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04-08-2021

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Abstract

Women may perceive their experiences of childbirth as traumatic and distressing and subsequently develop postpartum mental health difficulties. Although research has brought to light several risk factors for this, including a negative appraisal of the birth event, there is still a limited understanding of how objective negative events that involve medical and health-related childbirth elements, for example, an operative birth or use of unplanned pain medication, may influence symptomatology. Moreover, more research is required on how mothers cope with these experiences. This study, therefore, examined the relation between objective negative childbirth-related events and symptoms of PTSD, depression and anxiety. It also investigated the direct relationship between behavioural and cognitive coping strategies and symptomatology, and whether coping strategies moderated the relationship between objective negative childbirth-related events and symptomatology. Mothers who had delivered a healthy term baby after a first-time pregnancy between three and 12 months previously were asked to fill in an online questionnaire (N = 152). Results revealed a significant positive relationship between objective negative childbirth-related events and symptoms of PTSD, depression and anxiety. The behavioural coping strategy Psychological Flexibility and the cognitive coping strategies Positive Refocusing and Other-blame were associated with fewer symptoms, whereas more use of the behavioural strategy Ignoring and the cognitive strategies Catastrophizing, Self-blame and Rumination was associated with more symptomatology. No moderation effect was found, indicating that the coping strategies did not buffer or exacerbate postpartum symptomatology. The findings may increase awareness of mothers' childbirth-related experiences and allow healthcare staff to better meet mothers' needs.

1. Introduction

1.1 Negative experiences of childbirth and associated psychopathology

Childbirth and becoming a parent are generally perceived as rewarding and transformative experiences (Hill & Firth, 2018). Although this phase may involve stress and difficulties adjusting to a new routine, most parents cope well and report largely positive experiences, aligning with society's common belief of childbirth and the transition to parenthood as positive or even idyllic (Malacrida & Boulton, 2012). However, research indicates that 10% of women in the Netherlands perceive their experiences of childbirth as traumatic and distressing (Stramrood et al., 2010). A negative childbirth experience can result from a fear of, or actual, injury to the mother or her baby, alongside a dehumanising and demeaning treatment of the expectant mother (Beck & Watson, 2016). These distressing experiences may lead to postpartum mental health difficulties, such as posttraumatic stress disorder (PTSD), with research suggesting that 4% of women who experienced negative birth events develop this disorder (Dikmen-Yildiz, Ayers, & Phillips, 2017). Research has proposed a diathesis-stress model to understand birth-related PTSD. This model argues that a negative subjective appraisal of birth and negative objective risk factors combine with vulnerability factors and poor postnatal coping to lead to trauma response symptoms, and possible subsequent PTSD (Ayers, 2004). To clarify, the subjective experience of birth is based on mothers' personal feelings and opinions, whilst the negative objective risk factors involve the medical and health-related elements of the event.

Before reviewing the available literature, it is helpful to make a distinction between the perception of birth as traumatic and a clinical diagnosis of PTSD (Ayers, 2003). A perception of birth as traumatic may arise following a negative subjective appraisal of and personal dissatisfaction with the process and outcome of the birth experience (Sorensen & Tschetter, 2010). This contrasts to a clinical presentation of PTSD, which requires individuals to show symptoms of intrusions, where the event is persistently re-experienced through nightmares and flashbacks, and avoidance, both of internal and external trauma-related stimuli. Furthermore, trauma-related negative thoughts and feelings, and changes in arousal and reactivity, must be present (American Psychological Association, 2013). Although some studies clinically diagnose participants, many only discuss participants' perception of birth as traumatic or combine the presentation of posttraumatic stress symptoms and the disorder (PTS/D). For the

purpose of this thesis, only the perception of birth as traumatic and subsequent self-perceived symptoms of PTSD will be discussed, except when referring to results by other studies.

The existing body of literature has put forward several objective negative factors that may strengthen the perception of childbirth as traumatic, including aspects that occur during pregnancy, during the delivery and during the postpartum period. Vulnerability factors during pregnancy that are associated with birth-related PTSD include poor maternal health and medical complications, as well as a history of depression and PTSD, as shown in a meta-analysis by Ayers, Bond, Bertullies, and Wijma (2016). Simpson, Schmied, Dickson, and Dahlen's review (2018) additionally found that a previous traumatic event, such as sexual abuse, was a significant predictor of childbirth-related PTS/D. As far as childbirth itself is concerned, Ayers et al. (2016) suggest that an operative birth, for example, a birth involving an emergency Caesarean section or an instrumental vaginal delivery, acts as a particularly important intrapartum risk factor for PTS/D. Moreover, an impending preterm birth has also been related to PTSD following childbirth (Andersen, Melvaer, Videbech, Lamont, & Joergensen, 2012). The period following childbirth may be characterised by physical pain and difficulties with breastfeeding, which have both been identified as significant postpartum risk factors for PTS/D (Simpson et al., 2018).

However, it is important to note that, in addition to objective negative factors, a subjective negative appraisal of pregnancy, childbirth, and of the maternity period, may also increase the risk of symptoms of PTSD. Firstly, during pregnancy, a fear of childbirth may result in more symptomatology (Ayers et al. 2016). Secondly, subjective experiences during the delivery, such as seemingly negative interactions with staff, dissociation, and worries about death and injury to the self and to the baby, may also result in a perception of birth as traumatic (Andersen et al., 2012). Moreover, experiences of a loss of control and lack of support from the partner have been associated with childbirth-related PTS/D, as well as a delivery characterised by negative emotions and distress (Olde, van der Hart, Kleber, & van Son, 2006). Falling under the theme of a loss of control, Harris and Ayers (2012) found that women's peak emotional distress during labour predominantly stemmed from feeling abandoned and ignored. Elmir, Schmied, Wilkes, and Jackson (2010) propose that not being included in decisions and feeling powerless and vulnerable were significant risk factors for a negative appraisal of childbirth. Thirdly, subjective negative experiences during the maternity period, such as the perception of low social support, have also been associated with symptoms of PTS/D (Simpson et al., 2018).

The occurrence of these objective negative risk factors and subjective negative experiences during pregnancy, during the delivery and during the maternity period, may be associated with various psychopathological symptoms. For example, women with childbirth-related PTSD report painful memories, nightmares and flashbacks, avoidance of situations and people that remind them of the trauma, and feelings of shame, anger and fear (Dikmen-Yildiz et al., 2017).

Although less is known about depression and anxiety following traumatic experiences of childbirth, studies have shown that there are high rates of comorbidity amongst these disorders, and that many of the risk factors outlined above are also associated with postnatal depression and anxiety (Falah-Hassani, Shiri, & Dennis, 2016; Field, 2018). Mothers may subsequently suffer from a negative mood and negative cognitions, as well as maladaptive beliefs about the self and the baby (Bell et al., 2016; Vliegen, Casalin, & Luyten, 2014). Symptoms of PTSD, depression and anxiety that may result from negative experiences of childbirth also seem to act as risk factors that reinforce the chance of other or comorbid symptoms (Ayers et al., 2016).

Psychopathology following these risk factors has a significant impact on mothers and their relationships with their child and their partner. For example, in an interview study, women with childbirth-related PTSD demonstrated either avoidant or over-protective behaviours towards their baby, along with an initial sense of rejection towards the child (Ayers, Eagle, & Waring, 2006). Postpartum depression has also been associated with hostile and unresponsive interactions between the mother and her infant (Flykt et al., 2010), whilst both postnatal depression and anxiety have been shown to affect infant temperament and sleep (Field, 2018; Werner, Miller, Osborne, Kuzava, & Monk, 2015). Women's relationships with their partners may also be impacted. Some relationships may be strengthened, whilst in others, mothers report anger towards their partners for lacking understanding and not providing sufficient emotional and practical support, and a loss of intimacy (Delicate, Ayers, Easter, & McMullen, 2017). In turn, these relationship difficulties may also act as risk factors that cause postnatal symptomatology (Simpson et al., 2018).

It is clear that a negative subjective appraisal of childbirth and objective negative events can have a tremendous impact on women, in terms of their mental health and their relationships with their child and their partner. It is important, however, to acknowledge the methodological variations in studies, including in outcome measures used, the time of measurement, and the

population sample involved. Often samples are self-selecting and range from presenting with symptoms only to full PTSD, whilst the design is frequently retrospective, calling for questions regarding the generalisability of results and the effect of recall bias. Nevertheless, these studies provide an insight into women's experiences postpartum.

Little is still known about how women cope with these negative experiences, resulting in insufficient evidence to guide interventions and support. A greater understanding of coping strategies following childbirth is crucial, as research suggests that the strength of the association between stressors and psychopathology may be affected by the ability to cope (Sloan et al., 2017). This supports the stress-diathesis model, which states that poor postnatal coping following a negative subjective experience of birth and objective negative events may increase the chance of trauma response symptoms. Coping following stressful and traumatic events will now be discussed, distinguishing between behavioural and cognitive strategies, as they encapsulate different processes following trauma.

1.2 Behavioural Coping

Behavioural coping refers to the manner in which individuals behaviourally respond to threatening or stressful life events (Garnefski, Kraaij, & Spinhoven, 2001). Kraaij and Garnefski (2019) propose three adaptive and two maladaptive ways of behavioural coping. Adaptive coping strategies include Seeking Distraction by doing something else, Actively Approaching to deal with the event, and Seeking Social Support by sharing emotions and asking for support and advice. In contrast, Ignoring and behaving like nothing has happened, as well as Withdrawal by drawing back from situations and social contacts, can be considered less adaptive ways of behavioural coping.

Research has investigated the relationship between behavioural coping strategies and symptomatology following traumatic experiences in general and those of childbirth in particular. For instance, generally, trauma research suggests that Actively Approaching to deal with stressful events is associated with fewer depression and anxiety symptoms (Kraaij & Garnefski, 2019). Moreover, Seeking Distraction has been highlighted as an effective strategy to deal with negative life events (Joormann & Stanton, 2016). More specifically for traumatic experiences of childbirth, a plethora of studies have highlighted the importance of Seeking Social Support, as it has been shown to protect against the development of PTSD and depression

in postnatal women (Felice, Saliba, Grech, & Cox, 2004; Ford, Ayers, & Bradley, 2010; Webster, Nicholas, Velacott, Cridland, & Fawcett, 2011).

Two further behavioural coping strategies involve Self-compassion and Psychological Flexibility. As defined by Neff (2003), self-compassion consists of self-kindness, taking a mindful and non-judgmental stance towards oneself, and understanding that negative events are a common experience amongst humanity. Higher levels of self-compassion have been associated with greater psychological well-being, and specifically for mothers, an intervention stimulating self-compassion found decreases in PTSD symptoms of intrusion and hyperarousal (Mitchell, Whittingham, Steindl & Kirby, 2018; Scoglio et al., 2018). Furthermore, Allen and Leary (2010) suggest that self-compassion may be strongly related to psychological flexibility, which focuses on accepting the present moment and one's thoughts and feelings (Bond et al., 2011). Psychological inflexibility has been associated with overall lower psychological health, and PTSD symptoms (Seligowski, Miron, & Orcutt, 2014).

As mentioned earlier, less adaptive behavioural coping strategies have also been proposed: Withdrawal and Ignoring. Following traumatic experiences of childbirth, reviews demonstrate avoidance and withdrawal as passive coping strategies used by primiparous women six weeks after giving birth; these mechanisms, it is suggested, normalise and even pathologize maladaptive emotional responses (Fenech & Thomson, 2015; Razurel, Bruchon-Schweizer, Dupanloup, Irion, & Epiney, 2011). The available research on behavioural coping strategies suggests the use of adaptive strategies may be associated with greater mental health, whilst the use of maladaptive strategies may be associated with poorer mental health.

1.3 Cognitive Coping

Cognitive coping can be defined as the cognitive way in which individuals manage the intake of emotionally arousing information (Thompson, 1991). Garnefski et al. (2001) suggest that cognitive processes aid in the regulation of emotions, and prevent individuals from being overwhelmed during or following threatening or stressful events. Research has suggested that generally speaking, the following coping strategies could be considered more adaptive: Acceptance, Refocus on Planning (thinking about how to handle the event), Positive Refocusing (thinking about pleasant issues in contrast to the negative event), Positive Reappraisal (thoughts of attaching a positive meaning to the event), and Putting into Perspective (thoughts of relativizing or playing down the seriousness of the event) (Garnefski et al., 2001).

Less adaptive cognitive coping strategies include Self-blame and Other-blame, as well as Rumination (thinking about the feelings and thoughts associated with the negative event), and Catastrophizing (thoughts of emphasizing the difficulty of the experience) (Garnefski et al., 2001).

The relationship between cognitive coping strategies and symptoms of PTSD, depression and anxiety, in the context of negative experiences of childbirth, has been reported by multiple studies. For example, research has illustrated a reduction of PTSD and depressive symptoms following reappraisal of childbirth and an acceptance of events (Gamble et al., 2005; Gutiérrez-Zotes et al., 2016). This aligns with the results of George, Luz, de Tychey, Thilly, and Spitz's study (2013), in which mothers with difficulties in positive reframing in the perinatal period showed more symptoms of anxiety. Another coping strategy entails planning, with Nakić Radoš, Sawyer, Ayers, and Burn (2018) reporting that higher levels of planning were associated with lower levels of depression following childbirth.

Use of maladaptive cognitive coping strategies has also been shown to predict symptomatology following a traumatic experience of childbirth. For example, in Tomsis, Gelkopf, Yerushalmi and Zipori's (2018) prospective study with first-time mothers, Self-blame and Rumination were associated with higher postnatal PTS symptoms. This supports research on Self-blame and its association with postnatal symptoms of anxiety and depression (de Tychey et al., 2005; George et al., 2013). Moreover, acute catastrophizing of pain has been associated with PTS symptoms (Carty, O'Donnell, Evans, Kazantzis, & Creamer, 2011).

There is preliminary support for the stress-diathesis theory, in which the use of cognitive and behavioural coping may be associated with outcomes following a traumatic perception of childbirth (King, McKenzie-McHarg, & Horg, 2017). Nevertheless, an understanding of both behavioural and cognitive coping strategies in the context of objective negative childbirth events is still limited, with many studies finding the use of coping strategies not significant in predicting outcomes (de Tychey et al., 2005; Faisal-Cury, Tedesco, Kahhale, Menezes, & Zugaib, 2004). A greater understanding of the relationship between these objective negative events and psychopathology, and which coping strategies may lead to better mental health, is necessary to guide support to better meet the needs of postpartum mothers.

1.4 Research questions and hypotheses

This study, therefore, examined the relationship between objective negative events during pregnancy, during childbirth and in the first two weeks following childbirth and symptoms of PTSD, depression and anxiety. Furthermore, it investigated whether the use of adaptive and maladaptive coping strategies influences the strength of the relationship. For the purposes of this thesis, the relationship between symptomatology and a negative subjective appraisal of childbirth was not investigated. The study's specific research questions can be outlined as:

1. Is there a significant positive relationship between objective negative childbirth-related events and symptoms of PTSD, depression and anxiety?

2.1 To what extent is there a relationship between behavioural coping strategies (Seeking Distraction, Actively Approaching, Seeking Social Support, Self-compassion, Psychological Flexibility, Withdrawal and Ignoring) and symptoms of PTSD, depression and anxiety, after accounting for the influence of objective negative childbirth-related events?

2.2 To what extent is there a relationship between cognitive coping strategies (Acceptance, Refocus on Planning, Positive Refocusing, Positive Reappraisal, Putting into Perspective, Self-blame, Other-blame, Rumination, and Catastrophizing), and symptoms of PTSD, depression and anxiety, after taking into account objective negative childbirth-related events?

3.1 To what extent is the relationship between objective negative birth events and symptoms of PTSD, depression and anxiety moderated by the use of behavioural coping strategies (Seeking Distraction, Actively Approaching, Seeking Social Support, Self-compassion, Psychological Flexibility, Withdrawal and Ignoring)?

3.2 To what extent is the relationship between objective negative birth events and symptoms of PTSD, depression and anxiety moderated by the use of cognitive coping strategies (Acceptance, Refocus on Planning, Positive Refocusing, Positive Reappraisal, Putting into Perspective, Self-blame, Other-blame, Rumination, and Catastrophizing)?

Based on the literature, the following hypotheses were drawn:

Hypothesis 1: Objective negative events before, during and after childbirth are associated with more symptoms of PTSD, depression and anxiety.

Hypothesis 2.1: The use of adaptive behavioural coping strategies is negatively associated with symptoms of PTSD, depression and anxiety, after accounting for objective negative childbirth-related events.
Hypothesis 2.2: The use of maladaptive behavioural coping strategies is positively associated with symptoms of PTSD, depression and anxiety, after accounting for objective negative childbirth-related events.
Hypothesis 3.1: The use of adaptive cognitive coping strategies is negatively associated with symptoms of PTSD, depression and anxiety, after accounting for objective negative childbirth-related events.
Hypothesis 3.2: The use of maladaptive cognitive coping strategies is positively associated with symptoms of PTSD, depression and anxiety, after accounting for objective negative childbirth-related events.

Several exploratory research questions were also developed. For example, the study explored the influence of general life events, such as parents' divorce or the death of a loved one, on mental health, in relation to objective negative events during childbirth. An in-depth evaluation of the contribution of general life events is not presented, as this does not fall within the scope of the project.

Research questions 3.1 and 3.2 concern the moderating effect of adaptive and maladaptive behavioural and cognitive coping strategies on the relationship between objective negative events and symptoms of PTSD, depression and anxiety. These research questions are exploratory in nature, involving no hypothesis testing. Instead, the study explored the function of these coping strategies and aimed to understand whether the use of the adaptive strategies weakens the relationship between objective negative events and symptomatology, and whether the use of maladaptive strategies strengthens this relationship.

2. Method

2.1 Participants

Inclusion criteria consisted of parents who had delivered a healthy term baby after a first-time pregnancy between three and 12 months before completing the questionnaire. Moreover, participants had to be over 18 years of age, and possess a sufficient level of reading and writing in Dutch or English. Individuals were excluded from the study in the case of a multiple birth,

and if they had previous experiences of childbirth. Participants were recruited through an online advertisement on the social media platform Facebook, and on online motherhood forums and blogs. The advertisement was posted in groups and chatrooms, and was sent to individual Facebook profiles, containing a link to the online questionnaire on Qualtrics.com.

Data collection ran for 80 days, from 19/03/2020 up to 06/06/2020. This resulted in a total of 212 responses from the Dutch version of the questionnaire for individuals based in the Netherlands. For the purpose of the present study, the data from the English version posted on UK-based online forums and Facebook groups were not included, as data collection had resulted in only a small number of responses. 60 responses were eliminated from the statistical analysis, due to (a) not giving consent, (b) completing less than 30% of the questionnaire, or (c) spending less than 300 seconds completing the questionnaire. This resulted in a total sample of 152 participants above 18 years old (mean age 31 years old, SD = 7.91). Demographic information about the participants and information regarding their pregnancy is presented in Table 1 in the Results section.

2.2 Procedure

This cross-sectional study was designed in the form of an internet-based questionnaire on Qualtrics.com. Before publishing the questionnaire, the study obtained ethical approval from the Leiden University Psychology Ethics Committee. Following the recruitment of participants as outlined above, the Qualtrics questionnaire first provided participants with an information sheet outlining the purpose of the study and the questionnaire process. The information sheet also highlighted confidentiality. A consent form checked participant understanding of the information and their agreement to take part. The questionnaire started with demographic questions and general questions related to pregnancy, childbirth, and negative life events. Following this, participants were asked about objective negative events that occurred during pregnancy, during the delivery, and during the first two weeks following the delivery. The questionnaire consisted of validated measures to assess symptoms of PTSD, depression and anxiety, and additionally evaluated participants' maladaptive and adaptive coping strategies, both behavioural and cognitive. At the end of the questionnaire, participants were shown a debrief sheet, in which the aims of the study were once again outlined, as well as the researchers' contact details, in case they had any final questions or concerns.

2.3 Materials

The measures used to understand participants' experiences consisted of validated scales and checklists designed by the researchers. Demographic questions allowed an insight into the ages, gender, living situation and marital status of participants. Questions related to pregnancy and childbirth covered the method participants used to get pregnant, how long this took, whether the pregnancy was planned and with how many weeks they gave birth. Moreover, participants were asked about the location of their delivery, whether someone other than the midwife and medical caregivers was present, and whether the baby was found to have any illnesses or conditions following the birth.

Negative events during pregnancy, and during and after childbirth

As a pre-existing measure for objective negative events during pregnancy, during childbirth and after the delivery was not available, a checklist was developed. Before formulating the questions, a literature review and internet search was conducted to gain insight into what events may occur during the pregnancy, delivery and the first two weeks following the delivery, which may result in postpartum psychopathology. Studies that guided this checklist included Simpson et al. (2018), Ayers et al. (2016), and Anderson et al. (2012). A total of 8 events during pregnancy, 12 events during childbirth, and 9 events following childbirth were included in the checklist. Examples of events during pregnancy were 'pre-eclampsia' and 'gestational diabetes', events during childbirth included 'an unplanned caesarean section' and 'complications due to an abnormal position of the baby', while 'difficulties with breastfeeding' and 'infections or sepsis' are examples of negative events listed during the maternity period. Participants could add further events that were not covered by the checklist. The negative events were scored on whether the individual experienced the event (1) or did not experience the event (0). Events experienced during all time periods were totalled to create a final score between 0 and 29. Possible events during pregnancy ranged from 0 to 8, with a range of 0 to 12 for events during the delivery, and 0 to 9 for events following the delivery. Both the total score and the separate scores for each time period were used in the analyses.

Life Events Questionnaire (LEQ)

The LEQ is a Dutch instrument that measures participants' experiences of various life events, including 'parents' divorce' and 'death of a relative'. It was developed by Garnefski and Kraaij (2001) and consists of 18 items. Answer options were slightly adapted for the purpose of the

present study to 'never experienced', 'experienced in the year before childbirth', and 'experienced after childbirth'. Scores were obtained for total life events experienced, in which events experienced in the year before the delivery, and after childbirth, were summed up. The 18 life events are scored on whether the individual experienced them (1) or did not experience them (0), creating a total sum score between 0 and 18 for either time period.

Schok Verwerkings Lijst (SVL-22)

The SVL-22 (Brom & Kleber, 1985) is the Dutch version of the Impact of Event Scale by Horowitz, Wilner, and Alvarez (1979). It is a 22-item self-report instrument to measure two subscales of reactions to traumatic events: avoidance and intrusive thoughts. Items are measured on a 5-point scale, ranging from 0 (not at all) to 4 (very often). This study utilised total scores on the SVL-22, rather than scores on the subscales, which were obtained by summing up the 22 items. Research has found high internal consistencies for the questionnaire, with Cronbach's alpha = .96 (Weiss & Marmar, 1996).

Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a self-administered tool to measure the severity of depressive symptoms (Kroenke, Spitzer, & Williams, 2001). It consists of 9 items, scaled from 0 (not at all) to 3 (nearly every day). Scores were added up producing a range from 0 to 27, with higher scores relating to more severe depression. Prior studies have shown PHQ-9 to be a reliable instrument, with Cronbach's α= .89 (Kroenke et al., 2001).

Generalised Anxiety Disorder Assessment (GAD-7)

This self-report questionnaire consists of 7 items that measure the severity of anxiety symptoms, and includes a 4-point scale ranging from 0 (not at all) to 3 (nearly every day) (Kroenke, Spitzer, Williams, & Löwe 2010). A total sum score of 0 to 21 was calculated, with higher scores corresponding to more and more severe anxiety symptoms. Research has indicated high internal consistency, with Cronbach α = .92 (Kroenke et al., 2010).

Behavioural Emotion Regulation Questionnaire (BERQ)

The BERQ was administered to measure behavioural strategies in response to threatening or stressful events (Kraaij & Garnefski, 2019). This self-report questionnaire includes 5 subscales with 4 items each, measured on a 5-point scale ranging from 1 ([almost] never) to 5 ([almost] always). The subscales consist of Seeking Distraction, Actively Approaching, Seeking Social Support, Ignoring and Withdrawal. By adding up the four items, each subscale received a final score between 4 and 20, with higher scores referring to greater use of that behavioural coping

strategy. Research has indicated high internal consistency for BERQ, with α values for all subscales ranging from .86 – .93 (Kraaij & Garnefski, 2019).

Self-Compassionate Coping Measure (SSCM)

The SSCM is a self-report questionnaire that measures a person's ability to be positive and kind towards themselves when confronted with difficulties (Garnefski & Kraaij, 2019). This instrument consists of 4 items, measured on a 5-point scale ranging from 1 ([almost] never) to 5 ([almost] always). The subscales are 'I am nice to myself', 'I give myself loving attention', 'I am understanding to myself', and 'I say friendly things to myself'. Scores for the subscales were obtained by adding the four items, resulting in a total score between 4 and 20. The higher the scores, the greater the use of self-compassionate behaviours. Garnefski and Kraaij (2019) indicated a high internal consistency for the SCCM and its subscales, with Cronbach's α = .91 for the questionnaire as a whole.

Acceptance and Action Questionnaire (AAQ-II)

This self-report questionnaire measures Psychological Flexibility, in terms of accepting the present moment and the accompanying thoughts and feelings (Bond et al., 2011). It is measured on a 7-point scale from 1 (never true) to 7 (always true). Total scores were obtained by adding up responses and ranged from 7 to 49. Higher total scores referred to less psychological flexibility. The AAQ-II has shown good internal consistency in previous research, with Cronbach's α = .85 (Fledderus, Oude Voshaar, ten Klooster, & Bohlmeijer, 2012).

Cognitive Emotion Regulation Questionnaire (CERQ)

The CERQ is a 36-item self-report questionnaire developed by Garnefski et al. (2001) to measure the use of 9 cognitive coping strategies after threatening or stressful events. These strategies include Self-blame, Other-blame, Rumination, Catastrophizing, Putting into Perspective, Positive Refocusing, Positive Reappraisal, Acceptance, and Refocus on Planning. These 9 subscales each consist of 4 items, measured with a 5-point scale from 1 ([almost] never) to 5 ([almost] always). Higher scores equalled a higher use of the specific coping strategy, with a total subscale score ranging from 4 to 20. CERQ subscales have shown good internal consistency in previous studies, ranging from .75 – .86 (Garnefski & Kraaij, 2007).

2.4 Statistical Analysis

The data was analysed with the IBM SPSS software version 26.0. Regarding descriptive statistics, the mean, standard deviation, and the level of reliability (through Cronbach's alpha)

were calculated for the following scales: the LEQ, the SVL-22, the PHQ-9, the GAD-7, the CERQ and BERQ subscales, the AAQII and the SSCM. For statistical significance testing, a two-tailed test with significance level of .05 was used.

Prior to the analyses for the research questions, the data were tested to see whether they met the assumptions of the regression analyses. A scatterplot was used to test for linearity between the independent and dependent variables, to check for outliers and to check for homoscedasticity. The scatterplot indicated some heteroscedasticity, but as this was minimal the data was not manipulated. Moreover, a histogram and Q-Q-plot checked that all variables were normally distributed, and multicollinearity was also checked before analyses were conducted. To avoid potentially problematic high multicollinearity with the interaction terms for research questions 3.1 and 3.2, the variables were centered and an interaction term between each coping strategy and negative objective childbirth-related events was created with these variables (Aiken, West, & Reno, 1991).

To investigate research question 1, correlation analyses were run to assess the direction and strength of the relationship between objective negative events before, during and after childbirth and symptoms of PTSD, depression and anxiety. For research questions 2.1 and 2.2, which consider the direct effects of behavioural and cognitive coping strategies on symptoms of PTSD, depression and anxiety, linear regression analyses were run in which each coping strategy was added into block 2, following objective negative childbirth-related events in block 1, using the 'Enter' method. Research questions 3.1 and 3.2 concern the moderating effects of adaptive and maladaptive behavioural and cognitive coping strategies on the relationship between objective negative events and symptoms of PTSD, depression and anxiety. Additional linear regressions were run, in which the subscales of the BERQ and the CERQ, as well as the AAQ-II and the SSCM, were entered into block 3 of the regression model, following total objective negative childbirth-related events in block 1, and the coping strategies as individual variables in block 2. To assess moderation, the interaction effect between the predictor/independent variable (X) and the individual moderator (M) was examined, as well as whether such an effect is significant in predicting the outcome/ dependent variable (Y). Finally, to explore the influence of general life events on the correlation between objective negative childbirth-related events and symptomatology, linear regression analyses were carried out. Hereby, the variable 'total life events', as measured by the LEQ, was added in block 2,

following objective negative childbirth-related events in block 1. These were run against the dependent variables: symptoms of PTSD, depression and anxiety.

3. Results

3.1 Descriptive statistics

Table 1 shows descriptive statistics relating to participants' demographics and information regarding their pregnancy and delivery (*n,* percentage, mean, and standard deviation). It indicates that a large majority of the participants was married or lived with a partner, conceived naturally within half a year, and delivered a healthy baby in hospital in the presence of their partner. Table 2 presents descriptive statistics for the study variables, including the dependent variables (SVL-22, PHQ-9 and GAD-7), and the proposed moderators (the CERQ, BERQ, SSCM and AAQ-II). The reliability analyses indicate that the variables have high internal consistency, with Cronbach's alpha scores ranging from .72 to .96. A correlation matrix is included in Table 3, showing the Pearson correlation coefficients between the study variables. It is interesting to note the correlation between symptoms of PTSD, depression and anxiety and each specific period of objective negative events, i.e. during pregnancy, the delivery, and the first two weeks postpartum (see Table 3). Although significant correlations were found for "events during pregnancy" and depressive symptoms (p = .023), and for "events during childbirth" and symptoms of PTSD (p =.007); the objective negative events during the postpartum period correlated most strongly with all symptomatology, and especially with symptoms of depression, with a correlation coefficient of .49, $p < .001$. The correlation coefficient found for postpartum negative events and symptoms of PTSD was .24, $p = .005$, whilst the significant correlation between postpartum negative events and symptoms of anxiety had a coefficient of .31, $p < .001$.

Bar graphs relating to the percentage of participants that experienced the various objective negative events during pregnancy, during the delivery, and during the first two weeks following the delivery can be found in Appendices A, B and C.

Table 1.
Demographic characteristics and pregnancy- and delivery-related information

	n	*%*	*M*	*SD*
Age			30.74	7.91
Living situation				
Living alone with child	5	3.3		
Married/living together with partner and child	138	90.8		
Living with parents and child	6	3.9		
Other	3	2		
Marital status				
Single (never married)	12	7.9		
Married or living together	139	91.4		
Divorced	1	0.7		
Number of weeks pregnant when giving birth			38.48	4.82
Time to get pregnant				
Shorter than half a year	111	73		
Between half a year and a year	23	15.1		
Longer than a year but shorter than two years	4	2.6		
Longer than two years	14	9.2		
Way of getting pregnant				
Naturally	140	92.1		
In-vitro fertilisation (IVF)	3	2.0		
Intrauterine insemination (IUI)	4	2.6		
Other	5	3.3		
Planned pregnancy	123	80.9		
Unplanned pregnancy	29	19.1		
Location of birth				
In hospital	133	87.5		
At home	18	11.8		
Other	1	0.7		
Someone present at birth (multiple options possible)				
No	0	0		
Yes, partner	145	95.4		
Yes, parent	17	11.2		
Yes, friend	1	0.7		
Yes, other	10	6.6		
Illnesses or conditions in baby after birth				
No	138	90.8		
Yes	14	9.2		
Number of general life events total (LEQ)			1.03	1.32
Number of general life events in year before delivery			0.73	1.02
None	79	56.8		
Between 1 and 2 life events	51	21.6		
More than 2 life events	9	6.4		
Number of general life events after the delivery			0.29	0.63
None	110	79.1		
Between 1 and 2 life events	28	20.1		
More than 2 life events	1	0.7		

Table 2.
Descriptive statistics for the study variables

	Range of possible scores	*n*	*Missing*	*M*	*SD*	*α*
Total objective negative events	0-29	151	1	5.76	3.38	
During the pregnancy	0-8	151	1	1.02	1.05	
During the delivery	0-12	145	7	2.45	1.94	
Two weeks postpartum	0-9	143	9	2.51	1.70	
SVL-22	0-88	132	20	10.08	13.97	.96
PHQ-9	0-26	124	28	4.21	4.52	.92
GAD-7	0-21	127	25	4.17	4.78	.88
CERQ Subscales	4-20	110	42			
Self-blame				8.08	4.10	.89
Acceptance				10.72	4.38	.87
Rumination				8.45	3.50	.78
Positive Refocusing				10.78	4.15	.82
Refocus on Planning				10.25	4.02	.85
Positive Reappraisal				11.64	4.32	.86
Putting into Perspective				11.61	4.21	.84
Catastrophizing				5.81	2.33	.72
Other-blame				5.26	1.95	.73
BERQ Subscales	4-20	90	62			
Seeking Distraction				11.96	3.63	.77
Withdrawal				7.32	3.56	.90
Actively Approaching				11.19	4.15	.92
Seeking Social Support				11.53	4.19	.89
Ignoring				9.22	4.55	.93
SSCM	4-20	90	62	11.13	4.28	.93
AAQ-II	7-49	85	67	16.67	7.90	.90

Table 3.

Bivariate Correlation by Pearson Correlation Coefficient between objective negative childbirth-related events, the SVL-22, GAD-7, PHQ-9, general life events, and the subscales of the CERQ and the BERQ

Variables		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	Objective negative childbirth-related events	-																							
2	Events during pregnancy	.54***	-																						
3	Events during childbirth	.76***	.18*	-																					
4	Events 2 weeks postpartum	.73***	.25**	.24**	-																				
5	SVL-22	.31***	.15	.23**	.24**	-																			
6	GAD-7	.25**	.08	.12	.31***	.57***	-																		
7	PHQ-9	.39***	.20*	.12	.49***	.60***	.72***	-																	
8	Total life events (LEQ)	.08	.11	.02	.06	.33***	.35***	.31**	-																
9	Self-blame	.22*	.11	-.04	.39***	.31**	.43***	.57***	.20*	-															
10	Acceptance	.20*	.04	.15	.18	.35***	.41***	.26**	.41***	.44***	-														
11	Rumination	.37***	.16	.22*	.35***	.49***	.56***	.53***	.30**	.64***	.54***	-													
12	Positive Refocusing	.20*	.14	.19*	.07	.16	.09	.07	.29**	.11	.61***	.28**	-												
13	Refocus on Planning	.12	.02	.12	.07	.16	.27**	.11	.17	.34***	.66***	.51***	.51***	-											
14	Positive Reappraisal	.02	-.00	.10	-.08	.09	.16	-.06	.14	.09	.62***	.27**	.62***	.70***	-										
15	Putting into Perspective	.03	-.05	.03	.07	-.01	.08	-.12	.10	.17	.51***	.17	.52***	.48***	.61***	-									
16	Catastrophizing	.19*	-.02	.13	.23*	.60***	.46***	.49***	.37***	.33***	.35***	.51***	.14	.14	.07	-.03	-								
17	Other-blame	-.00	-.16	.06	.02	.01	.03	.04	.05	.08	.21*	.20*	.02	.19*	.13	.14	.40***	-							
18	Seeking Distraction	.12	.15	.14	-.02	.11	.11	.051	.14	.061	.36**	.09	.61***	.34**	.40***	.44***	.06	.05	-						
19	Withdrawal	.26*	.10	.12	.30**	.37***	.44***	.53***	.18	.37***	.24*	.40***	-.01	.10	-.04	-.01	.46***	.13	-.07	-					
20	Actively Approaching	-.02	-.05	.08	-.10	-.02	.16	-.12	.11	.07	.25*	.26*	.30**	.62***	.51***	.35**	-.07	.09	.36**	-.10	-				
21	Seeking Social Support	-.08	-.10	.05	-.14	-.12	.06	-.18	.00	.08	.19	.23*	.25*	.47***	.43***	.26*	-.02	.17	.23*	-.19	.75***	-			
22	Ignoring	.13	.09	.03	.16	.30**	.35**	.45***	.33**	.37***	.28**	.21*	.16	-.08	.02	.16	.32**	.03	.34**	.46***	-.28**	-.43***	-		
23	Self-compassion	-.20	-.10	-.03	-.28**	-.30**	-.28**	-.41***	-.01	-.27***	.04	-.21*	.25*	.30**	.38***	.29**	-.19	.21	.32**	-.36***	.44***	.44***	-.33**	-	
24	Psychological Flexibility	.36**	.13	.19	.39***	.45***	.46***	.65***	.22*	.56***	.17	.57***	-.07	-.02	-.22*	-.09	.42***	.09	-.02	.63***	-.17	-.22*	.46***	-.51	-

* $p < .05$
** $p < .01$
*** $p < .001$

3.2 Relationship between objective negative childbirth-related events and symptoms of PTSD, depression and anxiety

Research question 1 explores the relationship between the occurrence of objective negative childbirth-related events and symptoms of PTSD, depression and anxiety. For symptoms of PTSD, the correlation matrix in Table 3 indicates a weak yet significant positive correlation with a coefficient of .31, $p < .001$. The correlation found for objective negative events and symptoms of depression was also significant, with a coefficient of .39 ($p < .001$), approaching a moderate correlation. Finally, there was a significant weak positive correlation between objective negative childbirth-related events and symptoms of anxiety, with a correlation coefficient of .25, $p = .004$. In conclusion, there is a significant positive relationship between total objective negative childbirth-related events and symptoms of PTSD and anxiety, and particularly, symptoms of depression.

To answer the exploratory research question regarding a possible confounding impact of general life events, as measured by the LEQ, on the correlation between negative childbirth-related events and symptomatology, a regression analysis was carried out. A rule of thumb proposes that a change in regression coefficient of more than 10% indicates the variable is a confounder (LaMorte & Sullivan, 2021). For neither PTSD, depression nor anxiety did the regression coefficient change more than 10%, suggesting general life events did not have a confounding impact on the association between negative childbirth-related events and symptomatology (no table).

3.3 Main effects of behavioural coping strategies on symptomatology

Research question 2.1 concerns the relationship between behavioural coping strategies and symptoms of PTSD, depression and anxiety. Specifically, it explored whether these coping strategies explained a significant amount of variance in symptomatology after accounting for objective negative childbirth-related events. Three hierarchical multiple linear regressions were calculated to demonstrate this relationship. Total objective negative childbirth-related events experienced were added in block 1, and the behavioural coping strategies were added in block 2. Table 4 shows the results of these regression analyses.

For symptoms of PTSD, a significant regression equation was found, $F(8,76) = 3.47$, $p = .002$, with $R^2 = .27$. In this case, none of the individual coping strategies within this regression contributed significantly to the model, as can be seen in Table 4. They did not explain any

further variance in symptoms of PTSD; i.e. in addition to the variance explained by the total objective negative events in step 1, $p = .004$.

An additional multiple linear regression was performed to investigate the proportion of the variance in symptoms of depression that can be explained by behavioural coping strategies, after accounting for objective negative childbirth-related events. A significant regression equation was found, $F(8,76) = 9.30$, $p < .001$, with $R^2 = .50$. Of the individual variables within this regression, only Psychological Flexibility contributed significantly to the model, $p = .003$, in addition to the contribution of total objective negative events, $p < .001$. As the beta coefficient for Psychological Flexibility was positive ($\beta = .38$), this suggests that less Psychological Flexibility indicated more symptoms of depression (as per the scoring of the AAQ-II questionnaire). To conclude, approximately half of the observed variation in symptoms of depression can be explained by the contribution of total objective negative events and Psychological Flexibility.

A final multiple linear regression was carried out to demonstrate the relationship between behavioural coping strategies and symptoms of anxiety. Again, a significant regression equation was found, $F(8,76) = 5.61$, $p < .001$, with $R^2 = .37$. As individual variables within this regression, only Ignoring contributed significantly to the model, $p = .043$, following the contribution of objective negative events, $p = .02$. With a positive beta coefficient of .29, the results suggest that the more participants ignored their childbirth-related events, the higher their symptoms of anxiety were. To sum up, two behavioural coping strategies had direct effects on symptoms: Psychological Flexibility on symptoms of depression, and Ignoring on symptoms of anxiety, following the contribution of objective negative childbirth-related events.

Table 4.

Main effect results following linear regression analyses for behavioural coping strategies on symptoms

		PTSD symptoms			Depression symptoms			Anxiety symptoms		
Step		*B*	*SE B*	*ß*	*B*	*SE B*	*ß*	*B*	*SE B*	*ß*
1	(Constant)	2.75	2.88		1.21	0.90		2.12	1.00	
	Total negative events	1.27	0.43	.31**	.52	0.14	.39***	0.36	0.15	.25*
2	(Constant)	-6.14	8.17		-3.36	2.20		-4.95	2.59	
	Total negative events	0.58	0.45	.14	.24	0.12	.18*	0.14	0.14	.10
	Seeking Distraction	0.43	0.54	.11	-0.02	0.14	-.02	-.09	0.17	-.07
	Actively Approaching	0.41	0.54	.12	0.01	0.14	.01	0.32	0.17	.28
	Seeking Social Support	-0.23	0.54	-.07	0.06	0.14	.06	0.17	0.17	.15
	Self-compassion	-0.50	0.44	-.15	-0.09	0.12	-.09	-0.21	0.14	-.18
	Psychological Flexibility	0.41	0.26	.23	0.22	0.07	.38**	0.11	0.08	.19
	Withdrawal	0.49	0.54	.13	0.17	0.14	.14	0.20	0.17	.15
	Ignoring	0.11	0.47	.04	0.19	0.13	.19	0.31	0.15	.29*

Note. For PTSD symptoms, R^2 = .10 for Step 1: ΔR^2 = .17 for Step 2 (p = .020)
For Depression symptoms, R^2 = .15 for Step 1: ΔR^2 = .34 for Step 2 (p < .001)
For Anxiety symptoms, R^2 = .06 for Step 1: ΔR^2 = .31 for Step 2 (p < .001)
* p < .05, ** p < .01, *** p < .001

3.4 Main effects of cognitive coping strategies on symptomatology

Research question 2.2 investigates the relationship between cognitive coping strategies and symptoms of PTSD, depression and anxiety. Three further hierarchical multiple linear regressions were carried out, allowing an insight into whether the addition of cognitive coping strategies significantly improves the model's ability to predict symptoms. Total objective negative childbirth-related events were added in block 1, and the cognitive coping strategies were added in block 2. Table 5 illustrates the results of these regression analyses.

For symptoms of PTSD, a significant regression equation was found, F (10,99) = 9.45, p < .001, with R^2 = .49. As individual variables within this regression, Catastrophizing (p < .001) and Other-blame (p = .002) contributed significantly to the model, in addition to the total objective negative events (p = .001). With a positive beta coefficient of .55, more use of Catastrophizing indicated more PTSD symptoms. In contrast, as the beta coefficient for Other-blame was negative (β = -.27), more use of this strategy implied fewer symptoms.

An additional multiple linear regression was performed to demonstrate to what extent the addition of cognitive coping strategies to the regression model could explain the variance in symptoms of depression. Again, a significant regression equation was found, F (10,99) = 10.33, p < .001, with R^2 = .51. As Table 5 shows, two variables contributed significantly to the

model: Catastrophizing (p = .001) and Self-blame (p < .001), following the contribution of objective negative events (p < .001). With both beta coefficients being positive, higher use of Catastrophizing (β = .32) and Self-blame (β = .38) predicted higher symptoms of depression.

A final multiple linear regression was calculated to demonstrate the relationship between cognitive coping strategies and symptoms of anxiety. Another significant regression equation was found, F (10,99) = 7.56, p < .001, with R^2 = .43. Table 5 shows that as individual variables within this regression, Rumination (p = .011), Catastrophizing (p = .004), Other-blame (p = .017) and Positive Refocusing (p = .022), contributed significantly to the model. These coping strategies were able to explain an additional 37% of the variance in symptoms of anxiety, following objective negative events (p = .008). With positive beta coefficients, more use of Rumination (β = .33) and Catastrophizing (β = .30) predicted higher symptoms of anxiety. On the other hand, the negative beta coefficients suggest that higher use of Other-blame (β = -.21) and Positive Refocusing (β = -.26) resulted in fewer symptoms of anxiety.

Table 5.

Main effect results following linear regression analyses for cognitive coping strategies on symptoms

		PTSD symptoms			Depression symptoms			Anxiety symptoms		
Step		*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
1	(Constant)	2.76	2.52		1.21	0.79		2.12	0.88	
	Total negative events	1.27	0.38	.31**	0.52	0.12	.39***	0.36	0.13	.25**
2	(Constant)	-8.60	4.70		-2.53	1.49		-2.10	1.70	
	Total negative events	0.51	0.33	.12	0.28	0.10	.21**	0.09	0.12	.07
	Acceptance	0.57	0.40	.18	-0.02	0.13	-.02	0.28	0.14	.26
	Positive Refocusing	-0.25	0.35	-.07	-0.01	0.11	-.01	-0.30	0.13	-.26*
	Refocus on Planning	-0.13	0.42	-.04	-0.08	0.13	-.07	-0.02	0.15	-.02
	Positive Reappraisal	0.05	0.41	.01	-0.09	0.13	-.08	0.08	0.15	.08
	Putting into Perspective	-0.09	0.33	-.03	0.02	0.10	.02	0.02	0.12	0.02
	Self-blame	-0.22	0.34	-.06	0.42	0.11	.38***	0.04	0.12	.04
	Rumination	0.82	0.47	.21	0.18	0.15	.14	0.44	0.17	.33*
	Catastrophizing	3.28	0.57	.55***	0.62	0.18	.32**	0.61	0.21	.30**
	Other-blame	-1.92	0.59	-.27**	-0.27	0.19	-.12	-0.52	0.21	-.21*

Note. For PTSD symptoms, R^2 = .10 for Step 1: ΔR^2 = .39 for Step 2 (p < .001)
For Depression symptoms, R^2 = .15 for Step 1: ΔR^2 = .36 for Step 2 (p < .001)
For Anxiety symptoms, R^2 = .06 for Step 1: ΔR^2 = .37 for Step 2 (p < .001)
* p < .05, **p < .01, *** p < .001

3.5 Moderating effects of behavioural coping strategies on the relationship between negative childbirth-related events and symptomatology

Research question 3.1 concerns the extent to which the relationship between objective negative birth events and symptoms of PTSD, anxiety, and depression is moderated by adaptive and maladaptive behavioural coping strategies. The following will discuss the results of hierarchical linear regression analyses that consist of total objective negative childbirth-related events in block 1, behavioural coping strategies as individual variables in block 2, and the interaction terms between objective negative childbirth-related events and each coping strategy in block 3. A table outlining the F values, R^2 values, and significance levels of the models containing each interaction term can be found in Appendix D.

As multiple comparisons were carried out, the Bonferroni correction was applied, creating a new significance level of $p < .007$. After applying this correction, neither adaptive nor maladaptive behavioural coping strategies were found to significantly moderate the relationship between objective negative childbirth-related events and symptoms of PTSD, depression or anxiety (Table 6). A trend to significance could not be identified either.

Table 6.

Final linear regression models including moderation analyses for behavioural coping strategies

	PTSD symptoms			Depression symptoms			Anxiety symptoms		
	B	*SE B*	ß	*B*	*SE B*	ß	*B*	*SE B*	ß
Seeking distraction	0.13	0.13	.10	0.02	0.04	.06	-0.04	0.05	-.10
Actively approaching	-0.01	0.13	-.01	-0.02	0.04	-.04	-0.06	0.04	-.14
Seeking social support	-0.16	0.11	-.16	-0.07	0.03	-.20	-0.04	0.04	-.11
Self-compassion	-0.10	0.12	-.09	-0.05	0.04	-.14	-0.01	0.04	-.03
Psychological flexibility	0.05	0.06	.09	0.02	0.02	.11	-0.02	0.02	-.08
Withdrawal	0.20	0.13	.16	0.08	0.04	.19	0.03	0.05	.06
Ignoring	0.10	0.10	.11	0.04	0.03	.13	-0.03	0.03	-.11

Note. These findings result from the final regression model including the interaction term between total objective negative childbirth-related events and each behavioural coping strategy. Model 1 including total objective negative childbirth-related events, and Model 2 including total objective negative childbirth-related events and individual behavioural coping strategies, are not presented in this table.
$p < .007$ (after applying the Bonferroni correction)

3.6 Moderating effects of cognitive coping strategies on the relationship between negative childbirth-related events and symptomatology

Hierarchical linear regression analyses were also carried out to assess whether adaptive and maladaptive cognitive coping strategies moderated the relationship between negative childbirth-related events and symptoms of PTSD, depression and anxiety (RQ 3.2). Interaction terms between the cognitive coping strategies and negative childbirth-related events were added into the regression in block 3, following the cognitive coping strategies as main effect variables in block 2 and negative objective events in block 1. Appendix E includes a table outlining the F values, R^2 values, and significance levels of the models containing each interaction term.

Once again, the Bonferroni correction was applied to correct for the multiple comparisons carried out, resulting in a new significance level of $p < .006$. As Table 7 shows, after applying this correction, neither adaptive nor maladaptive cognitive coping strategies were found to significantly moderate the relationship between objective negative childbirth-related events and symptoms of PTSD, depression or anxiety. Moreover, a trend to significance could not be determined for cognitive coping strategies either.

Table 7.

Final linear regression models including moderation analyses for cognitive coping strategies

	PTSD symptoms			Depression symptoms			Anxiety symptoms		
	B	*SE B*	*ß*	*B*	*SE B*	*ß*	*B*	*SE B*	*ß*
Acceptance	0.10	0.08	.10	0.03	0.03	.11	-0.02	0.03	-.05
Positive refocusing	0.01	0.10	.01	-0.03	0.03	-.07	-0.04	0.03	-.11
Refocus on planning	0.04	0.10	.04	-0.01	0.03	-.02	-0.04	0.03	-.11
Positive reappraisal	0.07	0.09	.07	-0.01	0.03	-.03	-0.02	0.03	-.07
Putting into perspective	0.13	0.09	.13	0.04	0.03	.12	-0.01	0.03	-.04
Self-blame	0.07	0.10	.07	0.04	0.03	.13	-0.01	0.03	-.02
Rumination	0.08	0.10	.08	0.02	0.03	.06	-0.02	0.03	-.06
Catastrophizing	0.26	0.15	.13	0.11	0.05	.19	0.01	0.06	.01
Other-blame	-0.10	0.27	-.04	-0.04	0.09	-.04	-0.01	0.09	-.14

Note. These findings result from the 3rd regression model including the interaction term between the cognitive coping strategy and total objective negative childbirth-related events. Model 1 including total objective negative childbirth-related events, and Model 2 including total objective negative childbirth-related events and individual cognitive coping strategies, are not presented in this table.

$p < .006$ (after applying the Bonferroni correction)

4. Discussion

The present study investigated the relationship between objective negative childbirth-related events (i.e. events involving medical and health-related components) and symptoms of PTSD, depression and anxiety. Furthermore, it studied the direct effects of both behavioural coping strategies (Seeking Distraction, Actively Approaching, Seeking Social Support, Psychological Flexibility, Self-compassion, Ignoring and Withdrawal) and cognitive coping strategies (Acceptance, Refocus on Planning, Positive Refocusing, Positive Reappraisal, Putting into Perspective, Self-blame, Other-blame, Rumination, and Catastrophizing) on symptomatology. Finally, it explored the moderating effects of these coping strategies on the relationship between negative childbirth-related events and symptoms of PTSD, depression and anxiety.

The results showed a significant positive correlation between objective negative childbirth-related events and symptoms of PTSD, depression, and anxiety. Two behavioural coping strategies were directly related to symptoms: Psychological Flexibility and Ignoring. Cognitive coping strategies associated with symptoms included Catastrophizing, Self-blame, Rumination, Other-blame, and Positive Refocusing. None of the coping strategies moderated the relationship between objective negative events and symptoms of PTSD, depression or anxiety.

4.1 Summary and interpretation of results

The results showed a significant positive correlation between objective negative childbirth-related events and symptoms of PTSD, depression, and anxiety, supporting hypothesis 1. This suggests that as a woman experiences more medical and health-related events concerning herself or her baby, the more detrimental this is for her mental well-being. This confirms findings by Ayers et al. (2016) and Söderquist, Wijma, and Wijma (2002) on postpartum posttraumatic stress responses. Ayers (2004) attributes the increased risk for postnatal PTSD to prenatal and postnatal risk factors increasing the stress-load and impeding the postpartum recovery process. Moreover, the results are consistent with Vliegen et al.'s review study (2014), in which several risk factors were identified for postpartum depression, including medical problems during pregnancy and at birth. In the current study, depressive symptoms were most strongly associated with postpartum events (rather than the prenatal and birth events found in Vliegen et al.'s study (2014)), which supports the findings of Simpson et al. (2018). Particularly difficulties in breastfeeding and subsequent feelings of guilt and failure have previously been

identified as a significant risk factor which increases the likelihood of developing depressive symptoms (Watkins, Meltzer-Brody, Zolnoun, & Stuebe, 2011). Equally, women who experience depressive symptoms following a delivery were found to be less likely to attempt breastfeeding at all (Dias & Figueiredo, 2015). Finally, the study supports research on postpartum anxiety after experiences of childbirth with high labour pain, more medical interventions, and concerns about the health of the baby and the self (Bell et al., 2016; Coates, de Visser, & Ayers, 2015; Ford & Ayers, 2009). However, most research on postnatal anxiety has focused on anxiety and the subjective perception of childbirth, rather than the occurrence of objective negative events (Türkmen, Yalniz Dilcen, & Özcoban, 2020).

The regression analyses showed that two behavioural coping strategies were directly associated with symptoms, after accounting for objective negative events: firstly, less Psychological Flexibility was associated with more symptoms of depression, confirming hypothesis 2.1. Taking an accepting and mindful approach towards experiences of objective negative childbirth-related events seemed to have sustained mothers' mental well-being. This supports findings by Monteiro, Fonseca, Pereira, Alves, & Canavarro (2019), who found that women who took a non-judgmental and self-compassionate stance to their experiences and thoughts were more likely to present with less depressive symptomatology. Secondly, more use of Ignoring was associated with more symptoms of anxiety, supporting hypothesis 2.2. The more participants ignored their childbirth-related events and behaved as if they had not happened, the higher their symptoms of anxiety, supporting research on the general population by Kraaij and Garnefski (2019). Research on behavioural strategies for postpartum anxiety specifically is limited, so these findings make a valuable contribution to the research base. With respect to symptoms of PTSD, no behavioural coping strategies were directly associated with symptomatology, thus rejecting hypotheses 2.1 and 2.2. This suggests that with the current sample, these coping strategies did not buffer or exacerbate posttraumatic stress responses, which contradicts previous research by Nakić Radoš et al. (2018).

Various cognitive coping strategies were also directly associated with symptoms of PTSD, depression and anxiety, after accounting for objective negative events. For example, higher use of the adaptive cognitive strategy Positive Refocusing was associated with fewer symptoms of anxiety, thus meeting hypothesis 3.1. Although previous research on this coping strategy for postpartum anxiety is lacking, interventions often encourage women to refocus their attention on the positive things around them to improve coping (The BC Reproductive

Mental Health Program, 2013). Furthermore, the results support general research showing associations between positive refocusing and lower levels of anxiety (Garnefski, Kraaij, Schroevers, & Somsen, 2008; Garnefski, Legerstee, Kraaij, van den Kommer, & Teerds, 2002). Methodological differences, such as different measures for coping and for anxiety, and different assessment timings, may explain why further adaptive coping strategies, such as Acceptance and Positive Reframing, that have previously been associated with postpartum anxiety, were not found to be significant in this study (George et al., 2013).

In terms of maladaptive cognitive coping strategies, the results showed that higher use of Catastrophizing was associated with more symptoms of all three disorders, thereby supporting hypothesis 3.2. This finding is accordant with previous research. Based on the model by Ehlers and Clark (2000), catastrophizing following objective negative childbirth-related events may have increased levels of stress and hypervigilance to further medical and health-related threats, and may in turn have increased PTSD symptoms. Research suggests that catastrophizing on childbirth pain increases the intensity of postpartum pain and of PTSD and depression symptoms (Ferber, Granot, & Zimmer, 2005; Soares et al., 2012). In the current study, 45% of the sample experienced postnatal physical pain: catastrophizing may also have increased both pain levels *and* symptoms of PTSD and depression.

For anxiety specifically, higher use of Rumination was also related to increased symptoms, thereby supporting hypothesis 3.2. This result aligns with previous general research (Garnefski, van Rood, de Roos, & Kraaij, 2017; Omran, 2011). It also supports an experimental study by Stein et al. (2012), who found that mothers with Generalised Anxiety Disorder showed an increased likelihood of negative affect and difficulty controlling thoughts after a worry/rumination prime. The results of this study contribute towards a better understanding of the impact of catastrophizing and rumination on postnatal anxiety.

A significant association was additionally found for the cognitive coping strategy Other-blame: higher use of this strategy was associated with fewer symptoms of PTSD and anxiety, thereby rejecting hypothesis 3.2 and contradicting several previous studies, which have instead shown that blaming others, such as healthcare staff, for events during birth is associated with postpartum psychopathology (Czarnocka & Slade, 2000; George et al., 2013). Objective negative childbirth-related events often entail medical procedures regarding which the mother has little influence, such as unplanned caesarean sections (Olde et al., 2006). The ability to blame others for this seemed to have reduced feelings of distress; directing blame outwards and

not inwards may have led to better mental health (Weinberg, 1994). The mechanism that underlies this seeming benefit is unclear, although research suggests that attributing negative events to others helps to gain a sense of control and helps avoid difficult emotions (Malle, Guglielmo, & Monroe, 2014). Indeed, directing the blame for negative childbirth-related events inwards was associated with increased symptoms of depression in the current study, thereby supporting prior research by Gutiérrez-Zotes et al. (2016). Based on theory by Abramson, Seligman and Teasdale (1978), self-blame in this case may have decreased mothers' self-esteem, leading to helplessness and depressive symptoms.

Finally, a nonsignificant result was found for the moderating effect of coping strategies on the relationship between objective negative childbirth-related events and psychopathology: the strategies did not strengthen or weaken this relationship, and thereby did not seem to buffer or intensify the influence of objective negative events on symptoms of PTSD, depression or anxiety. This disconfirms the study's exploratory research question. However, after reviewing the literature, this finding is consistent with previous research, including the lack of significant interactions found between stress during pregnancy and individual coping on mental health outcomes (Guardino & Dunkel-Schetter, 2014). Instead, research has found that family coping may play a protective role against the impact of birth complications on parental stress responses (Janis, Callahan, Shelton, & Aubuchon-Endsley, 2016). These researchers theorised that as the experience of birth complications may impact the entire family, involving the family unit as a whole may reduce the consequences of these events to a greater extent than individual coping strategies would. This difference between individual and family coping may be a promising avenue for future research, and could tie into research on the coping strategy Seeking Social Support.

4.2 Implications and significance

The current study's findings make a valuable contribution to the limited existing research base. There is still an insufficient understanding and awareness of the influence of objective negative childbirth-related events on mothers' mental health. This may be due to the societal pressures to see childbirth as wholly positive, thereby disregarding the development of postpartum psychopathology. Particularly postnatal anxiety is underreported, possibly owing to the high rates of comorbidity with postpartum depression (Nakić Radoš et al., 2018). Although Matthey, Barnett, Howie, and Kavanagh (2003) propose an all-encompassing diagnosis of 'postnatal

mood disorder', the differences found in symptomatology in the current study emphasise the importance of differentiating disorders in clinical practice. The distinction of postnatal maladjustment into its separate symptoms in this study is therefore one of its strengths (Miller, Pallant, & Negri, 2006).

The findings may help healthcare staff to better meet the needs of women during and after pregnancy and childbirth, and identify factors that may be used for screening and prevention of postpartum psychopathology. For example, potential health complications can be assessed during pregnancy, the delivery and the maternity period, as well as mothers' employment of maladaptive coping strategies, to evaluate their level of risk for postnatal maladjustment. The study also highlights the importance of promoting adaptive coping strategies such as Positive Refocusing and Psychological Flexibility. These coping strategies can be fostered within counselling that allows mothers to share their experiences and feelings, whilst answering their questions and addressing gaps in their understanding of events (Gamble & Creedy, 2004). Future research should test specific counselling interventions.

4.3 Limitations and future research

The current study provides detailed insight into the relationship between objective negative childbirth-related events, coping strategies and psychopathology in Dutch-speaking first-time mothers. However, several limitations need to be considered. Firstly, due to the correlational design of the study, it was not possible to ascertain causation between objective negative childbirth-related events and symptoms. Moreover, it is important to note that the proportion of the variance in either PTSD, depression or anxiety symptoms explained by these events and coping strategies varied between 27% and 51%. This suggests that more than half of the variance in symptoms of either disorder is explained by other, unknown variables. In any case, the results did suggest that general life events did not have a confounding impact. In terms of data evaluation, a limitation concerns multiple testing and the Bonferroni correction applied to the moderation analyses. This reduced the significance level considerably, leading to insignificant main effects of certain coping strategies.

Regarding the study sample, firstly, its limited size may also explain why certain main effects of coping strategies or in fact their moderation effects were not found. Secondly, the homogenous sample consisting of Dutch-speaking women only, and mainly of married women or those living together with their partners, who conceived naturally and who gave birth in

hospital following a planned pregnancy, limits the generalisability of the results. A more diverse sample, including, for instance, single mothers and teen mothers, would enhance the generalisability to the general population (Grekin, Brock, & O'Hara, 2017; SmithBattle & Freed, 2016). Moreover, the results cannot be generalised in terms of childbirth-related factors such as unplanned pregnancies and preterm births, which have both been identified as significant risk factors for postpartum PTSD development (Anderson & Cacola, 2017; Slade, 2006). Such factors were, unfortunately, too expansive to be included here.

Thirdly, participants were not clinically diagnosed with PTSD, depression or anxiety, so results pertaining to these disorders must only be understood in terms of self-perceived symptoms measured by a self-report design. This may be flawed, as participants, unaware of the impact of their deliveries, may have underreported their symptoms. Alternatively, they may not have fully disclosed their emotional well-being, as was shown in Forder et al.'s study (2020), in which women felt symptoms had been normalised and feared adverse repercussions or involvement of health services and therefore did not report their well-being honestly. This may have resulted in the sample of the present study overall presenting with mild symptoms of PTSD, depression and anxiety, and few corresponding objective negative childbirth-related events. Also, the symptoms reported may have differed significantly dependent on how recent the birth experience was: for some women symptoms may begin shortly after, whilst in others they may start only after six months (Bindeman, 2016). The retrospective design of the study also entails possible recall bias, calling into question the accuracy of participants' reports of their symptoms. The halo effect may additionally play a role in mothers' perception of childbirth, with the happiness and sense of reward following the labour colouring the memory of their pain (Callister, Khalaf, Semenic, Kartchner, & Vehvilainen-Julkunen, 2003), although this may only apply to cases with moderate pain (Waldenström & Schytt, 2008). Regarding the questionnaire, many objective negative events included in the checklist generally occur during the first two weeks postpartum, e.g. insomnia or physical pain. This may have increased the chance of events during the maternity period being the greatest predictor of symptoms of PTSD, depression and anxiety (as was the case).

It is important for future research to explore the subjective birth experience alongside the experience of objective negative events, as research suggests that a subjective negative experience can result from objective negative events, and may directly increase the likelihood of postpartum psychopathology (Eckerdal et al., 2018). This could also confirm the diathesis-

stress model for birth-related PTSD and symptomatology and may provide insight into the variance in symptoms not accounted for in this study. Moreover, a longitudinal design would allow insight into the potential lasting effect of a negative childbirth experience. Finally, inclusion of other assessment methods, such as a qualitative design, could validate the current findings and analyse experiences more deeply.

4.4 Conclusion

The current study found significant associations between objective negative childbirth-related events and symptoms of PTSD, depression and anxiety, supporting previous research. Several coping strategies were associated with lower levels of symptoms, including Psychological Flexibility, Positive Refocusing and Other-blame, and may have helped sustain mothers' well-being. Coping strategies that were associated with more symptoms were Ignoring, Catastrophizing, Self-blame and Rumination. None of the coping strategies moderated the relationship between negative events and either outcome measure. Future directions of study could focus on the subjective birth experience, and include a more diverse sample. With further insight into traumatic perceptions of childbirth and a deeper understanding of how mothers cope with their birth experiences, support for postnatal distress could certainly be improved.

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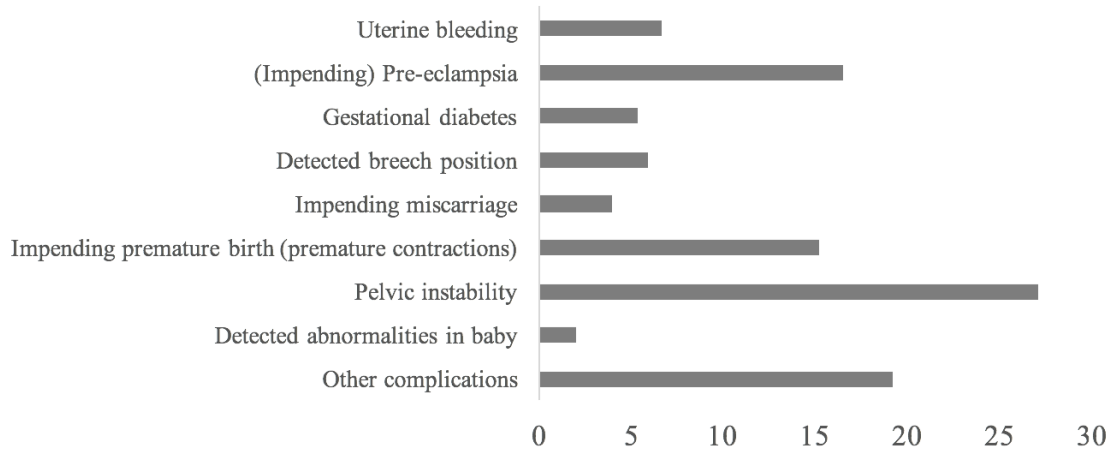
Appendices

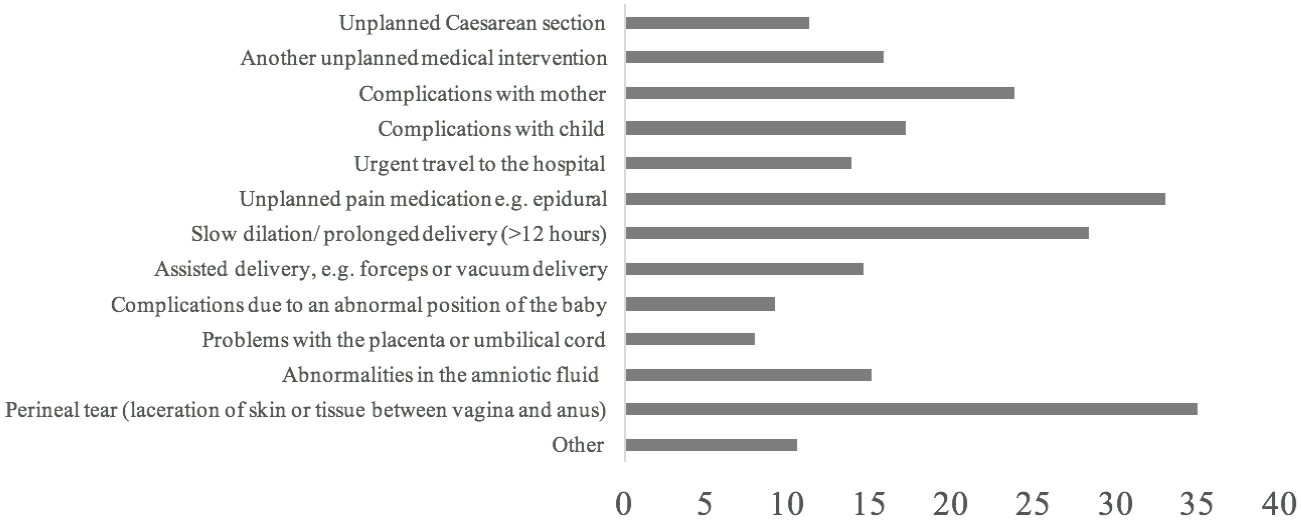
Appendix A

Percentage of participants that experienced objective negative events during pregnancy.



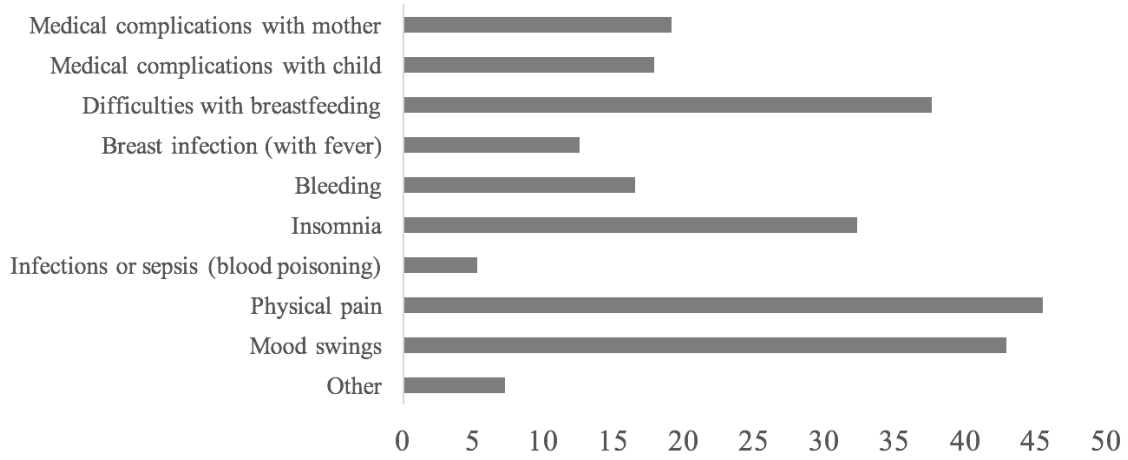
Appendix B

Percentage of participants that experienced objective negative events during the delivery.



Appendix C

Percentage of participants that experienced objective negative events during the maternity period.



Appendix D

F values, R^2 and significance levels for the final models, including the interaction terms between each behavioural coping strategy and total objective negative childbirth-related events.

	PTSD symptoms		Depression symptoms		Anxiety symptoms	
	F	R^2	*F*	R^2	*F*	R^2
Seeking distraction	3.53*	.11	25.24**	.16	2.43	.08
Actively approaching	3.02*	.10	5.72* *	.17	3.52*	.11
Seeking social support	4.15**	.13	7.74***	.21	2.49	.08
Self-compassion	5.49**	.16	11.26***	.28	3.89*	.12
Psychological Flexibility	8.19***	.23	22.78***	.46	7.79***	.22
Withdrawal	7.58***	.21	17.52***	.38	7.75***	.21
Ignoring	6.07**	.18	13.70***	.32	6.23**	.18

* $p > .05$

** $p > .01$

*** $p > .001$

Appendix E

F values, R^2 and significance levels for the final models, including the interaction terms between each cognitive coping strategy and total objective negative childbirth-related events.

	PTSD symptoms		Depression symptoms		Anxiety symptoms	
	F	R^2	*F*	R^2	*F*	R^2
Acceptance	8.25***	.19	8.64***	.20	8.81***	.20
Positive refocusing	4.14**	.11	6.58***	.16	2.93*	.08
Refocus on planning	4.47**	.11	6.50***	.16	5.48**	.13
Positive reappraisal	4.25**	.11	6.54***	.16	3.57*	.09
Putting into perspective	4.43**	.11	6.96***	.16	2.63	.07
Self-blame	6.79***	.16	24.74***	.41	9.41***	.21
Rumination	12.68***	.26	16.92***	.32	16.56***	.32
Catastrophizing	24.66***	.41	19.68***	.36	10.99***	.24
Other blame	3.76*	.10	6.47***	.16	3.18*	.08

* $p > .05$

** $p > .01$

*** $p > .001$