

Child coping, parent coping assistance, and post-traumatic stress following paediatric physical injury

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Abstract

Background Following a physical injury, many children exhibit long-term psychological reactions such as post-traumatic stress symptoms (PTSS). Children's coping strategies, and the ways that others help them cope with injury (i.e. coping assistance), are understudied, potentially malleable variables that could be targeted in preventive interventions. The objectives of the current research were to describe child coping behaviour and parent coping assistance following a child's injury, and to investigate the relationships among coping, coping assistance and child PTSS.

Method Participants included 82 children with injuries and one parent of each child. Children completed measures of coping and coping assistance 2 weeks after their injury (T1). Children also completed measures of coping and PTSS at a 3-month follow-up (T2). Parents reported on the coping assistance they provided to their child at T1.

Results Children reported using an average of six coping strategies (out of 10) with wishful thinking, social support, distraction, and cognitive restructuring endorsed most frequently. Child-reported social withdrawal and resignation 2 weeks after his or her injury (T1) were related to subsequent PTSS (T2). Social withdrawal at T2 was related to concurrent child PTSS (T2). Children were more likely to seek social support when their parents reported helping their child cope. No relationships were identified between active coping behaviours or parent coping assistance and PTSS outcomes.

Conclusions Findings suggest that children's coping strategies (particularly social withdrawal and resignation) play a possibly important, complex role in the development of traumatic stress symptoms. When parents help their child cope, children are more likely to seek out social support, suggesting that they will be more able to ask their parents for help as needed. Future research should identify effective strategies to prevent PTSS including how parents can best support their child following paediatric injury.

Keywords

children, coping, coping assistance, injury, PTSD, traumatic stress

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Introduction

Physical injury is one of the most common potentially traumatic events for children. Twenty million children in the USA

incur injuries each year (National Center for Injury Prevention and Control 1999), resulting in 8.7 million emergency room visits and 241 000 inpatient hospitalizations (Grossman 2000). While the majority of injured children experience full physical

recovery post-injury, a significant subset of children suffer negative psychological sequelae (Kassam-Adams & Fein 2003; Winston *et al.* 2003; Kassam-Adams & Winston 2004; Kenardy *et al.* 2006). Empirical studies suggest that among child and parent reactions to physical injury, post-traumatic stress disorder (PTSD) is a particular concern, because of the significant impact that PTSD symptoms can have on children's post-injury functioning (Holbrook *et al.* 2005; Zehnder *et al.* 2006; Zatzick *et al.* 2008). The diagnosis of PTSD refers to a constellation of distress symptoms (re-experiencing, avoidance, arousal) that may follow a traumatic experience (American Psychiatric Association 1994). Sub-syndromal PTSD (significant symptoms that do not meet full diagnostic criteria) is also associated with functional impairment and distress (Zatzick *et al.* 2008; Landolt *et al.* 2009). Between 10% and 30% of injured children have significant post-traumatic stress symptoms (PTSS) up to 1 year post-injury (de Vries *et al.* 1999; Daviss *et al.* 2000; Winston *et al.* 2003).

Although the relationship between child coping strategies post-injury and the development of PTSS has seldom been studied, initial research suggests a relationship between coping and later PTSS (Stallard *et al.* 2001; Zehnder *et al.* 2006; Stallard & Smith 2007). Coping is defined as behaviours that individuals engage in to control and change the situation and to manage emotional reactions to the perceived stressor (Lazarus 1996). Folkman and Lazarus posit that an individual first appraises the event to determine if it is threatening and then selects a coping technique (Folkman & Lazarus 1985). Applied to traumatic events such as injury, empirically supported cognitive models posit that maladaptive appraisals of the event and of one's reactions to it can lead to behavioural strategies (i.e. maladaptive coping) that produce PTSS and prevent development of adaptive appraisals (Ehlers & Clark 2000; Meiser-Stedman 2002). The effectiveness of coping strategies varies based on the situation (Spirito 1996; Eisenburg *et al.* 1997; Schmidt *et al.* 2002; Aldridge & Roesch 2007). Research has begun to suggest specific strategies as maladaptive or adaptive for children dealing with an injury, but the 'best' type of coping for promoting injury recovery remains unclear. For example, Stallard and colleagues (2001, 2007) examined coping and PTSD concurrently and found that injured children with PTSD used more coping strategies (particularly avoidant strategies – distraction, social withdrawal and blaming others) than children without PTSD and that the use of cognitive coping (rumination, suppression and distraction) predicted concurrent PTSS. Landolt and colleagues assessed 161 children at 1 month and 1 year after medical events (injury, newly diagnosed illness) to examine their selection of coping strategies at 1 month (Landolt *et al.* 2002) and the effec-

tiveness of these strategies in reducing PTSS at 1 year (Zehnder *et al.* 2006). Avoidance (86%), distraction (77%), active (71%) and religious (61%) coping strategies were most frequently reported, with support seeking (36%) far less common. In multiple regression analyses to predict PTSS at 1 year, only religious coping strategies predicted fewer PTSS. Bivariate correlations between coping at 1 month and outcomes at 1 year revealed PTSS severity at 1 year had weak but significant associations with active coping and support seeking.

Child PTSS has been associated with level of social support (Vernberg *et al.* 1996; Stallard *et al.* 2001). Parents are primary social supports for children and adolescents. Parents can affect child coping via coaching (direct instruction or suggestions), modeling (child observes parents' own coping behaviour), and through the general family context (Miller *et al.* 1994). Studies have examined parent socialization (i.e. coping assistance) of children's efforts to cope with stressors such as divorce, natural disaster, community violence, medical procedures and chronic medical conditions (Miller *et al.* 1994, 2010; Kliwer & Lewis 1995; Prinstein *et al.* 1996; Peterson *et al.* 1997; Kliwer *et al.* 2006). Substantive findings demonstrate the potential utility of parents helping their children cope following potential traumatic events. No studies have examined the types of parent coping assistance over the course of injury recovery.

In order to inform future intervention development to prevent PTSS, this study aimed to describe child coping strategies among injured children and the coping assistance provided by their parents, and to explore relationships among coping strategies, coping assistance and PTSS outcomes. The following specific research questions were addressed:

- 1 What types of coping do children use following an injury?
- 2 Is parent coping assistance related to child coping behaviour?
- 3 Are child coping strategies (i.e. active strategies, avoidant strategies, negative strategies) associated with PTSS?
- 4 Is early parent coping assistance related to later development of child PTSS?

Method

Sample

Eighty-two children (aged 8–17 years; $M = 12.1$, $SD = 2.7$) and one parent per child participated in the study. Most children (70%) were boys, and the sample was predominantly African American (40%) and White (59%). Type of injuries children had incurred included fractures (63.3%), sprains/strains (4.9%), contusion/lacerations (4.9%), head injuries (9.8%),

organ injuries (7.3%), multiple traumas (3.7%) and other (6.1%). Most participating parents were mothers or other female guardians (82%). T2 (3 months post-injury) assessments were completed by 71 children (87%). There were no significant differences with regard to gender, age or ethnicity for those retained to follow-up versus those completing T1 (2 weeks post-injury) only.

Procedures

This study followed an Institutional Review Board-approved protocol and recruited child–parent dyads from a large, urban Level I paediatric trauma centre. Children were eligible to participate if they had incurred a physical injury (a potentially traumatic event) within the past 4 weeks, were treated for their injury in the hospital, were between ages 8 and 17 years old, and read or understand English well enough to complete questionnaires. Children were excluded from participating if their injury was the result of family violence, their current medical status or cognitive functioning precluded the completion of assessment instruments, or no parent was available. The data presented were collected as part of a larger study assessing parents' use of educational materials about recovery after physical injury. No significant differences emerged between groups (i.e. parents who used educational materials and parents who did not use materials) for any outcomes. Thus, groups were collapsed for analyses presented in this paper.

Children completed self-report measures of coping and parent coping assistance at 2 weeks post-injury (T1). Children again completed a measure of coping as well as PTSS at 3 months post-injury (T2). Parents reported on the coping assistance they provided to their child at T1.

Measures

Child coping

Children reported on the coping strategies that they utilized after injury using the KidCope (Spirito *et al.* 1988). The KidCope is a 15-item measure with a yes/no response scale. The measure contains 10 subscales which can conceptually be categorized into three groups: active (problem solving, emotional regulation, cognitive restructuring, social support), avoidant (distraction, social withdrawal, wishful thinking) and negative (self-criticism, blaming others, resignation) coping strategies. Because the factor structure of the measure is not consistent for categories, it is recommended that each subscale be evaluated individually. The KidCope has demonstrated moderate (0.41)

to high (0.83) test–retest reliability within 3 to 7 days of retesting and moderate correlations with other measures of coping (Spirito *et al.* 1988).

Parent coping assistance

Children reported on coping assistance they received from parents, using a modified version of the Children's Coping Assistance Checklist (CCAC; Prinstein *et al.* 1996). This nine-item checklist assesses three types of coping assistance (emotional processing, encouragement to return to roles and routines, and distraction) that parents may use to help children recover from a traumatic event. Internal consistencies are moderate (emotional processing $\alpha = 0.57$, roles/routines $\alpha = 0.59$, distraction $\alpha = 0.73$). The items are rated on a 4-point Likert scale (0 = 'not at all', 1 = 'sometimes', 2 = 'a lot' and 3 = 'almost all the time'). The CCAC was originally developed for use following a hurricane. For this study, items were modified to reflect the trauma of an injury. Items not relevant to injury were dropped resulting in a six-item scale (two items per subscale). A total score is the sum of items on the checklist, and a higher total score indicates a higher frequency of coping assistance. Parents reported the coping assistance they provided to their child, using a parallel version of the CCAC.

Child persistent post-traumatic stress

Child persistent PTSS were assessed with the well-validated Child PTSD Symptom Scale (CPSS; Foa *et al.* 2001). The CPSS consists of 17 symptom items (rated on a 4-point scale; 0 = 'not at all' to 3 = '5 or more times a week') and seven items related to daily functioning (rated as 'absent'/'present' and on a 7-point scale of severity). The CPSS has shown excellent internal consistency ($\alpha = 0.89$), test–retest reliability (0.84), and convergent validity with structured clinical interview measures of PTSD (Foa *et al.* 2001). The CPSS yields scores for both continuous symptom severity (CPSS total score) and the presence of each DSM-IV PTSD symptom. This study reports on clinically significant PTSD symptoms, defined as having at least one symptom in each symptom category (re-experiencing, avoidance and hyper-arousal) and associated impairment from these symptoms.

Statistical analyses

The proportion of children using each coping strategy or receiving each type of coping assistance were compared for groups based on child sex, race, age category, and the presence/absence

of significant PTSS utilizing chi-squared analyses. Inter-rater (parent-child) comparisons were conducted for parent coping assistance, using paired samples *t*-tests. Relationships between continuous measures (e.g. number of coping strategies, trauma symptom severity) were evaluated with Spearman's rho correlations. For missing data between T1 and T2, cases were dropped for T2 analyses ($n = 11$). For other random missing data, listwise deletion was used ($n = 0-2$).

Results

What types of coping do children use following an injury?

Children reported engaging in a mean of 6.1 (SD = 1.5, range = 2 to 9) out of a possible 10 coping strategies during the 2 weeks following their injury (see Table 1). Wishful thinking was almost universally reported; seeking social support, distraction and cognitive restructuring were also frequently reported. No significant differences were detected in types of coping strategies based on child gender, age or race.

Child coping strategies were fairly consistent from 2 weeks to 3 months. Children reported engaging in a mean of 5.9 (SD = 1.5, range = 2 to 9) strategies at 3 months. The most frequently reported strategies were the same at T2 as T1. The most consistently used strategies from T1 to T2 were wishful thinking, social support, distraction, cognitive restructuring and blaming others (80% agreement or greater).

Most parents reported using every type of coping assistance: 100% of parents reported helping their child with emotional processing, 98.8% reported encouraging their child to return to normal routines, and 91.5% reported helping by distraction. Children also reported that parents frequently used these strategies: 95.1% reported emotional processing, 97.6% reported

return to routines, and 84.1% reported distraction. There was no difference in type or amount of parent coping assistance based on child gender or race (by either child or parent report). There was no difference in type of parent coping assistance by child age; however, there was a significant negative correlation between child age and the amount of parent-reported coping assistance ($r = -0.26, P < 0.05$), with parents of younger children reporting more assistance.

Is parent coping assistance related to child coping behaviour?

We examined associations between specific types of coping and coping assistance at T1 (emotional regulation coping with emotional processing assistance, distraction coping with distraction assistance, and social support coping with coping assistance of any type). Children were more likely to use social support coping when they also reported that their parents helped them with emotional processing (94% vs. 50%, $\chi^2 = 9.12, P < 0.01$), encouraging a return to normal routines (94% vs. 0%, $\chi^2 = 21.7, P < 0.001$) or using distraction (94% vs. 77%, $\chi^2 = 4.09, P < 0.05$).

Are child coping strategies (i.e. active strategies, avoidant strategies, negative strategies) associated with child PTSS?

Use of early coping strategies was compared for children who later (at 3 months) presented with significant PTSS ($n = 14$; 16%) versus those who did not ($n = 74$; 84%). Children who later had significant PTSS were more likely to have utilized avoidant (social withdrawal) or negative (resignation) coping strategies in the 2 weeks post-injury (see Table 1). For these two coping strategies we further examined the association between

Table 1. Number and per cent of children reporting the use of specific coping strategies 2 weeks post-injury, for those with and without significant PTSS assessed at 3 months

Child coping (child report: T1)	All children (T1)	Children without significant PTSS at 3 months (T2)	Children with significant PTSS at 3 months (T2)	Significant χ^2
Distraction	70 (85%)	50 (83%)	10 (100%)	$\chi^2 = 5.83, P < 0.05$
Social withdrawal	27 (33%)	14 (23%)	6 (60%)	
Problem solving	54 (66%)	40 (68%)	7 (78%)	
Emotional regulation	61 (74%)	44 (72%)	7 (78%)	
Wishful thinking	80 (98%)	60 (98%)	9 (100%)	$\chi^2 = 7.94, P < 0.01$
Cognitive restructuring	69 (84%)	51 (84%)	10 (100%)	
Self-criticism	18 (22%)	14 (23%)	3 (33%)	
Blaming others	16 (20%)	8 (13%)	3 (33%)	
Social support	74 (90%)	57 (93%)	7 (78%)	
Resignation	20 (24%)	13 (22%)	6 (67%)	

PTSS, post-traumatic stress symptoms.

early (T1) and later (T2) coping, to see whether consistent use of social withdrawal or resignation coping strategies might be related to poorer PTSS outcomes. Significant PTSS at 3 months was associated with the use of social withdrawal at both time points, but was related to the use of resignation only at 2 weeks and not at 3 months (see Table 1).

No statistically significant relationship was found between active coping behaviours post-injury and (T1, T2) and PTSS outcome (T2).

Is early parent coping assistance related to later development of child PTSS?

No statistically significant relationship was found between early parent coping assistance post-injury (T1) and PTSS outcome (T2).

Discussion

This research demonstrated a potentially significant role for coping in the development of PTSS following injury, and highlighted the importance of parents in helping children cope. Injured children reported use of a wide range of coping strategies (on average six coping strategies out of 10) consistently across time points. Wishful thinking, social support, distraction and cognitive restructuring are endorsed most frequently. Parents help their children cope in multiple ways, which is related to children seeking out social support. Two types of child coping strategies utilized soon after the injury (social withdrawal and resignation) were related to subsequent PTSS. Social withdrawal at 3 months was also related to current PTSS. Findings suggest a possibly important, complex relationship between children's coping, the coping assistance provided to them, and traumatic stress symptoms.

These results are consistent with and build on prior studies of coping in children with injuries. Children typically use a variety of coping strategies to deal with medical stressors (Stallard *et al.* 2001; Zehnder *et al.* 2006; Stallard & Smith 2007). The pattern of results is similar to previous studies on medical stressors with regard to the most frequently used strategies (Stallard *et al.* 2001; Landolt *et al.* 2002). Knowing that children often employ a variety of coping strategies, medical professionals can work with children to use these strategies in a positive way. For example, professional might acknowledge a child's 'wishing' that the injury had never happened, and then encourage realistic hope and expectation of recovery.

We found that two coping strategies (social withdrawal at 2 weeks and 3 months; resignation at 2 weeks) were related to

more severe PTSS outcomes. Previous studies have indicated that PTSS is associated with lower social support (Vernberg *et al.* 1996; Stallard *et al.* 2001). Children who use social withdrawal to cope may also experience insufficient support. Presence of social withdrawal may indicate a need for parents and professionals to assess child recovery and to provide more support to these children. Resignation at 2 weeks (but not at 3 months) was related to 3-month PTSS. It may be that 'giving up' early on is especially problematic, if children fail to put forth the necessary effort towards their emotional recovery in the aftermath of an injury. Unlike Zehnder and colleagues (2006), we did not identify any type of active coping that was related to better PTSS outcomes; however, we did not assess religious coping.

Findings demonstrated a relationship between parents' coping assistance and children's coping but not with children's PTSS. Most traumatic events are beyond the power of parents to control or resolve (Peterson *et al.* 1997). However, parents can influence children's coping responses and children often benefit from parents' direct coaching or encouragement of positive coping (Power 2004). Parent coping assistance was related to child coping strategies (namely seeking social support), indicating a role for parents in helping their child recover.

We did not observe an association between early coping assistance and later PTSS. This is concerning in that optimal child recovery may rely on the ability of those in children's support systems, particularly parents, to be able to adapt the coping assistance to their child's reactions. Our previous research demonstrated that parents may have difficulty accurately discerning child reactions, over- or underestimating their child's symptoms based on their own symptoms after an injury event (Kassam-Adams *et al.* 2006). Education about what to expect after injury, and how to help children cope, might be helpful for caretakers.

Limitations

The sample had several limitations which may affect the generalizability of the study results. We assessed children with injuries only, so children experiencing other acute traumatic events may have a different recovery path. It should also be noted that our sample (consistent with most paediatric injury samples) had a higher representation of boys and female caretakers. This study did not assess long-term physical recovery, and it is possible that physical recovery influenced coping, coping assistance and/or PTSS outcomes. In addition, coping was assessed using a brief screening measure. As suggested by the scale's authors (Spirito 1996), using a brief measure limits

our ability to fully understand the adaptive and/or maladaptive nature of each coping strategy and how children are applying these strategies. In addition, the way in which social withdrawal (an avoidance strategy) is assessed by this measure may overlap with the assessment of PTSS, which brings to question the nature of this relationship. It could be that the findings regarding social withdrawal are a result of the assessment rather than a true finding. Further research is needed to obtain a deeper understanding of the relationship between coping and PTSS, with a particular focus on how to differentiate between avoidant coping and avoidance symptoms. Limited variability in reports of parent coping assistance may be good news, reflecting overall high levels of support, but also limits our ability to examine correlates of coping assistance. Future studies might use a more finely grained assessment of the ways that parents help children cope with trauma, in order to tease apart more subtle differences in this process.

Future directions

This study brings us a step closer to understanding the role of child coping in the development of trauma symptoms and the role of parents in supporting children after trauma. To better inform preventive early interventions, future studies can help clarify the interrelationships among coping, coping assistance and paediatric post-traumatic stress by assessing all of these constructs at multiple time points across the post-injury recovery period. This would allow us to understand how coping behaviour changes across time and whether specific coping behaviours help reduce or prevent traumatic stress symptoms.

Key messages

- Coping throughout the physical recovery process after paediatric physical injury may play an important role in emotional recovery.
- Parents play an important role in a child's recovery, potentially influencing the manner in which children cope. Providers can work with parents to help promote positive adaptation after physical injury in children.
- Future research is needed to help clarify the causal and/or bidirectional nature of the relationship between specific child coping behaviours and the development of traumatic stress symptoms.

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