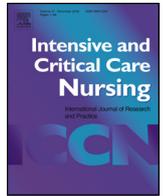




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Relation between parental psychopathology and posttraumatic growth after a child's admission to intensive care: Two faces of the same coin?

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ABSTRACT

Objectives: Confronted with the potentially traumatic experience of a child's admission to a paediatric intensive care unit, parents may experience psychopathological post-trauma symptoms as well as posttraumatic growth. The aim of this cross-sectional study was to explore the relation between psychopathology symptoms, namely, posttraumatic stress disorder, anxiety and depression, as well as post traumatic growth in parents following their child's hospitalisation in a paediatric intensive care unit.

Methods: Six months after their child's discharge, 143 parents completed the questionnaire, which assessed post traumatic growth (*Posttraumatic Growth Inventory*), post traumatic stress disorder (*Davidson Trauma Scale*), depression and anxiety (*Hospital Anxiety and Depression Scale*).

Results: Of the 143 parents, 23.1% reported symptoms of post traumatic stress disorder, 21% reported symptoms of moderate to severe anxiety, 9.1% reported symptoms of moderate to severe depression and 37.1% reported at least a medium degree of post traumatic growth. There was a moderate, direct association between post traumatic stress disorder, depression and anxiety with post traumatic growth. Higher scores in anxiety, depression and post traumatic stress disorder were associated with higher levels of post traumatic growth, contradicting the notion of an inverted U-shaped relationship between psychopathology symptoms and post traumatic growth.

Conclusions: Given that positive and negative outcomes after a child's critical admission tend to co-occur, it is surmised that parents who indicate post traumatic growth do not deny the difficulties. While not negating the negative impact on the mental health of a parent with a child admitted to intensive care, including the assessment of post traumatic growth as an outcome following this event has important implications for research and clinical practice.

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Implications for clinical practice

- Parents who have experienced the hospitalisation of their child in a paediatric intensive care unit display significant levels of posttraumatic stress, anxiety, depression and posttraumatic growth six months post-discharge.
- As positive and negative outcomes following a child's admission to the PICU tend to co-occur, parents who indicate posttraumatic growth tend not to deny the difficulties.
- Not considering the possibility of both positive and negative psychological consequences of this experience would provide an incomplete view of the psychological impact on parents of their critically ill child's hospitalization.
- Interventions to facilitate the psychological adaptation of the family following the admission of a child to the PICU should aim at preventing psychopathological symptoms and helping families find growth and meaning following the event.

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Introduction

The existing literature on parental reactions after a child's admission to a paediatric intensive care unit (PICU) has focused on exploring the presence and severity of psychopathological reactions, primarily posttraumatic stress disorder (PTSD) and less frequently, anxiety and depression (Bronner et al., 2008; Bronner et al., 2010; Colville and Gracey, 2006; Colville and Pierce, 2012; Fauman et al., 2011). However, over the past two decades, there has been increasing acknowledgement that facing traumatic events can cause the individual to function at a higher level than before, an event termed posttraumatic growth (PTG) (Tedeschi and Calhoun, 1996). A single study has explored this phenomenon among parents of critically ill children and found moderate levels of PTG among this group (Colville and Cream, 2009).

Thus, the evidence suggests that facing the experience of having a child undergo intensive care treatment may produce both positive and negative consequences for parents. However, a question that has emerged from the literature is whether PTG is related to a higher or lower level of psychopathological symptoms following a traumatic event. Understanding the relation between these opposing consequences of a traumatic event would provide valuable information for developing intervention strategies. To our knowledge, only one study (Colville and Cream, 2009) has explored both the positive and negative outcomes of having a child undergo intensive care treatment. Using a sample of 50 parents four months after their child's discharge from a PICU, they found an inverted U-shape relation between PTG and PTSD, with higher levels of PTG corresponding to medium levels of PTSD symptoms. They also found that PTG was unrelated to symptoms of anxiety and depression.

Previous studies aimed at exploring the relation between PTSD symptoms and PTG with a variety of trauma-exposed populations have yielded inconsistent results. Tedeschi (2011) reports that facilitating PTG may provide opportunities to reduce PTSD symptoms among combat veterans and their families. Consistent with this, some studies suggest that PTG following trauma is associated with lower PTSD symptoms over time (Frazier et al., 2004; Ullrich and Lutgendorf, 2002). Conversely, other studies have found that PTSD symptoms are positively associated with PTG scores (Helgeson et al., 2006; Levine et al., 2009; Morris et al., 2005; Taku et al., 2007; Jin et al., 2014), and again, other studies have found that these variables were uncorrelated (Powell et al., 2003). Barakat et al. (2006) find a positive relation between posttraumatic stress symptoms and PTG, whereas, consistent with the results by Colville and Cream (2009), Kleim and Ehlers (2009) find a curvilinear relationship between PTG and post-trauma depression and PTSD. Although the relation between PTG and depression and anxiety has been much less studied, the meta-analytic review of Helgeson et al. (2006) concludes that PTG is significantly associated with lower depression and unrelated to anxiety.

The picture that emerges from the literature is that the relation between positive and negative outcomes after trauma is unclear. In addition, to our knowledge, only the study of Colville and Cream (2009) has explored the positive and negative outcomes in parents after a child's admission to the PICU. Therefore, in this study, we aim to gather evidence about the association between PTG and the symptoms of psychopathology, i.e., symptoms of depression, anxiety and PTSD, among parents of critically ill children.

Method

Setting

Data were collected from a PICU located in a tertiary level hospital with 16 beds, eight physicians and 49 nursing staff. The

nurse-to-patient ratio is 2:1. Regarding psychosocial services provided in the PICU, a social worker attends to families upon request, and a psychologist from a non-governmental organisation provides psychological support twice a week to the children with heart conditions and their families.

Ethical approval

The study was approved by the institutional review board (approval number 13/015) of the hospital where the study was conducted. All participants signed an informed consent form that guaranteed confidentiality and described the study, including its purposes, potential risks and benefits.

Participants

The parents of children who had been admitted for more than 12 hours to a 16-bed PICU in a tertiary hospital in Madrid, Spain, were asked to participate in the study six months post-discharge of their child. Exclusion criteria were the inability to speak sufficient Spanish to complete the questionnaire and the death of the child during the admission or within the six month follow-up period.

Data collection

Procedure

This study was part of a series of studies designed to assess the psychological outcomes of having a child admitted to a PICU. The parents of every child that had been admitted to the PICU for more than 12 hours were contacted by email, post or telephone six months after the child's discharge from the PICU and were asked to complete and return the included questionnaires.

Instruments

Medical data. Data to complete the Paediatric Index of Mortality II (PIM2; Slater et al., 2003), which predicts the mortality risk in the PICU during the first 24 hours of admission, were obtained from the child's medical records. To determine the severity of the child's condition as perceived by the parent, the parents were asked to respond, using an eight-point Likert scale that ranged from 0 to 7, to the following question: *How severe do you think your child's condition was at the time of your child's admission to the PICU?*

Davidson trauma scale (DTS; Davidson et al., 1997). The DTS is a 17-item self-report measure that assesses the 17 symptoms of PTSD as defined in the DSM-IV-TR (Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision) and included under criteria B: re-experiencing; C: avoidance/numbing and D: hyperarousal (American Psychiatric Association., 2011). The DTS yields a total score ranging from 0 to 136. A cut-off of 40 is recommended for classification of those with PTSD, with a diagnostic accuracy of 83% (Davidson et al., 1997). A more recent study (McDonald et al., 2009) has found that the DTS has adequate internal consistency ($\alpha = 0.97$) and concurrent, convergent and discriminant validity. The Spanish version has demonstrated adequate internal consistency ($\alpha = 0.90$) and test-retest reliability (ICC = 0.87) (Bobes et al., 2000). The three DTS subscales (re-experiencing, avoidance/numbing, and hyperarousal) were computed by adding all subscale items and dividing by the total number used in the scale (McDonald et al., 2009), resulting in a possible range of 0–4.

Hospital anxiety and depression scale (HADS; Zigmond and Snaith, 1983). The HADS is a 14-item, self-reporting screening scale with two 7-item Likert subscales, one for anxiety and one for depression. For both subscales, a score of 8–10 indicates a mild case and a score ≥ 11 indicates a moderate to severe case. A literature review

(Bjelland et al., 2002) finds that Cronbach's alpha for anxiety varied from 0.68 to 0.93 (mean 0.83) and from 0.67 to 0.90 (mean 0.82) for depression. In this study, we used the Spanish version (Quintana et al., 2003). A recent review aimed at exploring the psychometric properties of the Spanish HADS (Terol-Cantero & Cabrera-Perona, 2015) confirms the two-factor structure of this scale and reveals that both subscales have adequate internal consistency (α ranging from 0.80 to 0.87).

Posttraumatic growth inventory (PTGI; Tedeschi and Calhoun, 1996). The PTGI is the best-known measure to assess PTG. It consists of 21 items with a 6-point Likert response format ranging from 0 ("I did not experience this change as a result of my crisis") to 5 ("I experienced this change to a very great degree as a result of my crisis"). Reliability of the PTGI was high for the original version ($\alpha = 0.90$) and the Spanish version ($\alpha = 0.95$) (Weiss and Berger, 2006). To ensure that parents' responses referred to the experience of their child's hospitalization, instead of using the phrase "as a result of my crisis", we reworded the responses to read "as a result of my child's admission to the PICU". Although according to Tedeschi and Calhoun (1996), the PTGI includes five domains (appreciation of life, interpersonal relationships, personal strength, new possibilities and spiritual PTG), the literature has yielded inconsistent results regarding this factor structure (Costa-Requena and Gil Moncayo, 2007; Powell et al., 2003; Ho et al., 2004; Taku et al., 2007). Consequently, the PTGI factor structure was examined in our sample, and it was found that a three-factor model with a personal, an interpersonal and a transpersonal dimension fit our data better (Rodríguez-Rey, Alonso-Tapia, Kassam-Adams & Garrido-Hernansaiz, 2016). Thus, this factor structure was used to guide the interpretation of the PTGI scores in the present study. To provide results comparable to previous studies, we also calculated the scores for the five original factors

Data analysis

Descriptive analyses were conducted to establish the prevalence of symptoms of PTSD, anxiety, depression and PTG. Next, bivariate Pearson's correlation analyses were conducted to explore the relation between PTSD and its subscales, anxiety, depression and PTG and its subscales. To explore the possibility of U-inverse shaped relationships between anxiety, depression and PTSD with PTG, we calculated a quadratic solution and compared it to a linear solution. If the quadratic solution fit the data better than the linear solution, the relation between psychopathology symptoms and PTG may be curvilinear. As only parents who completed the 21 items of the PTGI were included in the study, there are no missing data in the present study.

Results

Sample descriptive data

A total of 158 parents were asked to participate in the study 6 months after their child's discharge from the PICU of which 143 parents (90.5%) of 100 children agreed to participate. Descriptive data of the sample are summarized in Table 1.

Level of psychopathology and posttraumatic growth

On the DTS, 33 parents of the 143 participants (23.1%) reported PTSD symptoms over the cutoff of 40. Regarding the scores on the three DTS subscales, the most common PTSD symptom was hyperarousal ($M = 0.96, SD = 0.99$), followed by re-experiencing ($M = 0.71, SD = 0.78$), and avoidance/numbing ($M = 0.57, SD = 0.74$).

Table 1
Socio-demographic and medical characteristics for the children and the parents.

Socio-demographic data			
Children (n = 99)	Mean (SD) or n/%	Parents (n = 143)	Mean (SD) or n/%
Age (months)	59.56 (61.77)	Age (years)	38.24 (6.31)
Male	59/59.6	Male	52/36.4
Female	40/40.4	Female	91/63.6
Medical data of the children			Mean (SD) or n/%
Illness severity (PIM2)			5.69 (9.44)
Parental perception of severity of the child's condition (0–7)			4.08 (1.97)
Diagnosis			
Heart disease			29/29.3
Oncological disease			18/18.2
Respiratory condition			8/8.08
Others			44/44.44
Reasons for PICU admission			
Recovery after planned surgery			68/68.7
Emergency medical treatment			15/15.2
Relapse of a chronic disease			4/4
Accidental injury/emergency surgery			12/12.1

Note. PICU = Pediatric Intensive Care Unit; PIM = a Pediatric Index of Mortality.

Table 2
Percent of Sample Endorsing Posttraumatic Growth (PTG) in the five original dimensions of the PTGI, in the three dimensions of the PTGI that emerged in our sample and in the total PTGI at least in a medium degree*.

	%
Total growth	37.1
Three factor structure	
Personal growth	44.8
Interpersonal growth	54.5
Transpersonal growth	21
Five-factor structure	
Appreciation for life	54.5
Perceived strength	46.2
Relating to others	40.6
New Possibilities	29.4
Spiritual change	25.9

Note: PTGI: Posttraumatic growth inventory. *At least in a medium degree means that the average score is ≥ 3 .

On the HADS, 30 parents (21%) reported moderate-severe anxiety symptoms (scores ≥ 11), and 13 reported moderate-severe symptoms of depression (9.1%).

The average score on the PTGI was 47.40 ($SD = 26.74$). To determine the percentage of the sample who experienced significant PTG, we calculated the number of parents who obtained mean scores of at least 3 ("I have experienced this change to a medium degree") in the PTGI total score. Based on this criterion, 53 parents (37.1%) experienced positive change at least to a medium degree. In Table 2 we are including the percentage of parents who reported PTG in the PTGI dimensions of the original five-factor structure as well as the three-factor structure that emerged in our sample.

Relation between psychopathology and posttraumatic growth

Table 3 presents the correlation coefficients for PTG scores and symptoms of PTSD, anxiety and depression.

Although PTSD symptoms were moderately and positively correlated with PTG, the significant correlations between symptoms of anxiety and depression with PTG were weaker. Moreover, while interpersonal PTG was moderately and positively correlated with symptoms of PTSD and anxiety, its correlation with depression was significant albeit weaker. Transpersonal PTG, however, was positively correlated with symptoms of PTSD, anxiety and depression.

Table 3
Correlation coefficients of the PTGI, the DTS and the HADS total scores and subscales.

	PTG Pers.	PTG Interp.	PTG Transp.	DTS	Intr.	Avoid.	Hyper.	HADS-A	HADS-D	PIM2	Perceived Severity
PTG	0.911***	0.825***	0.754***	0.277***	0.269***	0.215**	0.271***	0.218**	0.200	0.060	0.207
PTG Personal.		0.648***	0.565***	0.151	0.157	0.128	0.158	0.075	0.081	0.041	0.159
PTG Interpersonal			0.552***	0.317***	0.321***	0.268***	0.298***	0.224**	0.167	0.081	0.185
PTG Transpersonal				0.306***	0.289***	0.179	0.294***	0.285***	0.311***	−0.006	0.113
DTS					0.863***	0.759***	0.924***	0.673***	0.677***	−0.050	0.151
Intrusion						0.676***	0.681***	0.468***	0.442***	0.022	0.281
Avoidance							0.668***	0.492***	0.479***	−0.078	0.136
Hyperarousal								0.736***	.722***	−0.051	0.038
HADS-A									0.835***	−0.091	−0.055
HADS-D										−0.084	−0.081
PIM2											0.363***

Note: PTGI = posttraumatic growth inventory; PTG = posttraumatic growth; DTS = Davidson Trauma Scale; HADS = Hospital Anxiety and Depression Scale; Pers. = personal; Interp. = interpersonal; Trans. = transpersonal; Intr. = intrusion; Avoid. = avoidance; Hyper. = hyperactivation; HADS-A = Hospital Anxiety and Depression Scale, subscale anxiety; HADS-D = Hospital Anxiety and Depression Scale, subscale depression; PIM2 = paediatric index of mortality 2.

* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

Table 4
Linear and quadratic relations between PTG (DV) and PTSD, anxiety and depression symptoms (IVs) (N = 143).

IV	Model	R ²	p
PTSD	Linear	0.077	0.001
	Quadratic	0.093	0.001
Anxiety	Linear	0.048	0.009
	Quadratic	0.074	0.005
Depression	Linear	0.040	0.017
	Quadratic	0.040	0.057

As presented in Table 3, only interpersonal PTG exhibited a significant correlation with perceived severity of the child's condition, while none of the factors was correlated with the child's probability to die within the first 24 hours of admission to the PICU (PIM2).

Table 4 indicates the adjustment of linear and quadratic relations between PTG and PTSD, anxiety and depression. A quadratic solution between PTSD and PTG did not fit the data better than a linear solution. Regarding anxiety, a quadratic solution fit the data slightly better than a linear solution. A subsequent ANOVA conducted after dividing the sample into three groups, namely, low anxiety, medium anxiety and high anxiety, with approximately 33% of the parents in each group, revealed that the parents in the lowest anxiety group reported significantly lower levels of PTG than those in the medium and high anxiety groups ($p = 0.002$ and $p = 0.038$, respectively). However, the differences between the medium and high anxiety groups in PTG were not significant ($p = 0.412$). With regards to depression, the linear solution fit the data better than the quadratic solution.

Discussion

The findings of this study indicate the extent to which parents suffer from symptoms of PTSD, anxiety, depression and PTG six months after their child's discharge from PICU and identify the relation between PTG and psychopathology symptoms. Our first finding is that both positive and negative psychological outcomes are frequent in parents following their child's admission. Our second finding is that higher anxiety, depression and PTSD scores are related to higher PTG scores. Thus, consistent with previous studies (Helgeson et al., 2006; Levine et al., 2009; Morris et al., 2005; Taku et al., 2007; Jin et al., 2014), as our study supports the premise that positive and negative effects of traumatic events coexist in the same person, those who perceive benefits do not deny experiencing difficulties. Accordingly, PTG and pain are inextricably linked

as part of the post-trauma recovery process, similar to two sides of the same coin.

One possible explanation for the positive relation between psychopathology and PTG is that for PTG to occur, the event must be upsetting enough to cause considerable disruption to an individual's assumption about how the world operates and how they fit into that world (Janoff-Bulman, 2004). Thus, it is likely that individuals who have been more negatively impacted by the traumatic experience also have greater opportunity for PTG. This is supported by the fact that, in our study higher, perceived severity of the child's medical condition is related to higher intrusion thoughts and higher PTG, thus suggesting that parents who perceive their child's situation as more severe experience the deepest changes, both positively and negatively. This is coherent with Helgeson et al. (2006), who suggest that experiencing intrusive thoughts reflects cognitive processing aimed at understanding and processing the traumatic event rather than serving as a marker of mental health. Thus, experiencing intrusive thoughts may be a signal that people are working through the implications of the stressor in their lives, which then could lead to PTG.

A second possibility to explain the association between psychopathology and PTG is that PTG takes time to emerge and therefore, measures of PTG taken soon after the event reflect a cognitive strategy to face distress more than actual PTG (McFarland and Alvaro, 2000). Even though, in our study, PTG was measured six months post discharge, there is a possibility that this time lapse has not been long enough for some parents to experience real PTG. If this is so, more severely distressed parents may be compensating for their symptoms of psychopathology by drawing on illusory PTG. This is coherent with data from a meta-analytic review that indicated the finding of benefits is more strongly related to better outcomes when more than two years has elapsed since the traumatic event (Helgeson et al., 2006). To explore whether this is true for parents of critically ill children, new studies that increase the time between discharge assessment should be conducted to assess the relationship of PTG and symptoms of psychopathology.

Additionally, our data contradict the notion that the relation between PTSD and PTG has an inverted U-shape, as found in the study by Colville and Cream (2009). Although a quadratic solution adjusted better to the relation between anxiety and PTG, an ANOVA indicated that not only medium but also high levels of anxiety were related to higher PTG scores. As only the mentioned study and the present study have explored the association of PTSD with PTSD, depression and anxiety in this context and as the results are non-convergent, more evidence is needed before further conclusions are drawn.

Limitations

This study presents with certain limitations. First, as all questionnaires used are screening instruments and no clinical interviews have been conducted, we can refer only to parental psychopathology symptoms, not to psychopathology diagnoses. Furthermore, a note of caution is added regarding the use of the HADS. Although it has been used in research with parents of children in the PICU (Colville and Cream, 2009; Rees et al., 2004), some authors have noted its limitations and advised researchers against its use (Coyné and van Sonderen, 2012; Cosco et al., 2012). Second, as most of the children were admitted electively to the PICU, the results may not generalize to a population of parents whose children have experienced urgent PICU admissions. Third, although special efforts were made to engage and retain fathers in our study, this group constitutes only one-third of the sample. Future studies should invest in efforts to engage fathers (Board, 2004).

Conclusion

While not negating the negative impact on mental health of the adverse or traumatic experience of having a child who is critically ill, including the assessment of PTG as an outcome has important implications. First, not considering the possibility of both positive and negative psychological consequences of this experience would provide an incomplete view of the psychological impact on the parents of their critically ill child's hospitalization. Second, interventions to facilitate families' psychological adaptation after PICU should not be aimed only at preventing psychopathology, but also at helping them grow and find meaning from the experience, neither of which is not incompatible with the suffering of the negative sequelae of trauma. This represents a challenge for researchers and health care providers who should evaluate whether interventions to prevent psychopathology affect parental PTG and whether a focus on PTG enhances the effectiveness of psychological interventions for these families.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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Ethical statement

The study was approved by the institutional review board of the hospital where the study was conducted. All participants signed an informed consent form that guaranteed confidentiality and described the study, including its purposes, potential risks and benefits.

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