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Post-traumatic growth in parents after a child's admission to intensive care: maybe Nietzsche was right?

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Abstract *Objective:* The aim of this prospective study was to establish the degree to which parents report post-traumatic growth after the intensive care treatment of their child. *Design:* Prospective cross-sectional cohort study. *Setting:* Paediatric Intensive Care Unit (PICU). *Subjects:* A total of 50 parents of children, admitted to PICU for >12 h. *Measurements and results:* Parents provided stress ratings as their child was discharged from PICU and, 4 months later, completed postal questionnaires rating their anxiety, depression, post-traumatic stress and post-traumatic growth. As much as 44 parents (88%) indicated on the Posttraumatic Growth Inventory (PTGI) [1] that they had experienced a positive change to a great degree as a result of their experiences in PICU.

Parents of children who were ventilated ($P = 0.024$) reported statistically higher post-traumatic growth as did parents of older children ($P = 0.032$). PTGI scores were positively correlated with post-traumatic stress scores at 4 months ($P = 0.021$), but on closer inspection this relationship was found to be curvilinear. *Conclusions:* Post-traumatic growth emerged as a salient concept for this population. It was more strongly associated with moderate levels of post-traumatic stress, than high or low levels.

Keywords Post-traumatic growth · Post-traumatic stress · Parents · Intensive care

Introduction

“That which does not kill us makes us stronger”
(Friedrich Nietzsche 1889)

The literature on psychological trauma has traditionally focused on pathological reactions. Recently, however, there has been an increasing acknowledgement that through struggling with adversity, a traumatised person may ultimately come to function at a higher level than before, demonstrating what has come to be termed as “post-traumatic growth” [1].

This phenomenon has been described in a number of different populations traumatised after disaster, war and

other forms of adversity, including bereaved parents [2] and parents of disabled children [3]. The degree to which people report post-traumatic growth after a crisis is related to a number of factors, which include the severity of the trauma, constitutional factors such as optimism and high self-worth and also particular coping styles and satisfaction with level of social support [4]. A meta-analytic study of 87 studies has also found that benefit finding and post-traumatic stress symptoms are positively associated [5], although some authors caution that this relationship may be curvilinear, with those experiencing low or very high levels of stress less likely to experience growth [6].

There are now a number of studies confirming the prevalence of post-traumatic stress symptomatology in

parents after their child's hospitalisation on a Paediatric Intensive Care Unit (PICU) [7]. There is, however, very little information on perceived growth in this population, beyond anecdotal observations that parents report positive as well as negative changes after their child's period of critical illness [8].

The main aims of this prospective study were to investigate the degree to which parents report post-traumatic growth after their child's PICU admission and to investigate the nature of the associations between this phenomenon and other variables, thereby adding to the literature by providing information on a group, which has not previously been studied. It was hypothesised that parents whose experiences had been more traumatic (objectively and/or subjectively) would report higher levels of post-traumatic growth.

Methods

This study was part of a larger randomised controlled trial, evaluating the impact of a PICU follow-up clinic on parents' psychological well-being [9], for which ethical approval was obtained and written informed consent required. In the main study, parents were allocated randomly to the intervention group (appointment with PICU staff to discuss child's admission 2 months after discharge) or the control group (not offered an appointment) and were all followed up at 4 months. The present study reports on the parents in the control group only.

Participants in the main study were the parents of children admitted consecutively over a 16-month period for >12 h, to an eight-bed PICU in an inner city area. Parents were excluded if they were not available to complete the baseline stress measure ($n = 131$), if the child died ($n = 18$) or if the unit staff felt that it was inappropriate to approach them ($n = 19$). Illness severity on admission was measured using the Paediatric Index of Mortality (PIM) [10], and the family's level of socio-economic deprivation was measured using the Townsend Deprivation Index [11], which is derived from the UK census data relating to four variables: rates of car ownership, employment, home ownership and overcrowding.

They completed the Parental Stressor Scale: PICU [12] within 48 h of their child's discharge. This is a 37 item questionnaire with good internal consistency and acceptable test-retest reliability, which measures parents' perceptions of PICU-related stress from 1 ("not stressful") to 5 ("extremely stressful"). The total score is the mean of the subscale scores.

At 4 months after discharge, the parents received the following three questionnaires in the post:

- (1) The Posttraumatic Growth Inventory (PTGI) is a 21-item self-report measure of positive outcomes following traumatic experience with acceptable internal consistency and test-retest reliability. The total score (range 0–105) is the sum of the scores on the five subscales: "relating to others"; "new possibilities"; "personal strength"; "spiritual change" and "appreciation of life".
- (2) The Impact of Event Scale (IES) [13] is a 15-item self-report measure of symptoms of post-traumatic stress, with scores of above 35 regarded as clinically significant [14]. It has good split-half and test-retest reliability, factor structure and validity [15].
- (3) The Hospital Anxiety and Depression Scale (HADS) is a self-report questionnaire, made up of two separate seven-item scales, measuring symptoms of anxiety and depression. Scores of over 11, on either scale, are assumed to be clinically significant. It has demonstrated good levels of internal consistency and test-retest reliability [16].

(Further information on the outcome measures is provided in the electronic supplementary material)

Given the small sample size, the fact that not all variables were normally distributed and that not all data were independent (when data from both parents of a child was used), non-parametric statistics were used to examine the associations between variables.

Results

Of the 164 families approached, 133 (81%) agreed to take part in the original trial and, of these, 61 were allocated to the control arm. The children of families who took part were admitted for longer ($P = 0.029$), more likely to be ventilated ($P = 0.044$) and less likely to come from an ethnic minority group ($P < 0.001$) or live in a deprived area ($P = 0.001$). Of the 61 control families who were recruited, 43 provided outcome data at 4 months. The children of those who dropped out between baseline and follow-up were statistically less sick in terms of mortality risk ($P = 0.039$), rate of emergency admission ($P = 0.036$) and ventilation status ($P = 0.046$), but did not differ in terms of baseline stress levels. A total of 50 parents (33 mothers; three fathers and seven mother-father pairs) completed the PTGI in total. Sample characteristics are given in Table 1.

The PTGI total scores of the parents were normally distributed. Mean (SD) total score was 49.0 (23.9), with good internal consistency (0.93). In total, 44 parents (88%) indicated that they had experienced positive change to a "great" or "very great" degree. Paired comparisons indicated that parents' mean item scores for "personal strength" and "appreciation of life" were

Table 1 Sample characteristics and associations with parents' scores on Posttraumatic Growth Inventory and Impact of Event Scale ($n = 50$)

	Sample characteristics ^a	Associations with PTGI score $n = 50$ parents p^b	Associations with IES score $n = 50$ parents p^b
Parents $n = 50$			
Age (years)	40 (23–58)	0.910	0.036*
Male	11 (22%)	0.140	0.916
PSS:PICU at 48 h	2.41 (1.14–4.33)	0.185	<0.001**
Anxiety (HADS) at 4 months	8 (0–20)	0.179	<0.001**
Depression (HADS) at 4 months	4 (0–17)	0.331	0.001**
IES at 4 months	21.5 (0–58)	0.021*	–
PTGI at 4 months	50 (6–101)	–	0.021*
Children $n = 43$			
Age (years)	2.83 (0.05–16.49)	0.032*	0.025*
Male	27 (63%)	0.396	0.708
White UK	30 (70%)	0.220	0.553
TDI	0.05 (–4.84 to 10.87)	0.622	0.012*
LOS (h)	70 (12–1008)	0.374	0.078
Emergency admission	35 (81%)	0.272	0.063
Ventilated	24 (56%)	0.024*	0.322
PIM score	2.14 (0.16–17.63)	0.193	0.227

PTGI Posttraumatic Growth Inventory, PSS:PICU Parental Stressor Scale:PICU, HADS Hospital Anxiety and Depression Scale; IES Impact of Event Scale, TDI Townsend Deprivation Index, LOS length of stay, PIM Paediatric Index of Mortality

* $P < 0.05$; ** $P < 0.001$ (all significant associations were positive)

^a Values are given as median (range) or n (%)
^b Spearman's σ for continuous variables, Mann–Whitney U test for categorical variables

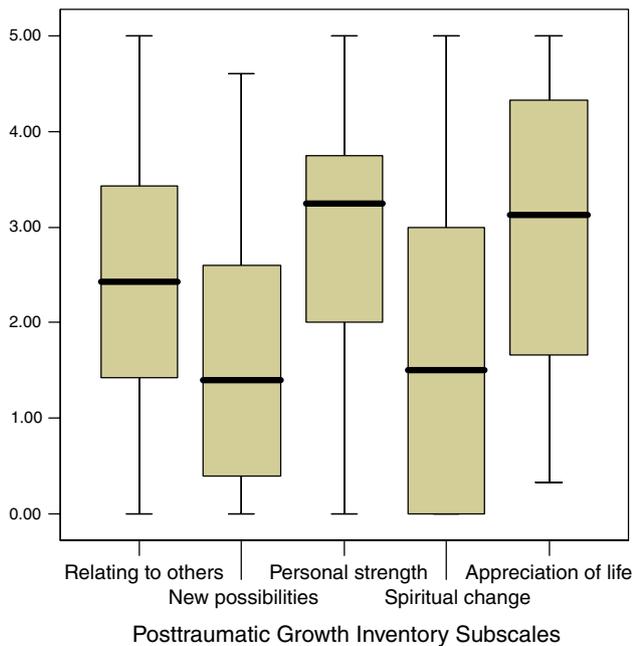


Fig. 1 Distribution of mean item subscale scores on the post-traumatic growth inventory ($n = 50$). The *box* and *whisker plots* show the median, interquartile range and range of the group mean item scores for each of the five subscales of the Posttraumatic Growth Inventory (0 = “I did not experience this change as a result of my crisis”, 5 = “I experienced this change to a very great degree as a result of my crisis”)

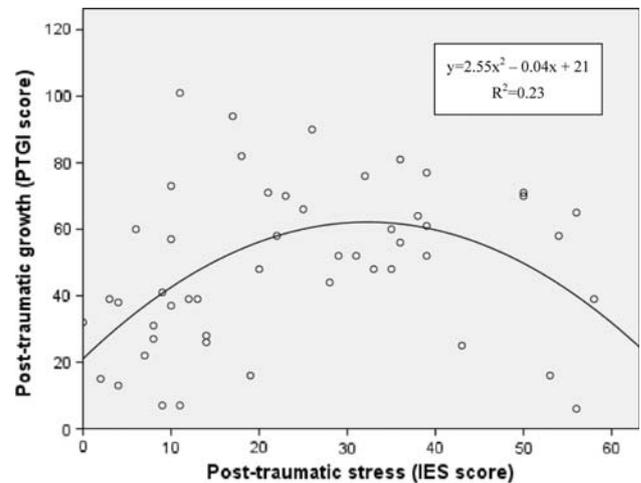


Fig. 2 Relationship between post-traumatic stress and post-traumatic growth at 4 months ($n = 50$ parents). The graph illustrates the inverted-U curvilinear relationship between the parents' post-traumatic stress scores and post-traumatic growth scores, 4 months after their child's discharge from intensive care. PTGI Posttraumatic Growth Inventory, IES Impact of Event Scale

significantly higher than those for “new possibilities” or “spiritual change” (Wilcoxon signed ranks test, $P < 0.002$; see Fig. 1).

Associations with PTGI scores and scores on the IES are given in Table 1. Parents of children who were ventilated and parents of older children, reported statistically higher post-traumatic growth on the PTGI. IES scores were associated with baseline stress, deprivation and age of parent and child and intercorrelated with anxiety and depression.

A significant positive association was also found between parents’ IES and PTGI scores at 4 months. Further analysis revealed that a quadratic solution (in the form of an inverted-U) fitted the data better [$R^2 = 0.23$, $F(2, 47) = 6.90$, $P = 0.002$] than a linear solution [$R^2 = 0.05$, $F(1, 48) = 2.42$, $P = 0.126$] (see Fig. 2).

Discussion

This study provides further evidence for the existence of post-traumatic growth by demonstrating the validity of the PTGI in a group who have not previously been assessed with this instrument. It also suggests that the psychological impact of this experience is not necessarily wholly negative. The overwhelming majority of parents indicated that they had experienced at least one of the benefits listed in the inventory “to a great degree”, following their child’s PICU hospitalisation. The mean PTGI score for this sample was somewhat lower than that reported in original studies in the USA, which may be a reflection of the sample’s higher mean age [4] or of cultural differences [17].

The finding that PTGI scores were positively correlated with post-traumatic stress scores is consistent with the literature [5] and indicative of the complex nature of the individual’s reaction to adversity. However, the fact

that their patterns of association with other variables were not the same suggests that different mechanisms may influence their development after a traumatic experience, and the curvilinear relationship between stress and growth suggests that there is a levelling-off of benefit-finding at high levels of stress in this situation [7].

One objective measure of the severity of the child’s condition (ventilation status) was associated with subsequent post-traumatic growth, but parents’ baseline stress was not. The association with the child’s age was not predicted and, if replicated, warrants further investigation.

This preliminary study had a number of limitations. The sample size was small and parents of less sick children, and those from ethnic minorities and deprived areas were under-represented. Furthermore, there was no assessment of parents’ subjective appraisal of threat to the child’s life (which is associated with the development of post-traumatic stress [18]), or of parents’ personality type or coping style, both of which may have influenced the relationship between stress and growth. Finally, although useful as an overall indicator of the level of post-traumatic stress [19], the IES does not include measurement of symptoms of hyperarousal.

Longer term follow-up with parents in this situation would establish whether post-traumatic growth is ultimately associated with better adjustment, as Nietzsche proposed over a century ago and as has been found in disaster survivors [20]. If this is the case, the next challenge for researchers will be to evaluate whether a focus on post-traumatic growth enhances the effectiveness of psychological interventions with this traumatised group.

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