Breastfeeding continuation is associated with trait mindfulness but not with trajectories of postpartum depressive symptoms

Lianne P Hulsbosch [a],[*], Ivan Nyklíček [a], Myrthe GBM Boekhorst [a], Eva S Potharst [b],[c],
Victor JM Pop [a]

[a] Center of Research in Psychological and Somatic disorders (CoRPS), Department of Medical and Clinical Psychology, Tilburg University, Tilburg, the Netherlands
[b] UvA minds, academic outpatient (child and adolescent) treatment center of the University of Amsterdam, Amsterdam, the Netherlands
[c] Research Institute of Child Development and Education, University of Amsterdam, Amsterdam, the Netherlands

ABSTRACT

Objective: The WHO recommends breastfeeding for at least six months as breastfeeding has many benefits for both infant and mother. The association of breastfeeding continuation with trait mindfulness during pregnancy and trajectories of postpartum depressive symptoms has not been examined yet. The current study aimed to assess this association using cox regression analysis.

Design, setting and participants: The current research is part of a large longitudinal prospective cohort study following women from 12 weeks of pregnancy onwards in the South-East part of the Netherlands.

Measurements: A total of 698 participants filled out the Three Facet Mindfulness Questionnaire-Short Form (TFMQ-SF) at 22 weeks of pregnancy and completed both the Edinburgh Postnatal Depression Scale (EPDS) and questions on breastfeeding continuation one week, six weeks, four months, and eight months postpartum. Breastfeeding continuation was defined as exclusive breastfeeding or both breastfeeding and formula. The assessment eight months postpartum was used as a proxy for the WHO recommendation to continue breastfeeding for at least six months.

Findings: Two trajectories (classes) of EPDS scores were determined using growth mixture modeling: 1) *low stable* ($N = 631$, 90.4%), and 2) *increasing* ($N = 67$, 9.6%). Cox regression analysis showed that the trait mindfulness facet non-reacting was significantly and inversely associated with the risk of breastfeeding discontinuation (HR = 0.96, 95% CI [0.94, 0.99], $p = .002$), while no significant association was found for belonging to the *increasing* EPDS class versus belonging to the *low stable* class ($p = .735$), adjusted for confounders.

Key conclusions: This study is the first to show that higher trait mindfulness non-reacting scores, but not persistently low levels of postpartum depressive symptoms, increase the likelihood of breastfeeding continuation.

Implications for practice: Improving non-reacting in perinatal women by meditation practice as part of a mindfulness-based intervention may lead to better breastfeeding continuation outcomes. Several mindfulness-based programs may be suitable.

Statement of significance

Problem or Issue: In Europe, breastfeeding continuation rates decrease considerably within six months, whereas the WHO recommends breastfeeding for at least six months given its many benefits.

What is already known: Several factors have been associated with breastfeeding continuation. Postpartum depressive symptoms (cross-sectionally measured) have been negatively associated with breastfeeding continuation.

What this Paper Adds: This paper investigates the association of trait mindfulness and longitudinal trajectories

* Corresponding author at: Tilburg University, Department of Medical and Clinical Psychology, P.O. BOX 90153, 5000 LE Tilburg, the Netherlands.
E-mail address: l.p.hulsbosch@tilburguniversity.edu (L.P. Hulsbosch).

of postpartum depressive symptoms with breastfeeding continuation during the first eight months postpartum. Higher trait mindfulness non-reacting scores increase the likelihood of breastfeeding continuation. Persistently high depressive symptoms are not related to breastfeeding continuation.

Introduction

The World Health Organization (WHO) strongly recommends breastfeeding for at least six months after childbirth (WHO, 2021). Benefits for breastfeeding are well-known. For infants, breastfeeding is a vital part of a healthy development, provides immune protection, improves neurodevelopmental outcomes, and protects against developing obesity and diabetes (Horta and de Lima, 2019; Horta et al., 2015; Hosea Blewett et al., 2008; Hou et al., 2021; Lund-Blix et al., 2017; WHO, 2021). For mothers, breastfeeding involves a decreased risk of postpartum depression, reduced blood pressure, and a reduced risk for breast and ovarian cancer and type 2 diabetes (Chowdhury et al., 2015; Figueiredo et al., 2013; Groer et al., 2013; Ip et al., 2007; Miksic et al., 2020). In Europe, the breastfeeding initiation rates are rather high (from 57% in Ireland to 99% in Scandinavian countries), while the breastfeeding continuation rates six months postpartum are rather low (from 22% in Greece to 80% in Scandinavian countries) (Sarki et al., 2019).

Breastfeeding continuation six months postpartum has been associated with higher age, high level of education, being married, breastfeeding intention, breastfeeding self-efficacy and social support, and negatively associated with insufficient milk supply, employment outside the home and postpartum depressive symptoms (Meedya et al., 2010; Radwan et al., 2021). However, most studies assessed the association between postpartum depressive symptoms and breastfeeding continuation cross-sectionally (Dias and Figueiredo, 2015; Radwan et al., 2021; Wouk et al., 2017; Wu et al., 2019), while symptoms of depression can vary considerably over time, both within and between individuals (Nandi et al., 2009). This emphasizes the importance of using trajectories of postpartum depressive symptoms that reflect the longitudinal course of these symptoms over time, instead of cross-sectional measurements when examining the possible association with breastfeeding continuation.

Moreover, given the beneficial impact of breastfeeding continuation and the remarkable decrease in breastfeeding rates over time, it is of great importance to investigate other possible 'protective' maternal factors that are associated with prolonged breastfeeding continuation. Understanding maternal factors with a beneficial impact on breastfeeding behavior could expand our knowledge on how to support women after childbirth in their breastfeeding practice. A maternal factor that may be associated with breastfeeding continuation is trait mindfulness, which is a person's aptitude to be mindful in daily life, which can be defined as being fully attentive to experiences in the here-and-now in a curious and accepting way (Baer et al., 2006; Bishop et al., 2004; Brown and Ryan, 2003). Besides this definition of mindfulness as a trait, mindfulness can also be conceptualized as a state (Baer et al., 2006; Brown and Ryan, 2003), which is dependent on the situation and can therefore be highly variable over a period of time (Bishop et al., 2004; Tanay and Bernstein, 2013). State mindfulness is a psychological process that can be exercised with mindfulness meditation (Bishop et al., 2004; Kiken et al., 2015). Increasing state mindfulness with mindfulness meditation could gradually enhance trait mindfulness (Kiken et al., 2015). However, without intervention trait mindfulness appears to be stable over time (Brown and Ryan, 2003; Veehof et al., 2011).

It has previously been reported that women who initiated breastfeeding showed higher trait mindfulness scores (Hulsbosch et al., 2021). However, the question whether trait mindfulness is also related to continuation of breastfeeding is unknown. Moreover, the association between trajectories of postpartum depressive symptoms and breastfeeding continuation has not been examined yet. In the current study, we used cox regression analysis to investigate the possible association of trait mindfulness during pregnancy and postpartum depressive symptoms with breastfeeding discontinuation during the first eight months postpartum.

Methods

Procedure

This study is part of the longitudinal prospective HAPPY cohort study (Holistic Approach to Pregnancy and the first Postpartum Year), of which the design has been reported elsewhere (Truijens et al., 2014). From January 2013 to September 2014, a total of 2269 Dutch-speaking pregnant women were invited to participate in the HAPPY study, at their first antenatal appointment. Women were followed at each pregnancy trimester, at one and six weeks postpartum, and at four and eight months postpartum. Exclusion criteria were multiple pregnancy, severe psychiatric disorder (e.g., schizophrenia, borderline personality disorder and bipolar disorder) and/or a documented history of chronic disease (e.g., diabetes and thyroid dysfunction). The HAPPY study was approved by the ethical committee of Tilburg University (protocol number EV-2012.25) and reviewed by the Medical Ethics Committee of the Máxima Medical Centre Veldhoven. All women provided written informed consent.

Participants

All women who were included in the HAPPY study between March 2013 and December 2013 completed a questionnaire measuring trait mindfulness at 22 weeks of pregnancy ($N = 911$). Of these women, 57 had missing data on the first assessment (one week postpartum) on the type of feeding they provided to their child. Moreover, 156 women had missing data on level of education ($N = 17$), parity ($N = 11$), and postpartum depressive symptoms ($N = 141$). These 213 women were excluded from analyses. Therefore, the final study sample included 698 women, which was 77% of the total 'mindfulness sample'.

Measures

Trait mindfulness during pregnancy

Trait mindfulness during pregnancy was measured using the Dutch version of the 12-item Three Facet Mindfulness Questionnaire-Short Form (TFMQ-SF) (Truijens et al., 2016) at 22 weeks of pregnancy. The TFMQ-SF was acquired from the Five Facet Mindfulness Questionnaire short form (Baer et al., 2006; Bohlmeijer et al., 2011). The measure contains three subscales that each contain four items and assess a different facet of mindfulness: (1) *acting with awareness*, being attentive to one's activities in the present moment, (2) *non-judging*, accepting thoughts and feelings without judgment, and (3) *non-reacting*, allowing thoughts and feelings to come and go, without getting carried away by them. Total scores per subscale range from 4 to 20 and higher scores indicate greater levels of mindfulness. The validity of the TFMQ-SF has been established in Dutch pregnant women (Truijens et al., 2016). The Cronbach's alphas in the current study were 0.87 (*acting with awareness*), 0.80 (*non-judging*), and 0.80 (*non-reacting*).

Postpartum depressive symptoms

The Dutch version of the 10-item Edinburgh Postnatal Depression Scale (EPDS) (Cox et al., 1987; Pop et al., 2011) was used to assess postpartum depressive symptoms. The EPDS was completed one week, six weeks, four months, and eight months postpartum. The EPDS includes two subscales: depression (7 items) and anxiety (3 items) (Brouwers et al., 2001; Matthey, 2008; Pop et al., 1992). In the current study the total EPDS was used as it has been shown to assess depressive and anxiety symptoms more accurately as compared to the subscales (Brouwers et al., 2001). Items are rated on a 4-point scale ranging from 0 to 3. Total scores range from 0 to 30, with higher scores reflecting greater levels of depressive symptoms. The EPDS has been shown to be a valid instrument to assess depressive symptoms in Dutch postpartum women with appropriate psychometric properties (Pop et al., 1992). The Cronbach's alphas in the current study were 0.87 (one week postpartum), 0.87 (six weeks postpartum), 0.86 (four months postpartum), and 0.89 (eight months postpartum).

Breastfeeding continuation

Whether women continued to breastfeed their child in the first postpartum year was measured at four time points: one week, six weeks, four months, and eight months postpartum. The measurement of breastfeeding continuation eight months postpartum was used as a proxy for the WHO recommendation to continue breastfeeding for at least six months. At all four time points women completed the following question: *"What kind of feeding do you give at the moment?"*. This question included the following answer options: breastfeeding / both breastfeeding and formula / formula. To assess breastfeeding continuation, the answer options were dichotomized in: 0 = exclusive formula / 1 = exclusive breastfeeding or both breastfeeding and formula.

Descriptive characteristics

Demographic characteristics were collected at 12 weeks of pregnancy, including *age, level of education* (low/medium/high (low = primary education or secondary pre-vocational education, medium = secondary education or vocational education, high = Bachelor's degree or higher)), *employment* (yes/no), *living with partner* (yes/no), *parity* (primiparous/multiparous), *unplanned pregnancy* (yes/no), *preterm birth* (≤ 37 weeks; yes/no), and *history of depression* (yes/no).

Statistical analysis

Longitudinal trajectories (classes) of postpartum depressive symptoms were determined by means of growth mixture modeling in Mplus version 8.5 (Muthén and Muthén, 1998–2017). The total EPDS scores at four time points were used: one week, six weeks, four months, and eight months postpartum. The EPDS scores were positively skewed with a high number of scores equaling zero. Therefore, the MLR estimation (maximum likelihood estimation with robust standard errors) was used in the analyses. Several fit indices were considered to make decisions on the most favorable number of classes: Bayesian Information Criterion (BIC), Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT), and Bootstrapped Likelihood Ratio Test (BLRT) (Jung and Wickrama, 2008; Nylund et al., 2007). Better-fitting models are indicated by lower BIC values (Collins and Lanza, 2010), while a significant LMR-LRT and BLRT indicate that a model with an additional class improves the model fit. In addition, the entropy was observed, as entropy values closer to 1 indicate a clearer delineation of classes (Collins and Lanza, 2010).

After growth mixture modeling was completed, women were assigned to their most likely class and a variable that indicated

Table 1
Characteristics of the study sample ($N = 698$).

	N (%)	Mean (SD)	Range
Demographics			
Age		30.2 (3.5)	19–43
Level of education			
Low	29 (4.2)		
Medium	188 (26.9)		
High	481 (68.9)		
Employed	645 (92.4)		
Living with partner	693 (99.3)		
Pregnancy related			
Primiparity	371 (53.2)		
Multiparity	327 (46.8)		
Unplanned pregnancy	663 (95.0)		
Preterm birth (≤ 37 weeks)	22 (3.2)		
Psychological features			
History of depression	94 (13.5)		
TFMQ-SF 22 weeks of pregnancy			
Acting with awareness		14.6 (3.1)	7–20
Non-judging		16.2 (3.1)	5–20
Non-reacting		11.9 (4.2)	4–20
EPDS			
One week postpartum		5.0 (4.6)	0–28
Six weeks postpartum		4.8 (4.7)	0–25
Four months postpartum		4.8 (4.4)	0–24
Eight months postpartum		4.4 (4.7)	0–26

Note: SD, standard deviation; low level of education, primary education or secondary pre-vocational education; medium level of education, secondary education or vocational education; high level of education, Bachelor's degree or higher; TFMQ-SF, Three Facet Mindfulness Questionnaire - Short Form; EPDS, Edinburgh Postnatal Depression Scale.

a participant's class membership was exported to Statistical Package for Social Sciences (SPSS version 24, IBM, Chicago IL, USA). A cox regression was used to examine a possible association of facets of trait mindfulness (predictor) and trajectories of postpartum depressive symptoms (predictor) with breastfeeding discontinuation during the first eight months postpartum. We defined that an event occurred at a certain time point when a breastfeeding woman (either exclusive or in combination with formula) reported to exclusively give formula feeding at this time point. The duration measure (time until event) was defined in months. Women were designated as *censored* when the event was not observed, either due to missing values or due to them continuing breastfeeding eight months postpartum. The proportional hazard assumption was tested by including the interaction terms with time in the model for all predictors and confounders. For the trajectories of postpartum depressive symptoms, the trajectory with the highest percentage of women was set as the reference category. We adjusted for the following confounders: age, level of education, parity, preterm birth, and history of depression. Level of education (low, medium, and high) was dummy coded with low level of education as the reference. Statistical significance was assumed for $p < .05$.

Findings

Table 1 shows the characteristics of the study sample ($N = 698$). Compared to the remainder of the HAPPY sample ($N = 1517$), the women in the study sample were more often highly educated ($\chi^2(2) = 15.8$, $p < .001$, Cramer's $V = 0.09$) and primiparous ($\chi^2(1) = 6.2$, $p = .013$, phi coefficient = 0.05). Moreover, the women in the study sample more often had a partner ($\chi^2(1) = 3.9$, $p = .047$, phi coefficient = 0.04) and an unplanned pregnancy ($\chi^2(1) = 5.9$, $p = .015$, phi coefficient = 0.05), and less often had a history of depression ($\chi^2(1) = 4.9$, $p = .027$, phi coefficient = 0.05). However, all differences showed small effect sizes (clinically not relevant). The study sample did not differ from the remainder of
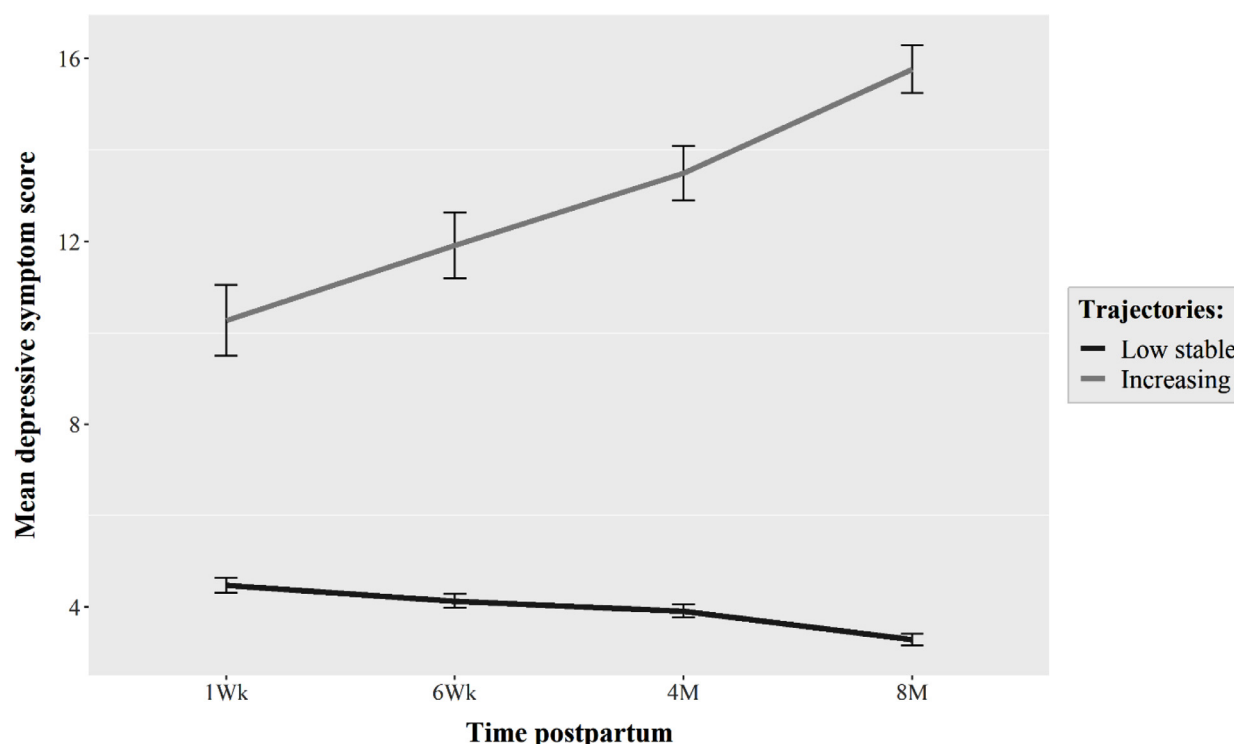
Fig. 1. Longitudinal trajectories of postpartum depressive symptoms (N = 698).

the HAPPY sample regarding age and employment. In addition, no significant differences were found for breastfeeding continuation and postpartum depressive symptoms at each time point.

Longitudinal trajectories of postpartum depressive symptoms

The fit indices (BIC, LMR-LRT, BLRT) and entropy showed the two-class model to be the optimal model in representing longitudinal trajectories of postpartum depressive symptoms (Supplementary Table 1). This two-class model is shown in Fig. 1. The first class (N = 631, 90.4%, *low stable*) consisted of women who showed low stable depressive symptom scores throughout the first eight months postpartum with EPDS mean scores between 3.3 and 4.5. The second class (N = 67, 9.6%, *increasing*) included women with high and increasing depressive symptom scores from one week postpartum until eight months postpartum (EPDS mean scores between 10.3 and 15.8, repeated measures (RM) ANOVA: $F(2.53)$ = 21.2, p < .001, η^2_P = 0.31, large effect size). At each time point the depressive symptom mean scores were significantly higher in the *increasing* class compared to the *low stable* class (t(58.4 to 72.1) = 7.3 to 23.1, all p < .001, Cohen's d = 1.09 to 3.64, large effect sizes).

Breastfeeding continuation

One week postpartum, 78.8% of the women breastfed their child. This percentage of breastfeeding women decreased to 14.3% eight months postpartum. Between one and six weeks postpartum, the percentage of breastfeeding women dropped 27.4%, between six weeks and four months postpartum another 17.0%, and between four and eight months postpartum this percentage dropped 20.1%.

A cox regression was performed to assess a possible association of facets of trait mindfulness during pregnancy (acting with awareness, non-judging, and non-reacting) and trajectories of postpartum depressive symptoms with discontinuation of

breastfeeding during the first eight months postpartum, adjusted for confounders (age, level of education, parity, preterm birth, and history of depression). No multicollinearity occurred between the predictor variables (facets of trait mindfulness and trajectories of postpartum depressive symptoms) as the correlations between these variables showed to be below 0.5 (Pearson correlation, Supplementary Table 2). During the first eight months postpartum, an event occurred in 575 of the 698 women (82.4%), indicating that they exclusively bottle-fed their baby with formula. Twenty-three women (3.3%) did not complete all questions on type of feeding throughout the postpartum period, and it was therefore unclear whether and/or when an event occurred. A total of 100 women (14.3%) still breastfed their baby eight months postpartum, thus an event did not occur for these women. These 123 women were included in the cox regression as *censored*. The proportional hazard assumption was checked for all predictors and covariates. The inclusion of the interaction terms with time in the model did not provide a significant improvement of the model (p = .197). Moreover, none of the interaction terms with time were significant (p = .103 to .968). Therefore, the proportional hazard assumption was not violated in our model. Our cox regression model was statistically significant ($\chi^2(10)$ = 39.3, p < .001). Fig. 2 shows the probability that a woman continued to breastfeed her child beyond a given time point during the postpartum period adjusted for the predictors and confounders in the cox regression model.

The mindfulness facet non-reacting was negatively associated with the hazard of discontinuation of breastfeeding (HR = 0.96, 95% CI [0.94, 0.99], p = .002, Table 2). This hazard ratio of 0.96 can be interpreted as follows: for every increase of 1 on the non-reacting facet (with scores ranging from 4 to 20) the risk of breastfeeding discontinuation decreased with 4%. No significant associations were found for the mindfulness facets acting with awareness (p = .280) and non-judging (p = .748). Moreover, belonging to the *increasing* postpartum depressive symptom class (predictor) versus belonging to the *low stable* class did not show a significant association with breastfeeding discontinuation
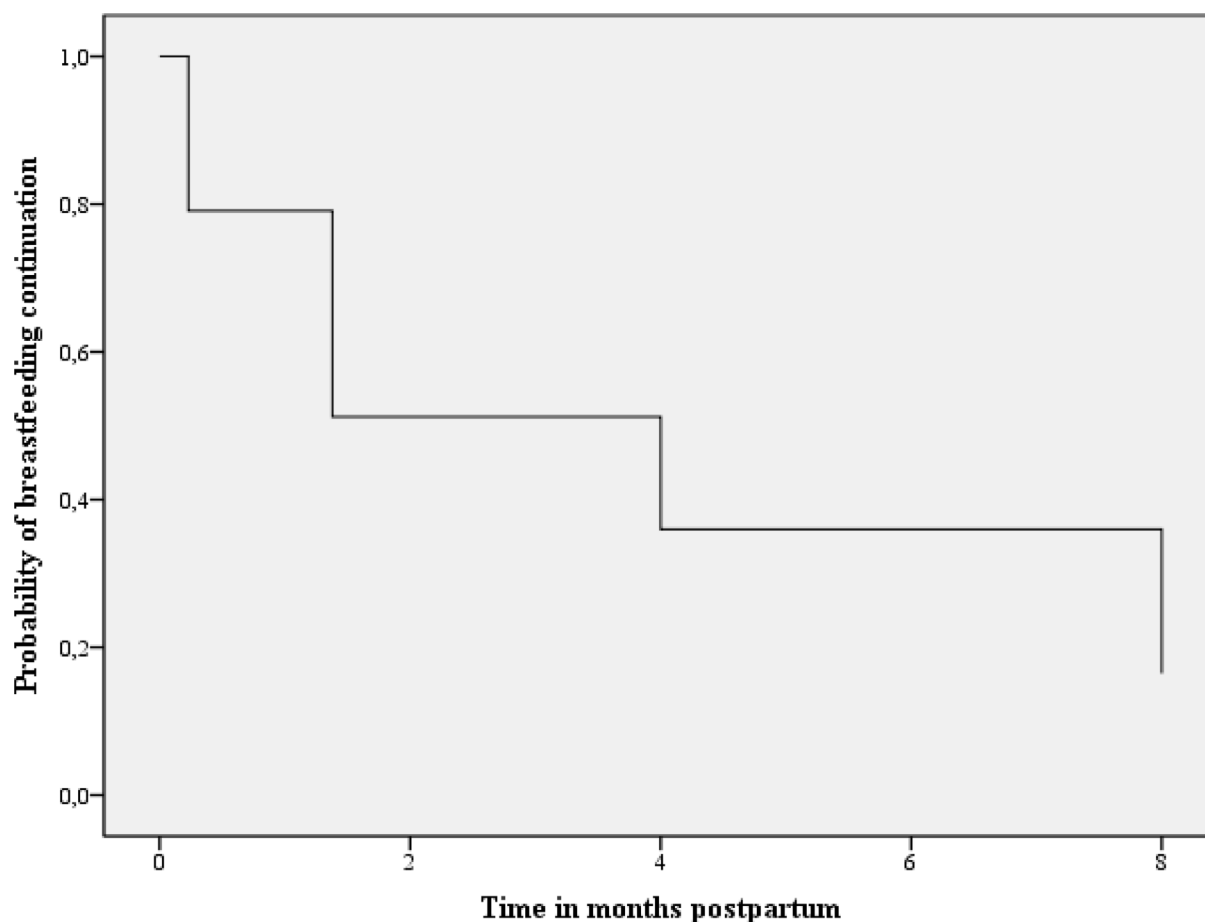
Fig. 2. Probability that a woman is breastfeeding beyond a given time point during the postpartum period adjusted for predictors (trait mindfulness and trajectories of postpartum depressive symptoms) and confounders (age, level of education, parity, preterm birth ($\leq$ 37 weeks), and history of depression) ($N = 698$).

Table 2
Cox regression predicting time to discontinuation of breastfeeding ($N = 698$).

	HR	95% CI	*p*-value
TFMQ-SF: acting with awareness	0.98	[0.95, 1.01]	.280
TFMQ-SF: non-judging	1.01	[0.97, 1.04]	.748
TFMQ-SF: non-reacting	0.96	[0.94, 0.99]	**.002**
Increasing EPDS vs. *low stable* EPDS	0.95	[0.71, 1.27]	.735
Age	0.99	[0.96, 1.01]	.256
Level of education: medium vs. low	0.75	[0.50, 1.13]	.171
Level of education: high vs. low	0.60	[0.40, 0.90]	**.014**
Multiparity	1.19	[1.01, 1.41]	**.046**
Preterm birth ($\leq$ 37 weeks)	1.24	[0.79, 1.95]	.352
History of depression	0.88	[0.68, 1.14]	.326

Note: HR, Hazard Ratio; CI, Confidence Interval; TFMQ-SF, Three Facet Mindfulness Questionnaire - Short Form; EPDS, Edinburgh Postnatal Depression Scale; low level of education, primary education or secondary pre-vocational education; medium level of education, secondary education or vocational education; high level of education, Bachelor's degree or higher.
Bold: significance as defined by p < .05.

($p = .735$). Regarding the confounders, being highly educated was negatively related to the hazard of discontinuation of breastfeeding, compared to having a low level of education (HR = 0.60, 95% CI [0.40, 0.90], $p = .014$). The hazard ratio for level of education indicates that the risk of breastfeeding discontinuation decreased with 40% for a high educational level compared to a low educational level. Multiparity was positively related to the hazard of discontinuation of breastfeeding (HR = 1.19, 95% CI

[1.01, 1.41], $p = .046$). The hazard ratio indicates that the risk of breastfeeding discontinuation increased with 19% for multipara. No significant associations were found for age ($p = .256$), preterm birth ($p = .352$), and history of depression ($p = .326$).

Discussion

The current study showed that the percentage of women that still breastfed after childbearing decreased from 78.8% one week postpartum to 14.3% eight months postpartum. A cox regression analysis showed that the trait mindfulness facet non-reacting was significantly and negatively associated with the risk of breastfeeding discontinuation while persistently high levels of depressive symptoms (9.6%) were not, after adjusting for confounders such as age, education level, and parity.

The current study's results of the trait mindfulness facet non-reacting are an extension of previous findings regarding trait mindfulness and breastfeeding *intention and initiation*. It was previously reported that women who initiated breastfeeding after childbirth showed higher non-reacting scores (Hulsbosch et al., 2021). Findings of the current study further emphasize the advantage of the ability not to get carried away by thoughts and feelings (i.e., non-reacting) for the *continuation* of breastfeeding. Breastfeeding women may experience difficulties such as pain, lack of sleep, and problems with milk supply or latching on (Andrew and Harvey, 2011; McFadden and Toole, 2006). Moreover, breastfeeding women may experience limitations in their freedom or feel embarrassed to feed in front of others (McFadden and Toole, 2006;

Stewart-Knox et al., 2003). When breastfeeding women return to work after their maternity leave, they may face problems with expressing milk at work (Stewart-Knox et al., 2003). These difficulties may cause negative thoughts and feelings about breastfeeding which eventually could lead to breastfeeding discontinuation. Women with high scores on non-reacting may be able to let these negative thoughts and feelings come and go, without getting absorbed by them. Even when these women experience breastfeeding difficulties, they may still be able to see all the positive aspects of breastfeeding, resulting in that they may continue breastfeeding for a longer period of time. Since trait mindfulness was measured at 22 weeks of pregnancy it is important to note that this characteristic is relatively stable over time (Brown and Ryan, 2003; Veehof et al., 2011). Therefore, we presumed that women with high non-reacting scores at 22 weeks of pregnancy could depend on this in the postpartum period as well.

We found no significant association with risk of breastfeeding discontinuation for the mindfulness facet acting with awareness. This is also consistent with previous findings on trait mindfulness and breastfeeding *initiation* (Hulsbosch et al., 2021). When a woman with a high acting with awareness score breastfeeds her child, she may be able to be more attentive to this experience, which may help in the decision to continue breastfeeding. However, our results imply that there may be other factors that are more important in a woman's decision to continue breastfeeding. One of these factors may include breastfeeding difficulties. The mother's awareness in the precious breastfeeding moments with her child may not be sufficient to outweigh the breastfeeding difficulties she may encounter. These breastfeeding difficulties may be more consequential in making the decision to discontinue breastfeeding. Another factor that may outweigh the ability to fully experience the breastfeeding moments, when making decisions about breastfeeding, could be breastfeeding self-efficacy. Breastfeeding self-efficacy refers to how confident mothers feel about their ability to breastfeed, and has been associated with breastfeeding continuation (Economou et al., 2021; Meedya et al., 2010). It makes sense that when mothers feel less confident about their ability to breastfeed that they are less likely to continue breastfeeding. This (lack of) confidence may be more important when making the decision to discontinue breastfeeding.

We also found no significant association with risk of breastfeeding discontinuation for the mindfulness facet non-judging, consistent with previous findings on trait mindfulness and breastfeeding *initiation* (Hulsbosch et al., 2021). Non-judging refers to the ability to accept thoughts and feelings without judgement. A breastfeeding woman with a high non-judging score may be able to be more empathetic towards herself and less self-critical when she encounters breastfeeding difficulties. However, in the light of our results, also this ability of non-judgmental acceptance of negative thoughts and feelings may not be enough in deciding to continue breastfeeding for a longer time. It could be speculated that other factors such as breastfeeding difficulties and breastfeeding self-efficacy may be more significant when deciding to discontinue breastfeeding. When considering the fact that breastfeeding is a *decision* that mothers can make themselves, it could be speculated that a higher non-judging level might even 'help' to make the decision to discontinue breastfeeding, as women with high levels of non-judging might be less self-critical towards themselves when they do not choose to continue breastfeeding.

Interestingly, as shown in Supplementary Table 2, the trait mindfulness facet non-reacting was negatively correlated with the other two facets of trait mindfulness: acting with awareness and non-judging, and failed to show a correlation with the trajectories of postpartum depressive symptoms. In addition, the facets acting with awareness and non-judging were negatively correlated with the *increasing* class of postpartum

depressive symptoms. In contrast, previous studies in general samples showed a significant negative correlation between all three facets of trait mindfulness (including non-reacting) and depressive symptoms (Bohlmeijer et al., 2011; Branstrom et al., 2011; de Bruin et al., 2012). An explanation for these contrasting findings could be that perinatal women might approach the ability to let go of negative thoughts and feelings (i.e., non-reacting) differently compared to non-pregnant populations. During the perinatal period, women experience an intrapsychic change, which is called the Motherhood Constellation (Stern, 1995). This entails a development in which the mother becomes pre-occupied with the well-being and protection of her baby, and her own ability to be a good mother. These themes become especially salient and fear-organized during mid-pregnancy (Innamorati et al., 2010; Vizziello et al., 1993), the period in which trait mindfulness was measured in the current study. The fears related to the Motherhood Constellation that pregnant women encounter are not neurotic, but seem to facilitate a healthy adjustment to the new role as mother and the intensive task of taking care of a baby. Dealing with these fears in a healthy way entails emotional investment, emotional tolerance, the seeking of support, and making space for the baby, both mentally and practically. It may be that during this phase of the pregnancy, the non-reacting subscale (with, for example, the item *"When having distressing thoughts/images, I can just notice them without reacting"*) measures a tendency to move away from these fears instead of turning towards and tolerating them. This may explain the non-existent correlation between non-reacting and the increasing class of postpartum depressive symptoms in the current study, and the negative correlation between non-reacting and the other two trait mindfulness facets. However, given our results regarding breastfeeding continuation, it could be speculated that the ability to let go of negative thoughts and feelings about breastfeeding might be appropriate for postpartum women and thus might result in breastfeeding continuation for a longer period of time.

Our results showed that the risk of breastfeeding discontinuation did not increase for women with heightened depressive symptoms throughout the postpartum period. This finding is comprehensible, as the trait mindfulness facets acting with awareness and non-judging did not show a significant association with breastfeeding continuation, and both facets showed a negative correlation with the *increasing* class of postpartum depressive symptoms. However, this finding contrasts with most studies on postpartum depressive symptoms and breastfeeding continuation that reported a significant and inverse relation (Dias and Figueiredo, 2015; Radwan et al., 2021; Wouk et al., 2017; Wu et al., 2019). Nonetheless, two studies were in line with our results and did also not find a significant association between postpartum depressive symptoms and continuation of breastfeeding (Bogen et al., 2010; Chung et al., 2004). However, it must be noted that most of these studies examined cross-sectional relationships and thus failed to account for the depressive symptom variability over time. Therefore, we recommend the use of statistical methods that reckon with the postpartum depressive symptom variability within and between individuals throughout time, such as growth mixture modeling, when assessing the association with breastfeeding continuation. We used the EPDS to assess postpartum depressive symptoms, which consists of the subscales depression and anxiety (Brouwers et al., 2001; Matthey, 2008; Pop et al., 1992). Future studies could also solely examine anxiety symptoms (for instance with the Generalized Anxiety Disorder 7-item scale (GAD-7) (Spitzer et al., 2006) or the anxiety subscale of the Symptom Checklist (SCL-90) (Arrindell and Ettema, 1981, 2003)), and address the association between longitudinal trajectories of anxiety symptoms and breastfeeding continuation.

The current study involved several strengths and limitations. The relatively large sample size ($N = 698$) was a strength.

Moreover, the repeated assessment of postpartum depressive symptoms was a strength, as it allowed us to use growth mixture modeling to determine longitudinal trajectories of these symptoms over time. The use of self-report assessments for the measurement of trait mindfulness and postpartum depressive symptoms was a limitation. Especially in self-report assessment of trait mindfulness, personal values and social desirability could induce bias (Bergomi et al., 2013). In addition, the trait mindfulness assessment at 22 weeks of pregnancy instead of postpartum was a limitation. However, trait mindfulness showed to be relatively stable without intervention (Brown and Ryan, 2003; Veehof et al., 2011), also in the perinatal period (Brassel et al., 2020). Moreover, a very recent randomized controlled trial (RCT), that examined the effectiveness of a Mindfulness-Based Childbirth and Parenting (MBCP) program, showed improvements in trait mindfulness scores in the intervention group ($N = 94$) at post-intervention but *not* in the control group ($N = 89$), who did not receive the MBCP program (Zhang et al., 2023). The trait mindfulness scores in the control group also showed no improvements in the two follow-up assessments (eight weeks postpartum and six months postpartum) (Zhang et al., 2023). In the current study, the participating women were asked whether they participated in pregnancy and birth courses, and which pregnancy and birth course this was. None of the women mentioned that the course she participated in was a mindfulness-based course or a course including mindfulness meditation that might have affected the trait mindfulness levels. Therefore, we presumed the levels of trait mindfulness at 22 weeks of pregnancy to be comparable to the levels in the postpartum period. However, we did not specifically ask if participants took part in a mindfulness training during the perinatal period or started meditation practice. Another limitation was that we did not assess breastfeeding continuation six months postpartum, as the WHO recommends breastfeeding for at least six months (WHO, 2021). Instead, we used the assessment of breastfeeding continuation eight months postpartum as a proxy for this recommendation. Future studies should include the time point of six months postpartum as well, when studying breastfeeding continuation. Furthermore, in the current study social support from relatives and/or healthcare professionals was not assessed during the postpartum period. Therefore, we were unable to include this variable as confounder in the cox regression analysis. Previous research has reported that positive (emotional and informational) social support from the partner, mother, family, friends, and health care professionals may increase the initiation and duration of breastfeeding (Chambers et al., 2023; Raj and Plichta, 1998). Future studies should therefore include social support when studying breastfeeding continuation. Another limitation was that our study sample included mostly Dutch and white women who were more often highly educated compared to the national figures (StatLine, 2021). Moreover, the study was conducted in a low risk non-clinical sample. This may restrict generalizability of the results. Future research should assess to what extent our results can be replicated in samples that include more women with lower education levels and women with other ethnicities, as well as in clinical samples.

In conclusion, the current study is the first to show that higher trait mindfulness non-reacting scores increase the likelihood of breastfeeding continuation. These findings are important for clinical practice, as breastfeeding is associated with many health benefits for both the infant and the mother. Gaining knowledge on beneficial factors for improvement of breastfeeding continuation is of great importance as the WHO strongly recommends breastfeeding for six months, whereas in Europe the breastfeeding continuation rates are rather low (Sarki et al., 2019; WHO, 2021). Knowing that the trait mindfulness facet non-reacting may increase the likelihood of breastfeeding continuation is important since it provides information on how to support women in continuing breastfeeding for a longer period of time, in order for them to consequently benefit from the many advantages associated with breastfeeding. The clinical implications of our results are that improving non-reacting in breastfeeding women, or already during pregnancy, may lead to better breastfeeding continuation outcomes. Trait mindfulness (including *non-reacting*) could be improved by meditation exercises (Kiken et al., 2015), as practiced during mindfulness-based interventions. There are several mindfulness-based interventions available for perinatal women. Since trait mindfulness may be helpful for breastfeeding *initiation* as well, we would advise women to partake in an intervention already during pregnancy. Mindfulness-Based Childbirth Education (MBCE) programs (Hauck et al., 2016) could specifically be suitable during pregnancy. This program combines childbirth education with meditation exercises, which may strengthen both non-reacting and breastfeeding self-efficacy in pregnant women. This may be double effective in enhancing breastfeeding outcomes as breastfeeding self-efficacy has also been associated with breastfeeding continuation (Economou et al., 2021; Meedya et al., 2010). Other interventions for both pregnant and breastfeeding women could involve a general Mindfulness-Based Stress Reduction (MBSR) program (Segal et al., 2013) or an MBCP program (Duncan and Bardacke, 2010). These interventions might increase the number of women initiating breastfeeding but might also increase the period of time in which these women continue breastfeeding. As far as we know, no quantitative studies have been conducted that examine the effectiveness of mindfulness-based programs on breastfeeding initiation and continuation, except for a recent RCT (Lönnberg et al., 2021). This RCT compared a group that received an MBCP program ($N = 43$) with a group that received a Lamaze program for infant's social-emotional development ($N = 45$) and reported no differences between breastfeeding initiation and continuation rates three months postpartum (Lönnberg et al., 2021). Future research should further assess whether mindfulness-based programs are effective in enhancing breastfeeding initiation and continuation. When shown effective, midwifes and obstetricians could advise pregnant women to take part in a mindfulness-based intervention to improve breastfeeding outcomes.

Ethical approval

The HAPPY study was approved by the ethical committee of Tilburg University on 11 November 2012 (protocol number EV-2012.25) and reviewed by the Medical Ethics Committee of the Máxima Medical Centre Veldhoven.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRediT authorship contribution statement

Lianne P Hulsbosch: Conceptualization, Methodology, Formal analysis, Writing – original draft, Visualization. **Ivan Nyklíček:** Methodology, Validation, Writing – review & editing. **Myrthe GBM Boekhorst:** Writing – review & editing. **Eva S Potharst:** Writing – review & editing. **Victor JM Pop:** Conceptualization, Methodology, Investigation, Writing – review & editing, Supervision.

Funding Sources

Acknowledgments

We are indebted to the 17 primary care midwife practices for their contribution in recruiting participants.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2023.103770.

References

Andrew, N., Harvey, K., 2011. Infant feeding choices: experience, self-identity and lifestyle. Matern. Child. Nutr. 7 (1), 48–60. doi:10.1111/j.1740-8709.2009.00222.x.

Arrindell, W.A., Ettema, J.H.M., 1981. Dimensionele structuur, betrouwbaarheid en validiteit van de Nederlandse bewerking van de Symptom Checklist (SCL-90): gegevens gebaseerd op een fobischen een "normale" populatie, [Dimensional structure, reliability and validity of the Dutch version of the Symptom Checklist (SCL-90): data based on a phobic and a "normal" population]. Nederlands Tijdschrift voor de Psychologie en haar Grensgebieden 36 (2), 77–108.

Arrindell, W.A., Ettema, J.H.M., 2003. SCL-90. Symptom Checklist. Handleiding bij Een Multidimensionele Psychopathologie-Indicator [Symptom Checklist, Manual of a Multidimensional Psychopathology-Indicator]. Swets Test Publishers, Lisse.

Baer, R.A., Smith, G.T., Hopkins, J., Krietemeyer, J., Toney, L., 2006. Using self-report assessment methods to explore facets of mindfulness. Assessment 13 (1), 27–45. doi:10.1177/1073191105283504.

Bergomi, C., Tschacher, W., Kupper, Z., 2013. The assessment of mindfulness with self-report measures: existing scales and open issues. Mindfulness 4 (3), 191–202. doi:10.1007/s12671-012-0110-9.

Bishop, S.R., Lau, M., Shapiro, S., Carlson, L., Anderson, N.D., Carmody, J., Segal, Z.V., Abbey, S., Speca, M., Velting, D., Devins, G., 2004. Mindfulness: a proposed operational definition. Clin. Psychol.-Sci. Pr. 11 (3), 230–241. doi:10.1093/clipsy/bph077.

Bogen, D.L., Hanusa, B.H., Moses-Kolko, E., Wisner, K.L., 2010. Are maternal depression or symptom severity associated with breastfeeding intention or outcomes? J. Clin. Psychiatry 71 (8), 1069–1078. doi:10.4088/JCP.09m05383blu.

Bohlmeijer, E., ten Klooster, P.M., Fledderus, M., Veehof, M., Baer, R., 2011. Psychometric properties of the five facet mindfulness questionnaire in depressed adults and development of a short form. Assessment 18 (3), 308–320. doi:10.1177/1073191111408231.

Branstrom, R., Duncan, L.G., Moskowitz, J.T., 2011. The association between dispositional mindfulness, psychological well-being, and perceived health in a Swedish population-based sample. Brit. J. Health Psych. 16, 300–316. doi:10.1348/135910710x501683.

Brassel, A., Townsend, M.L., Pickard, J.A., Grenyer, B.F.S., 2020. Maternal perinatal mental health: associations with bonding, mindfulness, and self-criticism at 18 months' postpartum. Infant Ment. Health J. 41 (1), 69–81. doi:10.1002/imhj.21827.

Brouwers, E.P., van Baar, A.L., Pop, V.J., 2001. Does the Edinburgh Postnatal Depression Scale measure anxiety? J. Psychosom. Res. 51 (5), 659–663. doi:10.1016/s0022-3999(01)00245-8.

Brown, K.W., Ryan, R.M., 2003. The benefits of being present: mindfulness and its role in psychological well-being. J. Pers. Soc. Psychol. 84 (4), 822–848. doi:10.1037/0022-3514.84.4.822.

Chambers, A., Emmott, E.H., Myers, S., Page, A.E., 2023. Emotional and informational social support from health visitors and breastfeeding outcomes in the UK. Int. Breastfeed. J. 18 (1), 14. doi:10.1186/s13006-023-00551-7.

Chowdhury, R., Sinha, B., Sankar, M.J., Taneja, S., Bhandari, N., Rollins, N., Bahl, R., Martines, J., 2015. Breastfeeding and maternal health outcomes: a systematic review and meta-analysis. Acta Paediatr. 104, 96–113. doi:10.1111/apa.13102.

Chung, E.K., McCollum, K.F., Elo, I.T., Lee, H.J., Culhane, J.F., 2004. Maternal depressive symptoms and infant health practices among low-income women. Pediatrics 113 (6), e523–e529. doi:10.1542/peds.113.6.

Collins, L.M., Lanza, S.T., 2010. Latent Class and Latent Transition analysis: With Applications in the social, behavioral, and Health Sciences. John Wiley & Sons, Hoboken.

Cox, J.L., Holden, J.M., Sagovsky, R., 1987. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. Br. J. Psychiatry 150, 782–786. doi:10.1192/bjp.150.6.782.

de Bruin, E.I., Topper, M., Muskens, J.G., Bogels, S.M., Kamphuis, J.H., 2012. Psychometric properties of the Five Facets Mindfulness Questionnaire (FFMQ) in a meditating and a non-meditating sample. Assessment 19 (2), 187–197. doi:10.1177/1073191112446654.

Dias, C.C., Figueiredo, B., 2015. Breastfeeding and depression: a systematic review of the literature. J. Affect. Disord. 171, 142–154. doi:10.1016/j.jad.2014.09.022.

Duncan, L.G., Bardacke, N., 2010. Mindfulness-based childbirth and parenting education: promoting family mindfulness during the perinatal period. J. Child Fam. Stud. 19 (2), 190–202. doi:10.1007/s10826-009-9313-7.

Economou, M., Kolokotroni, O., Paphiti-Demetriou, I., Kouta, C., Lambrinou, E., Hadjigeorgiou, E., Hadjiona, V., Middleton, N., 2021. The association of breastfeeding self-efficacy with breastfeeding duration and exclusivity: longitudinal assessment of the predictive validity of the Greek version of the BSES-SF tool. BMC Pregn. Childb. 21 (1), 421. doi:10.1186/s12884-021-03878-3.

Figueiredo, B., Dias, C.C., Brandao, S., Canario, C., Nunes-Costa, R., 2013. Breastfeeding and postpartum depression: state of the art review. J. Pediatr. (Rio. J) 89 (4), 332–338. doi:10.1016/j.jped.2012.12.002.

Groer, M.W., Jevitt, C.M., Sahebzamani, F., Beckstead, J.W., Keefe, D.L., 2013. Breastfeeding status and maternal cardiovascular variables across the postpartum. J. Womens Health (Larchmt) 22 (5), 453–459. doi:10.1089/jwh.2012.3981.

Hauck, Y., Fisher, C., Byrne, J., Bayes, S., 2016. Mindfulness-based childbirth education: incorporating adult and experiential learning with mindfulness-based stress reduction in childbirth education. J. Perinat. Educ. 25 (3), 162–173. doi:10.1891/1058-1243.25.3.162.

Horta, B.L., de Lima, N.P., 2019. Breastfeeding and type 2 diabetes: systematic review and meta-analysis. Curr. Diab. Rep. 19 (1), 1. doi:10.1007/s11892-019-1121-x.

Horta, B.L., Loret de Mola, C., Victora, C.G., 2015. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. Acta Paediatr. 104 (467), 30–37. doi:10.1111/apa.13133.

Hosea Blewett, H.J., Cicalo, M.C., Holland, C.D., Field, C.J., 2008. The immunological components of human milk. Adv. Food. Nutr. Res. 54, 45–80. doi:10.1016/S1043-4526(07)00002-2.

Hou, L., Li, X., Yan, P., Li, Y., Wu, Y., Yang, Q., Shi, X., Ge, L., Yang, K., 2021. Impact of the duration of breastfeeding on the intelligence of children: a systematic review with network meta-analysis. Breastfeed. Med. 16 (9), 687–696. doi:10.1089/bfm.2020.0364.

Hulsbosch, L.P., Potharst, E.S., Boekhorst, M.G., Nyklíček, I., Pop, V.J., 2021. Breastfeeding intention and trait mindfulness during pregnancy. Midwifery 101, 103064. doi:10.1016/j.midw.2021.103064.

Innamorati, M., Sarracino, D., Dazzi, N., 2010. Motherhood constellation and representational change in pregnancy. Infant Ment. Health J. 31 (4), 379–396. doi:10.1002/imhj.20261.

Ip, S., Chung, M., Raman, G., Chew, P., Magula, N., DeVine, D., Trikalinos, T., Lau, J., 2007. Breastfeeding and maternal and infant health outcomes in developed countries. Evid. Rep. Technol. Assess (Full Rep.) 1–186. https://www.ncbi.nlm.nih.gov/pubmed/17764214.(153).

Jung, T., Wickrama, K.A.S., 2008. An introduction to latent class growth analysis and growth mixture modeling. Soc. Personal. Psychol. Comp. 2 302–317. doi:10.1111/j.1751-9004.2007.00054.x.

Kiken, L.G., Garland, E.L., Bluth, K., Palsson, O.S., Gaylord, S.A., 2015. A state to a trait: trajectories of state mindfulness in meditation during intervention predict changes in trait mindfulness. Personal. Indiv. Differen. 81, 41–46. doi:10.1016/j.paid.2014.12.044.

Lönnberg, G., Niemi, M., Salomonsson, B., Bränström, R., Nissen, E., Jonas, W., 2021. Exploring the effects of mindfulness-based childbirth and parenting on infant social-emotional development. Mindfulness 12 (8), 2009–2020. doi:10.1007/s12671-021-01658-w.

Lund-Blix, N.A., Dydensborg Sander, S., Størdal, K., Nybo Andersen, A.-M., Rønningen, K.S., Joner, G., Skrivarhaug, T., Njølstad, P.R., Husby, S., Stene, L.C., 2017. Infant feeding and risk of type 1 diabetes in two large Scandinavian birth cohorts. Diabet. Care. 40 (7), 920–927. doi:10.2337/dc17-0016.

Matthey, S., 2008. Using the Edinburgh Postnatal Depression Scale to screen for anxiety disorders. Depress. Anxiety 25 (11), 926–931. doi:10.1002/da.20415.

McFadden, A., Toole, G., 2006. Exploring women's views of breastfeeding: a focus group study within an area with high levels of socio-economic deprivation. Matern. Child Nutrit. 2 (3), 156–168. doi:10.1111/j.1740-8709.2006.00054.x.

Meedya, S., Fahy, K., Kable, A., 2010. Factors that positively influence breastfeeding duration to 6 months: a literature review. Women Birth 23 (4), 135–145. doi:10.1016/j.wombi.2010.02.002.

Miksic, S., Uglesic, B., Jakab, J., Holik, D., Milostic Srb, A., Degmecic, D., 2020. Positive effect of breastfeeding on child development, anxiety, and postpartum depression. Int. J. Environ. Res. Public Health 17 (8). doi:10.3390/ijerph17082725.

Muthén, L.K., Muthén, B.O., 1998–2017. Mplus User's Guide, Eighth Edition Muthén & Muthén, Los Angeles, CA.

Nandi, A., Beard, J.R., Galea, S., 2009. Epidemiologic heterogeneity of common mood and anxiety disorders over the lifecourse in the general population: a systematic review. BMC Psychiatry 9, 31. doi:10.1186/1471-244X-9-31.

Nylund, K.L., Asparouhov, T., Muthén, B.O., 2007. Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. Struct. Equ. Model.: Multidiscipl. 14 (4), 535–569. doi:10.1080/10705510701575396.

Pop, V.J., Komproe, I.H., van Son, M.J., 1992. Characteristics of the Edinburgh post natal depression scale in the Netherlands. J. Affect. Disord. 26 (2), 105–110. https://www.ncbi.nlm.nih.gov/pubmed/1447427.

Pop, V.J., Pommer, A.M., Pop-Purceleanu, M., Wijnen, H.A., Bergink, V., Pouwer, F., 2011. Development of the Tilburg pregnancy distress scale: the TPDS. BMC Pregn. Childb. 11, 80. doi:10.1186/1471-2393-11-80.

Radwan, H., Fakhry, R., Metheny, N., Baniissa, W., Faris, M., Obaid, R.S., Al Marzooqi, S., Al Ghazal, H., ElHalik, M., Dennis, C.L., 2021. Prevalence and multivariable predictors of breastfeeding outcomes in the United Arab Emirates: a prospective cohort study. Int. Breastfeed. J. 16 (1), 79. doi:10.1186/s13006-021-00428-7.

Raj, V.K., Plichta, S.B., 1998. The role of social support in breastfeeding promotion: a literature review. J. Hum. Lactat. 14 (1), 41–45. doi:10.1177/089033449801400114.

Sarki, M., Parlesak, A., Robertson, A., 2019. Comparison of national cross-sectional

breast-feeding surveys by maternal education in Europe (2006-2016). Public Health Nutr. 22 (5), 848–861. doi:10.1017/S1368980018002999.

Segal, Z.V., Williams, J.M., Teasdale, J.D., 2013. Mindfulness-Based Cognitive Therapy For Depression: Second edition. The Guilford Press, New York.

Spitzer, R.L., Kroenke, K., Williams, J.B., Lowe, B., 2006. A brief measure for assessing generalized anxiety disorder: the GAD-7. Arch. Intern. Med. 166 (10), 1092–1097. doi:10.1001/archinte.166.10.1092.

StatLine, 2021. Bevolking; onderwijsniveau; geslacht, leeftijd en migratieachter-grond. https://www.cbs.nl/nl-nl/cijfers/detail/82275NED. (Accessed 19 January 2022).

Stern, D., 1995. The Motherhood Constellation: a Unified View of Parent-Infant Psy-chotherapy. Routledge, New York.

Stewart-Knox, B., Gardiner, K., Wright, M., 2003. What is the problem with breast-feeding? A qualitative analysis of infant feeding perceptions. J. Hum. Nutr. Diet. 16 (4), 265–273. doi:10.1046/j.1365-277X.2003.00446.x.

Tanay, G., Bernstein, A., 2013. State Mindfulness Scale (SMS): development and Ini-tial Validation. Psychol. Assessm. 25 (4), 1286–1299. doi:10.1037/a0034044.

Truijens, S.E., Meems, M., Kuppens, S.M., Broeren, M.A., Nabbe, K.C., Wijnen, H.A., Oei, S.G., van Son, M.J., Pop, V.J., 2014. The HAPPY study (Holistic Approach to Pregnancy and the first Postpartum Year): design of a large prospective cohort study. BMC Pregn. Childb. 14, 312. doi:10.1186/1471-2393-14-312.

Truijens, S.E.M., Nyklíček, I., van Son, J., Pop, V.J.M., 2016. Validation of a short form Three Facet Mindfulness Questionnaire (TFMQ-SF) in pregnant women. Personal. Indiv. Differen. 93, 118–124. doi:10.1016/j.paid.2015.06.037.

Veehof, M.M., ten Klooster, P.M., Taal, E., Westerhof, G.J., Bohlmeijer, E.T., 2011. Psy-chometric properties of the Dutch Five Facet Mindfulness Questionnaire (FFMQ) in patients with fibromyalgia. Clin. Rheumatol. 30 (8), 1045–1054. doi:10.1007/s10067-011-1690-9.

Vizziello, G.F., Antonioli, M.E., Cocci, V., Invernizzi, R., 1993. From pregnancy to motherhood: the structure of representative and narrative change. In-fant Ment. Health J. 14 (1), 4–16. doi:10.1002/1097-0355(199321)14:1(1::AID-IMHJ2280140102)3.0.CO;2-S.

WHO, 2021. Infant and young child feeding. https://www.who.int/en/news-room/fact-sheets/detail/infant-and-young-child-feeding. (Accessed 29 December 2021).

Wouk, K., Stuebe, A.M., Meltzer-Brody, S., 2017. Postpartum mental health and breastfeeding practices: an analysis using the 2010-2011 pregnancy risk assess-ment monitoring system. Matern. Child Health J. 21 (3), 636–647. doi:10.1007/s10995-016-2150-6.

Wu, X., Gao, X., Sha, T., Zeng, G., Liu, S., Li, L., Chen, C., Yan, Y., 2019. Modifiable individual factors associated with breastfeeding: a cohort study in China. Int. J. Environ. Res. Public Health 16 (5). doi:10.3390/ijerph16050820.

Zhang, D., Tsang, K.W.K., Duncan, L.G., Yip, B.H.K., Chan, D.C.C., Lee, E.K.P., Gao, T.T., Tam, W.H., Lam, K.Y., Tong, W.H., Bardacke, N., Wong, S.Y.S., 2023. Effects of the mindfulness-based childbirth and parenting (MBCP) program among pregnant women: a randomized controlled trial. Mindfulness 14 (1), 50–65. doi:10.1007/s12671-022-02046-8.