
Brief Report

Psychosocial Correlates of Fire Disaster Among Children and Adolescents

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This study examined the extent of children's and adolescents' psychosocial maladjustment associated with a natural disaster, namely, wildfire. The course of psychopathology was assessed six weeks after a major wildfire destroyed 420 homes. Victims' functioning relative to a comparison group from the same community, matched for age, gender, socioeconomic status, and fire insurance was examined. The major goal of this study was to assess systematically the short-term mental health consequences of a wildfire disaster among children and adolescents. This goal was achieved through the use of standardized assessment procedures. The results of this study add useful information to the literature concerning the impact of disaster among children and adolescents and provide a methodological framework for future efforts in this area.

KEY WORDS: fire; child; adolescent; disaster; post-traumatic stress disorder.

INTRODUCTION

While the impact of disaster on children's psychological functioning has been addressed, much ambiguity and speculation remain concerning the nature and degree of resulting trauma. This pilot investigation assessed the consequences of wildfire among children and adolescents and addressed several shortcomings which have plagued both child- and adult-focused disaster studies. The lack of standardized assessment batteries and clinical interviews is a major problem in the field (Green *et al.*, 1991). So too is the reliance on adults to report children's reactions to disaster. In many instances, degree of distress experienced by children is underestimated by

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adults (Earls *et al.*, 1988; McFarlane, 1987). This attests to the necessity of assessing child victims themselves.

A common threat to findings from traumatic events is lack of attempts to account for preexisting psychopathology. Given that children with preexisting psychiatric disorders are vulnerable to the development of other psychiatric symptoms (Earls *et al.*, 1988), assessment which taps previous and/or present psychopathology is essential. Matched control groups provide one step toward achieving the goal of well-controlled research in the disaster area. The benefit of control groups is documented (Aptekar and Boore, 1990; Rubonis and Bickman, 1991) and makes a compelling case for their inclusion. Relatively little attention has focused on the impact of fire (Jones and Haney, 1984; Jones and Ribbe, 1991); given the devastating consequences of fires, research of this nature is warranted.

METHODS

Subjects

Individual interviews, six weeks after a large-scale wildfire which destroyed 420 homes in a southern California city, were carried out with victims, i.e., those whose homes had sustained significant damage or total destruction, and control subjects with compatible demographic variables whose homes did not burn. Most participants were of middle class status. There were 23 children and adolescents in the victim group ranging in age from 7 to 18 years of age, with a mean age of 11.4 years. Seven were male, and 16 were female. There were 17 whites, 2 African-Americans, and 4 Mexican-Americans. Ten subjects from 7 to 13 years of age (mean age, 10.1 years) made up the control group. Five were male, and five were female. Two children were African-American, four were Mexican-American, and four were white.

Procedures

Using a multi-method strategy, the following portions of a structured diagnostic interview, the Diagnostic Interview for Children and Adolescents-Revised (DICA-R; Reich and Welner, 1990), were used: past major affective disorder (Past MAD), present major affective disorder (Present MAD), conduct disorder (CD), oppositional defiant disorder (ODD), over-anxious disorder (OAD), and post-traumatic stress disorder (PTSD). The Horowitz Impact of Event Scale (HIES; Horowitz *et al.*, 1979) and the Fire

Questionnaire-Child Form (FQ-C; Jones and Ribbe, 1990) were also employed.

RESULTS

Due to the lack of adolescent control subjects ($N = 1$) and age differences on number of DICA-R symptoms, child and adolescent data were combined. The victim vs nonvictim groups did not differ on any demographic characteristics. Within a series of univariate analyses of variance (ANOVAs) across the two groups, differences were found to be nonsignificant ($p > .05$) for the number of symptoms reported on ODD, CD, OAD, past MAD, or present MAD as well as symptoms endorsed for PTSD, $F(1, 31) = 0.04, p = .84$. There was, however, a significant difference in PTSD criteria met, $F(1, 31) = 5.44, p = .03$. Victims met an average of 2.8 out of 5 PTSD criteria compared to an average of 1.6 criteria met by controls. Of the 23 victims, an 8-year-old female and a 7-year-old male met the criteria for diagnosable PTSD, while 1 of 10 controls, a 15-year-old girl, met criteria.

A two-way factorial MANOVA using intrusion and avoidance HIES subscale scores with group and gender as the independent variables revealed a significant main effect for group, $F(2, 28) = 3.39, p = .048$. A two-way factorial ANOVA performed on the HIES subscales using the model described above revealed a significant main effect for group, $F(1, 29) = 5.96, p = .02$ on the avoidance subscale (see Table I).

Concerning preexisting psychiatric disorders, the DICA-R revealed that three children met diagnostic criteria for overanxious disorder, one met criteria for previous PTSD. Two adolescents met diagnostic criteria for oppositional defiant disorder, while one met criteria for conduct disorder as well. An additional adolescent met criteria for conduct disorder

Table I. Means and Standard Deviations of One-Month Post-Disaster HIES

Subscale	Subscales: Victims vs Controls			
	Group ^a	N	X	SD
Intrusion	1	23	15.1	6.6
	2	10	11.6	8.7
Avoidance	1	23	20.3	9.2
	2	10	10.4	11.1
Total	1	23	35.3	14.3
	2	10	22.0	19.1

^aGroup 1 = Victim; Group 2 = Control.

alone, and the fourth adolescent met criteria for overanxious disorder. There were no differences across the victim and nonvictim groups regarding preexisting psychiatric disorders.

The FQ-C revealed that while some subjects had experienced a number of stressful life events including earthquake, other fire, etc., there were no significant differences across subjects who had or had not experienced such stressors.

DISCUSSION

Consistent with earlier studies, varying degrees of psychosocial distress do indeed result from fire disaster (Maida *et al.*, 1989; McFarlane, 1987). While the sample size was quite small, our results parallel other disaster-related research (Earls *et al.*, 1988; Green *et al.*, 1991).

A primary outcome was the relatively comparable levels of PTSD symptoms on the DICA-R endorsed by both victim (4.4 symptoms) and control (4.1 symptoms) groups, similar to that obtained by Jones and Ribbe (1991). While these results may seem counterintuitive, upon closer examination they may be quite reasonable. Several researchers have provided heuristic frameworks in which these findings might be interpreted. One framework concerns degree of exposure to the event which has correlated with individuals' reactions to trauma. Given that most residents in this study were highly aware of the wildfire, it is likely that all were affected. While we contend that victims may have experienced a greater level of trauma, we also maintain that all residents were negatively affected to some degree by the fire. A more parsimonious explanation for the lack of difference may have been small sample sizes in each group.

Failure to find differences between groups on number of avoidance symptoms reported on the DICA-R compared to differences on HIES highlights the need for further attention to assessment issues. A plausible explanation is that the HIES and DICA measure different aspects of the construct of avoidance given that the avoidance construct assessed with the HIES is based on pre-DSM-III notions of trauma-related avoidance or "numbing-of-responsiveness-to-the-external world" symptoms (Brett *et al.*, 1988) while symptoms assessed with the DICA-R are based on DSM-III-R PTSD classification. Victims and controls differed in their efforts to avoid thoughts and feelings associated with the disaster as measured by the HIES, with the victims showing more avoidance; but in the broader conceptualization of avoidance symptomatology reflected in the DICA-R, the differences between groups were statistically insignificant.

Differences in the HIES and DICA-R were also found in the magnitude of the symptoms reported. Both victim and control subjects scored in the "high" range on total HIES score. No such cutoff categories have been reported for PTSD symptoms endorsed, but it seems that both groups reported fewer symptoms on the DICA-R. It is clear that the HIES assesses the intensity of some aspects of PTSD symptomatology, whereas the DICA-R primarily assesses the presence or absence of PTSD symptoms, representing two modes of assessing PTSD. While the meaning of these discrepant findings is not totally clear, it underscores the necessity of closely examining differences and similarities of instruments hypothesized to assess symptoms of the stress response.

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