficult times. As found previously, pain either when breastfeeding or following a traumatic birth are reported barriers to breastfeeding (McAndrew et al., 2012). Although such issues were highlighted several years ago, the current research demonstrates that this is still an important area that needs to be addressed if breastfeeding rates are to be improved in the UK.

*Implications for practice:*

This research has provided many implications for practice. Firstly, this study supports previous research by finding that higher levels of perceived stress were linked to lower self-efficacy (Aziziz et al., 2018). This suggests that targeted interventions to reduce maternal stress could have a positive influence on levels of self-efficacy. Secondly, 91% of mothers decided how they would feed their baby before they were pregnant (57%) or during pregnancy (34%) which provides an important time point to provide accurate and supportive information about breastfeeding. Even though the majority of the mothers in this sample intended to breastfeed and initiated breastfeeding at birth, this reduced by one week and reduced further by six weeks. At six months less than half of those initiated at birth had continued to breastfeed. This reducing pattern of breastfeeding is similar to previous findings (McAndrew et al., 2012; Office for Health Improvement & Disparities, 2021; World Health Organisation, 2021), albeit a slightly higher rate of breastfeeding was found in the current study due to the high level of intention to breastfeed in this sample. This pattern was backed up by the finding that most of the mothers would have found breastfeeding support most beneficial leading up to the birth or within the first week following the birth. Thus providing a key time point and opportunity to discuss the intention to breastfeed earlier in the pregnancy and an urgency to provide adequate support immediately after the birth for at least the first week after birth.

Only 57% of women in this sample reported receiving plenty of support following the birth, from the community midwife and their health visitor. This has led to further questions around what support is needed by new mothers, how women define ‘support’ and who is the required support provider. Future research needs to work with new mothers to develop breastfeeding support interventions within the first few weeks after the baby is born to increase breastfeeding rates. The mothers in this sample understood the benefits of breastfeeding and named the key benefits being for the baby’s health and to promote bonding between mother and baby, and on the whole, wanted to breastfeed, but this needs to be backed up by practical support in the first hours and days when mothers are establishing breastfeeding for the first time.

*Limitations of this study:*

It is important to note that the breastfeeding duration for this sample is higher than that found in the previous infant feeding survey (McAndrew et al., 2012) and recent statistics (Public Health England, 2019). This is likely due to 80% of the mothers in the sample beginning with a high intention to breastfeed. Due to there being a low proportion of mothers who did not intend to breastfeed, the findings are not representative of all mothers in general. Attention was paid to designing this study to access a representative sample. Although our sample was biased towards a group who typically have higher breastfeeding rates (Oakley et al., 2013), we found large reductions in breastfeeding over time and quite a high proportion of this women had faced signigicant difficulties during the birth and afterwards. Nevertheless, the results of this study are important because they further our knowledge about the impact of psychosocial factors and the application of the TPB on the duration of breastfeeding in first-time mothers.There was a good rationale to investigate this combination of factors and the research findings demonstrate that focusing on these variables alone may not be suffcieint and additional factors raised in the content analysis, also need to be considered in future research.

Conclusion

The findings from this sample of first-time mothers showed that although many intended to breastfeed, a considerable number of them had stopped by the time their baby was six weeks old. Although significant predictors of breastfeeding were not found, this study makes a contribution to knowledge in the area.  It involved examining variables, following models in health psychology, for which there was a good rationale to include but which had not been included in combination in this context before. Given that such a study was worth conducting, a lack of significant results still helps inform research and practice in the area. This study found that higher levels of perceived stress were linked to lower self-efficacy, suggesting that targeted interventions to reduce maternal stress could have a positive influence on levels of self-efficacy. This research highlighted the complexities of measuring breastfeeding duration as a research variable. The open text survey responses provided an valuable insight into the breastfeeding experiences of first-time mothers.

A recommendation for future practice is that health care professionals work more closely with mothers with a strong intention to breastfeed to ensure they get the correct information and practical support at the right time to increase the likelihood of success. Specifially by preparing women for the potential difficulties they may face in establishing breastfeeding and by providing practical support in the first week after birth.

**References:**

Akman, I., Kuscu, M.K., Yurdakul, Z., Özdemir, N., Solakoǧlu, M., Orhon, L., Karabekiroǧlu, A., Özek, E., 2008. Breastfeeding duration and postpartum psychological adjustment: Role of maternal attachment styles. J. Paediatr. Child Health 44, 369–373. https://doi.org/10.1111/j.1440-1754.2008.01336.x

Amiel Castro, R.T., Glover, V., Ehlert, U., O’Connor, T.G., 2017. Antenatal psychological and socioeconomic predictors of breastfeeding in a large community sample. Early Hum. Dev. 110, 50–56. https://doi.org/10.1016/J.EARLHUMDEV.2017.04.010

Aziziz, E., Maleki, A., Mazloomzadeh, S., Pirzeh, R., 2018. An Evaluation of the Relationship between Perceived Stress and Breastfeeding Self-efficacy in Women Referred to Delivery Preparatory Classes in Zanjan, Iran in 2018. Prev. Care Nurs. Midwifery J. 8, 9–17. https://doi.org/10.29252/pcnm.8.2.9

Bai, Y., Middlestadt, S.E., Peng, C.-Y.J., Fly, A.D., 2010. Predictors of continuation of exclusive breastfeeding for the first six months of life. J. Hum. Lact. 26, 26–34. https://doi.org/10.1177/0890334409350168

Bandura, A., 1978. Self-efficacy: Toward a unifying theory of behavioral change. Adv. Behav. Res. Ther. 84, 191–215. https://doi.org/10.1016/0146-6402(78)90002-4

Bartle, N.C., Harvey, K., 2017. Explaining infant feeding: The role of previous personal and vicarious experience on attitudes, subjective norms, self-efficacy, and breastfeeding outcomes. Br. J. Health Psychol. 22, 763–785. https://doi.org/10.1111/bjhp.12254

Bengtsson, M., 2016. How to plan and perform a qualitative study using content analysis. NursingPlus Open 2, 8–14. https://doi.org/10.1016/j.npls.2016.01.001

Bland, R.M., 2003. Maternal recall of exclusive breast feeding duration. Arch. Dis. Child. 88, 778–783. https://doi.org/10.1136/adc.88.9.778

Blyth, R., Creedy, D.K., Dennis, C.-L., Moyle, W., Pratt, J., De Vries, S.M., Healy, G.N., 2004. Breastfeeding duration in an Australian population: The influence of modifiable antenatal factors. J. Hum. Lact. 20, 30–38. https://doi.org/10.1177/0890334403261109

Blyth, R., Creedy, D.K., Dennis, C.L., Moyle, W., Pratt, J., De Vries, S.M., 2002. Effect of maternal confidence on breastfeeding duration: An application of breastfeeding self-efficacy theory. Birth 29, 278–284. https://doi.org/https://doi.org/10.1046/j.1523-536X.2002.00202.x

Burton, A., Taylor, J., Swain, S., Heyes, J., Cust, F., Dean, S., 2021. A qualitative exploration of mixed feeding intentions in first-time mothers. https://doi.org/10.12968/bjom.2022.30.1.20 30, 20–29. https://doi.org/10.12968/BJOM.2022.30.1.20

Clark-Carter, D., 2004. Quantitative psychological research: The complete student’s companion. Psychology Press.

Cohen, S., Kamarck, T., Mermelstein, R., 1983. A Global Measure of Perceived Stress. J. Health Soc. Behav. 24, 385–396. https://doi.org/10.2307/2136404

Cohen, S., Wills, T.A., 1985. Stress, Social Support, and the Buffering Hypothesis. Psychol. Bull. 98, 310–357.

Colaizy, T.T., Saftlas, A.F., Morriss, F.H., 2012. Maternal intention to breast-feed and breast-feeding outcomes in term and preterm infants: Pregnancy Risk Assessment Monitoring System (PRAMS), 2000–2003. Public Health Nutr. 15, 702–710. https://doi.org/10.1017/S1368980011002229

Corby, K., Kane, D., Dayus, D., 2021. Investigating Predictors of Prenatal Breastfeeding Self-Efficacy. Can. J. Nurs. Res. 53, 56–63. https://doi.org/10.1177/0844562119888363

Dagher, R.K., McGovern, P.M., Schold, J.D., Randall, X.J., 2016. Determinants of breastfeeding initiation and cessation among employed mothers: A prospective cohort study. BMC Pregnancy Childbirth 16, 194. https://doi.org/10.1186/s12884-016-0965-1

De Jager, E., Broadbent, J., Fuller-Tyszkiewicz, M., Skouteris, H., 2014. The role of psychosocial factors in exclusive breastfeeding to six months postpartum. Midwifery 30, 657–666. https://doi.org/10.1016/j.midw.2013.07.008

De Jager, E., Skouteris, H., Broadbent, J., Amir, L., Mellor, K., 2013. Psychosocial correlates of exclusive breastfeeding: A systematic review. Midwifery 29, 506–518. https://doi.org/10.1016/j.midw.2012.04.009

Dennis, C.-L., 2003. The Breastfeeding Self-Efficacy Scale: Psychometric Assessment of the Short Form. J. Obstet. Gynecol. Neonatal Nurs. 32, 734–744. https://doi.org/10.1177/0884217503258459

Dennis, C.-L., 1999. Theoretical Underpinnings of Breastfeeding Confidence: A Self-Efficacy Framework. J. Hum. Lact. 15, 195–201. https://doi.org/10.1177/089033449901500303

Gila-Díaz, A., Carrillo, G.H., de Pablo, Á.L.L., Arribas, S.M., Ramiro-Cortijo, D., 2020. Association between Maternal Postpartum Depression, Stress, Optimism, and Breastfeeding Pattern in the First Six Months. Int. J. Environ. Res. Public Heal. 2020, Vol. 17, Page 7153 17, 7153. https://doi.org/10.3390/IJERPH17197153

Giles, M., McClenahan, C., Armour, C., Millar, S., Rae, G., Mallett, J., Stewart-Knox, B., 2014. Evaluation of a theory of planned behaviour-based breastfeeding intervention in Northern Irish schools using a randomized cluster design. Br. J. Health Psychol. 19, 16–35. https://doi.org/10.1111/BJHP.12024

Graffy, J., Taylor, J., 2005. What Information, Advice, and Support Do Women Want With Breastfeeding? Birth 32, 179–186. https://doi.org/10.1111/j.0730-7659.2005.00367.x

Grano, C., Fernandes, M., Conner, M., 2022. Predicting intention and maintenance of breastfeeding up to 2-years after birth in primiparous and multiparous women. Psychol. Heal. https://doi.org/10.1080/08870446.2021.2025374

Guo, J., Wang, T., Liao, J., Huang, C., 2015. Efficacy of the theory of planned behavior in predicting breastfeeding: Meta-analysis and structural equation modeling. Appl. Nurs. Res. 29, 37–42. https://doi.org/10.1016/j.apnr.2015.03.016

Ismail, T.A.T., Muda, W.A.M.W., Bakar, M.I., 2016. The extended theory of planned behavior in explaining exclusive breastfeeding intention and behavior among women in Kelantan, Malaysia. Nutr. Res. Pract. 10, 49–55. https://doi.org/10.4162/nrp.2016.10.1.49

Kronborg, H., Vaeth, M., 2004. The influence of psychosocial factors on the duration of breastfeeding. Scand. J. Public Health 32, 210–216. https://doi.org/10.1080/14034940310019218

Lucijanic, M., Petrovecki, M., 2012. Analysis of censored data Lessons in biostatistics, Biochemia Medica.

McAndrew, F., Thompson, J., Fellows, L., Large, A., Speed, M., Renfrew, M.J., 2012. Infant Feeding Survey 2010. The Health and Social Care Information Centre.

Mcmillan, B., Conner, M., Woolridge, M., Dyson, L., Green, J., Renfrew, M., Bharj, K., Clarke, G., 2008. Predicting breastfeeding in women living in areas of economic hardship : explanatory role of the theory of planned behaviour. Psychol. Health 23, 767–788. https://doi.org/10.1080/08870440701615260

Meedya, S., Fahy, K., Kable, A., 2010. Factors that positively influence breastfeeding duration to 6 months: A literature review. Women and Birth 23, 135–145. https://doi.org/10.1016/j.wombi.2010.02.002

Mezzacappa, E.S., 2004. Breastfeeding and maternal stress response and health. Nutr. Rev. 62, 261–268. https://doi.org/10.1301/nr.2004.jul.261-268

Mezzacappa, E.S., Guethlein, W., Vaz, N., Bagiella, E., 2000. A preliminary study of breast-feeding and maternal symptomatology. Ann. Behav. Med. 22, 71–79. https://doi.org/10.1007/BF02895170

Mezzacappa, E.S., Katkin, E.S., 2002. Breast-feeding is associated with reduced perceived stress and negative mood in mothers. Heal. Psychol. 21, 187–193. https://doi.org/10.1037/0278-6133.21.2.187

Ngo, L.T.H., Chou, H.F., Gau, M.L., Liu, C.Y., 2019. Breastfeeding self-efficacy and related factors in postpartum Vietnamese women. Midwifery 70, 84–91. https://doi.org/10.1016/J.MIDW.2018.12.014

Noel-Weiss, J., Boersma, S., Kujawa-Myles, S., 2012. Questioning current definitions for breastfeeding research. Int. Breastfeed. J. 7, 9. https://doi.org/10.1186/1746-4358-7-9

O’Brien, M., Buikstra, E., Hegney, D., 2008. The influence of psychological factors on breastfeeding duration. J. Adv. Nurs. 63, 397–408. https://doi.org/10.1111/j.1365-2648.2008.04722.x

Oakley, L.L., Renfrew, M.J., Kurinczuk, J.J., Quigley, M.A., 2013. Factors associated with breastfeeding in England: an analysis by primary care trust. BMJ Open 3, e002765-. https://doi.org/10.1136/bmjopen-2013-002765

Office for Health Improvement & Disparities, 2021. Breastfeeding statistics [WWW Document]. URL https://www.gov.uk/government/collections/breastfeeding-statistics (accessed 2.9.22).

Public Health England, 2019. Breastfeeding at 6 to 8 weeks after birth: annual data [WWW Document]. URL https://www.gov.uk/government/statistics/breastfeeding-at-6-to-8-weeks-after-birth-annual-data (accessed 2.14.22).

Royal College of Paediatrics and Child Health, 2021. Breastfeeding in the UK - position statement [WWW Document]. URL https://www.rcpch.ac.uk/resources/breastfeeding-uk-position-statement#key-facts (accessed 2.14.22).

Schwarzer, R., Jerusalem, M., 1995. General Self-efficacy Scale. Meas. Heal. Psychol. A user’s portfolio. Causal Control beliefs 35–37. https://doi.org/10.1037/t00393-000

Semenic, S., Loiselle, C., Gottlieb, L., 2008. Predictors of the duration of exclusive breastfeeding among first-time mothers. Res. Nurs. Heal. 31, 428–441. https://doi.org/10.1002/nur.20275

Victora, C.G., Bahl, R., Barros, A.J.D., França, G.V.A., Horton, S., Krasevec, J., Murch, S., Sankar, M.J., Walker, N., Rollins, N.C., Allen, K., Dharmage, S., Lodge, C., Peres, K.G., Bhandari, N., Chowdhury, R., Sinha, B., Taneja, S., Giugliani, E., Horta, B., Maia, F., de Mola, C.L., Hajeebhoy, N., Lutter, C., Piwoz, E., Martines, J.C., Richter, L., 2016. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet 387, 475–490. https://doi.org/10.1016/S0140-6736(15)01024-7

Wallenborn, J.T., Perera, R.A., Wheeler, D.C., Lu, J., Masho, S.W., 2019. Workplace support and breastfeeding duration: The mediating effect of breastfeeding intention and self-efficacy. Birth 46, 121–128. https://doi.org/10.1111/BIRT.12377

Wilhelm, S.L., Rodehorst, T.K., Stepans, M.B.F., Hertzog, M., Berens, C., 2008. Influence of intention and self-efficacy levels on duration of breastfeeding for midwest rural mothers. Appl. Nurs. Res. 21, 123–130. https://doi.org/10.1016/j.apnr.2006.10.005

World Health Organisation, 2021. Infant and young child feeding [WWW Document]. URL https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding (accessed 2.9.22).

Zhang, Z., Zhu, Y., Zhang, L., Wan, H., 2018. What factors influence exclusive breastfeeding based on the theory of planned behaviour. Midwifery 62, 177–182. https://doi.org/10.1016/J.MIDW.2018.04.006

Zimet, Powell, S., Farley, G., Werkman, S., Berkoff, K., 1988. Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. J. Pers. Assess. 52, 30–41. https://doi.org/10.1080/00223891.1990.9674095

|  |  |  |
| --- | --- | --- |
| **What would have helped you feel more prepared?** = 49 responses | N | % |
| Attending Antenatal Class  Raising awareness of breastfeeding difficulties  Interaction with someone who is already breastfeeding  More ‘hands on’ practical support  Information on ‘normal’ breastfeeding behaviour  More realistic breastfeeding information  Information on bottle-feeding  How to stimulate milk supply  **Other:** Breastfeeding positions, Awareness of feeding support, Feeding support closer to home, information on health conditions. | 7  7  7  7  6  6  3  2  4 | 14  14  14  14  12  12  6  4  8 |
| **What was the reason for stopping breastfeeding?** = 34 responses | N | % |
| Pain and discomfort make it hard to continue  Issue with supply and demand  General happiness of the mum or baby  Issue with latch  Baby losing weight  Traumatic birth led to difficulties feeding  Difficulty expressing milk | 10  8  6  4  3  2  1 | 29  24  18  12  9  6  3 |
| **What was the reason for feeding your baby formula?** = 17 responses | N | % |
| Issue with supply and demand  Issue with latch  To give me a rest  Allow others to feed the baby  To fit in with my lifestyle  **Other:** Baby losing weight, pain and discomfort making it hard to continue | 4  4  3  2  2  2 | 24  24  18  12  12  12 |
| **What would have helped you to Breastfeed for longer?** = 24 responses | N | % |
| More ‘hands on’ practical support  Not having a traumatic birth  Pain management  Better milk supply  Awareness of breastfeeding difficulties beforehand  **Other:** Diagnosis of tongue-tie, expressing milk, If I had enjoyed it, not returning to work, the time between birth and first feed | 7  4  3  2  2  5 | 29  17  13  8  8  21 |
| **What was the most useful source of support?** = 92 responses | N | % |
| Getting the latch right  Being shown breastfeeding positions  Support with feeding in hospital  Someone visiting my house to help with feeding  Not being pressured either way  Going to baby café for support  Being told things are normal  Being reassured  Support with feeding from friends or family  Antenatal information on feeding  Encouragement  Information on how often a baby needs to feed  How to express milk  Information on bottle-feeding  Keeping practicing  Provided with a contact number if needed help  Reading books on feeding  Recognising when something is wrong  Information from the Internet  **Other:** Feeling listened to, emotional support, how partner could support, staff being patient, not preparing to formula feed | 16  13  7  6  6  6  5  4  3  2  2  2  2  2  2  2  2  2  2  5 | 17  14  8  6  6  6  5  4  3  2  2  2  2  2  2  2  2  2  2  5 |
| **What was the least useful source of support?** = 48 responses | N | % |
| Being provided with contradictory information  Health professionals not being helpful  Being given leaflets  Unrealistic expectations of breastfeeding  Pressure to formula feed by health professionals  Being encouraged to ‘top up’ feed  Health professionals having different opinions  Antenatal classes judgemental of bottle-feeding  Being told by a health professional to stop breastfeeding if is painful  Seeing a different midwife each time  **Other:** Getting information on feeding when pregnant, lack of breastfeeding support, no awareness of difficulties | 8  7  6  5  5  5  3  3  2  2  2 | 15  13  12  9  9  9  6  6  4  4  4 |

**Table 8:The total number of codes (N) and the % for each open text question.**