Brief Report: Children’s Responses to Trauma- and Nontrauma-related Hospital Admission: A Comparison Study

Belinda L. Murray,1 BA(HONS), Justin A. Kenardy,1,2 PHD, and Susan H. Spence,3 PHD
1Centre of National Research on Disability and Rehabilitation Medicine, 2School of Psychology, University of Queensland, and 3Division of Linguistics and Psychology, Macquarie University, Australia

Objective This study aims to investigate and compare psychological responses in children and parents 1 month after trauma- and nontrauma-related hospital admission. Methods Two hundred and five children aged 7–16 years (and their parents) were assessed for posttraumatic stress disorder (PTSD), other psychopathology, and distress 1 month after trauma-related (Trauma Group; n = 101) and nontrauma-related hospital admission (Non-Trauma Group; n = 104). Results Clinically elevated PTSD symptom levels were more prevalent in children admitted for trauma-related (18%) than nontrauma-related reasons (4%). Parents also experienced posttraumatic distress, although rates of clinically elevated symptom levels did not differ between the Trauma (11%) and Non-Trauma (8%) groups. Other pathology and distress in children and parents were comparable across groups. Conclusions Children experienced greater posttraumatic distress following trauma-related hospital admission, while parents’ experience of their child’s hospitalization is equally distressing regardless of the reason for admission.

Key words children; hospital admission; illness; injury; pediatrics; posttraumatic stress disorder; trauma.

Hospitalization has been associated with a variety of adverse psychological responses in pediatric patients and their parents, including posttraumatic stress symptoms at both diagnostic (posttraumatic stress disorder: PTSD) and subsyndromal levels (Kassam-Adams & Winston, 2004; Kazak et al., 2006). It is unclear, however, whether such posttraumatic distress reflects the experience of hospitalization common to all injury- and illness-related admissions, or the effects of injury, pain, and other events specific to trauma-related admissions.

Several studies link trauma- or injury-related hospital admission with posttraumatic distress, with prevalence rates of clinically elevated levels ranging from 6% to 45% following trauma such as motor vehicle accidents (Kassam-Adams & Winston, 2004; Stallard, Velleman, & Baldwin, 1998), burns, sporting accidents, falls, and animal attacks (Aaron, Zaglul, & Emery, 1999; Daviss et al., 2000). However, factors related to the general experience of hospitalization, such as invasive medical procedures, lack of sleep, sedation, and separation from parents may also be distressing and could lead to the development of PTSD. Clinically elevated posttraumatic distress has been reported in 5–32% of children following nontrauma- or illness/medical-related hospital admission, such as cardiac surgery (Connolly, McClowry, Hayman, Mahony, & Artman, 2004), newly diagnosed cancer and newly diagnosed diabetes (Landolt, Vollrath, Ribi, Gnehm, & Sennhauser, 2003). Parents have also shown high levels of distress, including clinically elevated posttraumatic distress, at rates of 13–47% following their child’s trauma-related hospital admission (Landolt, Vollrath, Timm, Gnehm, & Sennhauser, 2005; Sturms et al., 2005) and 22–51% following their child’s nontrauma-related hospital admission (Landolt et al., 2002; Landolt, Vollrath, Laimbacher, Gnehm, & Sennhauser, 2005). Again, it is unclear whether parental reactions reflect the admission process or events prior to admission.

A study conducted by Landolt and colleagues (2003) directly compared children’s and parent’s outcomes following different hospital admissions. They found that children aged 6–15 years injured in accidents had higher...
levels of PTSD symptoms than children hospitalized for diabetes, suggesting that events leading to hospital admission, rather than the admission process, are important in children’s distress. No difference in distress was found between parents of children diagnosed with diabetes versus those injured in accidents, suggesting that parental distress does not vary according to events prior to hospital admission, but rather the hospitalization process itself. However, this study did not offer the opportunity to investigate other psychopathology and distress that also occur following traumatic stress (O’Donnell, Creamer, & Pattison, 2004).

The present study aimed to investigate and compare rates of clinically elevated posttraumatic and other distress in children and parents 1 month after trauma- and nontrauma-related hospital admission. Based on previous findings, it was hypothesized that children’s responses would differ depending on the events leading to hospital admission. That is, children admitted for trauma-related reasons would show a higher prevalence of PTSD and other distress than children admitted for nontrauma-related reasons. Also, we anticipated that parent’s responses would not differ depending on events leading to their offspring’s hospitalization. That is, parents of children with trauma-related admission would suffer comparable levels of event-related and other distress to parents of children with nontrauma-related admission.

**Method**

**Participants**

Participants were 205 children hospitalized for trauma- or nontrauma-related reasons, and their parents. Sample characteristics are summarized in Table 1. The Trauma Group consisted of 101 children admitted to hospital following a traumatic accidental event resulting in injury. Inclusion criteria consisted of: age at admission between 7 and 16 years, admission time ≥24 hr (as in Landolt et al., 2003) and fluency in English (both child and parent). Children hospitalised in the previous 12 months, children with a Glasgow Coma Scale rating of 1–13 (moderate–severe head injury) and children with a known history of abuse (in the care of the Department of Families) were excluded. Of 201 eligible families approached to participate, 45 declined and a further 55 were later excluded or dropped out. Thus, 50% of the eligible Trauma sample participated in the study. Events leading to admission included falls (40%), motorbike, bicycle, scooter, and skateboarding accidents (23%), sporting injuries (15%), burns (8%), accidents involving cars (6%), animal attacks (2%), and other events (6%). Injuries sustained were predominantly fractures or dislocations (77%).

A comparison Non-Trauma Group consisted of 104 children admitted to hospital for a nontrauma-related illness. Inclusion and exclusion criteria were consistent with the Trauma Group but additionally, children with

**Table 1. Sample Characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Trauma</th>
<th>Nontrauma</th>
<th>$\chi^2$ or $t$</th>
<th>$p$</th>
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</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
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<tr>
<td>Male, n (%)</td>
<td>66 (65.35)</td>
<td>55 (52.88)</td>
<td>3.29</td>
<td>.070</td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>35 (34.65)</td>
<td>49 (47.12)</td>
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<tr>
<td>Age, M (SD)</td>
<td>10.82 (2.37)</td>
<td>10.26 (2.21)</td>
<td>1.71</td>
<td>.089</td>
</tr>
<tr>
<td>Length of stay in hospital (in hours), M (SD)</td>
<td>126.91 (196.95)</td>
<td>77.43 (57.14)</td>
<td>2.46</td>
<td>.015*</td>
</tr>
<tr>
<td>Injury Severity Score (ISS), M (SD)</td>
<td>6.89 (4.43)</td>
<td>—</td>
<td>5.83</td>
<td>.120</td>
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<tr>
<td>Highest professional level in the family</td>
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<tr>
<td>Gr 12 or below, n (%)</td>
<td>49 (48.51)</td>
<td>35 (33.65)</td>
<td>6.78</td>
<td>.238</td>
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<tr>
<td>Certificate, n (%)</td>
<td>21 (20.79)</td>
<td>22 (21.15)</td>
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<tr>
<td>Advanced diploma or diploma, n (%)</td>
<td>4 (3.96)</td>
<td>8 (7.70)</td>
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<tr>
<td>Bachelor’s degree or higher, n (%)</td>
<td>27 (26.74)</td>
<td>39 (37.50)</td>
<td>2.46</td>
<td>.015*</td>
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<tr>
<td>Highest education level in family</td>
<td></td>
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<tr>
<td>Managers, administrators, and professionals, n (%)</td>
<td>34 (33.66)</td>
<td>42 (40.38)</td>
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<tr>
<td>Associate professionals, n (%)</td>
<td>7 (6.93)</td>
<td>10 (9.62)</td>
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<tr>
<td>Tradespersons, advanced clerical, and service, n (%)</td>
<td>30 (29.70)</td>
<td>19 (18.27)</td>
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<tr>
<td>Intermed. production, transport, clerical/services, n (%)</td>
<td>7 (6.93)</td>
<td>13 (12.50)</td>
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<tr>
<td>Elementary clerical, sales, service, and labourers, n (%)</td>
<td>9 (8.91)</td>
<td>5 (4.81)</td>
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<tr>
<td>Not in paid employment</td>
<td>14 (0.99)</td>
<td>15 (2.88)</td>
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*p < .05
a terminal illness were excluded. Of 200 eligible families approached, 40 declined and a further 56 were later excluded or dropped out. Thus, 52% of the eligible nontrauma sample participated in the study. Reasons for admission included appendicitis (20%), infection (20%), diabetes (14%), asthma (13%), pneumonia (10%) gastrointestinal illnesses (5%), and other illnesses (18%).

Procedure
This study was conducted under ethical clearance from The University of Queensland and the Mater and Royal Children’s Hospitals. Families were recruited through accident and emergency centers and children’s admissions in three hospitals in Queensland within 1–3 days of the child’s admission. Written informed consent was obtained after complete description of the study to parents and children. Families were contacted by telephone to arrange a home-based interview 4–6 weeks ( \( M = 5.61; \) \( SD = 0.80 \)) following the child’s discharge from hospital. Once an interview date was confirmed, families were sent the self-report questionnaires for completion by the child and parent. During the home-based interview, a trained interviewer conducted the complete ADIS-C/P diagnostic interview with either one or both parents together, and the completed questionnaires were collected. Interviewers were graduate psychology students who were closely supervised, and any diagnostic issues were raised and discussed in supervision meetings.

Measures
Injury Severity
Injury severity was measured in both groups by the child’s length of stay in hospital (in hours). For the Trauma Group, the widely-used Injury Severity Score (ISS; Baker, O’Neill, Haddon, & Long, 1974) was also used. Scores of 1–8 indicate a minor injury, 9–15 indicates a moderate injury, and 16 and above indicates a major injury.

Child PTSD
The Anxiety Disorders Interview Schedule for DSM-IV: Child Version—the Parent Interview Schedule (ADIS-C/P; Silverman & Albano, 1996) is a diagnostic semi-structured interview conducted with parents to assess for child emotional and behavioural disorders, including PTSD. Collateral information for the subjective experience of trauma was obtained from the child and this information was used to guide the diagnosis of PTSD. Subsyndromal PTSD was also used as a measure of outcome, and applies when one or more symptoms of avoidance, re-experiencing and hyperarousal are present with other PTSD criteria (Kassam-Adams & Winston, 2004).

Child Anxiety
The Spence Child Anxiety Scale (SCAS; Spence, 1998) is a child self-report scale that yields a total anxiety score, together with scores on six subscales including: panic attacks and agoraphobia, separation anxiety, physical injury fears, social phobia, obsessive compulsive, and generalized anxiety disorder/overanxious disorder. The SCAS has demonstrated good internal reliability (\( \alpha = .92; \) Spence, 1998).

Child Distress
The Children’s Impact of Event Scale (CIES, Short form; Dyregrov, Kuterovac, & Barath, 1996) is a child self-report scale that provides the frequency of re-experiencing or avoiding a traumatic event and an overall measure of event-related distress. The CIES has demonstrated satisfactory internal reliability (\( \alpha = .78–.84; \) Dyregrov et al., 1996).

Child Behaviour
The Child Behaviour Checklist—Revised (CBCL; Achenbach, 1991) is a parent-report measure of child emotional and behavioural difficulties relating to internalizing and externalizing problems. Subscales include withdrawn, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, delinquent behaviour, and aggressive behaviour. The CBCL has demonstrated satisfactory internal reliability, with Cronbach’s \( \alpha \)-values ranging from .46 to .93 across subscales (median = .80; Achenbach, 1991).

Parent PTSD
The Impact of Event Scale (IES; Horowitz, Wilner, & Alvarez, 1979) was used as a parent self-report measure of distress. It yields a total score of traumatic stress and subscale scores of intrusion and avoidance. Researchers have used total IES scores as a diagnostic tool in various settings. While recommended cutoffs range from 25 to 35, the lower score of 25 has been used for community, rather than clinical, samples (McFarlane, 1988). Thus, scores of 25 or more in the current study were utilized as clinically elevated scores in parents. The IES has demonstrated satisfactory internal reliability, with Cronbach’s \( \alpha \)-values of .78 for intrusion and .82 for avoidance (Horowitz et al., 1979).

Parent Distress
The Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995) was used as parent self-report measure
of depression, anxiety, and stress symptoms over the previous 7 days. Each subscale of depression, anxiety, and stress has demonstrated good internal reliability, with Cronbach’s $\alpha$-values of .91, .84, and .90, respectively (Lovibond & Lovibond, 1995). The General Health Questionnaire (GHQ-28; Goldberg & Hillier, 1979) was also used as a parent self-report measure of mental health. The GHQ-28 has demonstrated good internal reliability, with Cronbach’s $\alpha$-values ranging from .76 to .87 across subscales (Goldberg & Hillier, 1979).

Results

There were no significant differences in sample characteristics between groups, except that children in the Trauma Group has a significantly greater mean duration of admission ($M = 126.91$, $SD = 196.95$) than children in the Non-Trauma Group ($M = 77.43$, $SD = 57.14$), $t(203) = 2.46$, $p < .05$. The relationship between length of stay and each outcome variables was explored, and where a significant relationship existed, ANCOVA was used to examine differences between groups, with the effect of length of stay removed.

Child PTSD

Across the sample of all hospitalized children, 2.9% ($n = 6$) fulfilled criteria for PTSD and 10.7% ($n = 22$) fulfilled criteria for subsyndromal PTSD. The frequency of PTSD in the Trauma Group (5%) was not significantly different to that of the Non-Trauma Group (1%), $\chi^2(1) = 2.87$, $p = .09$. However, there was a higher frequency of subsyndromal PTSD in the Trauma Group (18%) than children in the Non-Trauma Group (4%), $\chi^2(1) = 10.45$, $p < .01$. More children in the Trauma Group fulfilled avoidance criteria (12%) than children in the Non-Trauma Group (3%), $\chi^2(1) = 6.12$, $p < .05$. Also, significantly more children met DSM-IV PTSD Criterion A (exposure to a traumatic event that threatens the life or physical integrity of self or others, and evokes intense fear, helplessness, or horror) in the Trauma Group ($n = 86$, 85%) than the Non-Trauma Group ($n = 27$, 26%), $\chi^2(1) = 72.56$, $p < .001$. There were no significant differences between groups in the prevalence of other psychopathology assessed by the ADIS-C/P.

Child Anxiety, Distress, and Behaviour

No significant differences in child distress as measured by CIES were observed between groups. The relationship between length of stay and CIES scores was investigated. In the Trauma Group, length of stay was positively associated with CIES intrusion scores, $r(99) = .30$, $p < .01$, but not CIES avoidance scores. However, in the Non-Trauma Group, length of stay was not related to CIES scores. Using ANCOVA to adjust for length of stay in hospital, total CIES scores and CIES avoidance scores still did not differ between groups. However, groups differed on CIES intrusion scores, $F(1, 192) = 4.26$, $p < .05$. Adjusted mean scores suggest that, once the effect of length of stay in hospital was removed, children in the Non-Trauma Group ($M = 5.67$, $SE = 0.49$) reported more intrusive thoughts and feelings than children in the Trauma Group ($M = 3.99$, $SE = 0.47$).

Child anxiety as measured by SCAS was significantly higher among children in the Non-Trauma Group ($M = 24.28$, $SD = 14.51$) than children in the Trauma Group ($M = 16.62$, $SD = 12.37$), $t = -3.98$, $p < .001$. A higher level of internalizing problems in the Non-Trauma Group ($M = 51.38$, $SD = 10.64$), than the Trauma Group ($M = 46.82$, $SD = 11.06$) was also found on the CBCL, $t(195) = -2.95$, $p < .01$. Additionally, 16% of children in the Non-Trauma Group were in the clinical range on CBCL total scores compared to 9% of children in the Trauma Group, although this difference was not significant.

Parent PTSD and Distress

Clinically elevated PTSD symptomatology was present in 9.6% ($n = 19$) of parents overall. The frequency of clinically elevated posttraumatic distress did not differ between parents in the Trauma Group (10.9%) and the Non-Trauma Group (8.3%), $\chi^2(1, n = 197) = 0.54$, n.s. No significant differences were found on other measures of parental health and adjustment between groups.

Discussion

This study investigated and compared children’s and parents’ responses to trauma- and nontrauma-related hospital admission. Overall, 10.7% of children and 9.6% of parents showed clinically elevated posttraumatic distress 1 month after a hospital admission of at least 24 hr duration. As predicted, children admitted to hospital for trauma experienced higher rates of subsyndromal PTSD than children admitted for nontrauma, and parental posttraumatic stress symptoms and other distress were comparable across groups.

Contrary to predictions, parents reported higher levels of anxiety and internalizing problems in children in the Non-Trauma group. This may reflect a higher level of somatic symptoms and general concerns about
long-term health outcomes. Perhaps parents and children perceive the physical effects of injury following trauma as short-term, whereas nontrauma illnesses may be persistent or recurrent and thus result in greater parent and child concerns. Even so, levels of anxiety and internalizing problems in both conditions were within the normal range, suggesting that the hospitalization experience was not associated with severe psychopathology. Given that these findings differ from previous research that has demonstrated more serious emotional problems following hospitalization (Stallard, Salter, & Velleman, 2004), we need to ask why the present study did not find this effect. It is possible that improvements in procedures related to children’s admission to hospital, such as encouraging parents to remain with the child and child-friendly physical environments, may reduce the negative effects of admission.

Some limitations in the current study warrant mention. Firstly, assignment of children to groups was not random and there was no way of controlling for injury type, severity, length of stay, number and nature of medical procedures, and other factors that may be associated with outcome. We did compare groups on these variables, and attempted to statistically control for those that differed between groups. Secondly, although attempts were made to exclude those children with a recent hospital admission, the number or nature of hospitalizations prior to the preceding 12 months was not recorded and this may have impacted on outcomes in children and parents. Third, PTSD in children was diagnosed on the basis of parent interview, which may underestimate the extent of intrusive symptoms experienced by children (Yule, 1999). However, there is evidence to support the reliability of parent report of DSM-IV anxiety symptoms (Silverman, Saavedra, & Pina, 2001). Finally, the participation rate of 51% could potentially limit the generalizability of the results in this study. Unfortunately, due to privacy regulations, data could not be collected on those families who did not participate in the study to determine whether the participants were representative of the populations concerned. Still, participation rates were comparable across groups (50% Trauma Group; 52% Non-Trauma Group) and were consistent with participation rates in similar studies (56%, Aaron et al., 1999; 42.8%, Stallard et al., 1998).

The results of the current study indicate that children hospitalized for trauma-related reasons should be targeted for early intervention for posttraumatic distress. Trauma- or accident-related events prior to hospitalization are likely to be more salient than hospital or treatment factors in the levels of distress experienced by children and should be the focus of intervention in the early stages. However, as length of stay increases, children’s event-related distress also increases for those children admitted for trauma-related reasons. While factors associated with extended hospital stay were not studied, it may be that invasive procedures, ongoing pain, or secondary health complications (such as infection) add to children’s distress. Further investigation of factors associated with extended stays is required to inform intervention strategies for these children. Parents are also at risk of posttraumatic distress and should be targeted for intervention when their children are admitted to hospital, irrespective of the reason for admission. Factors related to hospital admission are more salient in parents’ distress than traumatic events occurring prior to hospital admission.

Conflict of interest: None declared.

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References


