

PSYCHOSOCIAL ADJUSTMENT IN SIBLINGS OF CHILDREN WITH WAR-RELATED INJURIES

Vivian Khamis

American University of Beirut

The study assessed the prevalence and predictors of post-traumatic symptomatology and emotional and behavioral difficulties in siblings of children who incurred war-related injuries. It was predicted that injury severity, gender and attributional style would account for a significant amount of the variance in post-traumatic stress symptoms and emotional and behavioral difficulties in those siblings. The sample consisted of 406 siblings of both genders with a mean age of 12.50 years. The results indicated that injury severity, gender and attributional style were related to emotional and behavioral difficulties and symptoms of post-traumatic stress, except for gender and post-traumatic stress. Siblings of children with severe injury appeared to be at greater risk for intrusive thoughts and avoidance as well as emotional and behavioral difficulties. Females exhibited more emotional and behavioral problems than did males. Siblings with more maladaptive attributional styles endorsed more emotional-behavioral problems and symptoms of post-traumatic stress. Techniques for strengthening coping abilities designed to enhance cognitive control may be used with siblings at risk, particularly females and siblings of children who sustained a severe injury. Treatments such as trauma-focused cognitive behavior therapy may incur positive results.

Introduction

The impact and long-term effects of war-related injuries in children represent traumatic events with ramifications for their social system (Cozza et al., 2010; Khamis, 2000 a). From a family systems' perspective (Minuchin, 1985) members of a family are interrelated, so what affects one family member will have effects across the whole system including the individual members of that system. As an integral part of the injured children's social system, siblings are affected. Because sibling relationships are both intense and intimate (Dunn, 1983; Dunn & McGuire, 1992; Rutter & Redshaw, 1991), the effect of the injured child on siblings may be profound.

While there has been a plethora of clinical and social science research on the impact of war-related injuries on children and their families (Khamis, 2008, 2000a,b,1993a,b; Randitz et al., 1998) , there is a dearth of published research on the specific effects upon a child of serious injury to a brother or a sister. Research on political violence and Palestinian families suggests reasons for concern regarding the siblings of those who were injured. One large-scale study indicated that family members of those who incurred *intifada-related* injuries are at greater risk for post-traumatic stress disorder (PTSD), psychological and behavioral problems (Khamis, 2000a). The Palestine Red Crescent Society, (PRCS), estimates that from the onset of *Al-Aqsa intifada* in September 2000 to December 2007 there were 31,873 injuries among the Palestinians of which a large number were children under 16 years (PRCS, 2007). Many of these injured children have siblings, yet the effects of their injury on these siblings are not known.

There is still uncertainty about the factors that make some children more vulnerable to developing psychological morbidity after traumatic events. The degree of exposure to the event is probably critical, and witnessing death or injury in others may all influence outcomes. There is little in the scientific literature that identifies the specific effects upon a child of serious injury to a sibling that does not result in death (Newman et al., 1997). The majority of the psychological research investigating the relationship between the severity of war injury, PTSD and emotional and behavioral problems has focused on the

injured persons (Khamis, 1993a, b, 2008) and their parents (Khamis, 2000a). While some studies reported strong relationships between severity of injury and PTSD (Randitz et al., 1998) other studies did not confirm any relationship (Khamis, 1993b, 2008). However, siblings may be at risk for increased distress and symptomatology due to the sudden changes in living arrangements, schedules, parenting practices, and the amount of time spent with their parents (Cozza et al., 2010).

One social status believed to influence differential vulnerability to adverse consequences of war atrocities among family members is gender (Hourani, Armenian, Zurayk, & Afifi, 1986; Lyons, 1979; Rosehech, 1986). Specific psychosocial theories that have been applied to the effects of trauma and stress have indicated that gender is a characteristic that influences the stressors to which people are exposed (Billings & Moos, 1984; Pearlin, 1989; Pearlin & Lieberman, 1979), as well as the personal and social mediating resources that can be utilized to deal with hardship. In general, research results on trauma-related symptomatology and gender have been inconsistent (Fairley, 1984; Gleser, Green, & Winget, 1981; Khamis, 2000a; Lopez-Ibor, Canas, & Rodriguez-Gamazo, 1985; Parkes, 1977). While some studies found that females were more likely to suffer from PTSD than males (Afana et al., 2002; Brewin et al., 2000; Punamäki, Komproe, El Masri, Qouta, & De Jong, 2005; Stein, Walker, & Forde, 2000), other studies have found that the prevalence of PTSD was higher in males than females (Llabre & Hadi, 1997; Khamis, 2005). How gender roles affect the outcomes of war-related injury in siblings may be prompted by the findings that girls tend to report more affection and intimacy in their sibling relationships than boys (Akiyama et al., 1996; Kim et al., 2006). In a society marked by strictly defined sex roles, the behavior of girls is extremely constrained, and, therefore, the overwhelming responsibilities that are placed on female siblings may be critical determinants in the development of psychological distress and emotional and behavioral difficulties (Khamis, 2000a). Because females shoulder most of the responsibility when a family member is injured, they may feel the pressure more that results in high psychological distress and lower well-being (Khamis, 1998).

Another variable that may influence the course of children's and adolescents' adjustment to war-related injury in siblings is attribution (Abramson, Seligman, & Teasdale, 1978). Researchers have found that trauma survivors with PTSD often exhibit negative beliefs about self and others (Janoff-Bulman, 1989; Newman, Riggs, & Roth, 1997). Maladaptive attributional styles have been associated with other psychopathological reactions, such as depression (Abramson, et al., 1978). Given that higher levels of depression in children are more likely to be associated with more internal-stable-global attributions for negative events, and more external-unstable-specific attributions for positive events (Gladstone & Kaslow, 1995), one might expect that such maladaptive attributional styles may also be associated with other psychological, behavioral, and adjustment problems in children of siblings who incurred war-related injuries. Similar constructs have been proposed by social psychologists in dealing with traumas. Reactions to traumatic events may be affected by the desire to maintain a belief in a just world (Lerner, 1971; Lerner & Mathews, 1967), the desire to protect oneself from blame (Shaver, 1970), external locus of control (Craig, Hancock, Chang, & Dickson, 1998), and belief in fate (Khamis, 2008). Accordingly, children's attributional styles may be related to the psychological sequelae of war-related injuries sustained by their siblings. Research on gender differences in attributional style is also inconsistent. While some researchers have reported no sex differences in attributional style during childhood or adolescence (e.g., Curry & Craighead, 1990; Gotlib et al., 1993; Schoenherr, Brown, Baldwin, & Kaslow, 1992), other researchers have found sex differences in the relation between attributional style and self-reported measures of depressive symptoms (e.g., DeMoss, Milich, & DeMers, 1993; Nolen-Hoeksema, Girgus, & Seligman, 1991; Nolen-Hoeksema et al., 1992). Studying the psychosocial conditions and attributional style of the siblings of children who incurred war-related injuries has various consequences for developing an adequate understanding of problems pertaining to their psychosocial adjustment and, therefore for instituting intervention programs that will effectively accommodate their needs.

The purpose of this research, therefore, was to identify predictors of post-traumatic stress symptoms and emotional and behavioral difficulties in siblings of children who incurred war-related injuries. It was predicted that injury severity, gender and attributional style would account for a significant amount of the variance in post-traumatic stress symptoms and emotional and behavioral difficulties in siblings of children who incurred war-related injuries. Specifically, it was hypothesized that children with maladaptive attributional style who make more internal-stable-global attributions for negative events and more external-unstable-specific attributions for positive events report more post-traumatic stress symptoms and emotional and behavioral difficulties than do children with the reverse attributional style. In addition, it was hypothesized that symptoms of post-traumatic stress and emotional and behavioral

difficulties would be associated with injury severity and the female gender. Also, it was predicted that siblings of children with severe injuries and females would display more childhood problems such as conduct problems, hyperactivity/ inattention, emotional symptoms, peer problems and pro-social behaviors as well as post-traumatic stress symptoms including intrusion and avoidance compared to siblings of children with mild injuries and males.

Method

Participants

The sample consisted of 406 siblings, of whom 202 were males and 204 were females. They ranged in age from 11 to 14 years ($M = 12.50$ years, $SD = 1.13$). Of the sample, 96.3 % were from intact families, predominantly Moslems. The mean of parents' educational level was secondary school. The mean for the number of children was 5.66 per family and the monthly income of the participants' families ranged from no income to 2425 US dollars ($M = 408.31$, $SD = 286.72$). All the injured children were males from the West Bank and Gaza Strip representing various residential patterns: cities ($n = 166$; 40.89%), village ($n = 70$; 17.24%), and refugee camps ($n = 170$; 41.87%). They ranged in age from 12 to 18 years ($M = 16.30$, $SD = 1.64$). The lapse of time between the date of injury and this study ranged from 6 months to 38 months ($M = 27.82$, $SD = 7.43$). Fifty one percent ($n = 207$) of the participants were assigned to the mildly injured group and 49% ($n = 199$) to the severely injured group.

Instrumentation

Personal History Form. The personal history form was used to provide background information about siblings and their families. The child variables considered for this study were age, and gender. Also, several of the trauma predictor variables were determined by the injured child's medical report. The severity of the injury was classified as mild if the child had soft tissue injury only and severe if it was a bone injury that caused a disability. The date the child was injured was used to determine how recent the injury was.

Strengths and Difficulties Questionnaire (SDQ). The SDQ (Goodman, 2001) was used to detect childhood emotional and behavioral problems. The SDQ is a brief 25 item behavioral screening instrument designed for use with children and teenagers between 4 and 16 years old. The 25 items are divided into five sub-scales each of five items, generating scores for conduct problems, hyperactivity/ inattention, emotional symptoms, peer problems and pro-social behaviors. Internal consistency for each of the five sub-scales has been shown to be good with a mean Chronbach's alpha of 0.73 (Goodman 2001). A total difficulties score ranging from 0 to 40, representing increasing difficulties, is derived by summing scores on the first four of these sub-scales. The remaining scale, pro-social behavior, is a positive measure ranging from 0 to 10 representing increasing caring, helpful behavior. The self-report version of the SDQ for children aged 11 to 16 years (Goodman *et al.* 1998) was used in this study. The SDQ has been validated and used in previous studies among Palestinian children (Thabet, Stretch, & Vostanis, 2000). In this sample Cronbach's alpha is .72.

Impact of Event Scale (IES). The Impact of Event Scale (IES) was used to measure the psychological impact of events (Horowitz, Wilner, & Alvarez, 1979). The scale measures two dimensions of PTSD: trauma-related intrusion and avoidance such as *I had trouble falling asleep or staying asleep, I felt as if it hadn't happened or wasn't real, I tried not to talk about it, I felt irritable and angry*. The frequencies of these symptoms were coded *not at all* 0, *rarely* 1, *sometimes* 3, and *often* 5 (Zilberg, Weiss, & Horowitz, 1982). The IES has been widely used with children (e.g., Dyregrov, Kuterovac, & Barath, 1996; Malmquist, 1986; Yule & Udwin, 1991). In a study that assessed the psychometric properties of the IES on the basis of a comprehensive list of studies (Horowitz & Sundin, 2002), the results indicated that the IES' two factor structure is stable over different types of events, that it can discriminate between stress reactions at different times after the event, and that it has convergent validity with observer – diagnosed post-traumatic stress disorder. Previous research found good split-half reliability (.87) and one-week test-retest reliability (.87) for the total score (Horowitz *et al.*, 1979). In this sample Cronbach's alpha is .89.

Children's Attributional Style Questionnaire –Revised (CASQ-R). The Children's Attributional Style Questionnaire –Revised (CASQ-R) was used to assess causal attributions. It includes 24 forced-choice items, half addressing positive outcomes and half addressing negative outcomes (Thompson, Kaslow, & Weiss, 1998). For the 12 positive events, 2 items tap the internal-external dimension, 7 items assess the stable-unstable dimension, and 3 items address the global-specific dimension. For the 12 negative events, 3 items tap the internal-external dimension, 6 items assess the stable-unstable dimension, and 3 items address the global-specific dimension. Positive, negative, and overall (positive minus negative

composite) scores are divided. The lower the positive composite score, the higher the negative composite score and the lower the overall composite score the more depressive is the attributional style. In this sample Cronbach's alpha is .76.

Procedure

The primary sample included 420 siblings of children who incurred war-related injuries. Of these, 406 were willing to participate in the study. The overall response rate was 96.6%. Participants were identified from official Palestinian National Authority reports. To be eligible to participate in this study, siblings had to be free of war injuries and serious physical problems. They also had to have a brother or a sister who sustained a war injury. One sibling was selected from the three- and four-child families based on age (11 years and above), gender and severity of injury. In families that have more than one sibling the youngest was selected. Participants were assigned to the severely injured group when their sibling had a bone injury that resulted in permanent disability such as paraplegia, and quadriplegia whereas those who were assigned to the mildly injured group had a sibling with a soft tissue injury only. Those who experienced other types of traumatic events were not included in the study in order to rule out the confounding effects of multiple traumas in addition to the critical injury.

All families were initially contacted by phone or a home visit and asked to participate in a study about the psychological status of siblings of war -injured children. If the family consented, an interview with the sibling was scheduled at their home. Parental consent and child assent to participate were obtained. They were given a full explanation of the study, were assured of the anonymity of their responses, and were ensured confidentiality of all information collected.

Two psychologists carried out the interviews with children at home. Completion of the interview took approximately 30 minutes. The interviewers had previous experience in working with children. Ethical approval for the study was obtained from the American University of Beirut.

The three instruments used in this study were translated into Arabic, and the content validity of the translated Arabic versions was assessed by comparing the pairs of original and back-translated items. Overall, the back translation of each item in the scales closely reflected the content of the original item.

Statistical Analysis

Preliminary analysis screened for missing data and tested distributional assumptions of analysis. There was a small amount of missing data as a consequence of entry error on the study variables of two participants and were handled with multiple imputation (MI). MI provides unbiased, generalizable estimates of missing values and standard errors (Graham 2009).

Inter-correlations among predictor variables and dependent variables were employed to examine the general relations. Then, separate stepwise regression analysis was used to examine the relative contribution of predictor variable (i.e., injury severity, gender, and attributional style) to total emotional and behavioral difficulties (SDQ) scale and post-traumatic stress symptoms (IES). To further investigate the impact of injury severity, and gender on the various outcome measures, a separate multivariate analysis of variance (MANOVA) was performed on the emotional and behavioral difficulties (SDQ) sub-scales (i.e., conduct problems, hyperactivity/ inattention, emotional symptoms, peer problems and pro-social behaviors) and the post-traumatic stress symptoms (IES) sub-scales (i.e., intrusion and avoidance) to determine whether the sub-scale scores varied with the sibling's group (mild and severe injury) or gender (male and female).

Results

Diagnostic Findings

Of all the siblings of war-injured children 21.6 % were reported as having total difficulties score in the 'abnormal' range and 147 (36.20 %) had a probable diagnosis of PTSD (Goodman ,1997). A cut-off score of 33 or more is recommended for PTSD diagnosis (Creamer, Bell, & Falilla, 2002).

Gender, Injury Severity, Attributional Style and Outcome Measures

Associations among the predictor and outcome variables were examined and are presented in Table 1. Each of the predictors was related to siblings' emotional and behavioral difficulties (SDQ) and post-traumatic stress symptoms (IES). Among the variables, trauma severity was associated with negative attributions indicating that siblings of children with severe injuries had higher negative composite scores than their counterparts in the mild injuries group. Also, positive and negative attributions were negatively

correlated in the expected direction. Gender was not associated with positive and negative attributions or with injury severity. Moderate positive correlations were also found between SDQ and IES.

Table 1. Inter-correlations of Predictor Variables and Outcome Measures

Variables	1	2	3	4	5	6
1) Injury severity	-					
2) Child's gender	-.09	-				
3) Positive attributions	-.06	-.02	-			
4) Negative attributions	.11*	-.08	-.31***	-		
5) Emotional and behavioral difficulties (SDQ)	.16**	-.16**	-.26***	.27**	-	
6) Post-traumatic symptoms (IES)	.21***	-.08	-.13**	-.26***	.32***	-

*Indicates $p < 0.05$; **Indicates $p < 0.001$; *** Indicates $p < 0.0001$

Note: Gender is coded: Male =1; Female =0. Injury severity is coded: Severe =1; Mild =0.

Prediction of Behavioral and Emotional Difficulties and Post-traumatic Stress Symptoms

Separate stepwise regression analysis was employed to assess the contribution of injury severity, gender and attributional variables (negative and positive) to total SDQ and IES. The standardized beta weights and amounts of explained variance from the two analyses are presented Table 2. The results indicated that 14.9 % of the variance in SDQ and 10.6 % of the variance in IES could be predicted by the variables assessed. The models were statistically significant, F 's (4,391) = 16.87 and 11.60, p 's < 0.0001, for SDQ and IES, respectively. All the predictors in the SDQ model were significant predictors. Siblings of children with severe injuries who acquired a permanent disability reported higher levels of emotional and behavioral problems than did siblings of children with mild injuries. Females reported higher levels of SDQ than did males. Also the results indicated that positive and negative attributions were significant predictors of SDQ in siblings of children who sustained war -related injuries. Siblings, who reported lower positive composite score and higher negative composite score, had more SDQ problems. Among all the predictors in the IES model injury severity and negative attributions were the only significant predictors. Siblings of children who acquired a permanent disability reported higher levels of intrusive and avoidance thoughts than did siblings of children with mild injuries. Also, siblings with higher negative composite scores reported more IES problems.

Table 2. Prediction of children's SDQ and IES levels from injury severity, gender and attribution variables.

	SDQ				IES			
	beta	R^2	t	p	beta	R^2	t	p
Injury severity	.116		2.44	.01	.180		3.73	.0001
Gender	-.141		-2.97	.003	-.31		-.05	.28
Positive Attribution	-.203		-4.10	.0001	-.05		-1.03	.30
Negative Attribution	.189		3.79	.0001	.22		4.34	.0001
Model		.149				.106		.0001

Injury Severity and Gender

Separate 2 (group : severe injury, mild injury) x 2 (gender : male, female) multivariate analysis of variance (MANOVA) was carried out to investigate the impact of injury severity, and gender on the various SDQ sub-scales including conduct problems, hyperactivity/ inattention, emotional symptoms, peer problems and pro-social behaviors and the two sub-scales of IES: trauma-related intrusion and avoidance respectively. The results yielded significant multivariate effects (using Wilk's Lambda) for group $F(5, 391) = 2.21$, $p < .05$ with a small effect size ($\eta_p^2 = .028$) and gender $F(5, 391) = 12.92$, $p < .0001$ with a medium effect size ($\eta_p^2 = .143$) on the SDQ sub-scales scores. Univariate results for the SDQ sub-scales revealed significant group effects with a small effect sizes for emotional symptoms ($F(1, 393) = 5.67$, $p < .01$, $\eta_p^2 = .014$); conduct problems ($F(1, 393) = 6.75$, $p < .01$, $\eta_p^2 = .017$); and pro-social behavior ($F(1, 393) = 5.54$, $p < .01$, $\eta_p^2 = .014$) with siblings of children with severe injuries experiencing more emotional symptoms, and conduct problems than siblings of children with mild injuries whereas siblings of children with mild injuries reported more pro-social

behaviors than siblings of children with severe injuries .No significant differences were found between the groups on inattention and hyperactivity and peer problems sub-scales (see Table 3). Also, univariate results for the SDQ sub-scales revealed significant main effects for gender with a small effect on emotional symptoms $F(1, 393) = 6.06, p < .01, \eta_p^2 = .015$; inattention and hyperactivity ($F(1, 393) = 13.94, p < .0001, \eta_p^2 = .035$); peer problems ($F(1, 393) = 6.11, p < .01, \eta_p^2 = .015$); and pro-social behavior

($F(1, 393) = 39.55, p < .0001, \eta_p^2 = .092$) with females experiencing more inattention and hyperactivity, emotional symptoms, and peer problems than males whereas males reported more prosocial behavior than did females .No significant differences were found between males and females on conduct problems (see Table 3).

As for post-traumatic stress symptoms, the results yielded significant multivariate effects (using Wilk's Lambda) for group $F(2, 397) = 8.52, p < .0001$ with a small effect ($\eta_p^2 = .041$) on the IES sub-scales. However, the results revealed no significant effects for gender $F(2, 397) = 1.64, p < .19$. Univariate findings for the IES measures revealed significant group effects for intrusive thoughts $F(1, 399) = 11.54, p < .001$; and avoidance $F(1, 399) = 16.27, p < .01$ with small effect sizes ($\eta_p^2 = .028$ and 0.039 respectively). Siblings of children with severe injuries experienced more intrusive thoughts and avoidance than siblings of children with mild injuries (see Table 3).

Table 3. Means and Standard Deviations of Gender and Group by SDQ and IES subscales

Variable	Gender				Group			
	Male		Female		Severe Injury		Mild Injury	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SDQ								
Conduct problems	2.78	2.19	2.80	2.20	3.07	2.25	2.49	2.09
Hyperactivity/ inattention	3.12	1.90	3.86	1.86	3.65	1.90	3.35	1.90
Emotional symptoms	3.44	2.26	4.04	2.10	4.05	2.13	3.45	2.23
Peer problems	3.25	1.99	3.77	1.70	3.70	1.80	3.35	1.92
Prosocial behaviors	8.01	2.13	6.68	2.01	7.00	2.26	7.62	2.05
IES								
Intrusion	11.18	8.29	12.92	7.77	13.55	7.76	10.75	8.15
Avoidance	13.94	9.32	14.93	8.10	16.25	7.98	12.73	9.07

Discussion

The substantial prevalence of behavioral and emotional difficulties and post-traumatic stress symptoms in this study is consistent with other studies of children in war zones (Bourdon , Goodman, Rae , Simpson, Koretz, 2005 ; Goodman, 1997; Malmquist, 1986; Mellor, 2005; Khamis, 2005,2008; Yule& Udwin, 1991) . The current study represents an important step in identifying reliable predictors of behavioral and emotional difficulties and post-traumatic stress symptoms in siblings of children with war related injuries. The results show that the severity of injury was a significant predictor of various psychological and behavioral problems. While siblings of children with severe injuries reported higher levels of post-traumatic stress symptoms and behavioral and emotional difficulties including emotional symptoms, and conduct problems, siblings of children with mild injuries reported more pro-social behaviors. These results are consistent with some previous findings (Newman, Black, & Harris-Hendriks, 1997). Perhaps the presence of the child with severe injury in the family engenders stress and as a result siblings become unable to cope with changes in family circumstances and manage the hardships and difficulties of transitions and crises. Another alternative explanation would suggest that the observed response differences in behavioral and emotional difficulties and post-traumatic symptoms between siblings of children with mild injuries and siblings of children with severe injuries may result from the later group having utilized a negative attributional style and therefore cannot evaluate the family circumstances posed by the war injury and cope with it. It is noteworthy to mention that the results indicated that siblings of children with severe injuries utilized a negative attributional style to a greater extent than did siblings of children with mild injuries. Therefore the impact of the injury severity in this study must be considered within siblings' attributional style. Also, previous studies on the injured of the *intifada* indicated that the severity and visibility of an injury intensifies the process of assimilating the trauma by increasing negative self concept, frustration, concern about stigma and passing, and feelings of

being disapproved of by others (Khamis, 1993a). Conversely, siblings of children with severe injuries that acquired a disability may endure stigma by association (Byrne, 2000; Gray, 2008). The nature of encounters experienced by these siblings is illustrated in Burke (2004), who showed how a number of siblings perceive themselves as disabled simply by being a member of a family who has a child with disability (Burke, 2010). It is noteworthy, however, that the context in which an injury is seen assumes special significance because the negative label associated with an injury seemed to fade to relative insignificance when it represents heroism and patriotism (Khamis, 1993a). Other feelings or experiences may be unique to siblings of children with severe war-related injuries such as the additional burden of shared care by siblings (Burke, 2010), the experience of severe disruption following the injury (Khamis, 1993 a), disrupted schedules, separation from parents, altered living arrangements, and changes in parenting behavior all compound the stress of siblings to heighten distress (Cozza et al., 2010).

In this study, females reported more, emotional symptoms, peer problems, inattention and hyperactivity, and emotional and behavioral problems than did males whereas males reported more prosocial behavior than did females. Previous research results yielded a relatively similar conclusion suggesting that girls may be more affected (Slone & Schechner, 2009). Furthermore, the differential response between males and females reinforces the case that emotional and behavioral difficulties are certainly associated with gender, with females experiencing more emotional symptoms than males (Muris, Meesters, & van den Berg, 2003; Vigil, Geary, Granger, & Flinn, 2010). Although, the results are not in line with previous studies that indicated that inattention and hyperactivity, peer problems, and total difficulties were more exhibited by males rather than females (Clarbour & Roger, 2004; Muris et al., 2003), the findings may be at least partially accounted for by the predominantly male culture of the Palestinian society where girls usually shoulder most of the responsibilities and duties. Also, when interpreting this result, it is important to bear in mind that females' position in the Palestinian family is less favorable since they carry a greater burden of demands and limitations compared to males (Khamis, 2000 a, b), which in turn may have contributed to emotional and behavioral difficulties. Other possible explanations for gender differences in emotional and behavioral problems include the willingness of girls to express feelings more than boys (Kleinke, Staneski, & Mason, 1982; Tolin & Foa, 2006). However, young females generally report or disclose more symptoms of distress, regardless of whether they have experienced trauma (Crick & Zahn-Waxler, 2003). Consistent with previous findings (Thompson et al., 1998), the results showed no significant differences in attributional analysis used by girls and boys. This would indicate that although both groups used the same attributional strategies, for females these attributional styles were not sufficient to overcome the traumatic event and most probably the demands placed upon them in their family life. While the absence of gender differences on post-traumatic stress symptoms was inconsistent with previous studies (Dyregrov, Gupta, Gjestad, & Mukanoheli, 2000), it was consistent with other studies on children exposed to warfare (Dyregrov, Gjestad, & Raundalen, 2002). It seemed that the injury itself was so intensely powerful that the gender variable was overshadowed (Khamis, 1993 a).

Children causal attribution is an important aspect of disaster response (Joseph, Yule & Williams, 1993). Consistent with previous findings, the results revealed that siblings with more maladaptive attributional styles (i.e., negative attribution) reported more emotional and behavioral problems as well as symptoms of post-traumatic stress (Thompson et al., 1998; Weiner, 1986). Recently, researchers have argued that emotionally distressed individuals are more likely than non-distressed individuals to perceive events as stressful (Miller & Rasmussen, 2010; Neuner, 2010).

Conclusion

The results of this study contribute to the growing literature highlighting the adverse effects of children's war related injuries on their siblings. The conditions of having a sibling with severe injury, being a female, and having a negative attribution style appear to be a heightened vulnerability that increased the risk for higher rates of post-traumatic stress symptoms and behavioral and emotional difficulties.

Studies of siblings' responses to their brother or sister war injuries provide a window to understand traumatic stress after events that are indirectly experienced in contrast with directly experienced events (Khamis 1993 a, b, 2008). Greater understanding of the impact of children's war-related injuries on siblings is required to better inform effective prevention approaches. As with any study, these results must be considered in the context of its limitations. First, the cross-sectional design leaves the findings open to questions concerning the potential effects of retrospective self report bias. Second, any generalization of the results of the study may be limited by the fact that the sample comprised only those who were listed by the Palestinian National Authority and could not include cases of injuries not reported. Third, all measures were obtained from children's own reports. External informants such as parents and teachers confirming what children say would lend more validity to the findings. Fourth, it

would be important to recognize the need to explore additional areas that are not tapped by this study such as other types of traumas and daily stressors encountered by siblings, family environment and ways of coping (Miller & Rasmussen, 2010; Neuner, 2010).

The results of the study also bear practical clinical implications. Given the apparent empirical outcome of the severity of injury, gender and attributional style revealed by this study, techniques for strengthening coping abilities designed to enhance cognitive control might have to be worked through females and siblings of children with severe injuries who sustained disabilities. The associations between maladaptive attributional styles and emotional and behavioral problems and posttraumatic stress symptoms make it likely that cognitive interventions such as trauma-focused cognitive behaviour therapy (CBT) may incur positive results (Cohen, Mannarino, Berliner, & Deblinger, 2000; Khamis, 2008). Further studies are called for to expand the currently meager understanding of how siblings' attributions relate to the treatment of behavioral and emotional problems and posttraumatic symptomatology.

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