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Posttraumatic growth after perinatal loss: A systematic review *,**,*

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ABSTRACT

Perinatal loss is a potentially painful event for parents and a grief that is often not recognised socially. Research has widely shown that grief responses can coexist with posttraumatic growth responses. The aim of this systematic review was to assess the available evidence of studies investigating posttraumatic growth in people who have suffered a perinatal loss. A search was conducted in PROQUEST and Web of Science for articles published from 2011 to 2021. After reviewing 10 selected articles, it was found that the participants showed moderate levels of posttraumatic growth, mostly in the domains of personal strength, relationships with others, appreciation of life, and to a lesser extent in the perception of new possibilities and spiritual growth. Factors that facilitated the growth experience were finding meaning in the loss, changes in core beliefs, adaptive coping strategies, deliberate rumination, continued bonds with the deceased baby, and social support. It is expected that this systematic review will provide a basis for the design of future interventions aimed at promoting growth when facing perinatal loss.

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Introduction

Perinatal death is defined as the loss in pregnancy, including early miscarriage (i.e., during first trimester of pregnancy up to 12 weeks), late miscarriage (i.e., during second trimester at 13– 23 weeks) and stillbirth (i.e., defined as intrauterine death after 24 weeks gestation (Hughes and Riches, 2003). Many researchers extend this period to include delivery, and up to 28 days after the birth of the baby (Cassidy et al., 2018; Kowalski, 1987). In terms of risk factors, maternal physical and mental health are essential variables since the presence of psychological distress during pregnancy may increase fetal loss (Wisborg et al., 2008). Although perinatal mortality and late neonatal death have been progressively decreasing worldwide (Hug et al., 2020), the global prevalence rate of perinatal loss in 2015 was 2.7 million (Lawn et al., 2016).

Losing a child is one of the most devastating things that a parent can experience in their lifetime (Doherty and Scannell-Desch, 2021). It is a major traumatic event that may has seri-

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ous long-term consequences for the parents' psychological health (Cordero et al., 2004; Stanhope et al., 2021). In this type of bereavement, it is common to experience shock, concentration difficulties, or recurrent thoughts about the event, which are often accompanied by feelings of guilt, sadness, and irritability, as well as avoidance behaviours of medical situations or any scenario involving pregnant women and children. Perinatal losses may also have a great impact on their identity as a mother (Cala and Hernández, 2019). In the case of men, they usually have difficulty in expressing their emotions, less need to talk about what happened or a higher tendency to feel loneliness, helplessness, and anger (Kersting and Wagner, 2012). Social and cultural factors may also affect this bereavement. As the loss may not always be recognised socially, parents can be left to grieve in isolation which may affect their psychological adjustment (Markin and Zilcha-Mano, 2018). A recent study revealed that 50% of women felt at least partially responsible for the death of their baby (Cassidy et al., 2018), with only 33% of them reporting receiving social support from their close environment, while 72.9% stated that they felt their grief was invisible to society.

The intensity of grief peaks six months after the loss, but tends to decrease thereafter, up to 12 months (Hall, 2014). However, people who suffer a perinatal loss may continue to experience depressive and anxiety symptoms (10-30%) or posttraumatic symptoms (7-28%) (Cassidy et al., 2018; Markin and Zilcha-Mano, 2018; Shannon and Wilkinson, 2020). Kerstig and Wagner (2012) observed that 41% of participants showed a decrease in psychological symptoms associated with bereavement two years after the loss.

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Review Article



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However, 59% of participants displayed complicated grief, characterised by symptoms that are more disruptive, generalised, or long-lasting than a normal grief response (Shannon and Wilkinson, 2020).

Posttraumatic growth

Posttraumatic growth (PTG) is defined as the positive psychological change experienced after facing highly challenging life circumstances (Black and Wright, 2012). It is worth mentioning that PTG does not replace the grieving process and the pain of loss. Coping with bereavement may also provide a context for significant positive change, so that growth and psychological symptoms may still coexist (Black and Wright, 2012). The psychological processes activated to cope with these traumatic events are similar to those promoting positive changes (Calhoun and Tedeschi, 2006). As previously mentioned, a traumatic event may violate core beliefs about oneself and the world, such as the controllability and safety of the world, or one's own identity (Kashyap and Hussain, 2018). PTG theory posits that when a discrepancy between general beliefs and the specific meaning of a particular event occurs, people strive to reduce this discrepancy by reconstructing those beliefs (Park, 2010). When an adequate meaning is found or created, this may lead to better psychological adjustment (Black and Wright, 2012; Meichenbaum, 2017). However, an inadequate or unproductive meaning reconstruction process may generate ruminative or maladaptive thoughts, affecting the individual's functioning (Segerstrom et al., 2003). Calhoun et al. (2010) presented a Model of Growth in Grief to understand how losing "a close other" may result in the acknowledgment of a number of positive changes. Tedeschi and Calhoun (2004) defined five domains of PTG: a) a greater meaning in life; b) warmer and more intimate relationships with others; c) a greater sense of self-competence; d) a search for new possibilities; and e) spiritual development.

There are some factors that promote PTG. For instance, rumination may help find meaning in the traumatic event. However, rumination can be intrusive (i.e., spontaneous and automatic thoughts that tend to occur after the event) or deliberate (i.e., voluntary and intentional thoughts that arise when the intensity of the initial impact decreases) (Calhoun et al., 2010; Triplett et al., 2012). Deliberate rumination is associated with PTG, but intrusive rumination tends to generate a lot of distress, especially if it is prolonged over time (Black and Wright, 2012). Besides cognitive processes, there are also some emotional or experiential factors that promote PTG (Triplett et al., 2012). Feeling positive emotions during the process (e.g., feeling a greater appreciation of life or a greater sense of personal strength) may help parents experience PTG after adversity (Tedeschi et al., 2018). Also, social and cultural constructs, such as values or norms, may affect the meaning and interpretation of the traumatic experience (Kashyap and Hussain, 2018).

The study of PTG has mostly focused on people who have experienced physical illnesses such as cancer (Stanton et al., 2006), domestic accidents (Nishi et al., 2010), sexual abuse (Ullman, 2014), gender-based violence (Ulloa et al., 2007), childhood adversity (Anderson et al., 2011), trauma following war (Tedeschi and Mc-Nally, 2011), or natural disasters (Mordeno et al., 2015), among other conditions. There is little research that focuses on PTG following miscarriage, foetal diagnosis, stillbirth, or neonatal death (Black and Wright, 2012). Despite this, some evidence already suggests that growth is an important outcome following perinatal loss.

The aim of this systematic review was to assess the available evidence of studies investigating posttraumatic growth in people who have suffered a perinatal loss. The specific objectives were to: 1) evaluate the presence and levels of PTG; 2) describe the types of positive changes regarding the five domains of PTG (i.e., meaning in life, relationships with others, personal strength, new possibilities, and spiritual development); 3) identify the factors that may facilitate the experience of PTG after perinatal loss.

Methods

A systematic review of the scientific literature was carried out. The PRISMA guidelines (Urrútia and Bonfill, 2010) were followed for reporting this systematic review.

Sources and search strategy

To identify relevant articles, we searched the PROQUEST Psychology Database and the Web of Science database for scientific articles published between 2011 and July 2021 for the terms 'posttraumatic growth', 'stillbirth', 'miscarriage', 'perinatal grief' with Boolean connectors (AND, NOT, OR). The search was completed in July 2021. It was re-run before the final analyses, and studies not identified in previous searches were retrieved for inclusion.

Inclusion and exclusion criteria

To be included, articles were required to: (a) examine the relationship between perinatal losses (including miscarriage, stillbirth or neonatal death) and PTG (or positive personal changes reported by parents); (b) present the results of cross-sectional, cohort, or case-control studies; (c) be published in the period comprising January 2011 through July 2021.

The exclusion criteria were: 1) articles that were not focused on perinatal death or PTG; 2) systematic reviews or articles involving an intervention; 3) those studies whose target population included other family members (e.g., siblings); 4) articles that, in addition to people with perinatal loss, included the death of children more than one month old; 5) those that studied the relationship with subsequent pregnancies and children; 6) samples of induced abortions that were not due to foetal anomaly.

Study selection

Two independent researchers (MA and CC) examined the consistency of the search and suitable of studies in light of the inclusion and exclusion criteria. All title, abstract and full text screening were conducted by both researchers. Disagreement was resolved through discussion, until consensus was reached.

The full texts of all articles deemed relevant were downloaded and examined to determine whether they met the inclusion criteria and to remove duplicates.

Data collection process and data items

Studies which met all inclusion criteria were reviewed by both researchers (MA and CC), extracting the year of publication, sample size, population characteristics, procedure, statistical analyses, and main findings from each paper and recording it in an Excel spreadsheet designed by researchers. Discrepancies in data extraction were resolved through discussion.

Assessment of study quality

The quality of the reviewed studies was assessed using the criteria developed by Keim-Malpass et al. (2015). These criteria include a number (based on study design) and A, B, or C (high, good, low study quality) based on five methodological aspects: consistent and generalizable results, sufficient sample size, adequate control, definitive conclusions, and consistent recommendations based on comprehensive literature review. Any discrepancies between the authors were resolved through discussion. Based on these criteria, all the studies included in this systematic review correspond to level III (i.e., includes non-experimental studies in which there is no manipulation of the independent variables), with the exception of one qualitative study that corresponds to a level IV. Nine of the studies (Cacciatore et al., 2018; Freedle and Kashubeck-West, 2021; Freedle and Oliveira, 2021; Isguder et al., 2018; Jones et al., 2021; Krosch and Shakespeare-Finch, 2017; Lafarge et al., 2017; Lafarge et al., 2020; Tian and Solomon, 2020) were rated at level B ("good study quality"), with sufficient sample size for the study design, reasonably consistent results, fairly definitive conclusions and reasonably consistent recommendations. Only one of the studies (Waugh et al., 2018) was rated at level C ("poor study quality"), with a small sample size.

Results

The PRISMA flow diagram in Fig. 1 summarizes the study selection process. Using these search criteria, a total of 692 results were found. Sixty-eight of them were duplicate articles. Therefore, the total number of articles extracted from the database search that were retained for potential selection was 624. The articles were screened and selected by reviewing subtitles and abstracts, keeping a total of 16 articles. After reading each full text, a total of 10 articles were selected for in-depth analysis.

The results were presented in Tables 1 and 2. First, characteristics of the studies (i.e., authors and year of publication, participants, time of loss, main objectives, and methodology) were presented in Table 1. Second, the most relevant results related to the main outcomes of the studies were presented in Table 2.

Participants

In most studies, the sample was recruited through perinatal loss support groups or organisations, hospitals, social networks, or by snowball sampling. The total number of participants in the studies was a minimum of 10 and a maximum of 328. The ages of the participants ranged from 18 to 67 (mean age = 33.49 years). Eight of the studies focused exclusively on women. Two studies included men, but the majority were women. None of the studies focused exclusively on men. Also, in relation to time since loss, this varied from the day after death to 25 years, but with a median time of 4-5 years. Lafarge et al. (2020) do not report the sampling method and Cacciatore et al. (2018) do not report the time since loss.

Time of loss

Data have been collected on the time that loss happened, which ranged from gestation to the first seven days of the baby's life.

Type of study

Most of the selected studies were quantitative cross-sectional exploratory studies, except for one qualitative study (Waugh et al., 2018) and one study with mixed methodologies (Cacciatore et al., 2018). Seven studies conducted the evaluations online and three conducted the evaluations face-to-face.

Measures

In addition to collecting information on demographic variables, nine of the ten selected studies used at least one self-report measure. The tests used were diverse. In relation to PTG, the Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) was predominantly used. This inventory consists of 21 items in the Likert scale format, designed to assess posttraumatic growth in five domains (i.e., new possibilities, relationships with others, personal strength, spiritual change, and appreciation of life). The PTGI has



Fig. 1. Flow diagram with information of the different phases of the review.

Table 1

Descriptive characteristics of the studies.

Study	Participants	Time of loss	Objectives	Type of study	Measures
Lafarge et al. (2017)	N=161 participants (women). Age: M=35.55 years, SD=5.29 (between 20 and 47 years). Time since loss: 6 months to 2 years. Recruited by support organisation	Loss between 11 and 34 weeks of gestation due to foetal abnormality (mean 18.16 weeks).	To measure posttraumatic growth after foetal abnormality death, examine the relationship between PTG, perinatal bereavement and coping, and determine predictors of PTG.	Cross-sectional correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996). Coping Orientation to Problems Experienced Inventory Brief Form (Brief COPE; Carver, 1997). Short Perinatal Bereavement Scale (Short PGS; Potvin et al., 1989)
Krosch and Shakespeare- Finch (2017)	N=328 participants (women). Age: M=34.52 years, SD=6.8. Time since loss: average 4.01 years. Recruited through perinatal bereavement support groups	Spontaneous abortion: ($n=174$, < 20 weeks gestation) or stillbirth ($n=154$; ≥ 20 weeks gestation). The mean was 20.13 weeks' gestation.	To explore the presence of PTG and to examine the relationship between alterations in core beliefs, perinatal bereavement factors, posttraumatic stress symptoms, and PTG.	Cross-sectional correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) Rating of the experience as traumatic (0-9) based on the DSM-5 conceptualisation of trauma (APA, 2013). Altering core beliefs using the CBI (Cann et al., 2010). Perinatal Grief Scale (PGS; Toedter et al., 1988). PTSD symptoms experienced in the last month, using the Impact of Events Scale (IES-R; Weiss and Marmar, 1997).
Cacciatore et al. (2018)	N=191 participants (180 women and 11 men). Age: between 18 and 41 years old. Time since loss: Does not report. Recruited through national non-profit organisations, social networks, and snowball sampling.	Miscarriage: >20 weeks gestation.	To study the influence of volunteering on parents who have suffered a miscarriage.	Cross-sectional mixed methods correlational study. Face-to-face interview.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996). Semi-structured interview.
lsguder et al. (2018)	N=156 participants (women) (experimental group=74, control group=82) Age: M=29.33 years, SD=6.35 Time since loss: patients under medical follow-up (not specified) and hospitalised (during admission or 1 day before discharge). Recruited from outpatient and inpatient clinics of the obstetrics and gynaecology department.	Spontaneous abortion: <23 weeks gestation.	To identify levels of PTG and to identify whether any domains were related to distress symptoms, dysfunctional cognitions, and coping strategies.	Cross-sectional correlational study, with control and experimental group. Face-to-face interview.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996). Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983). Ten Item Personality Inventory (TIPI; Gosling et al., 2003) Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999). Coping Orientation to Problems Experienced Inventory Brief Form (Brief COPE Carver, 1997).
Waugh et al. (2018)	N=10 participants (women). Age: between 18 and 49 years old. The time since loss ranged from 2 to 10 years. Recruited through support organisations via social media posts.	Neonatal death: up to 7 days after birth.	To understand whether mothers who suffered a neonatal loss experienced any positive changes in their lives and what factors may have facilitated or impeded these changes.	Qualitative cross-sectional study. Face-to-face interviews.	 Semi-structured and personalised interviews A topic guide, based on existing literature, was developed to guide the interviews, featuring: (i) the experience of the death of their baby and associated feelings (ii) how life had changed since the death of their baby and whether any of these changes were experienced as positive or as growth (iii) which factors helped or hindered positive changes

(iv) what factors helped the changes from being experienced as positive. Midwifery 121 (2023) 103651

Table 1 (continued)

Study	Participants	Time of loss	Objectives	Type of study	Measures
Lafarge et al. (2020)	N=161 participants (women). Age: over 18 years old. Time since loss: Not reported. Recruited by a support organisation.	Termination due to foetal abnormality (miscarriage or stillbirth). It does not refer to the exact moment.	To examine the relationship between rumination and psychological adjustment following termination of pregnancy due to foetal abnormality and its possible mediating role in the relationship between grief, coping, and PTG.	Cross-sectional correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) Coping Orientation to Problems Experienced Inventory Brief Form (COPE brief; Carver, 1997). Short Perinatal Grief Scale (Short PGS; Potvin et al., 1989). Event-Related Rumination Inventory (ERRI; Cann et al., 2011)
Tian and Solomon (2020)	N=298 participants (women) Age: M=30.73 years, SD=4.04 Time since loss: 1 year. Recruited by placing advertisements in a variety of sources.	Miscarriage: < 20 weeks gestation (mean of 12.70 weeks gestation).	To compare levels of PTG and bereavement and to investigate the factors that influence their relationship.	Cross-sectional correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) Perinatal Bereavement Scale (Toedter et al., 1988). Reconstructing the Meaning of Abortion: short version of the Integration of Stressful Life Experiences scale (ISLES; Holland et al., 2014) Communicative support within the couple Marital Quality Index (Norton, 1983).
Freedle and Kashubeck- West (2021)	N=476 participants (women). Age: M=34.22 years, SD=7.35 (between 19 and 67 years). Time since loss: M=3.66 years, SD=5.35. Recruited in social networks, through advocacy organisation and snowball sampling.	Spontaneous abortion: <20 weeks gestation (56.5% participants). Stillbirth: losses \geq 20 weeks gestation (23.3%). Both losses (20.2%). Mean number of weeks of gestation at the time of first loss – 15.92.	To study whether deliberate rumination mediates the relationship between core belief challenge and posttraumatic growth.	Non-experimental descriptive correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996) Altering core beliefs using the CBI (Cann et al., 2010). Event- Related Rumination Inventory (ERRI; Cann et al., 2011).
Freedle and Oliveira (2021)	N=227 participants (women) Age: M=32.01 years, SD=6.37 (between 18 and 45 years). Time since loss: M=3 years, SD=4.04 (between 1 and 25 years) Recruited through social network convenience sampling and snowball sampling methods.	Before 20 weeks gestation (9.04 weeks on average).	To explore the relationship between self-disclosure, positive social reactions to disclosure and cognitive processes (i.e., rumination) in experiences of positive change.	Cross-sectional correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996). Rating of the experience as traumatic (0-9) based on the DSM-5 conceptualisation of trauma (APA, 2013). Distress Disclosure Index (DDI; Kahn and Hessling, 2001); assesses individuals' tendency to withhold or disclose personally distressing information. Social reactions to disclosure: Social Reactions Questionnaire (SRQ; Ullman, 2000). Event-Related Rumination Inventory (ERRI; Cann et al., 2011),
Jones et al. (2021)	N=170 participants (162 women and 6 men). Age: M=38.1 years, SD=8.0 (between 18 and 61 years old). Time since loss: 7.06 years on average (between 13 months and 39 years). Recruited through charities around the world and regional support groups.	24 weeks' gestation or more. (35.3 weeks on average).	Investigate the association between parental expressions of the deceased baby and bereavement adjustment.	Cross-sectional correlational study. Online survey.	 Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun, 1996). Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983). PTSD symptoms in the last month using Stressor Impact Scale (IES-R; Weiss and Marmar, 1997) Bonding with the baby.

Table	2
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Main results of the studies.

Study	Presence of PTG	Other clinical aspects	Changes relating to the PTG	Factors promoting PTG	Contextual variables of loss
Lafarge et al. (2017)	Presence of PTG Moderate levels (range=0 to 105, M=46.6, SD=19.58): more intense grief, less PTG.	 Participants indicated active bereavement (range=11 to 55, M=37.70, SD=9.48). 	 Personal strength, greater capacity to face challenges. Relationship with others: more compassion. Meaning in life, change of priorities. New possibilities. 	 Bereaved women mainly used 'adaptive' coping strategies. 'Positive reframing' and 'religious coping' were significant predictors of PTG. 	 They found no relationship between time since death and PTG, which may simply reflect individual differences.
Krosch and Shakespeare- Finch (2017)	Presence of PTG Moderate levels: more intense grief, less PTG.	 57.01% of participants were still experiencing considerable grief and it was a predictor variable for PTG. 43.90% indicated clinical levels of posttraumatic stress. 	 Personal strength. Relationship with others: greater intimacy, compassion. Greater appreciation for life. Less spiritual growth. 	- Alterations in core beliefs predicted perinatal bereavement, posttraumatic stress symptoms, and PTG.	 The time elapsed since the loss, the gestational age of the baby at the time of the loss, the number of previous losses, the severity of the event, whether the participants had living children and whether they considered it a person. These factors contributed significantly to the model, explaining 6.50% of the variance of the PTGI.
Cacciatore et al. (2018)	Presence of PTG Moderate levels (M=65.5)	- Does not report.	 Strengths: Identity, awareness, introspection, new interests. Relationship with others: compassion, greater empathy. Meaning in life: new life resolutions. 	 Prosocial helping behaviours that are linked to the deceased infant promote meaning-making and are positively related to PTG. Positive reappraisal as a coping strategy is not related to volunteering and PTG. 	- Does not report.
lsguder et al. (2018)	Presence of PTG, but higher in the control group. Moderate levels (M=49.80, SD=26.17)	 39.7% showed symptoms of depression, 24.4% anxiety and 14.7% posttraumatic stress disorder. Not all participants considered themselves to be in mourning. 	 Personal strength, relationship with others, and sense of life: non-significant positive changes compared to control group: Presence of spiritual change. 	 Women who underwent abortion do not necessarily differ in PTG levels. The experimental group used more adaptive and maladaptive coping strategies, especially religious coping. Making sense of the loss is related to PTG. 	 Age, number of previous miscarriages, problems during pregnancy, and severity of the event. These selected independent variables had a unique variance in predicting the dependent variables such as PTG.
Waugh et al. (2018)	Presence of PTG. No levels reported.	- They continued to experience grief, anguish, and sadness.	 Positive changes in self-perception (identification of strengths, assertiveness, and maturity). Accompanied by feelings of vulnerability and fragility. Relationship with others: more compassion, ability to help, strengthening of the couple's relationship, greater appreciation for living children. Sense of life: greater appreciation of life, new possibilities, new purpose. 	- Mothers identified the facilitators of PTG, which were categorised into five themes: 'person-centred care', 'making sense', 'personal coping strategies', 'learning to live with it' and 'identity'.	- Most women described other significant losses (e.g., miscarriage); these seemed to compound the grief associated with the death of their baby.

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Table 2 (continued)

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Study	Presence of PTG	Other clinical aspects	Changes relating to the PTG	Factors promoting PTG	Contextual variables of loss
Lafarge et al. (2020)	Presence of PTG. Moderate levels.	 Reported high levels of active grieving. Does not report number of participants or average. 	 Greater personal strength. Relationship with others: compassion, valuing relationships. Sense of life: greater appreciation for life, shifting priorities. Identifying new possibilities. Spiritual change not significant. 	 Intrusive and deliberate rumination predicted PTG. Intrusive rumination was a negative predictor of growth and deliberate rumination a mediator between pain and PTG. Adaptive coping strategies were related to PTG. 	 The time elapsed since the loss, whether women were comfortable with their decision, if they had had subsequent children, and their age. They showed higher levels of 'deliberate rumination' when: 1) they were not comfortable with their decision to terminate and when the time since loss was less than 24 months.
Tian and Solomon (2020)	Presence of PTG when bereavement is moderate and higher when there is re-evaluation of meaning or communicative support from the partner.	- Levels of grief influence PTG in an inverted U-shape, with moderate levels of grief being more conducive to PTG.	 Personal strength, changes in identity. Relationship with others: increased compassion and bonding with partners. Meaning in life: developing new life goals and purposes, restoring direction. New possibilities. Low levels of spiritual change. 	- A moderate level of grief corresponded with greater posttraumatic growth among bereaved mothers, and the partner's reconstruction of meaning and supportive communication moderated this association.	- They observed associations between the variables of interest and time since miscarriage, duration of pregnancy, knowledge of miscarriage, and relationship satisfaction.
Freedle and Kashubeck-West (2021)	Presence of PTG. Moderate levels (M=55.14, SD=22.50).	 - 66.8% strongly agreed with the statement that they were mourning their baby/babies. 	 Significant changes in personal strength, new possibilities, greater appreciation for life, spiritual change. Relationship with others: the most significant area. 	 Change in beliefs about the world and rumination predicted PTG. Deliberate rumination mediated the relationship between core belief challenges and PTG. 	 The event is rated as traumatic by the participants (M=7.44/9, SD=1.91). Significant positive correlations were found between PTGI and type of loss, gestational age, and perceived severity of the event. These variables explained 8.7% of the variance of the total PTGI score.
Freedle and Oliveira (2021)	Presence of PTG. Moderate levels (M=50.48, SD=22.76).	- Does not report	 Sharing what happened improves emotional state and hope in stressful situations. Relationship with others: more meaningful and intimate relationships, greater compassion. Meaning in life: new perspectives. 	 Disclosure and positive social reactions predicted PTG. The relationship between positive social reactions and PTG was mediated by deliberate rumination. The positive response some women received after disclosure of the loss was related to their PTG. 	 Contextual factors for the loss included the number of miscarriages, time since the loss, gestational age of the infant or foetus at the time of loss, and whether the participants had living children. The results showed that the loss context variables explained 10.3% of the variance.
Jones et al. (2021)	Presence of PTG. Moderate levels (M=49.2, SD=20.2).	- They also showed symptoms of anxiety (range=0-20, M=9.8, SD=4.3), depression (range=0-16, M=5.1, SD=3.7).	 Personal strength, positive self-affirmations. Relationship with others: does not specify in what aspects. Sense of life: re-evaluating their worldview, greater appreciation for life, change in priorities. New possibilities and spiritual development to a lesser extent. 	- The highest PTG for parents who thought they had gained more meaning after their baby's death, who engaged more frequently in legacy-creating activities, who engaged more frequently in nature, and who refrained from sharing expressions of ongoing bonding with others to avoid negative feedback.	- They did not control for contextual variables despite assessing them (live births, weeks of gestation, and time since loss).

good validity and reliability (Tedeschi and Calhoun, 1996). On the other hand, one study used a literature-based topic guide that allowed assessment of positive changes through a semi-structured, one-to-one interview (Waugh et al., 2018).

Analysis of the main results

The results were divided into three specific aims: 1) the presence or absence of PTG and its level; 2) types of changes observed on the five domains of PTG (Tedeschi and Calhoun, 1996); 3) the factors that may promote PTG.

Presence of PTG

In eight of the studies (Cacciatore, 2018; Freedle and Kashubeck-West, 2021; Freedle and Oliviera, 2021; Isguder et al., 2018; Jones, 2021; Lafarge, 2017; Lafarge et al., 2020; Krosch and Shakespeare-Finch, 2017), the participants reported moderate levels of posttraumatic growth. A moderate level is defined as scores between 35 and 70 points on the PTGI, ranging from 0 to 105 (Tedeschi and Calhoun, 1996). This result indicates that the participants recognised positive personal changes in one or more areas of their lives.

The selected studies aimed at studying growth after such a loss, but other clinical symptoms have been reported. For instance, the participants of two studies considered the event as traumatic (Freedle and Kashubeck-West, 2021; Freedle and Oliveira, 2021). In three studies (Isguder et al., 2018; Jones et al., 2021; Krosch and Shakespeare-Finch, 2017), participants showed symptoms of anxiety (24.4%), depression (39.7%), or posttraumatic stress (14.7% and 43.90%) (Isguder et al., 2018; Jones et al., 2021; Krosch and Shakespeare-Finch, 2017). On the other hand, six studies reported the presence of active bereavement in their participants (Freedle and Kashubeck-West, 2021; Isguder et al., 2018; Krosch and Shakespeare-Finch, 2017; Lafarge et al., 2017; Lafarge et al., 2020; Waugh et al., 2018). Specifically, Krosch and Shakespeare-Finch (2017) found that 57% of participants were still experiencing considerable grief and Freedle and Kashubeck-West (2021) found that 66.8% of participants reported that they were grieving for their baby. Interestingly, Tian and Solomon (2020) observed an inverted U-shape relationship between bereavement reactions and PTG - that is, low or high levels of distress can inhibit growth, with a moderate level of bereavement being the most growth-promoting. Three studies found a negative relationship between grief and PTG, where higher levels of grief were associated with lower PTG (Lafarge et al., 2017; Lafarge et al., 2020; Krosch and Shakespeare-Finch, 2017). Isguder and colleagues (2018) reported that personal growth after loss may be part of the transformational process of grief, although not all participants in their study reported that they were grieving.

Types of changes observed

In terms of the types of positive changes related to PTG, the most frequent was in relation to personal strength (Cacciatore et al., 2018; Freedle and Kashubeck-West, 2021; Freedle and Oliveira, 2021; Krosch and Shakespeare-Finch; 2017; Tian and Solomon, 2020). In these studies, personal strength refers to people's perception of being stronger than they thought, feeling able to handle difficulties, being able to accept things that happen, or feeling more autonomous. Isguder et al. (2018) found no significant changes among women who suffered a miscarriage when compared to the control group of women with an uncomplicated pregnancy. On the other hand, participants in two studies identified skills that they were unaware of, such as feeling more assertive and more mature (Jones, 2021; Waugh et al., 2018).



Fig. 2. Variables analysed in the set of the studies revised.

In terms of positive changes related to others, several research studies identified this as the most significant area of PTG (Freedle and Kashubeck-West, 2021; Lafarge et al., 2017). One of the most prominent aspects in most studies was greater compassion (Lafarge et al., 2017; Krosch and Shakespeare-Finch, 2017; Lafarge et al. 2020) and a greater ability to help others (Jones et al., 2021; Waugh et al., 2018). Cacciatore et al. (2018) showed that these changes were identified when helping people (e.g., support groups). On the other hand, participants reported having more meaningful and intimate relationships with others (Freedle and Oliveira, 2021; Krosch and Shakespeare-Finch, 2017; Freedle and Kashubeck-West, 2021) and a strengthened bond with their life partner and children (Tian and Solomon, 2020; Waugh et al., 2018).

Similarly, a greater appreciation for life was also found (Lafarge et al., 2017; Freedle and Kashubeck-West, 2021; Krosch and Shakespeare-Finch, 2017; Waugh et al., 2018). In this dimension, some studies referred to a change in perspective (Freedle and Oliveira, 2021) or a change in defining priorities and what is important in life (e.g., family) (Jones et al., 2021; Lafarge et al., 2017; Lafarge et al., 2020).

Another common change was the perception of new possibilities. This change refers to setting new goals and life purposes and allowing the restoring of a sense of direction (Cacciatore et al., 2018; Freedle and Kashubeck-West, 2021; Tian and Solomon, 2020). The participants reported being able to change what they needed or to develop new interests (Lafarge et al., 2017). Some participants reported being willing to help improve services or volunteer for charities (Waugh et al., 2018).

Finally, most research reported low levels of spiritual growth (Freedle and Kashubeck-West, 2021; Krosch and Shakespeare-Finch, 2017; Jones et al., 2021). Specifically, Lafarge et al. (2017) found that the lowest rated statements were 'I have more religious faith' (13.04 %) and 'I understand spiritual aspects better' (19.88 %). However, several studies noted that for women who reported being religious before the death of their baby, faith remained as a protective factor (Isguder et al., 2018; Waugh et al., 2018).

Factors promoting PTG

Six psychological factors were identified (i.e., making meaning of the loss, increased changes in core beliefs, adaptive coping strategies, deliberate rumination, continued bonding with the deceased infant, and support from the social environment). These factors are presented in Fig. 2.

With regard to making meaning of the loss, four studies found that attempts to understand the loss and finding meaning were related to greater PTG (Isguder et al., 2018; Jones et al., 2021; Tian and Solomon, 2020; Waugh et al., 2018). Meaning-making process helped reduce cognitive dissonance. Meaning-making

processes include finding benefits or defining identity (Tian and Solomon, 2020; Waugh et al., 2018). However, it is worth mentioning that not all parents were able to find meaning after the death of their baby.

With regard to core beliefs, the two studies that specifically investigated core belief changes found that greater core belief challenge was associated with greater PTG (Freedle and Kashubeck-West, 2021; Krosch and Shakespeare-Finch, 2017). On the one hand, in the hierarchical regression analysis conducted by Freedle and Kashubeck-West (2021), they found that core beliefs explained 18.1% of the variance when controlling for loss context variables. On the other hand, in the study by Krosch and Shakespeare-Finch (2017), belief change was found to be the strongest predictor, suggesting that an event such as perinatal death disrupts the individual's belief system, after which it is necessary to construct new ways of understanding oneself and the world.

With regard to coping strategies, several studies found that adaptive strategies (i.e., acceptance, seeking emotional support, active coping, and planning) were positively related to PTG (Carver, 1997; Lafarge et al., 2017; Lafarge et al., 2020). In particular, Freedle and Oliviera (2020) found that positive reappraisal of the event was related to 'new possibilities' and 'appreciation of life' domains. However, Cacciatore et al. (2018) observed that only four out of 73 statements expressed an active and intrinsic attempt to positively reappraise. In Waugh et al.'s (2018) study, the participants reported active coping motivated by their living children and helping others in perinatal bereavement. On the other hand, Isguder et al. (2018) found that women with higher PTG employed both adaptive and maladaptive strategies. Religious coping was also an additional strategy for some women and a predictor of PTG highlighted in several studies (Lafarge et al., 2020; Lafarge et al., 2017).

Regarding rumination, four studies specifically investigated both intrusive and deliberate rumination (Freedle and Kashubeck-West, 2021; Lafarge et al., 2020). Intrusive rumination negatively correlated with PTG, indicating that high levels of intrusive thoughts may limit the growth experience. However, deliberate rumination was a mediating variable between beliefs violation and PTG, showing that reflective thinking can help assimilate the event (Krosch and Shakespeare-Finch, 2017). Specifically, Lafarge et al. (2020) found that intrusive rumination was related to high levels of grief. They also found that deliberate rumination facilitates the experience of PTG but that its influence is greater when levels of bereavement are considered. On the other hand, Freedle and Oliveira (2021) found that deliberate rumination mediated the relationship between positive social reactions and PTG, explaining 13.7% of the variance.

With regard to keeping bonds with the deceased infant, three studies found that mourners who participated in volunteering, with the aim of honouring or keeping the memory of the deceased infant, showed higher levels of growth (Cacciatore et al., 2018; Jones et al., 2021; Waugh et al., 2018). Some mourners (20.5%) reported that caring for other children, buying toys, or knitting blankets for newborns were actions that may create permanent bonds with their babies (Cacciatore et al., 2018). Similarly, Waugh et al. (2018) found that positive reminders through photographs or footprints fostered personal growth. Jones et al. (2021) found that another way of connecting with their baby was interacting with nature (i.e., visiting a garden, planting flowers, watching a sunset), which was a significant factor for growth.

Social support from partners, family, and friends was another essential factor for PTG (Jones et al., 2021; Waugh et al., 2018). Freedle and Oliviera (2021) found that sharing distress with others was associated with PTG, and that PTG was higher when social reactions were positive. In this regard, Jones et al. (2021) found that there were mourners who preferred not to share their experience in order to avoid a negative response from their environment. A supportive, person-centred environment of emotional validation and effective listening was found to promote growth (Tian and Solomon, 2020). This supportive environment can also be provided by the partner, and it is especially relevant when the wider environment ignores the grief. Also, it is important to receive kind and compassionate care from hospital staff or learn from other bereaved mothers through support groups (Cacciatore et al., 2018; Waugh et al., 2018).

In addition to these psychological factors, some contextual factors related to the experience of PTG after perinatal loss were identified. The number of previous losses, the time since the loss, the gestational age, knowing the cause of the loss, having living children, the severity of the event, or the intensity of grief were significant variables in explaining PTG (Isguder et al., 2017; Krosch and Shakespeare-Finch, 2017; Lafarge et al., 2020). The variance explained by these variables ranged from 6.5% to 10.3% (Freedle and Kashubeck-West, 2021; Freedle and Oliviera, 2021; Krosch and Shakespeare-Finch, 2017). Waugh et al. (2018) found that having had previous miscarriages aggravated the pain associated with the death. However, Lafarge et al. (2017) found that previous losses were not associated with PTG.

Discussion

This systematic review aimed to synthesize the findings in the growing body of literature exploring PGT in people who have suffered a perinatal loss. Although research in PTG is increasingly growing (Tedeschi and Calhoun, 1996), the possibility of PTG in the aftermath of pregnancy loss has received limited attention.

Regarding the first specific objective (i.e., to assess the presence and levels of PTG), results showed that growth can occur after perinatal loss and that levels of PTG tend to be moderate (Freedle and Oliveira, 2021). Furthermore, it is noteworthy that in most of the studies, bereavement was still active in their participants. These results are in line with the PTG theory that postulates that psychological symptoms and grief can coexist with growth (Gerrish et al., 2014; Tedeschi and Calhoun, 1996). Indeed, as Tedeschi and Calhoun (2004) indicate, distress is necessary to experience growth. However, not all studies find that higher levels of distress are related to greater PTG. These inconsistent results have been previously found in the literature on PTG in other groups, such as cancer patients (Chaves et al., 2013). Some studies conclude that these divergent results may be due to a non-linear relationship between grief and PTG. In fact, an inverted U-shape relationship has been found between bereavement and the experience of PTG (Tian and Solomon, 2020), suggesting that those people with moderate symptoms experience higher levels of PTG compared to those with milder or more severe symptoms. This curvilinear relationship has been previously reported in other populations (Laufer and Solomon, 2006; Levine et al., 2008).

With regard to the second specific objective (i.e., to describe the types of positive change), the most common positive changes observed were in the domains of personal strength, the relationships with others and appreciation of life and, to a lesser extent, in the perception of new possibilities and spiritual growth. These results indicate that facing a perinatal loss may involve a change in awareness and introspection that fosters greater engagement in other personal aspects (Cacciatore et al., 2018). These changes have been reported in other people facing stressful situations such as cancer (Stanton et al., 2006), natural disasters (Mordeno et al., 2015), or childhood adversity (Anderson et al., 2011). However, these changes may be accompanied by feelings of vulnerability when the perinatal loss may involve distancing from expected

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social roles and from the identity as parents (Cacciatore et al., 2018; Neimeyer et al., 2014).

In relation to the third objective (i.e., to know the factors that facilitate the experience of PTG after perinatal loss), six significant factors were identified: finding meaning in the loss, change of core beliefs, adaptive coping strategies, deliberate rumination, keeping bonds with the deceased baby, and support from the social environment. This traumatic event may violate the individual's belief system, so trying to find meaning in the loss and engaging in reflective repetitive thinking can help construct new ways of understanding the world or assimilating the event into the existing cognitive structure (Calhoun et al., 2010; Jones et al., 2021; Tedeschi et al., 2018). In this sense, challenging core beliefs may help experience growth (Ramos and Leal, 2013). On the other hand, numerous research studies indicate that deliberate rumination is related to greater positive change and acts as a mediator between perinatal loss and PTG (Allbaugh et al., 2016; Triplett et al., 2012). Furthermore, in line with the existing literature, intrusive rumination was not related to PTG, although it can be adaptive immediately after the event (Taku et al., 2009; Cann et al., 2010).

On the other hand, individuals using adaptive coping strategies, such as positive reappraisal or acceptance, showed a positive cognitive and behavioural adjustment, that was associated with growth after loss. This result is consistent with previous studies (Lafarge et al., 2017; Lafarge et al., 2020; Allbaugh et al., 2016). However, in one of the studies, maladaptive strategies were also related to PTG (Isguder et al., 2018). These authors observed that initially bereaved people may have difficulties in implementing adaptive strategies. The literature on this topic suggests that these two coping strategies may not be mutually exclusive (Taku et al., 2009).

Furthermore, some studies suggest that mourners who engage in activities aimed at honouring the memory of the deceased infant keep bonds with their infant and embrace new narratives that may foster PTG (Cacciatore et al, 2018; Jones et al., 2021). In addition, being able to share their emotional experience in a validating environment helps integrate the event and break the stigma associated with perinatal death (Markin and Zilcha-Mano, 2018a; Freedle and Oliveira, 2021; Pia, 2011). The benefit of social support from therapeutic groups (Cacciatore et al., 2018), family systems, including couples (Carlson et al., 2012), and faith communities (McIntosh et al., 1993) has been widely shown. Listeners may offer different perspectives or serve as role models, especially if they have experienced a similar event (Tedeschi et al., 2018).

This study has several limitations. Not uncommon for evidence syntheses, the body of studies included likely suffers from publication bias. First, the samples were mostly Caucasian women with good or high educational levels, so the generalisability of the results to diverse populations is limited (Freedle and Kashubeck-West, 2021; Freedle and Oliviera, 2021). On the other hand, most participants were recruited from organisations or support groups (i.e., people who have sought help and who tend to score higher on perinatal bereavement) (Toedter et al., 2001; Waugh et al., 2018). Also, most (70%) of the included studies report only significant associations, and it is not clear whether the authors disregarded negative results. In relation to methodology, we systematically reviewed studies retrieved from Proquest and Web of Science. Studies included in other databases may not have been identified. On the other hand, all studies were cross-sectional, so causality and changes over time cannot be inferred (Jones et al., 2021; Cacciatore et al., 2018). Also, some self-report measures were retrospective, which may affect the accurate recall of some aspects of the event (Freedle and Oliviera, 2021). For instance, Isguder et al. (2018) suggested that the time frame for assessing variables since the loss may have been too short to notice changes in comparison to the control group. Therefore, further research using prospective studies is needed to truly assess these changes and their frequency, as well as the design of comparative studies using relevant control groups (e.g., comparing levels of PTG in parents following stillbirth, miscarriage or neonatal death, or comparing between mothers and fathers).

Despite these limitations, this review provides an update on PTG in the specific area of perinatal death. Also, the samples were fairly homogeneous in terms of age, gender, and recruitment method. Furthermore, it is hoped that this work will provide useful recommendations for clinical practice. These results shed light on the characteristics of growth after perinatal loss. Also, identifying factors that may promote PTG in this population will provide a basis for the design of future clinical interventions. Ryninks et al. (2022) suggest that interventions targeting challenge to assumptive beliefs, disclosure, and rumination are likely to be clinically useful to promote psychological adjustment in mothers who have a perinatal loss. In addition to these cognitive aspects, the results of this review suggest that it is important to help parents find meaning, develop adaptive coping strategies, involve in activities that keep bonds with their babies (e.g., volunteering or connecting with nature) or create safe spaces where mourners can share their grief and feel validated. In sum, providing mental health care for parents and their health providers are undoubtedly essential priorities (Ching et al., 2021; Lee et al., 2020).

It should be noted that PTG is a relatively recent area of empirical study in perinatal psychology. This review provides new insight into the experience of PTG after perinatal loss and help set the basis for the design of future effective clinical interventions in this population.

Declaration of Competing Interest

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

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