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Caregiver functioning following early childhood TBI: Do moms and dads respond differently?

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Abstract

Introduction—Research suggests that pediatric TBI results in injury-related stress and burden and psychological distress for parents. However, existing studies have focused almost exclusively on mothers, so that we know relatively little about the impact of childhood TBI on fathers.

Specific aims—The aims were to prospectively examine differences in maternal and paternal response to early childhood TBI over time relative to a comparison cohort of mothers and fathers of children with orthopedic injuries (OI).

Methods—The concurrent cohort/prospective research design involved repeated assessments of children aged 3–6 years with TBI or OI requiring hospitalization and their families. Shortly after injury and at 6, 12, and 18 months post injury, parents of 48 children with TBI (11 severe and 37 moderate) and 89 with OI completed standardized assessments of injury-related stress and burden, parental distress, and coping strategies. Mixed models analyses and Generalized Estimating Equations examined differences in maternal versus paternal burden, distress, and coping over time. The analyses included interactions of parent sex with group (severe TBI, moderate TBI, OI) and time since injury, to examine the moderating effects of injury severity on parental response to injury over time.

Results—Fathers were more likely than mothers to use denial to cope following moderate and severe TBI, but not OI. Conversely, mothers were more likely to prefer acceptance and emotion-focused strategies than fathers regardless of the type of injury. The use of active coping strategies varied as a function of injury type, parent sex, and time since injury. Fathers reported greater injury-related stress and distress than mothers over time, with pronounced differences in the severe TBI and OI groups.

Conclusions—Mothers and fathers appear to respond differently following TBI. The different types of responses may serve to exacerbate emerging family dysfunction.

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1. Introduction

Pediatric traumatic brain injury (TBI) is a significant family stressor resulting in increased burden and distress for caregivers and heightened family dysfunction [14,23–25]. The literature regarding caregiver and family adaptation following TBI has spawned recommendations regarding the involvement of families in rehabilitation and the need for family intervention. However, virtually our entire understanding of the family consequences of childhood TBI is based on reports from the primary caregiver, typically mothers. As a result, it is unclear how fathers cope with the injury or the degree of burden and distress that they experience as a result. Clearer understanding of the differences between mother's and father's responses to childhood TBI is critical for designing family interventions that address the needs of both mothers and fathers.

One exception to the focus on maternal responses to pediatric TBI is a cross-sectional study by Benn and McColl [3] that examined both maternal and paternal coping following acquired brain injury. These investigators found that mothers were more likely to use perception-oriented coping strategies, directed at changing one's perception of the stressor, than were fathers in general. Mothers were also more likely to endorse approaches involving cognitive reframing than fathers. Maternal and paternal coping responses were negatively correlated, suggesting that parents may adopt complementary approaches to the situation. However, the study sample was small and heterogeneous, with only 9 of 15 participants having sustained TBI, making it difficult to generalize from their findings.

Research with other populations is equivocal regarding differences between maternal and paternal response to common childhood conditions and disabilities. While some studies suggest that mothers and fathers experience equivalent distress [6], others indicate that mothers report greater burden and distress [17] or that fathers experience greater distress overall or in some domains or under certain conditions [11]. For example, Holmbeck et al. [10] found that fathers of preteens with spina bifida reported more psychological symptoms than those of able-bodied children, whereas levels of maternal psychological symptoms did not differ. In another study of parents of children with neural tube defects, Macias and colleagues [11] found that fathers reported more stress associated with parent-child interactions than did mothers, although overall levels of parenting stress did not differ. Thus, little consensus exists about which parent is likely to be most adversely affected. Additionally, many studies examining both mothers and fathers of chronically ill children focus on how fathers of ill versus healthy children respond rather than on differences between mother's and father's responses within the patient group [8,15]. As a result, these studies fail to shed light on potential differences between maternal and paternal responses.

Consensus is also lacking regarding whether mothers and fathers employ different strategies when coping with their child's diagnosis or condition. In a study of families awaiting liver transplant [16] mothers reported greater use of engagement coping strategies such as problem solving and cognitive restructuring, than did fathers. This study, together with that of Benn and McColl [3], provides tentative evidence of sex differences in parental coping. The broader stress and coping literature also points to potential differences in how men and women respond to stress [13,21]. These studies suggest that men may engage in more active coping, whereas women rely more on emotion-focused and support seeking strategies. However, other studies point to a lack of sex differences in coping with stress [12].

Differences in findings regarding parental coping and distress may in part reflect the nature of the stress arising from the diagnosis or condition. Although TBI shares commonalities with pediatric illnesses, it also differs in several important respects. Like cancer, TBI occurs unexpectedly in a previously healthy child, thereby contributing to feelings of vulnerability,

anxiety, and loss. However, TBI differs from most acute and chronic health conditions with respect to its potential long-term impact on the child's cognition and behavior [20,27]. TBI also differs from developmental disabilities and mental retardation in that the profile of post-injury abilities may be quite varied, with normal performance in some domains and deficits in others. Because these cognitive and behavioral changes can be subtle, parental coping and distress may vary over time, with distress increasing as awareness of persistent changes grows [23].

Thus, the purpose of the present report was to examine differences between mothers' and fathers' responses to early childhood TBI relative to parents of children who sustained an orthopedic injury (OI) requiring hospitalization at the same age. We also sought to examine the relationship between parental coping strategies and psychological distress. Based on the limited literature on parental coping together with the broader literature on sex differences, we hypothesized that mothers would be more likely to use cognitive reframing strategies whereas fathers would be more likely to use active coping strategies. Based on previous research with school-age children, we hypothesized that parents of children with TBI would report greater use of active coping strategies than those with OI [22]. Given the equivocal literature on sex differences in parental distress, we did not have specific hypotheses regarding whether mothers or fathers would report more psychological symptoms.

2. Method

2.1. Research design

The study used a prospective, concurrent cohort research design to examine mothers' and fathers' responses to TBI over the initial 18-months post injury relative to those of parents of children with OI. Inclusion of a comparison group of children with OI allowed us to consider the effects of TBI relative to the effects of traumatic injuries not involving the CNS, thereby equating the groups with respect to the stress of having a child hospitalized for a traumatic injury. We further anticipated that both groups of families would be similar in terms of pre-injury behavioral characteristics and associated risk factors. The study was approved by the Institutional Review Boards at each of the participating medical centers and informed consent was obtained from participating caregivers.

2.2. Recruitment criteria

Consecutive admissions of children with TBI or with OI not involving the brain were screened at three tertiary care children's hospitals and a general hospital (all with level 1 trauma centers). Eligibility requirements for both groups included age from 36 to 84 months at the time of injury and English as the primary spoken language in the home. Eligibility for the TBI group also included a TBI requiring overnight admission to the hospital with a Glasgow Coma Scale (GCS) score of 12 or less or a higher score accompanied by evidence of abnormalities on imaging (MRI or CT scan). Children with non-blunt head trauma (e.g., projectile wounds, strokes, drowning) were excluded. Inclusion in the OI group required a documented bone fracture (other than the skull), an overnight hospital stay, and the absence of any evidence of loss of consciousness or other findings suggestive of brain injury (e.g., symptoms of concussion). Children were excluded if they had a previous history of brain injury; pre-existing neurological disorder or medical problem affecting the central nervous system; diagnosis of mental retardation or developmental disability; documentation in the medical chart or in the parent interview of child abuse as the cause of injury, or history of severe psychiatric disorder requiring hospitalization.

2.3. Sample characteristics

Families of 87 children with TBI (53.40% of those identified as potentially eligible) and 119 with OI (35.10% of those identified as potentially eligible) completed informed consent and were enrolled. To better understand the effects of injury, the TBI group was categorized based on the severity of injury. Consistent with previous investigations [2,7,19], GCS scores of 8 or less were considered to reflect severe TBI. Complicated-mild to moderate TBI was defined as a GCS score of 9–12 or a higher GCS score with abnormal neuroimaging. The GCS score assigned to the child was the lowest one recorded post-resuscitation.

Sixty-four of the primary caregivers in the TBI group (74%) and 101 of the primary caregivers in the OI group (85%) had spouses or partners. Of these, 141 or 88% completed self-report measures of injury-related impact and coping (see measures below). Completion rates by spouses/partners did not differ significantly by group (83% TBI vs. 93% OI). Fathers who did not participate did not differ from participating fathers in terms of demographic or child characteristics including race, income, education level, child age, and injury severity.

2.4. Procedure and measures

Following recruitment, parents completed ratings of their coping in response to the injury, injury-related burden, and psychological distress shortly after injury ($M = 40$ days, $SD = 19.38$), and at 6, 12, 18 month post-injury follow-up assessments.

2.4.1. Measures of parent burden and distress—The Family Burden of Injury Interview (FBII) [4] was used to assess injury-related stress in the domains of child adjustment and behavior, relationship with spouse, impact on siblings, and relationships with other/extended family members. Primary caregivers completed the FBII as a structured interview and secondary caregivers (fathers in all but 3 instances) completed the FBII as a self-report questionnaire. The reliability and validity of this measure from our school-aged TBI project have been reported previously [4]. In both versions, parents responded to questions pertaining to injury-related family burden in each of these domains. For each item, parents indicated if it was an area of concern for them, and rated the stress associated with the issue on a 5-point scale ranging from not at all (0) to extremely stressful (4). Because ratings of injury-related burden were highly skewed (mostly 0's or 1's), responses were dichotomized to reflect no burden versus any burden. Mothers and fathers were compared on stress associated with the child's recovery and the effects on their spouse/partner. Additionally, an overall index of family burden was constructed by averaging the ratings of stress associated with the child's recovery, the spouse's reaction, and the reactions of extended family and then dichotomizing into no stress versus any stress.

Caregiver psychological distress was measured using Brief Symptom Inventory (BSI) [6] a 53-item questionnaire tapping a wide range of psychological symptoms. Reliability and validity are well established. The General Severity Index (GSI) was used as an index of global psychological distress.

Caregiver coping was assessed using the COPE [5], a 60-item self-report inventory with documented reliability and validity. Based on previous research and statistical confirmation, the COPE subscales were combined to create three summary scales: active coping (active coping, planning, suppression of competing activities); acceptance (acceptance, restraint coping, positive reinterpretation and growth); and denial/disengagement (denial, mental disengagement, behavioral disengagement). The standardized Cronbach's alphas ranged from 0.69 for acceptance and denial/disengagement to 0.86 for active coping.

2.5. Data analyses

General linear mixed model analyses were used to examine parent coping and distress over time as a function of injury severity and parent sex. Separate analyses were conducted for each of the three types of coping measured by the COPE and psychological distress as measured on the BSI. General estimating equations (GEE) logistic regression analysis was used to examine differences in the endorsement of overall injury-related burden, as well as burden associated with the child's recovery and spouse's reaction. Family socioeconomic status (SES) and race were included as covariates in each analysis. SES was measured using the average of the z scores for maternal education and median income for the census tract in which the family resided. After including these covariates, we estimated the effects of injury severity (two dummy variables, one comparing severe TBI versus OI and one comparing the complicated-mild/moderate TBI versus OI), sex of parent, and linear and quadratic terms representing time post injury. The initial model also included interactions for group, parent sex, and time since injury. Subjects were considered a random effect, so that each subject was initially modeled with independent slopes and intercepts with respect to time. After fitting an initial model, we reduced model complexity to achieve the most parsimonious model. We followed an iterative process, eliminating predictors for which the *F* tests for fixed effects were not significant, starting with three-way interactions, and then re-estimating the model before examining lower-level interactions and, finally, main effects. For any significant interaction, all of the main effects and lower-level interactions upon which the significant interaction was based were retained in the model. Given the exploratory nature of this study, alpha was set at 0.05 (Table 1).

3. Results

3.1. Coping strategies

As hypothesized, mothers were more likely than fathers to cope with the injury using coping strategies involving acceptance ($F(1, 141) = 9.20; p = 0.003$), regardless of the nature or severity of the injury. Parent sex interacted with injury group to predict the use of coping through denial and disengagement ($F(2, 138) = 3.41, p = 0.04$). In this case, fathers reported using more denial than mothers following severe TBI ($F(1, 138) = 11.53, p < 0.001$) and moderate TBI ($F(1, 138) = 3.88; p = 0.05$), but not OI ($F(1, 138) = 2.67, ns$).

The use of active coping strategies varied as a function of parent sex, injury type, and time since injury (group $\times$ time $\times$ sex interaction $F(2, 737) = 3.70; p = 0.03$). As depicted in Fig. 1, fathers of children with severe TBI engaged in more active coping than did mothers shortly after injury; whereas mothers of children with OI engaged in more active coping initially than did fathers. Because of small sample sizes, differences in rates of active coping between the mothers and fathers of children with severe TBI did not reach significance at any time point. Within the OI group, mothers reported higher rates of active coping than fathers at baseline and 6 months post injury, but not at 12 or 18 months post injury. In the moderate TBI group, parents only differed significantly at 12 months post injury, with mothers reporting the use of more active coping at that time.

3.2. Injury-related stress and burden

The likelihood of endorsing injury-related stress varied as a function of the parent's sex, the nature/severity of the injury, and time since the injury (GEE estimate = 1.23 (0.64); $p = 0.05$). The proportion of mothers and fathers reporting overall injury-related stress only differed in the OI group, with fathers being significantly more likely than mothers to report some injury-related burden at all four time points. Both mothers and fathers of children with severe TBI consistently endorsed some injury-related stress over time, with proportions ranging from 0.64 for dads at 18 months post injury to 0.89 for dads at 6 months post injury.

Mothers and fathers of children with moderate TBI also did not differ in their perceptions of overall injury-related stress over time, with 69% of mothers and 71% of fathers reporting stress shortly after injury, diminishing to 48% of mothers and 63% of fathers by the 18-month follow-up. Mothers of children with moderate TBI were more likely to report injury-related stress than those of children with OI at each of the assessments. Mothers of children with severe TBI were more likely to report injury-related stress than of those of children with OI at all but the initial assessment. However, fathers' perceptions of injury-related stress did not differ among the groups.

Injury-related stress associated with the spouse or partner's reaction also varied by parent sex, injury type, and time since injury; spouse (GEE estimate = 1.56 (0.73); $Z = 2.12$; $p = 0.03$). Fathers in the moderate TBI and OI groups were significantly more likely than mothers to report stress associated with their spouse's response to the injury at each follow-up. Although the proportion of mothers and fathers reporting stress in the severe TBI group was not statistically different at any time point due to the small sample size, more fathers than mothers reported stress associated with their spouse or partner's reaction at baseline, 6, and 12-month follow-ups, whereas more mothers reported spouse stress at the 18-month assessment (see Fig. 2). These findings suggest dynamic patterns of stress associated with the spouse or partners reaction over time following severe TBI. Mothers of children with severe TBI were more likely to endorse stress associated with the spouse's response than those of children with OI at each time period. Mothers of children with moderate TBI were more likely than mothers of children with OI to report spousal stress at all but the 18-month assessment. Fathers of children with severe TBI and OI did not differ in their endorsement of stress with their spouse, whereas fathers of children with moderate TBI were more likely to report stress at the 6-month follow-up.

Injury related stress associated with child's recovery varied as a function of the parent's sex, with mothers in the OI group reporting significantly less stress over time than fathers, (GEE estimate = 1.19 (0.57). $Z = 2.09$; $p < 0.04$). Contrast estimates also show that mothers in the OI group were also less likely to report stress related to the child's recovery over time compared to mothers with mild/moderate group ($\chi^2 = 5.72$, $p = 0.02$). Within the OI group, only 30% of mothers reported stress associated with the child's recovery at the 6-month assessment, and this proportion dropped to 22% by 18 months post injury. In contrast, 58% of fathers of children with OI reported stress associated with the child's recovery at the 6-month follow-up, and 43% continued to report stress 18 months after injury. Mothers of children with moderate TBI demonstrated a similar pattern to fathers in the OI group, ranging from 68% reporting stress 6 months post injury to 48% at 18 months post injury. Finally, 72% of mothers of children with severe TBI reported stress at 6 months post injury, with 64% continuing to endorse stress associated with the child's recovery 18 months after the injury. While higher proportion of mothers of children with severe TBI reported stress associated at each of time points relative to mothers of OI children, the results did not reach statistical significance perhaps due to the small sample in the severe TBI group.

3.3. Psychological distress

Parent sex interacted with injury group to predict psychological distress on the BSI ($F(2,681) = 5.78$; $p = 0.003$). Although fathers reported significantly higher distress than did mothers in all groups, these differences were more pronounced following severe TBI and OI than following moderate TBI (see Fig. 3).

4. Discussion

The current study represents one of the few prospective investigations to examine differences in how mothers and fathers respond to early childhood TBI over time. The

findings provide evidence that fathers cope differently than mothers, with preferred coping styles varying, in some cases, as a function of both time since injury and the nature and severity of the injury. Specifically, mothers were more likely to use cognitive reframing regardless of the nature of the child's injury; whereas fathers of children with moderate or severe TBI were more likely to engage in denial. The use of active coping shifted over time, with fathers of children with severe TBI engaging in more active coping than did mothers acutely, while the opposite pattern held true following OI. These findings suggest that fathers of children with severe TBI may become discouraged and less engaged in their coping efforts over time. Conversely, fathers of children with OI may become more aware of potential long-term concerns over time. Caregiver burden and distress also differed by parent sex. Consistent with some prior literature [10], fathers reported more injury-related stress associated with the child's recovery as well as higher levels of overall distress, particularly following severe TBI and OI. These findings add to our understanding of family response to TBI and have potentially important implications for how we intervene with families after traumatic injury.

Differences between mothers and fathers in their coping responses may have important implications for their psychological adjustment to the injury over time. Coping strategies preferred by fathers tended to be those that have previously been associated with greater levels of distress over time, whereas the coping strategies preferred by mothers have been linked to less burden and distress [22]. The use of denial has been consistently linked to higher levels of depression and distress [1,9] in a variety of populations including parents of children with traumatic injuries [22]. Additionally, although active coping is often perceived as an effective strategy, it has been linked to elevated burden following pediatric TBI [22]. Thus, fathers of children with TBI cope with the injury in ways that are likely to exacerbate rather than ameliorate their distress.

Although previous research has described mother's and father's coping responses following TBI as complementary [3], the combination of paternal denial and maternal acceptance in response to the injury may contribute to parental disagreements and marital strain rather than marital harmony. Mothers may perceive fathers as unconcerned about the child's recovery because of their denial, despite the fact that fathers, as a whole, were more likely to endorse concerns about the child's recovery than were mothers. Fathers' preferred coping strategies may also make it more difficult for them to share their concerns with others. Thus, these diverging coping styles may result in poor communication and a perceived sense of estrangement between the parents.

Mothers' relative burden and distress also warrants consideration. Maternal burden and distress levels for children with severe and moderate TBI were elevated compared to those of mothers of children with OI, although these differences did not always achieve statistical significance. These findings support previous studies that have reported significantly elevated distress over time among primary caregivers (nearly all mothers) of school-age children with moderate to severe TBI [14,23–25]. However, overall maternal distress levels, even in the severe TBI group, were within the normal range. The reason for this relative lack of maternal distress is unclear. However, examination of distress in this sample as a whole [18] suggests that parental distress following TBI may be greater when the child is old enough to be faced with the demands of formal schooling. Anecdotally, mothers of young children seem to harbor considerable uncertainty about whether a particular concern regarding the child's behavior was actually attributable to the child's injury. This pattern of responses suggests that parents of younger children may have more difficulties distinguishing changes arising from the injury from those associated with normal development.

Rehabilitation providers working with families should be aware of these differences in parental response to TBI. Fathers' distress levels suggest that they may benefit from counseling; however, their denial may reduce their willingness to engage in treatment, thereby making it more difficult to diagnose and treat their distress. To facilitate successful adaptation as a family, each parent needs to understand the concerns of the other and how the other is choosing to cope with those concerns. Therapists working with families following a child's TBI also need to help them to identify and change maladaptive coping strategies, such as denial. Toward this end, findings such as these may be helpful in developing and implementing evidence-based treatment approaches. However, denial, by its very nature, is likely to remain a difficult problem to address.

These findings must be considered in the context of several important limitations. First, although the sample was not small for a prospective study of pediatric TBI, relatively few parent dyads were available in the severe TBI group, thereby limiting statistical power as well as generalizability. Although participating fathers did not differ from fathers who did not participate on key background characteristics, there may be other differences that were not assessed. Children with OI were more likely than those with TBI to come from two-parent families. Although this appears to reflect the epidemiology of TBI as opposed to OI rather than recruitment biases [26], other differences may exist between the injury groups, even after controlling for SES, which could account for some of the differences in coping and distress. Larger samples, particularly of children with severe TBI, are needed to address this issue. Coping, injury-related burden, and distress were all assessed by self-report questionnaires. Although the questionnaires have demonstrated validity, clinical rating scales or diagnostic interviews may provide a more detailed, and unbiased, assessment of parental psychological symptoms or disorders. Finally, although the use of mixed models analysis and GEE allowed us to retain participants for whom we had at least one data point, attrition over time may have affected the findings.

Despite these limitations, this may be the only study to prospectively examine differences in maternal and paternal coping, burden, and distress following early childhood TBI. The current findings provide important new information about differences in mothers' and fathers' responses to early childhood TBI. They suggest that mothers and fathers cope differently with such injuries. The higher levels of burden and distress reported by father's points to the need to assess father's coping and adaptation and to engage them in treatment as appropriate. Given the differences in mothers' and fathers' coping strategies, family-centered treatments may be particularly helpful in facilitating communication and family adaptation. Future research would benefit from larger samples that examine parental responses to TBI across a broader age range. Studies that examine dyadic interactions following TBI would be particularly useful in determining the effects of TBI on the marital relationship over time.

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References

1. Aldwin CM, Revenson TA. Does coping help? A reexamination of the relation between coping and mental health. *J Pers Soc Psychol.* 1987; 53:337–348. [PubMed: 3625471]
2. Anderson VA, Catroppa C, Dudgeon P, Morse SA, Haritou F, Rosenfeld JV. Understanding predictors of functional recovery and outcome 30 months following early childhood head injury. *Neuropsychology.* 2006; 20:42–57. [PubMed: 16460221]
3. Benn KM, McColl MA. Parental coping following childhood acquired brain injury. *Brain Inj.* 2004; 18:239–255. [PubMed: 14726284]
4. Burgess ES, Drolar D, Taylor HG, Wade SL, Stancin T, Yeates KO. The Family Burden of Injury Interview (FBII): Reliability and validity studies. *J Head Trauma Rehabil.* 1999; 14:394–405. [PubMed: 10407212]
5. Carver CS, Schierer MF, Weintraub JK. Assessing coping strategies: A theoretically based approach. *J Peru Soc Psychol.* 1989; 54:267–283.
6. Derogatis L, Spencer P. The Brief Symptom Inventory: Administration, scoring and procedures manual I, Baltimore. Clinical Psychology Research. 1982
7. Fletcher J, Kwing-Cobbs L, Miner M, Levin H, Eisenberg H. Behavioral changes after closed head injury in children. *J Consult Clin Psychol.* 1990; 58:93–98. [PubMed: 2319050]
8. Gerhardt CA, Vannanta K, McKellop JM, Zeller M, Taylor J, Passo M, Noll RB. Comparing parental distress, family functioning, and the role of social support for caregivers with and without a child with juvenile rheumatoid arthritis. *J Pediatr Psychol.* 2003; 28:5–16. [PubMed: 12490626]
9. Holahan CJ, Moos RH. Risk resistance and psychological distress: Personality, coping, and family support in stress resistance. *J Pers Soc Psychol.* 1987; 49:739–747. [PubMed: 4045701]
10. Holmbeck GN, Gorey-Ferguson L, Hudson T, Seefeldt W, Turner T, Uhler J. Maternal, paternal, and marital functioning in families of preadolescents with spina bifida. *J Pediatr Psychol.* 1997; 22:167–181. [PubMed: 9114641]
11. Macias MM, Saylor CF, Haire KB, Bell NL. Predictors of paternal versus maternal stress in families of children with neural tube defects. *Children's Health Care.* 2007; 36:99–115.
12. Porter LS, Stone AA. Are there really sex differences in coping? A reconsideration of previous data and results from a daily study. *J Soc Clin Psychol.* 1995; 14:184–202.
13. Ptacek JT, Smith RE, Dodge KL. Sex differences in coping with stress: When stressor and appraisals do not differ. *Personality, Social Psychology and Behavior.* 1994; 20:421–430.
14. Rivara JB, Fay GC, Jaffe KM, Polissar NL, Shurtleff HA, Martin KM. Predictors of family functioning one year following traumatic brain injury in children. *Arch Phys Med Rehabil.* 1992; 73:899–910. [PubMed: 1417464]
15. Seiffge-Krenke I. Come on, Say something, Dad! Communication and coping in fathers of diabetic adolescents. *J Pediatr Psychol.* 2002; 27:439–450. [PubMed: 12058008]
16. Simons L, Ingerski LM, Janicke DM. Social support, coping and psychological distress in mothers and fathers of pediatric transplant candidates: A pilot study. *Pediatr Transplantation.* 2007; 11:781–787.
17. Sloper P. Predictors of distress in parents of children with cancer: A prospective study. *J Pediatr Psychol.* 2000; 25:79–91. [PubMed: 10820946]
18. Stancin T, Wade SL, Taylor HG, Yeates KO, Walz NC. Traumatic brain injuries in young children: Initial impact on the family. *J Dev Behav Pediatr.* 2008; 29:253–261. [PubMed: 18454041]
19. Taylor HG, Yeates KO, Wade SL, Drolar D, Klein S, Stancin T. Influences on first-year recovery from traumatic brain injury in children. *Neuropsychology.* 1999; 13:76–89. [PubMed: 10067779]
20. Taylor HG, Yeates KO, Wade SL, Drolar D, Stancin T, Minich M. A prospective study of short- and long-term outcomes after traumatic brain injury in children: Behavior and achievement. *Neuropsychology.* 2002; 16:15–27. [PubMed: 11853353]
21. Verbrugge LM. Sex and health: an update on hypotheses and evidence. *J Health Soc Behav.* 1985; 26:156–182. [PubMed: 3905939]

22. Wade SL, Borawski EA, Taylor HG, Drotar D, Yeates KO, Stancin T. The relationship of caregiver coping to family outcomes during the initial year following pediatric traumatic injury. *J Consult Clin Psychol.* 2001; 69:406–415. [PubMed: 11495170]
23. Wade SL, Taylor HG, Drotar D, Stancin T, Yeates KO, Minich NM, Schulchter M. Long-term family adaptation following pediatric brain injury. *J Pediatr Psychol.* 2006; 31:1072–1083. [PubMed: 16150875]
24. Wade SL, Taylor HG, Drolar D, Stancin T, Yeates KO. Family burden and adaptation during the initial year following traumatic brain injury (TBI) in children. *Pediatrics.* 1998; 102:110–116. [PubMed: 9651422]
25. Wade SL, Taylor HG, Drolar D, Stancin T, Yeates KO, Minich NM. A prospective study of long-term caregiver and family adaptation following brain injury in children. *J Head Trauma Rehabil.* 2002; 17:96–111. [PubMed: 11909509]
26. Wade SL, Taylor HG, Walz NC, Salisbury S, Stancin ST, Bernard LA, Oberjohn K, Yeates KO. Parent-child interactions during the initial weeks following brain injury in young children. *Rehabil Psychol.* 2008; 53:180–190.
27. Yeates KO, Taylor HG, Wade SL, Drotar D, Stancin T, Minich N. A prospective study of short and long-term neuropsychological outcomes after pediatric traumatic brain injury. *Neuropsychology.* 2002; 16:514–523. [PubMed: 12382990]

Fig. 1.

Depicts the adjusted reported use of active coping strategies over time by mothers and fathers of children with severe TBI, moderate TBI, and OI. Post hoc contrasts revealed that mothers and fathers in the severe TBI group did not differ at any time point. Mothers in the moderate TBI group only differed significantly from fathers at 12 months post injury. Mothers in the OI group reported significantly higher rates of active coping than did fathers at baseline, 6, and 12 months post injury.

Fig. 2.

Depicts the unadjusted proportion of mothers and fathers of children with severe TBI, moderate TBI, and OI reporting stress associated with their spouse's or partner's reaction to the injury at each assessment. Post hoc contrasts indicated no statistically significant differences between mothers and fathers of children with severe TBI at any time point due to the small sample size. Fathers in the moderate TBI and OI groups were significantly more likely than mothers to report stress associated with their spouse's response to the injury at each follow-up.

Fig. 3.

Depicts unadjusted average BSI-GSI scores for mothers and fathers of children with severe TBI, moderate TBI, and OI. Fathers reported significantly higher levels of distress on average than mothers, with more pronounced difference following severe TBI and OI.

Table 1

Demographic and injury characteristics of participating families

Characteristic	Severe TBI (14)	Moderate TBI (39)	OI (94)	F/Chi
Age at injury	4.67 (0.81)	5.02 (1.21)	5.09 (1.09)	0.92
Number (%) boys	9 (64%)	20 (51%)	52 (55%)	0.71
Nonwhite ethnicity	4 (29%)	7 (18%)	16 (17%)	0.58
< = HS education	9 (64%)	20 (51%)	39 (41%)	3.09
Median income ^a	57,107 (17.78)	62,147 (23.67)	67,357 (20.41)	1.49
Lowest GCS Score	4.21 (2.04)	13.64 (1.94)	—	
Days Hospitalized	13.94 (23.72)	2.26 (1.52)	1.37 (1.10)	18.58 *
ISS	13.77 (9.28)	14.92 (7.31)	6.95 (2.50)	38.83 *

Note: HS = High School; ISS = Injury Severity Score.

^a Median Income is based on census tract data from the 2005 census. Standard deviations are reported in thousands.

* $p < 0.05$.