

Posttraumatic Growth in Women After a Childbirth Experience: The Influence of Individual Characteristics and Intrusive and Deliberate Rumination

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Objective: This study targets women who had a self-defined traumatic childbirth experience to (a) explore the differences between sociodemographic-, obstetric-, and trauma-related variables in relation to the rumination style; (b) determine differences between intrusive and deliberate rumination in relation to posttraumatic growth (PTG) dimensions, and (c) test whether intrusive rumination is associated with deliberate rumination, which in turn is associated with PTG dimensions. **Method:** A cross-sectional study design was employed using a web-based survey method for data collection. In total, 202 women who identified their childbirth experience as traumatic participated in this study. **Results:** Intrusive rumination and deliberate rumination were positively associated with all dimensions of PTG in women following the traumatic childbirth event. Deliberate rumination fully explained the relationship between intrusive rumination and PTG aspects of relating to others, new opportunities, and personal strength, and partially explained the relationship between intrusive rumination and PTG aspects of spiritual changes and appreciation of life. **Conclusions:** The results suggest that deliberate rumination can contribute to explain the occurrence of PTG. These findings could help develop psychosocial interventions to maximize opportunities for deliberate rumination for women with traumatic childbirth experiences.

Clinical Impact Statement

The posttraumatic maternal growth that occurs in response to a traumatic childbirth experience can be explained, to some extent, by rumination, particularly deliberate rumination.

Keywords: traumatic childbirth, deliberate rumination, intrusive rumination, posttraumatic growth

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Childbirth is a highly emotional and physical experience for the mother and wider family, which can involve feelings of great happiness (Jouhki et al., 2017), strengthening, and empowerment (Nieuwenhuijze & Leahy-Warren, 2019). In several studies, the importance of providing all women with a positive childbirth experience to protect the physical and mental health of mothers and babies has been recognized (Downe et al., 2018; Oladapo et al., 2018; World Health Organization, 2018). However, many women experience giving birth as a traumatic experience, which can lead to great suffering and despair (Henriksen et al., 2017). A traumatic childbirth experience has been defined as a “woman’s experience of interactions and/or occurrences directly related to childbirth that caused overwhelming emotions and distressing responses; leading to short- and/or long-term negative impacts on a woman’s health and well-being” (Leinweber et al., 2022, p. 691). Some studies suggest that between 9% and 50% of women report their experience of childbirth as a traumatic event (Alcorn et al., 2010; Ayers & Pickering, 2001; O’Donovan et al., 2014; Rodríguez-Almagro et al., 2019; Stramrood et al., 2011). Additionally, the COVID-19 pandemic has been associated with an increase in the incidence of traumatic childbirth experiences. For instance, some studies have reported a rise in trauma symptoms among women from before to after the pandemic (e.g., Mayopoulos et al., 2021), and other studies have suggested that perinatal healthcare changes during the COVID-19 pandemic have contributed to an increase in the development of trauma symptoms following childbirth (Diamond & Colaianni, 2022).

Research suggests that women’s subjective perception of childbirth experience is influenced by various factors, such as demographic, psychological, obstetric, and partner-, midwife-, and doctor-related factors (Chabbert et al., 2021). In terms of obstetric factors, women who more often perceive their childbirth as traumatic are those who have deliveries with more intervention, namely women who had a vaginal delivery with forceps and/or vacuum or a cesarean, compared with women who had a vaginal delivery, and those who had difficulty managing pain and/or had severe pain during labor (Chabbert et al., 2021; Kempe & Vikström-Bolin, 2020; Webb et al., 2021). Also, obstetric emergencies are named as a cause of a negative childbirth experience, namely emergency cesarean sections, perineal trauma, or newborn health complications (Molgora et al., 2020; Stramrood et al., 2011).

In terms of sociodemographic factors, women who more often perceive their childbirths as traumatic are first-time mothers, with primiparous mothers being more emotionally vulnerable (Smorti et al., 2019). In terms of factors related to midwives and doctors, women who perceive more negative attitudes and behaviors of midwives and attending physicians, and a greater lack of social support are more likely to experience a traumatic childbirth (Hajizadeh et al., 2020; Hollander et al., 2017; Kuipers et al., 2023; Leinweber et al., 2022; McKelvin et al., 2021). In terms of psychological factors, a negative childbirth experience is usually influenced by women’s psychological functioning, such as antenatal depression or a history of posttraumatic stress disorder (PTSD), and/or the psychological consequences of the childbirth for the mother, the partner, and/or the newborn (O’Donovan et al., 2014; Soet et al., 2003).

Several studies have reported negative psychological outcomes following a traumatic childbirth event, including postpartum depression, anxiety, or PTSD onset (Brandão et al., 2020; Dekel et al., 2020; O’Hara & McCabe, 2013). On the other hand, research has

shown that some individuals who experience traumatic events may also experience positive psychological changes, namely posttraumatic growth (PTG) (Brooks et al., 2017; Sawyer et al., 2012). PTG is the experience of positive change that occurs as a result of coping with highly challenging life crises. It is manifested in various forms, including a higher appreciation of life, more significant interpersonal relationships, a greater sense of personal strength, altered priorities, and a greater awareness of spiritual matters (Henson et al., 2021; Tedeschi & Calhoun, 2004).

PTG is likely to be influenced not only by sociodemographic factors but also by psychological ones. Overall, some studies suggest that young, more educated, and primipara women are more likely to experience growth after a traumatic childbirth experience (see Brandão et al., 2020 for a review).

In terms of psychosocial factors, and according to the PTG model developed by Tedeschi and Calhoun (2004), rumination is a necessary cognitive prerequisite for growth to occur. Rumination is divided into two categories: intrusive and deliberate rumination (Tedeschi & Calhoun, 2004; Zoellner & Maercker, 2006). Intrusive rumination occurs when a person automatically relives images, emotions, and thoughts related to a particular event (Beck et al., 2018; Cann et al., 2011; García et al., 2017; Ryninks et al., 2022). On the other hand, deliberate rumination concerns an intentional process of thinking and reflecting to understand the cause and meaning of an event (Beck et al., 2018; Ryninks et al., 2022; Yang & Ha, 2019). Deliberate rumination is often linked with practices such as journaling or expressive writing, which promote self-distancing and facilitate the process of making meaning (e.g., Park et al., 2016).

Following a traumatic event, individuals may suffer from intrusive rumination and intense emotional distress but may also simultaneously seek to intentionally engage in deliberate rumination to relieve psychological distress (Allen et al., 2022; Xu et al., 2019). Deliberate rumination is an active cognitive process that involves the reconstruction of a certain cognitive schema to facilitate understanding (Triplett et al., 2012) and the alteration of an individual’s beliefs and values to promote healing and growth (Alvarez-Calle & Chaves, 2023; Stockton et al., 2011).

Empirical studies suggest that deliberate rumination seems to be an important factor in facilitating PTG (Freedle & Kashubeck-West, 2021; Shigemoto, 2022). Results regarding intrusive rumination, however, are inconsistent with some studies finding a positive association with PTG (Henson et al., 2021) and other studies showing no significant associations (e.g., Cordova et al., 2007; Morris & Shakespeare-Finch, 2011). Moreover, some authors consider that intrusive rumination is essential to engaging in deliberate rumination (e.g., Cann et al., 2011) since intrusive thoughts have the potential to stimulate more intentional cognitive processing (Triplett et al., 2012). As proposed by some authors, intrusive rumination can promote cognitive dissonance, leading individuals to actively engage in reflective thought about trauma-related experiences (Nolen-Hoeksema et al., 2008; Ramos et al., 2018; Rzeszutek & Gruszczyńska, 2018). Indeed, some empirical studies have confirmed the mediating role of deliberate rumination in the link between intrusive rumination and PTG after a traumatic event (e.g., Kim & Bae, 2019; Triplett et al., 2012; Wu et al., 2015).

Traumatic or stressful childbirth experiences have the potential to give rise to intrusive thoughts, heightened emotional distress, and disturbances in cognitive processing. Consistent with findings

from prior research, women who undergo traumatic childbirth experiences often exhibit a reduced reliance on using present-centered coping strategies. Additionally, they are prone to encountering more distressing and intrusive memories related to the birth (e.g., perceived life threat; peritraumatic emotions), leading to increased rumination compared to women without such symptoms (Ayers, 2007; Vossbeck-Elsebusch et al., 2014). While no previous studies have explored the role of sociodemographic-, obstetric-, and trauma-related variables on explaining levels of rumination after a traumatic childbirth, other studies have suggested that these variables may influence levels of rumination in the wide context of trauma. For instance, studies suggest that younger adults are more likely to ruminate after a traumatic event (Sitterlin et al., 2012). Also, greater pain experienced during childbirth has been linked to higher levels of rumination (Tasuji et al., 2020).

While rumination style could affect how a woman copes with a traumatic birth, which could lead to PTG, currently there is no research in this area. Thus, the aim of this study was to (a) explore the differences between sociodemographic- (age, education, marital status, and professional status), obstetric- (parity, type of delivery, and pregnancy planning), and trauma-related (childbirth trauma related to infant conditions, delivery problems, and experiencing loss of control during labor) variables in relation to rumination style; (b) investigate the differences between intrusive and deliberate rumination in relation to PTG dimensions; and (c) test whether deliberate rumination explains the relationship between intrusive rumination and PTG dimensions (see Figure 1 for the model proposed).

Method

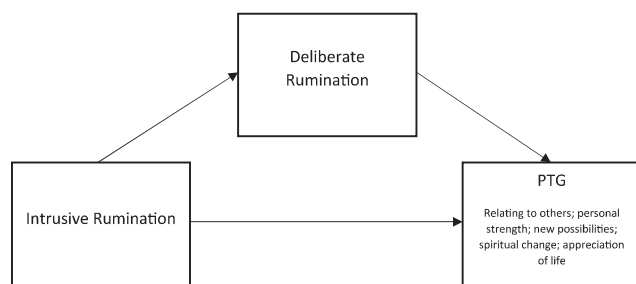
This study followed the rigorous reporting standards outlined in the Strengthening the Reporting of Observational Studies in Epidemiology guideline for cohort studies. It is part of the larger project undertaken under the umbrella of an EU COST (European Cooperation in Science and Technology) Action (COST Action 18211: DEVOTION: Perinatal Mental Health and Birth-Related Trauma: Maximising best practice and optimal outcomes).

Design

A cross-sectional study design was employed. A web-based survey method was used for data collection in the North of Portugal from April 2020 to December 2021.

Figure 1

Proposed Model to Explain the Link Between Intrusive Rumination, Deliberate Rumination, and PTG Dimensions



Note. PTG = posttraumatic growth.

Participants

Women who had delivered in hospitals in the north of Portugal were recruited using a snowball method. They were included only if they self-identified as having experienced a traumatic childbirth event, and their newborn was at least 1 month old. Women who experienced stillbirth or had clinical circumstances that made the interview inadvisable were excluded from the study. Thus, a total of 212 women fulfilled the inclusion criteria and were included in the study. However, during survey completion, 10 participants discontinued their participation, resulting in a final sample of 202 women. Demographic or birth-specific variables for the 10 individuals who discontinued participation were not retained.

Measures

The survey requested participants to address if they had undergone a distressing or traumatic childbirth event. Women who answered yes were eligible to proceed with the study, and those who answered no were redirected to a “thank you” page and exited the survey. A rigorous validation study was conducted that involved pretesting the survey to identify any problems with the wording or interpretation of the questions before the web survey launch.

Participant and Birth Characteristics

Survey questions asked women to record sociodemographic characteristics in terms of age, education, marital status, and employment status. The obstetrics characteristics included parity, type of delivery, and pregnancy planning. Childbirth trauma was measured using (a) a question on the type of childbirth trauma divided into infant conditions (i.e., infant health problems, including prematurity), (b) delivery problems (i.e., perineal trauma, change in the type of delivery, and use of forceps), and (c) related to experiencing loss of control issues during labor (i.e., lack of pain control during labor, prohibiting partners’ presence, and parturient unexpected health problems).

Rumination

The rumination style (intrusive or deliberate) was measured with the Event Related Rumination Inventory (Cann et al., 2011; Portuguese Version: Ramos et al., 2015). It is a self-report scale with 20 items that assess both intrusive and deliberate rumination. Items are scored on a Likert scale ranging from 0 (*not at all*) to 3 (*often*) to rate the frequency of their ruminative thoughts within a specific time frame. Ten items assess intrusive rumination, which evaluates how often individuals involuntarily think about a traumatic event right after it occurred (item example “Thoughts about the event came to mind and I could not stop thinking about them”). Ten items assess deliberate rumination, which assesses the frequency of purposeful thinking about the trauma in the weeks following the event (item example “I thought about whether I could find meaning from my experience”). Subscale scores are calculated, with higher scores signifying a higher frequency of intrusive or deliberate rumination. In the current study, Cronbach’s α was .96 for intrusive rumination and .91 for deliberate rumination.

PTG

PTG was measured with the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996; Portuguese Version: Silva et al., 2009). It

consists of 21 items that assess five dimensions of PTG: relating to others, personal strength, new possibilities, spiritual change, and appreciation of life. Items are rated on a Likert scale from 0 (*I did not experience this change*) to 5 (*I experienced this change to a very great degree*). Sample items on the PTGI include “I have a greater appreciation for the value of my own life” (appreciation of life), “I feel more capable of handling difficult situations” (personal strength), and “I have a better understanding of spiritual matters” (spiritual change). Subscale scores were calculated by adding up items on each subscale, with higher scores indicating higher levels of PTG. In the current study, Cronbach α was .92 for relating to others, .82 for personal strength, .83 for new possibilities, .54 (Spearman–Brown coefficient for two items) for spiritual change, and .82 for appreciation of life.

Ethical Considerations

Study procedures were approved by the Research Ethics Committee of the Nursing School of Porto with reference number 2019-530. This study rigorously adhered to the ethical principles outlined in the Helsinki Declaration, ensuring the protection of participants’ rights, confidentiality, and well-being throughout the research process.

Potential participants were informed about the study and enrolled through direct engagement with healthcare professionals. Health care professionals played a key role in approaching individuals and communicating the details of the study to facilitate enrollment. The study began by providing an information sheet to women, explaining the study’s objectives, ensuring anonymity, and giving them the option to withdraw from the study if they wished to do so. Participants were then asked to confirm their consent to participate, filling in a consent form on the first page of the web survey. Participants did not receive any type of incentive.

Data Analysis

Data were analyzed using SPSS (Version 28). Descriptive statistics were initially computed to provide a summary of the study variables, followed by the examination of Pearson correlations to determine the strength and direction of the associations between the variables. Multivariate analysis of variance (MANOVA) was used to examine differences in the two types of rumination according to sociodemographic-, obstetric-, and trauma-related variables. A multivariate linear regression was employed to examine the role of intrusive and deliberate rumination (independent variables) in explaining the five dimensions of the PTGI (relating to others, new opportunities, personal strength, spiritual changes, and appreciation of life) (dependent variables).

To examine the mediating role of deliberate rumination on the link between intrusive rumination and the five dimensions of the PTGI (Model 4), the PROCESS macro developed by Hayes (2017) was used. Thus, a total of five models were tested: the independent variables were intrusive rumination; the mediating variable was deliberate rumination; and the dependent variables were relating to others, personal strength, new possibilities, spiritual change, and appreciation of life. Direct, total, and indirect effects were estimated. Indirect effects were considered significant at 95% confidence intervals (CI) (i.e., did not include 0). The Bonferroni correction method was used to adjust the significance level of the five models tested to reduce the likelihood of Type I errors. Therefore, the adjusted significance level was $p < .01$.

Results

Participants Characteristics

Participants’ ages ranged from 18 to 46, with a mean age of 33.68 (standard deviations, $SD = 4.70$). Majority were Portuguese (95%), married or living with a partner (93%), had a higher degree (76.8%), and were employed (84.2%). In terms of annual income, 6.9% had a family annual income lower than €10,000 (around \$10,945), 43.1% had a family annual income between €10,000 and €20,000 (around \$21,889), 34.7% between €20,001 and €37,500 (around \$41,042), 10.9% between €37,501 and €70,000 (around \$76,600), and 4.5% above €70,001.

Most women were primiparas (66.3%), had a planned pregnancy (76.7%), and received standard antenatal care (i.e., had at least six medical appointments during the pregnancy). In terms of childbirth type, 11.4% had vaginal delivery, 51% had vaginal delivery with forceps or vacuum, and 37.6% had cesarean birth.

In terms of traumatic events during childbirth, 13.9% of women reported trauma related to infant conditions, 63.9% related to delivery problems, and 22.2% related to experiencing loss of control during labor. The sociodemographic, obstetric, and childbirth-related traumatic events of study participants are reported in Table 1.

Descriptive Statistics and Correlations

Means, SD s, and Pearson correlations are displayed in Table 2. The results show that intrusive rumination and deliberate rumination were positively associated with all dimensions of PTGI.

Multivariate Analyses

The results of the MANOVA showed no differences in rumination (both intrusive and deliberate) according to sociodemographic characteristics, namely according to education, $F(2, 198) = 1.48, p = .208, \eta_p^2 = .02$, marital status, $F(2, 199) = .89, p = .411, \eta_p^2 = .01$, or employment status, $F(2, 199) = .07, p = .930, \eta_p^2 = .00$. Also, no differences were found according to parity, $F(2, 199) = 1.82, p = .165, \eta_p^2 = .02$, type of delivery, $F(2, 198) = 1.45, p = .218, \eta_p^2 = .01$, and the type of childbirth trauma experienced, $F(2, 198) = 1.28, p = .276, \eta_p^2 = .01$, on rumination levels (both intrusive and deliberate).

Differences were found only for planned pregnancy, $F(2, 199) = 4.02, p = .020, \eta_p^2 = .04$, and only for deliberate rumination, $F(1, 200) = 4.02, p = .046, \eta_p^2 = .04$. No differences were found for intrusive rumination, $F(1, 200) = .56, p = .454, \eta_p^2 = .02$. Specifically, women with a planned pregnancy had higher levels of deliberate rumination ($M = 16.90; SD = 8.76$) than those with a nonplanned pregnancy ($M = 14; SD = 8.38$).

Multivariate Linear Regressions

For the PTG dimension relating to others, the results indicated that deliberate rumination had a significant positive effect on relating to others ($B = 0.33, p < .001$) but intrusive rumination did not ($B = -0.00, p = .964$). For the PTG dimension new possibilities, the results indicated that deliberate rumination had a significant positive effect on new possibilities ($B = 0.20, p < .001$) but intrusive rumination did not ($B = 0.06, p = .311$). For the PTG dimension personal strength, the results indicated that deliberate rumination had a significant positive

Table 1
Sociodemographic and Obstetric Characteristics and Trauma-Related Events (N = 202)

Characteristics	Responses options	Percentage	M (SD)
Sociodemographic			
Age			33.68 (SD = 4.70)
Marital status	Single	5	
	Married/nonmarital partnership	93	
	Divorced	2	
Education	Complete basic school	3.5	
	Complete secondary school	16.3	
	Bachelor's degree or more	80.2	
Employment status	Employed	84.2	
	Unemployed	15.8	
Family annual income	Less than €10,000	6.9	
	€10,000–€20,000	43.1	
	€20,001–€37,500	34.7	
	€37,501–€70,000	10.9	
	€70,001 or more	4.5	
Obstetric			
Parity	Primiparous	66.3	
	Multiparous	33.7	
Pregnancy planning	Planned	76.7	
	Not planned	23.3	
Childbirth type	Vaginal	11.4	
	Vaginal with forceps or vacuum	58.9	
	Caesarean	29.7	
Childbirth trauma events			
Related to infant conditions	Health problems (including prematurity)	13.9	
Related to delivery problems	Perineal trauma	27.7	
	Change in type of delivery	22.8	
	Use of forceps	13.4	
	Lack of pain control during labor	11.4	
	Interdiction of partners' presence in the delivery room	8.8	
	Parturient unexpected health problem	2	

effect on personal strength ($B = 0.16, p < .01$) but intrusive rumination did not ($B = 0.03, p = .492$). For the PTG dimension spiritual change, the results indicated that both deliberate rumination ($B = 0.08, p < .001$) and intrusive rumination had a significant effect on it ($B = 0.09, p < .001$). Finally, for the PTG dimension appreciation of life, the results indicated that both deliberate rumination ($B = 0.08, p < .01$) and intrusive rumination had a significant effect on it ($B = 0.24, p < .001$).

Direct, Indirect, and Total Effects

Five models were tested, one for each PTG dimension. Results of the path analysis are presented in Table 3. Deliberate rumination fully mediated the relationship between intrusive rumination and the

PTG dimensions of relating to others, new opportunities, and personal strength. In addition, deliberate rumination partially mediated the relationship between intrusive rumination and two other dimensions of PTG—spiritual changes and appreciation of life (since the direct effect of intrusive rumination on these two dimensions was significant and remained significant after considering deliberate rumination).

Discussion

This study on the relationship between rumination and PTG in women following a traumatic childbirth event had three aims, namely (a) to explore the differences between sociodemographic-, obstetric-, and trauma-related variables on women's rumination style; (b) to investigate the differences between intrusive and

Table 2
Mean, Standard Deviations, and Pearson Correlations Among Study Variables

Study variable	M (SD)	1	2	3	4	5	6
1. Intrusive rumination	22.57 (8.48)	—					
2. Deliberate rumination	16.22 (8.74)	.484***	—				
3. Relating to others	13.49 (8.92)	.155**	.326***	—			
4. New opportunities	11.99 (6.00)	.218**	.328***	.858***	—		
5. Personal strength	10.27 (5.21)	.182*	.291***	.960***	.821***	—	
6. Spiritual change	4.18 (2.55)	.419***	.412***	.562***	.615***	.560***	—
7. Appreciation of life	8.64 (3.76)	.632***	.452***	.175*	.194**	.187**	.585***

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

Table 3*Direct and Indirect Effects of Deliberate Rumination on the Association Between Intrusive Rumination and PTGI Five Dimensions*

Effects	Coeff	SE	t	p	LLCI	ULCI
Relating to others						
Intrusive rumination → deliberate rumination	.50	0.06	3.23	.001	.373	.624
Deliberate rumination → relating to others	.33	0.08	4.27	<.001	.180	.488
Total effect	.16	0.07	2.22	<.05	.018	.308
Direct effect (intrusive rumination → relating to other)	−.00	0.08	−0.05	.964	−.163	.155
Indirect effect	.17	0.08	—	—	.075	.265
$R^2 = 11\%$						
New opportunities						
Intrusive rumination → deliberate rumination	.50	0.06	3.23	<.001	.373	.624
Deliberate rumination → new opportunities	.20	0.05	3.81	<.001	.096	.303
Total effect	.15	0.05	3.16	<.01	.058	.251
Direct effect (intrusive rumination → new opportunities)	.05	0.05	1.02	.311	−.052	.161
Indirect effect	.10	0.03	—	—	.036	.165
$R^2 = 11\%$						
Personal strength						
Intrusive rumination → deliberate rumination	.50	0.06	3.23	<.001	.373	.624
Deliberate rumination → personal strength	.16	0.05	3.43	<.001	.067	.249
Total effect	.11	0.04	2.62	<.01	.028	.196
Direct effect (intrusive rumination → personal strength)	.03	0.05	0.69	.492	−.061	.127
Indirect effect	.08	0.03	—	—	.030	.134
$R^2 = 9\%$						
Spiritual changes						
Intrusive rumination → deliberate rumination	.50	0.06	3.23	<.001	.373	.624
Deliberate rumination → spiritual changes	.08	0.02	3.84	<.001	.039	.121
Total effect	.13	0.02	6.53	<.001	.088	.164
Direct effect (intrusive rumination → spiritual changes)	.09	0.02	4.05	<.001	.044	.129
Indirect effect	.04	0.01	—	—	.017	.065
$R^2 = 23\%$						
Appreciation of life						
Intrusive rumination → deliberate rumination	.50	0.06	3.23	<.001	.373	.624
Deliberate rumination → appreciation of life	.08	0.03	3.12	<.01	.030	.135
Total effect	.28	0.02	11.53	<.001	.232	.328
Direct effect (intrusive rumination → appreciation of life)	.24	0.03	8.80	<.001	.186	.293
Indirect effect	.04	0.02	—	—	.030	.162
$R^2 = 43\%$						

Note. Bold indicates significant results. PTGI = Posttraumatic Growth Inventory; Coeff = coefficient; LLCI = lower limit confidence interval; ULCI = upper limit confidence interval.

deliberate rumination in relation to PTG; and (c) to examine the mediating role of deliberate rumination on the relationship between intrusive rumination and PTG.

No differences in sociodemographic or obstetrics characteristics related to rumination style were found, except for pregnancy planning: women who planned their pregnancies had higher levels of deliberate rumination. A recent systematic review highlighted that when there is a discrepancy between a woman's expectations and her actual experiences during labor and birth, it can significantly impact her satisfaction with the childbirth process. This mismatch may also elevate the risk of developing PTSD after giving birth. Pregnant women who actively plan and form expectations about their childbirth experiences, particularly regarding the type of delivery and assistance they desire, face a higher likelihood of experiencing childbirth trauma. This is particularly evident in cases where there are deviations from the initially planned delivery method or professional care. For instance, women who have previously undergone a vaginal delivery and plan for a similar experience might perceive any unexpected changes, such as a cesarean section or instrumental delivery, as traumatic (Isbir et al., 2016; Rodríguez-Almagro et al., 2019).

Regarding the second aim of this study that investigate the differences between intrusive and deliberate rumination in relation to

PTG, the results indicate that both rumination styles (intrusive and deliberate) were positively associated with PTG dimensions, which is consistent with several studies (e.g., Romeo et al., 2022; Stockton et al., 2011; Zięba et al., 2022). Specifically, deliberate rumination was associated with all PTG dimensions while intrusive rumination was only associated with spiritual change and appreciation of life. This finding seems to support the idea that deliberate rumination is more important for promoting overall PTG than intrusive rumination (Taku et al., 2009). Intrusive rumination involves repetitive and intrusive thoughts and emotions about the traumatic event (e.g., Cann et al., 2011; Ryninks et al., 2022). The fact that this form of rumination was associated with changes in spirituality and the perception of meaning in life may be because it involves cogitating about deep existential questions (Cann et al., 2011; Ryninks et al., 2022), such as the purpose of life, the nature of suffering, or the existence of a higher power. It is possible that by grappling with these profound inquiries, individuals engaging in intrusive rumination may embark on a process of reflection and introspection that leads to spiritual and existential growth. In contrast to intrusive rumination, deliberate rumination, which involves purposeful reflection and efforts to understand the cause and meaning of an event (Beck et al., 2018; Ryninks et al., 2022; Yang & Ha, 2019),

appears to have a broader impact that extends beyond spirituality and appreciation of life. The focus on introspection and understanding of deliberate rumination seems thus contribute to growth in several dimensions. Through purposeful introspection, individuals may identify their strengths, weaknesses, and areas of interest, developing efforts to improve these areas which can contribute to discover new avenues for growth, exploration, and self-fulfillment. Yet, it is important to recognize that the emotional intensity associated with deliberate rumination might be too burdensome for certain women. The overwhelming nature of this process may vary based on individual coping mechanisms, personal histories, and the unique circumstances surrounding their childbirth experiences.

Finally, regarding the third aim of the study, results seem to suggest that intrusive rumination can be a precursor of deliberate rumination, which in turn can contribute to PTG within this context, consistent with theoretical assumptions and previous empirical studies (Calhoun & Tedeschi, 2014; Cann et al., 2011; Triplett et al., 2012). Indeed, our results seem to suggest that more intrusive rumination is associated with more deliberate rumination which in turn is associated with more growth in all PTG dimensions. As pointed out by Calhoun and Tedeschi (2014), intrusive rumination seems to provide traumatic clues and opportunities for further deliberate rumination. It has also been suggested that as intrusive rumination is usually associated with more distress, it can create cognitive dissonance which makes individuals actively engage in reflective thought about traumatic experiences or challenging events, resulting in more deliberate rumination (Nolen-Hoeksema et al., 2008; Ramos et al., 2018; Rzeszutek & Gruszczyńska, 2018). In addition, deliberate rumination can be associated with higher levels of PTG, as it evidences that the individual could carry out an ongoing process of constructing meaning and reconstructing representations of their social world after the traumatic event (Hill & Watkins, 2017; Hirooka et al., 2017; Stockton et al., 2011). The results of this study suggest that growth occurs following traumatic childbirth, and that deliberate rumination seems to contribute to explaining the occurrence of PTG. However, other variables not considered in this study can be important in this process. For instance, social support can be of high importance for understanding the link between rumination and PTG since disclosing one's trauma and distress can facilitate the meaning-making process and contribute to increasing deliberate rumination, as found in other contexts of trauma (e.g., Freedle & Oliveira, 2022; Shang et al., 2022).

These findings could be relevant in the development of psychosocial interventions for women after traumatic birth experiences. For example, by developing strategies and tools to facilitate deliberate rumination, such as opportunities for women to discuss the birth with professionals or peers or encouraging women to write about their experiences (e.g., Ayers et al., 2018). These approaches, however, may not be universally effective. Further studies are warranted to investigate which women derive greater benefits from these types of interventions.

This study has some limitations. First, the data were collected throughout the COVID-19 pandemic, sometimes during periods of lockdown. The cross-sectional nature of the study design may limit generalizations as well as conclusions regarding causality among study variables. In addition, this study was conducted using a web-based survey, which might create sampling bias by excluding women with digital poverty. Nevertheless, like most

researchers during the COVID-19 pandemic, we attempted to ensure the validity of the data collected. The study protocol of our study was adapted, and data were collected online to ensure participants' safety. However, the COVID-19 pandemic led to unprecedented changes in the method of research data collection carried out, and there are still no studies that specifically address threats to the validity of data collected during this pandemic, nor how changes to study protocols may compromise their integrity and/or pose significant risks to the validity of data collected in these studies. Also, one important limitation is related to the COVID-19 pandemic. This event has introduced unprecedented challenges that could potentially impact the reported traumatic childbirth experiences. The implementation of various COVID-19 mitigations and changes in perinatal health care (e.g., visitor restrictions, mask mandates, changes in birthing plans) may have contributed to altered perceptions and experiences during childbirth, with women experiencing more depressive and trauma symptoms (e.g., Diamond & Colaizzi, 2022; Liu et al., 2022). Thus, the potential impact of COVID-19 mitigations on reported traumatic childbirth experiences is a critical aspect deserving further consideration.

Behavioral studies or studies with a strong psychological component faced the greatest challenges because the pandemic context had the potential to alter the way individuals behaved (Mara & Peugh, 2020). In addition to protocol changes that could impact data validity, we also had to consider the impact the pandemic had on pregnant women, new mothers, and their families during this time. For example, the pregnant women being denied a significant person to accompany her during labor and the delivery of her baby, or the increase of inductions of labor during this period, may have contributed to women perceiving their childbirth as a traumatic event (Thomson et al., 2022). Despite the diverse reasons underlying the experience of traumatic childbirth, it is crucial to provide interventions to help these women process and cope with this challenging experience.

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