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Objective: Rumination is important in adjusting to traumatic events. Evidence suggests that deliberate rumination predicts posttraumatic growth (PTG), and mediates the relationship between coping and PTG. This study examined the relationship between rumination and psychological adjustment following pregnancy termination for fetal abnormality (TFA).

Method: A cross-sectional, online study was conducted with women who had undergone TFA. Women were recruited from a support organisation; 161 women completed the Brief COPE, the Perinatal Grief Scale, the Event-Related Rumination Inventory and the Posttraumatic Growth Inventory. Data were analysed using regression and mediation analyses.

Results: The results show that women engaged in high levels of intrusive and deliberate rumination post-TFA and that intrusive rumination predicted grief. Intrusive and deliberate rumination predicted PTG, although intrusive rumination was a negative predictor of growth. Deliberate rumination mediated the relationship between grief and PTG. It also mediated the path between positive reframing and PTG, and religious coping and PTG, although the mediation effect depended upon the inclusion of the grief variable in the models.

Conclusions: The results confirm the applicability of the PTG model to TFA and support the relevance of rumination to the PTG experience. The results also have clinical implications. Given the positive relationship between deliberate rumination and PTG, promoting interventions that encourage reflective thinking and narrative construction would benefit women post-TFA, particularly those experiencing high levels of distress and/or at risk of complicated grief.

Keywords – rumination, posttraumatic growth, psychological adjustment, mediation, termination of pregnancy for fetal abnormality

Clinical impact statement

Rumination is important in adjusting to traumatic events. This study examined the relationship between rumination (intrusive and deliberate) and psychological adjustment (grief and posttraumatic growth [PTG]) following pregnancy termination for fetal abnormality. Intrusive rumination was shown to predict grief, whilst deliberate rumination predicted PTG. Deliberate rumination also mediated the relationship between grief and PTG. These results suggest that psychological interventions that promoting deliberate rumination through activities such as reflective thinking and narrative construction would benefit women, particularly, those experiencing high levels of grief.

Introduction

The notion that individuals experience positive transformations following difficult life-events can be traced back to ancient philosophies and Eastern religions, the late 19th century philosophy of Nietzsche (1844-1900) and the 20th century Humanist and Existentialist traditions (Joseph, 2011). However, since the early 2000s, alongside the growth in popularity of the Positive Psychology movement (Seligman & Csikszentmihalyi, 2000), there has been a surge of interest about what is commonly referred to as 'posttraumatic growth' (PTG, [Tedeschi & Calhoun, 1996]).

PTG refers to a 'transformation' individuals experience as a result of trauma (Tedeschi & Calhoun, 1996). It is based upon the assumption that traumatic events profoundly unsettle individuals' sense of equilibrium and lead them to re-evaluate their world views (Janoff-Bulman, 1992). PTG corresponds to a new way of functioning, which can manifest itself on personal (e.g. finding new strengths), philosophical (e.g. finding a sense of purpose) and inter-personal (e.g. deeper sense of intimacy, compassion) levels (Joseph, 2011). PTG also has two underpinning characteristics: 1) it coexists with distress; and 2) it involves intense cognitive work (Tedeschi & Calhoun, 2004). The struggle with distress in the aftermath of a traumatic event leads individuals to engage in cognitive work to rebuild

their world views. It is this process of adjusting to trauma that is thought to be conducive to PTG (Tedeschi & Calhoun, 1996; 2004).

It is estimated that between 30% and 70% of individuals who experience a traumatic event will go on to experience PTG (Joseph, 2011). PTG has been documented in various contexts including: interpersonal violence (Allbaugh, Wright, & Folger, 2016), life threatening illness (Lelorain, Bonnaud-Antignac & Florin, 2010), natural disasters (Bosson, Kelley, & Jones, 2012), war (Rosner & Powell, 2006) and bereavement (Calhoun, Tedeschi, Cann, & Hanks, 2010). PTG has also been evidenced in both individualist and collectivist societies (Lelorain et al., 2010; Schroevers & Teo, 2008). Despite discussions of whether PTG research is operationalised in culturally sensitive ways (Kashyap & Hussain, 2018; Splevins, Cohen, Bowley, & Joseph, 2010), conceptually, the experience of PTG is thought to be universal.

Rumination in the Context of Posttraumatic Growth

The cognitive activity involved in rebuilding world views following a traumatic event, often referred to as rumination, has also been the subject of investigation (Tedeschi & Calhoun, 2004). Rumination can be linked to personality predisposition (trait-related rumination) or a particular event (event-related rumination), with the latter more closely associated with PTG (Cann, Calhoun, Tedeschi, Triplett, Vishnevsky, & Lindstrom, 2011; Taku, Calhoun, Cann, & Tedeschi, 2008; Taku, Cann, Tedeschi, & Calhoun, 2009). Event-related rumination itself can be split into two categories: intrusive rumination, which corresponds to repetitive, negative, and unwanted thoughts about the event, and deliberate rumination which encompasses repetitive, purposeful thoughts focusing on specific components of the difficult event (Cann et al., 2011). Research suggests that deliberate rumination is related to greater positive change (Joseph, 2011) than intrusive rumination, which itself is thought to lead to higher levels of distress (Allbaugh et al., 2016; Stockton, Hunt, & Joseph, 2011; Taku et al., 2008; 2009).

Rumination in the context of PTG has also been explored alongside coping, another cognitive process thought to contribute to the experience of positive growth. Research has shown that some coping strategies, such as positive reframing or acceptance, are closely associated with PTG (Anonymised), alongside problem-solving coping strategies such as seeking support (García, Cova, Rincón, Vázquez, & Páez, 2016; Prati & Pietrantoni, 2009). Rumination has also been shown to act as a mediator in the relationship between coping and PTG. For example, a study by Bosson et al. (2012) suggested that deliberate rumination mediates the relationship between religious coping and PTG in a sample of hurricane Katrina survivors. Similarly, the study by Garcia et al. (2016) established that deliberate rumination mediates the relationship between problem-solving coping and PTG among earthquake survivors.

Perinatal Loss: The Specificity of Pregnancy Termination for Fetal Abnormality

The relationship between rumination and PTG has yet to be examined in the context of perinatal loss. Perinatal loss is a common experience. One in eight confirmed pregnancies ends in miscarriage, and a small but significant number results in stillbirth and neonatal deaths (National Health Service, n.d.; Office for National Statistics [ONS], 2017). Evidence suggests that many women experience these losses as highly traumatic (Cacciatore, Frøen, & Killian, 2013; Rowlands & Lee, 2010). Although research on PTG in these populations is in its infancy, the evidence available indicates that women report various positive changes following pregnancy loss (Krosch & Shakespeare-Finch, 2017). These include: changes in priorities, strengthening of marital bonds, renewed appreciation for existing relationships, renewed empathy and compassion for others, and the ability to identify new possibilities in life (Black & Wright, 2012; Thomadaki, 2017).

Termination of pregnancy for fetal abnormality (TFA) is a particular type of perinatal loss. In England and Wales, it concerns 2% of all terminations (3,158 in 2017, Department of Health, 2018), but this number is rising over time due to developments in screening

technologies (Lewis, Hill, Silcock, Daley, & Chitty, 2014) and increasing maternal age (ONS, 2017). TFA is a unique type of loss because, although it shares some characteristics with other perinatal losses, it involves a parental decision. This decision adds a degree of complexity to the process of adjustment to TFA, with many women reporting feelings of self-blame (Anonymised; Nazaré, Fonseca, & Canavarro, 2014) which may also complicate the experience of PTG. Previous work on the experience of adjustment to TFA (Anonymised) has shown that despite high levels of grief, women also report some PTG in the area of 'relating to others,' 'personal strengths,' and 'appreciation of life' to a moderate degree. It also indicates that positive reframing and religious coping are significant predictors of PTG in this population. In this study, positive reframing predicted 'new possibilities' and 'appreciation of life' whilst 'religious coping' predicted 'spiritual changes.'

This research is the first to examine the relationship between rumination and psychological adjustment in the context of TFA. As such, it aims to extend previous research (Anonymised but available on request) which identified the roles of coping strategies and perinatal grief in predicting posttraumatic growth following TFA. Given the evidence indicating a relationship between distress, cognitive processes such as rumination and coping, and PTG (Cann et al., 2011; García et al., 2016; Tedeschi & Calhoun, 2004 amongst others), five hypotheses have been tested in relation to PTG following TFA:

H_1: Intrusive rumination will predict grief, but deliberate rumination will not

H_2: Deliberate rumination will predict PTG, but intrusive rumination will not

H_3: Deliberate rumination will mediate the relationship between grief and PTG

H_4: Deliberate rumination will mediate the relationship between positive reframing and PTG

H_5: Deliberate rumination will mediate the relationship between religious coping and PTG.

Methods

The study methodology has been reported in detail elsewhere (Anonymised). Therefore, in this section, only a summary of the key methodological elements is provided.

The study used a cross-sectional design. Participants were recruited from a UK online support group that provides support to parents when a severe fetal anomaly is suspected/diagnosed in their unborn baby. A message advertising the study was placed on the members' forums of the support organisation and disseminated through the email network. It is estimated that around 25% of women undertaking TFA in the UK contact this organisation, with a majority becoming members (Anonymised). To be eligible, women had to have experienced TFA and be over 18 years old. Power calculations were conducted to estimate the required sample size (Anonymised). All data were collected online and full ethical approval was received from the (Anonymised) Ethics committee.

Participants completed the Brief COPE (Carver, 1997), the Short Perinatal Grief Scale (Short PGS [Potvin, Lasker, & Toedter, 1989]), the Event-Related Rumination Inventory (ERRI [Cann et al., 2011]), and the Posttraumatic Growth Inventory (PTGI [Tedeschi & Calhoun, 1996]). The Brief COPE comprises 28 items measuring 14 coping strategies (e.g. 'self-distraction,' 'active coping,' 'denial') and uses a four-point Likert scale (*I haven't been doing this at all* to *I've been doing this a lot*). Higher scores indicate higher usage of the strategy. Following Carver's suggestions (1997) the subscale 'humour' was removed because it was deemed insensitive in the context of TFA. The Brief COPE's validity and reliability are well established with Cronbach's alpha values between 0.50 and 0.90 (Carver, 1997).

The Short PGS (Potvin et al., 1989) has 33 items scored on a five-point Likert scale *(strongly agree* to *strongly disagree*). Items are grouped into three 11-item subscales 'active grief,' 'difficulty coping' and 'despair' which are designed to portray increasingly severe grief symptomatology. The three subscales are aggregated into an 'overall grief' scale. Higher scores reflect higher levels of grief. The scale has good validity and reliability with Cronbach's alpha values between 0.86 and 0.92 (Potvin et al., 1989).

The EERI (Cann et al., 2011) comprises two subscales 'intrusive rumination' (e.g. "I could not keep images or thoughts about the event from entering my mind") and 'deliberate rumination' ("I thought about the event and tried to understand what happened"), with each subscale made of ten items. The items are scored on a four-point Likert scale indicating rumination frequency *(Not at all* to *Often*), with higher scores indicating higher levels of rumination. The scale displays good psychometric characteristics with Cronbach's alpha values of 0.88 and 0.94 (Cann et al., 2011).

The PTGI (Tedeschi & Calhoun, 1996) has 21 items, each scored on a six-point Likert scale (*I did not experience this change as a result of my crisis* to *I experienced this change to a very great degree*). Items are grouped into five subscales: 'relating to others,' 'new possibilities,' 'personal strength,' 'spiritual change' and 'appreciation of life.' The subscales are also aggregated into an 'overall growth' measure. Higher scores indicate greater growth. The PTGI has well-established validity and reliability with Cronbach's alpha values between 0.67 and 0.90 (Tedeschi & Calhoun, 1996).

Participants also answered demographic questions (e.g. age, education level, religion, ethnicity) and questions about the terminated pregnancy (e.g. gestational age, fetal prognosis, feeling about the decision to terminate, time elapsed since TFA). Reponses were either numerical (e.g. for age) or categorical. Participants were given the opportunity to select the 'prefer not to answer' category. The questionnaire is appended as a Supplementary file.

Analysis

Data were analysed using descriptive and inferential statistics in SPSS, version 24. Hierarchical regression analyses were run to test the first two hypotheses. The outcome variable was 'overall grief' in Model 1 and 'overall PTG' in Model 2. Mediation analyses were run to test the last three hypotheses, with 'overall PTG' as the outcome variable and 'deliberate rumination' as mediator, with variables showing significant associations with 'deliberate rumination' included as co-variates. Mediation analyses were run using the macro

command for SPSS 'PROCESS' Version 3 by Hayes (2018). A bootstrap methodology using 5,000 samples with 95% confidence intervals was utilised to calculate the indirect effect of 'deliberate rumination' on 'overall PTG.' Given the large number of analyses conducted, *p*-values < 0.01 were considered statistically significant.

Results

Participants' Profile

One hundred and seventy eight participants started the online survey, with 161 completing it (90.44%). However, due to the absence of data on the organisation members' level of activity on the forum, a response rate could not be calculated. The demographic and obstetric profiles of the participants (Table 1) show that the majority of women were White (98.14%); well-educated (69.57% educated to degree level or above), and that less than a quarter (23.75%) reported that they were not comfortable with their decision (defined as 'would not make' or 'unsure they would make the same decision to terminate again'). ***Insert Table 1 here***

Rumination, Coping, Grief and Posttraumatic Growth

The levels of intrusive and deliberate rumination as well as those of perinatal grief and PTG are shown in Table 2. The scales displayed satisfactory levels of reliability with Cronbach's alpha values above the minimum requirement of 0.5 (Nunnally, 1978). The levels of rumination displayed by women were high with both scores well above the midpoint of 1.5). Levels of 'intrusive rumination' were slightly higher than those of 'deliberate rumination' but the difference was not significant (M = 2.05, SD = 0.78, vs. M = 1.93, SD = 0.71, $p > 0.05$). In terms of frequency, 60.80% (n = 98) of participants reported experiencing 'intrusive rumination' at least sometimes and 12.40% (n = 20) often, whilst 54.00% (n = 87) engaged in 'deliberate rumination' at least sometimes and 2.50 % (n = 4) often. The results also show that 40.37% (n = 65) of participants reported experiencing both types of ruminations at least sometimes, but only one participant experienced both types often. This indicates that a

significant proportion of the sample engaged in both 'intrusive' and 'deliberate' rumination concurrently. Notably, levels of 'deliberate rumination' remained stable for 24 months, decreasing after that point, which is longer than for 'intrusive rumination' for which levels decreased significantly after just 12 months (up to 6 months: $M = 2.06$, $SD = 0.63$; 6-12 months: $M = 2.07$, $SD = 0.71$; 12-24 months: $M = 2.11$, $SD = 0.48$; over 24 months: $M = 1.67$, $SD = 0.80$). However, none of the differences between mean scores were significant $p > 0.01$.

Women used mainly 'adaptive' strategies such as acceptance, emotional support, active coping and planning. Levels of grief reported by women were high, in particularly for 'active grief.' The mean score for 'difficulty coping' was lower than for 'active grief,' but higher than for 'despair,' indicating that fewer women experienced the more severe levels of symptomatology. Women's levels of PTG were moderate and were higher for 'relating to others,' 'personal strengths' and 'appreciation of life.' For more detailed information on these variables, please refer to [Anonymised]. ***Insert Table 2 here***

Differences in Levels of Rumination across Participants

For this paper, analyses focused on differences in levels of rumination, whether intrusive or deliberate, across participants. Several differences were observed for the 'intrusive rumination' subscale. Women displayed higher levels of intrusive rumination when: 1) they were not comfortable with their decision to terminate ($M = 2.32$, $SD = 0.64$ vs. $M = 1.96$, $SD = 0.80$, $t(157) = 2.52$, $p < 0.05$, $d = 0.50$); 2) they had not had other children after TFA ($M = 2.30$, $SD = 0.64$ vs. $M = 1.83$, $SD = 0.83$, $t(154) = 3.99$, $p < 0.001$, $d = .63$) ; or 3) they were less than 35 years old ($M = 2.26$, $SD = 0.66$ vs. $M = 1.90$, $SD = 0.82$, $t(156) = 3.07$, $p < 0.01$, $d = 0.48$). There were also differences according to the time elapsed since TFA ($F(3,128) = 10.2$, $p < 0.001$)[1]. Levels of 'intrusive rumination' were stable for 12 months and decreased

[1] The assumption of homogeneity of variance was violated (Levene's test $p > .05$), thus the Brown-Forsythe correction is reported

significantly after that (up to 6 months: $M = 2.39$, $SD = 0.59$; 6-12 months: $M = 2.32$, $SD = 0.68$; 12-24 months: $M = 1.93$, $SD = 0.70$; over 24 months: $M = 1.70$, $SD = 0.83$). Mean differences between the 'up to 6 months' and 'over 24 months' periods and between the '6-12 months' and 'over 24 months' periods were significant $p < 0.001$ and $p < 0.01$ respectively.

Fewer differences across participants were observed in levels of 'deliberate rumination.' Nonetheless, women displayed higher levels of 'deliberate rumination' when: 1) they were not comfortable with their decision to terminate ($M = 2.14$, $SD = 0.58$ vs. $M = 1.86$, $SD = 0.73$, $t(157) = 2.08$, $p < 0.05$, $d = 0.42$); and 2) when the time elapsed since TFA was less than 24 months ($F(3,128) = 10.2$, $p < 0.01$).

Rumination as Predictor of Adjustment to TFA

Prior to running regression analyses, Pearson's correlation analyses were run to examine the relationship between levels of rumination and other variables. 'Intrusive' and 'deliberate' ruminations were positively correlated ($r = 0.46$, $p < 0.01$) confirming that women who engage in one type of rumination also engage in the other. The results also show that 'intrusive rumination' was positively correlated with all grief variables, with all coefficients higher than 0.5, the highest being for 'active grief' ($r = 0.65$, $p < 0.01$). It was also negatively correlated with four of the PTG subscales namely 'new possibilities' ($r = -0.2$, $p < 0.01$), 'personal strengths' ($r = -0.23$, $p < 0.01$), 'appreciation of life' ($r = -0.22$, $p < 0.01$) and 'overall PTG' ($r = -0.19$, $p < 0.05$).

'Deliberate rumination' was also positively correlated to grief variables, but to a smaller extent than 'intrusive rumination,' the strongest correlation coefficient being for 'active grief' ($r = 0.34$, $p < 0.01$). 'Deliberate rumination' was positively correlated to two subscales of PTG, 'relating to others' ($r = 0.25$, $p < 0.01$) and 'overall PTG' ($r = 0.21$, $p < 0.01$). This indicates that the experience of distress is not incompatible with PTG when 'deliberate rumination' is involved. All perinatal grief variables were negatively correlated with the PTG subscales.

To test the first hypothesis (H_1), namely that 'intrusive rumination' predicts grief, but that 'deliberate rumination' does not, a hierarchal regression analysis was run in which the two rumination subscales were entered as predictors, alongside key TFA-related variables that have been shown to predict perinatal grief (see [Anonymised]) and that showed significant associations with rumination. These included: time elapsed since the termination, whether women were comfortable with their decision, whether they had children at the time of TFA and whether they had had children since TFA, as well as age. Rumination scales were entered first, TFA-related variables second, and age third. For the final model, age was excluded because it did not contribute any variance in any of the grief variables.

The results support H_1 and indicate that, when controlling for TFA-related variables, 'intrusive rumination' was a significant predictor of all grief variables, and that 'deliberate rumination' was not. Whether women were comfortable with their decision was also a positive significant predictor of grief, with not 'being comfortable' predicting higher levels of grief. The model accounted for between 42% and 57% of the variance, with the inclusion of TFA-related variables accounting for 13-16% of the variance. Standardised residuals were checked for normal distribution and no issues were identified. The results are displayed in Table 3. ***Insert Table 3 here***

A similar analysis was run with 'overall PTG' as the outcome variable. Predictors included the rumination subscales and the variables showing significant associations with these (i.e. time elapsed since TFA, whether women were comfortable with their decision, whether they had had children since TFA, and age). Based on previous research (Anonymised), no other variables were included in the analysis. Similarly to Model 1, variables that did not significantly explain any part of the variance in PTG were excluded from the final model (Model 2), leaving only 'intrusive' and 'deliberate' rumination as predictors. The results partially support H_2. 'Deliberate rumination' was a significant predictor of PTG. 'Intrusive rumination' was also a significant predictor of PTG, although a

negative one. However, the variance explained by the model was low, the highest being 14% for 'overall PTG.' As per Model 1, standardised residuals were normally distributed. The results are displayed in Table 4. ***Insert Table 4 here***

To test the third hypothesis (H_3), that 'deliberate rumination' mediates the relationship between grief and PTG (Model 3), 'overall grief' was entered as the independent variable, 'deliberate rumination' as mediator and 'overall PTG' as the dependent variable. TFA-related variables showing significant group differences with 'deliberate rumination,' namely time elapsed since TFA and whether comfortable with decision to terminate were initially included as covariates. They were, however, removed from the final model as they did not contribute any variance in the path between grief and PTG and had no impact on the predictors' coefficient values. The results support H_3 and confirmed the mediating role of 'deliberate rumination' in the relation between grief and PTG (b = 0.05; 95% CI [0.01 - 0.11]). The results are illustrated in Figure 1. ***Insert Figure 1 here***

Finally, mediation analyses were run to test the fourth and fifth hypotheses, namely that 'deliberate rumination' mediates the relationship between 'positive reframing' and 'overall PTG' (Model 4) and between 'religious coping' and 'overall PTG' (Model 5). As with H_3, TFA-related variables that displayed a significant association with 'deliberate rumination' were entered as covariates in the models. These included: time elapsed since TFA and whether women were comfortable with their decision to terminate. 'Overall grief' was added as a covariate because of the theoretical contribution of distress to the PTG model and because, in this study, grief was significantly correlated with both PTG and rumination variables (see earlier paragraph on correlation analyses).

The results support H_4 and show that 'deliberate rumination' mediates the relationship, between 'positive reframing' and 'overall PTG,' b = 0.7615, 95% CI [0.056-1.58]. However, the indirect effect was no longer significant when 'overall grief' was not included in the model, b = 0.2831, 95% CI [-0.095-0.838]. This confirms the impact of grief

on the experience of PTG and is suggestive of a moderated mediation effect (Hayes & Rockwood, 2017). The other two covariates were not included in the final model because they had no significant effect on any of the variables.

To test H_5 (Model 5), a similar mediation analysis as for Models 3 and 4, including the same three covariates, was conducted. The results indicate that 'deliberate rumination' does not mediate the relationship between 'religious coping' and 'overall PTG', b = 0.3869, 95% CI [-0.5375-4.1921]. However, the indirect effect became significant when 'overall grief' was removed from the model, b = 0.3510, 95% CI [0.0142 – 0.0965]. The other two covariates were excluded from the final models because they had no impact on any of the variables. No suppressor effects were observed in any of the regression and mediation models, as the R squared and beta coefficients decreased with the inclusion of additional predictors (MacKinnon, Krull, & Lockwood, 2000).

Discussion

This paper sought to examine the role of rumination in women's adjustment to TFA, in particular, the predictive power of rumination on grief and PTG variables and its possible mediating role in the relationship between grief, coping and PTG. The results show that, following TFA, women engaged in both 'intrusive' and 'deliberate' rumination, for many concurrently, and that levels of 'intrusive rumination' subside earlier than levels of 'deliberate rumination.' This is consistent with existing literature and suggests that 'deliberate rumination' may substitute itself for 'intrusive rumination' over time (Taku et al., 2009). The levels of rumination reported by women in this study were elevated (both mean scores close to 2) and significantly higher than levels observed in other studies using the ERRI scale. For example, Groleau, Calhoun, Cann and Tedeschi (2013) reported mean scores of 1.47 and 1.35 for 'intrusive' and 'deliberate' rumination respectively among a sample of students who had experienced a traumatic event, whilst Hirooka, Fukahori, Taku, Togari and

Ogawa (2017) reported mean scores of 1.19 and 1.09 respectively among a group of bereaved family members of cancer patients.

Both 'intrusive' and 'deliberate' rumination levels were also significantly higher among women whose termination was more recent and those unsure of their decision to terminate the pregnancy. These findings reflect the complexity of the cognitive process involved in dealing with TFA, a situation women have initiated. Research has shown that women who undergo TFA report high levels of self-blame (Anonymised; Nazaré et al., 2014) and, in this study, almost a quarter of women reported being unsure of their decision to terminate. Therefore, it is possible that the high levels of rumination observed in this study relate to the cognitive work women undertake to process their role in their current situation and the rationale for the decision to end their pregnancy. This cognitive process may also be complicated by the perceived stigma associated with TFA (Maguire, Light, Kuppermann, Dalton, Steinauer, & Kerns, 2014).

The results also show that 'intrusive' and 'deliberate' rumination contribute to women's adjustment to TFA differently. As expected, 'intrusive rumination' predicted grief whilst 'deliberate rumination' predicted PTG. 'Intrusive rumination' negatively predicted PTG, suggesting that high levels of 'intrusive rumination' may hinder the growth experience. These findings are consistent with the literature on rumination and PTG (Cann et al., 2011; Taku, et al., 2008). They also suggest that, similarly to distress, rumination, particularly 'intrusive rumination,' may have a curvilinear relationship with PTG (Kleim & Ehlers, 2009), and that too little or too much 'intrusive rumination' may inhibit growth.

The study also shows that 'deliberate rumination' mediates the relationships between grief and PTG. Although the direct relationship between grief and PTG was negative, the indirect relationship between these two variables was positive when mediated by 'deliberate rumination.' This indicates that 'deliberate rumination' facilitates the PTG experience. 'Deliberate rumination' also mediated the relationship between 'positive reframing' and

PTG, and ‘religious coping’ and PTG, in line with the literature (Bosson et al., 2012; Garcia, et al., 2016). However, the mediation effects were contingent on the inclusion or exclusion of the grief variable in the models. This underlines the importance of grief in the experience of PTG.

The findings have important implications. On a theoretical level, this study demonstrates the validity of the PTG model proposed by Tedeschi and Calhoun (1996) to the experience of TFA. As such, it builds on the sparse literature that indicates that women can experience PTG following perinatal loss. The concurrent reliance on ‘intrusive’ and ‘deliberate’ rumination in this study may also be considered in the context of bereavement theories, and particularly, the Dual Process Model of Bereavement proposed by Stroebe and Schut (1999). This model posits that, following the loss of a loved one, individuals oscillate between loss-oriented and restoration-oriented coping activities and cognitive processes. Loss-orientation coping corresponds to attempts at dealing with stressors linked to the death itself, for example longing for the loved one and may involve intrusive thoughts. By contrast restoration-orientation is about dealing with the consequences of the death, whether material (e.g. adapting to a new financial situation) or psychological (e.g. building a new identify for oneself [Stroebe, & Schut, 2010]), which is more consistent with ‘deliberate rumination’ (Calhoun et al., 2010). The authors propose that the process of oscillation between loss- and restoration-orientation promotes psychological adjustment to bereavement by enabling individuals to both confront the reality of the loss and attend to issues relating to their new situation, thus distancing themselves temporarily from grief (Stroebe, & Schut, 2010). Engaging in both intrusive and deliberate rumination may thus reflect a wider process of oscillation between coping with the loss itself and the restorative challenges that it brings.

The study also has practical implications. The finding that ‘deliberate rumination’ positively predicts PTG is in line with previous research (Anonymised) which showed that ‘positive reframing’ is closely associated with PTG. This confirms that a systematic,

deliberate effort in reflective thinking and seeking meaning is beneficial to women post-TFA. Several interventions may be helpful in facilitating the process of 'deliberate rumination' or 'positive reframing' including Cognitive Behavioural Therapy or Acceptance and Commitment Therapy. However, these interventions are likely to involve significant resources whilst also being of particular benefit to women at risk of complicated grief (Neimeyer, Burke, Mackay, & van Dyke Stringer, 2010). Interventions that involve a different type of self-reflection and narrative construction such as those based on the expressive writing paradigm (e.g. therapeutic journals [Pennebaker, 1993]), whereby individuals are encouraged to write their story to construct a new narrative, have also been shown to promote PTG (Stockton, Joseph, & Hunt, 2014). More recently, there has been some interest in the role mindfulness could play in the experience of PTG and a study by Hanley, Peterson, Canto, and Garland (2015) has shown that mindfulness can facilitate PTG. The link between mindfulness and PTG has, however, generated much debate between those who consider mindfulness as a state of non-judgemental being, rooted in the present and thus, incompatible with self-reflection, and those who argue that mindfulness is a contemplative activity that facilitates self-reflection and reappraisal (Mindfulness-to-Meaning Theory; [Garland, Farb, Goldin, & Fredrickson, 2015]).

Perhaps of most relevance is the model of expert companionship proposed by Tedeschi & Calhoun (2006). The model does not position itself as an intervention per se but posits that there are several characteristics an individual needs to display to support another in constructing new narratives and world views. These characteristics include humility and respect, constancy, tolerance of the strange, non-rational, and ambiguous, courage to hear, and appreciation of paradox (e.g. from distress, emerges strength). Although Tedeschi and Calhoun initially proposed that these characteristics are helpful when used within a clinical setting (Calhoun et al., 2010), expert companionship does not need to limit itself to

professionals. Simple tools aimed to educate those close to individuals who have experienced a traumatic event on the best way to support them, may go a long way in facilitating PTG.

To our knowledge, this study is the first to examine the role of rumination following TFA. As such, it contributes to the evidence base on the experience of PTG following perinatal loss. The study also has some limitations. Women were mainly White and well-educated. They were recruited from a support organisation, which may have led to biases in the results. However, although members of this support organisation may not be representative of the totality of women undergoing TFA in England and Wales, they represent a significant proportion of that population. Thus, the findings are robust for this specific population group. Further research would be beneficial amongst a more diverse sample of women, including those who do not rely on support organisations, to ascertain whether the PTG model is also valid in these populations. Importantly, as no intervention has been specifically designed to support women post-TFA, further research is needed to ascertain the best way to reduce distress and promote PTG in the long term in this population.

In summary, this study contributes new knowledge to understanding the role of rumination in the adjustment to TFA and in particular in the experience of PTG. It confirms the relevance of the PTG model proposed by Tedeschi & Calhoun (1996) to the TFA experience, by indicating that deliberate rumination positively predicts PTG and acts as mediator in the relationship between grief and PTG and between coping (i.e. positive reframing and religious coping) and PTG. As such, interventions that encourage women to reflect upon their experience and construct a narrative that is meaningful to them would be beneficial post-TFA, in particular for women who experience high levels of distress and/or are at risk of complicated grief.

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