Issues in Mental Health Nursing, 31:470–476, 2010

ISSN: 0161-2840 print / 1096-4673 online
DOI: 10.3109/01612840903582528

informa
healthcare

Developmental Differences in Children's and Adolescents' Post-Disaster Reactions

Aysun Dogan-Ates, PhD
EGE University, Izmir, Turkey

Disaster literature suggests that children's and adolescents' post-disaster reactions vary according to their developmental levels. Preschool children show less psychological problems as compared to older children and adolescents, but they have a higher incidence of trauma-specific fears and behavioral problems (e.g., dependency, clinging). School-age children's disaster responses include sleep and eating disturbances, behavioral problems, and poor school performance. Adolescents tend to exhibit symptoms such as posttraumatic stress disorder, depression, anxiety, belligerence, and pessimistic views about the future (Korol, Green, & Gleser, 1999).

Literature suggests that children and adolescent victims of natural (e.g., earthquake, flood) and manmade (e.g., accidents, war) disasters often exhibit a wide range of psychological problems. Earlier research has examined general disruptions in children's daily functioning (Galante & Foa, 1986; McFarlane, 1987) whereas more recent studies focused on various types of problems, including posttraumatic stress disorder (PTSD), anxiety, depression, and disturbances in sleep, eating patterns, and life satisfaction (Houlihan, Ries, Polusny & Hanson, 2008; Roussos et al., 2005).

Although most child and adolescent disaster victims exhibit some kind of post-disaster reactions, clinical research suggests that the symptoms vary with age. Indeed, a number of studies have proposed that age is a key factor in understanding children's reactions to a disaster. Age, as an index of developmental skills, reflects differences in children's abilities to comprehend the nature of traumatic events and their own involvement in them (Vogel & Vernberg, 1993). According to Eth and Pynoos' (1985) developmental perspective, the child's symptom manifestation and his or her coping strategies may vary with age; the child's developmental level can interact either to improve or impair his or her post-disaster adaptation; and the traumatic event interacts with age-appropriate salient developmental tasks. Overall, this model highlights the importance of developmental levels when examining child's posttraumatic reactions.

Address correspondence to Aysun Dogan-Ates, EGE University, Psychology Department, Izmir, Bornovo, 35040 Izmir, Turkey. E-mail: aysun.dogan@ege.edu.tr

This paper describes post-disaster reactions of preschoolers, school-age children, and adolescents by presenting findings from empirical studies.

POST-DISASTER REACTIONS OF PRESCHOOLERS

Preschoolers are an understudied group in the disaster literature. Limited research findings suggest that preschoolers show less psychological distress and fewer cognitive problems compared to older children (Salmon & Bryant, 2002). However, they tend to show high incidence of generalized or specific fears, loss of language skills, behavior problems (e.g., temper tantrums, aggression), dependency, separation anxiety, irritability, nightmares, posttraumatic play, behavioral re-enactments, and specific regressive behaviors (e.g., thumb sucking, bed wetting, enuresis, tics) (Baggerly & Exum, 2008; Coffman, 1998; Corrarino, 2008; Dyregrov & Yule, 2006; Starr, 2002).

Previous research has indicated the presence of high levels of both trauma specific and generalized fears among preschoolers following a traumatic event. For instance, after the 1989 Loma Prieta earthquake, children exhibited fears of sudden noises such as when loud trucks passed by their homes (Ponton & Bryant, 1991). Preschool children who were exposed to an Illinois tornado in 1982 reportedly exhibited high levels of storm related fears (88%), fears of being alone (67%), and of darkness and accidents (56%) (Seroka, Knapp, Knight, Siemon, & Starbuck, 1986).

Saylor, Swenson, and Powell (1992) conducted one of the most detailed and systematic series of studies that investigated the post-disaster reactions of preschoolers. Eight weeks after a major hurricane in South Carolina, 238 families were surveyed, providing information about 278 children. According to parental reports, many children had new or unusual fears (e.g., mild fears of storms and water) since the hurricane. Some children even refused to take baths because of fear of water. Moreover, personification of Hurricane Hugo in play and conversation was a common reaction among children. A parent of a two and a half year old girl reported that her daughter believed "Hugo was a real person—a very bad [person] who destroyed everything and then died" (Saylor et al., 1992, p.144).

Using the same group of children, Sullivan, Saylor, and Foster (1991) concluded that parents reported a significant increase in the number and severity of children's behavior problems as compared to their behaviors prior to the hurricane. Sleeping problems, dependent behavior, frustration, temper tantrums, and whining were the most frequently reported problems. Parents also informed a variety of nervous behaviours, including twisting hair and biting fingernails. In order to assess the long-term effects of the hurricane, parents of 161 preschool children were re-evaluated 14 months after the hurricane (i.e., one year after the original data collection) (Swenson, Saylor, Powell, Stokes, Foster, & Belter, 1996). In this study, a control group was included, consisting of 170 children from Boston and Utah who had not been exposed to natural disasters. Findings indicated that 9% of the children continued to play hurricane games, while 14% showed fear of storms or reminders of the hurricane. Further, hurricane survivors showed significantly greater behavioral problems than did their peers in the control group.

With respect to dependent behavior, preschoolers increased their dependency needs as exemplified by clinging to parents, wanting to remain close to home, and asking to sleep with parents (Pynoos et al., 1993). Clingy behaviors and separation difficulties were reported by approximately 70% of the parents following the Loma Prieta earthquake (Ponton & Bryant, 1991). Sleep disturbances and nightmares (e.g., imaginary creatures such as monsters, witches) are another common reaction of preschool children (Proctor et al., 2007).

Additionally, young children often engage in reenactment through posttraumatic play (Davis & Siegel, 2000). According to Brooks and Siegel (1996), young children engage in posttraumatic play in which they may play the same scene over and over again because they don't have enough vocabulary to express their feelings. Some children also personify the disaster event itself. For example, young victims of Hurricane Andrew often referred to it as "one-eyed Andrew who was a monster." Findings also suggest that younger children are particularly vulnerable to the disruption of their lives. Because they have the most limited repertoire of coping strategies, they are often influenced by the reactions of their parents and other family members (Turkel & Eth, 1990).

In summary, major findings of preschoolers who exposed to natural disasters indicate marked increase in heightened trauma specific or generalized fear reactions, developmentally regressive behaviors, and a reflection of disaster experience in their play. In those instances when a control group was used, there is evidence of greater behavior problems (e.g., temper tantrums, whining) for disaster-exposed children.

POST-DISASTER REACTIONS OF SCHOOL-AGE CHILDREN

There is a greater amount of empirical research that includes school-age children compared to other age groups in the disaster literature. In general, results have revealed that school-age children show more overall psychological distress and posttraumatic stress symptoms than preschoolers, but less than adolescents.

There is a breadth of literature focusing on school-age children's various post-disaster reactions. For example, Dollinger, O'Donnell, and Staley (1984) interviewed 29 children (aged 10–12) and their mothers after a lightning strike disaster. Results showed that both children and their parents reported higher levels of lightning specific fears than an untraumatized control group. As expected, children reported fears of storm, animals, noises, death, enclosed spaces, and separation from parents. In a follow up study, Dollinger (1986) found that children's sleep disturbances (e.g., difficulty going to sleep or sleeping well) and somatic complaints (e.g., muscle aches and pains, diarrhea) were significantly correlated with their fears of storm and death. Moreover, Galante and Foa (1986) surveyed 300 Italian elementary school children six months after an earthquake. Children reported various real and fantastic fears, and they had fears of recurrence around the anniversary.

School-age children may also show decline in school performance following a disaster. Specifically, post-disaster disruption and discontinuity in living conditions and schooling may result in school problems. Children's disinterest with school activities and somatic problems (e.g., headaches) may affect their school attendance (Gurwitch et al., 2004). For example, McFarlane, Policansky, and Irwin (1987) found that children exposed to a wildfire reported a decrease in their school performance and an increase in their school absenteeism. Moreover, according to Ollendick and Hoffman (1982), 11% of the children exposed to a severe thunderstorm displayed temporary school difficulties while 9% were reported to have continuing school problems. Additionally, Shannon, Lonigan, Finch, and Taylor's (1994) analysis of children's pre- and post-disaster academic functioning three months after Hurricane Hugo revealed that children who reported more severe posttraumatic symptoms had a greater decline in their academic performance than those with fewer symptoms.

In addition, PTSD symptoms were commonly reported by school-age children. For example, when children re-experience the event, which is a central phenomenon to PTSD, they imagine recurrent thoughts, images, and sounds; experience traumatic dreams; and exhibit distress to reminders of the event (e.g., during the anniversary of the disaster). Another element is avoidance of trauma related events and numbing. For example, children intentionally try to avoid thoughts and feelings of the event; exhibit a reduction of interest in and less enjoyment of normal activities; report greater feelings of estrangement from others and restricted emotional range. When children are in an increased state of arousal, they experience sleep disturbances, become more irritable and aggressive, and remain on alert (i.e., hypervigilance) (Coffman, 1994; Pynoos, 1990).

Pynoos et al.'s (1987) study of the aftermath of a sniper attack was one of the first systematic and detailed studies that examined children's PTSD symptoms. In 1984, a sniper opened fire

on a crowded elementary school playground in South Central Los Angeles. During the attack, one child and a passerby were killed and 13 children were injured. One month after the event, they interviewed 159 children, ranging in age from 5 to 13 years, who had varying degrees of exposure to the violence. Findings showed that, overall, 38% of the children had either moderate or severe PTSD symptoms after the event, 22% reported mild and 40% reported no symptoms. As exposure increased so did the number of reported posttraumatic symptoms. In fact, of those children in the playground, 77% had moderate to severe levels of PTSD symptoms compared to those who were at school (67%) and at home (26%). At 14-month follow-up, Nader, Pynoos, Fairbanks, and Frederick (1990) re-interviewed 100 of the original 159 children. Despite the findings that PTSD symptoms decreased over time for all groups, 74% of the children ($n = 19$) in the playground continued to report moderate to severe levels of PTSD.

Shaw, Applegate, Tanner, Perez, and Rothe (1995) investigated the prevalence and the progression of PTSD symptoms in 144 elementary school children (aged 6–11) two months after Hurricane Hugo. Two groups of children, HI (i.e., in the pathway of hurricane) and LI (i.e., comparison group) were examined. Findings indicated that 87% of children in the HI group, and 80% of those in the LI group endorsed at least moderate levels of PTSD symptomatology. Even though children in the HI group tended to have more severe PTSD symptoms, there were no significant differences between the two groups. At eight months, three quarters of the children in the HI group ($n = 47$) were re-examined. There was a significant change in PTSD symptomatology, suggesting gradual recovery; however 89% of the students were still in the moderate to very severe category. At a 21-month follow-up, 30 children were surveyed (Shaw, Applegate, & Schorr, 1996). Findings indicate that 70% of the children still endorsed moderate to severe PTSD symptoms.

In another Hurricane study, Vernberg, La Greca, Silverman, and Prinstein (1996) investigated the emergence of PTSD symptoms in 568 school-age children three months after Hurricane Andrew. Results indicated that the vast majority of children (86%) reported at least mild levels of PTSD symptoms. Of these children, 30% reported severe to very severe levels of symptoms. In a follow-up study, La Greca, Silverman, Vernberg, and Prinstein (1996) reevaluated 442 of these children seven (Time 2) and ten months (Time 3) following the hurricane. Although children's PTSD symptoms declined over time, some children continued to report severe or very severe levels of PTSD symptoms at Time 2 (18%) and Time 3 (13%).

In addition, Kolaitis et al. (2003) studied a group of children (grades 4 thru 6) six months after the 1999 Greek earthquake. They found that 40% of the children showed severe to moderate PTSD symptoms such as experiencing the event as an extreme stressor, avoiding reminders, and having a fear of reoccurrence. Similar findings were obtained from the survivors of 2004 Tsunami in the Indian Ocean. Researchers investigated the PTSD symptoms of 246 children (ages 8 thru 14) living in three severely affected communities in Sri Lanka. Findings indicated that disaster related PTSD rates ranged between 14% and 39% among these children (Neuner, Schauer, Catani, Ruf, & Elbert, 2006).

In sum, school-age survivors of disasters exhibit high levels of fears and a wide range of somatic, cognitive, behavioral, and social problems. Cognitive problems include poor concentration, problems with reading and comprehension, and declining performance in school (Brown, 2005; Gurwitch et al., 2004). School problems emerge through behaviors such as refusal to attend school and inability to concentrate. Children's behavior may be inconsistent following the disaster, as they become irritable, rude, and emotionally sensitive. Therefore, their peer relationships may suffer as a result of inappropriate and aggressive behaviors. They may even experience a loss of social support networks (e.g., friends). Research also indicates that compared to preschoolers, school-age children exhibit more PTSD related symptoms (i.e., re-experiencing event, avoidance, hyperarousal) and a greater understanding of the traumatic experience (Silverman & La Greca, 2002).

POST-DISASTER REACTIONS OF ADOLESCENTS

As an age group, adolescents have rarely been studied in terms of their post-disaster responses. Adolescents have been considered more adult-like than child-like in their responses because they are considered to have more sophisticated cognitive appraisals of the disaster and its after-effects; thus, they display more understanding of the meaning of the trauma (Eth & Pynoos, 1985).

In contrast to younger children, adolescents exhibit a foreshortened future, negative expectations, and changed attitudes about career goals and marriage. In fact, some adolescents may not plan far ahead since they have lost trust in long-term planning (Barnard, Morland, & Nagy, 1999). When Terr (1983) reexamined victims of the Chowchilla school bus kidnapping four years after the event, the teenagers reported pessimism or foreshortened future. For instance, some expected an unusually short life span and some were unable to envision marriage and children. Moreover, adolescent victims of the 1999 Marmara earthquake showed a greater number of concerns and worries regarding their future when compared to unexposed control group (Dogan-Ates & Camparo, 2004)

Several studies suggest that teenagers also show depression, belligerence, and anxiety following a disaster. In a large study of the Buffalo Creek dam collapse, Gleser, Green, and Winget (1981) found that adolescents (ages 12–15) exhibited greater symptoms of depression and belligerence than the younger age groups (aged 2–7 and 8–11 years). More specifically, overall, 39% of the adolescents displayed symptoms that led to a rating of moderate to severe depression as compared to 32% of the school age and 14% of the preschool group. Goenjian et al.'s (1995) study supports these findings, indicating that a high level of depression was prevalent among earthquake survivors one

and a half years after the Armenian earthquake. Similarly, Eksi et al. (2007) found that 31% of adolescents showed depressive symptoms following the 1999 Marmara earthquake in Turkey. With regards to anxiety, Yule (1992) examined 334 adolescents five to nine months following the horrifying ship sinking disaster in 1988. A control group consisted of 71 adolescent girls who were unaffected by the disaster. Findings indicated that girls who survived the ship sinking disaster showed higher scores on anxiety measures than did the control group. Lastly, Kar and Bastia (2006) examined adolescents exposed to a super-cyclone in India. They found that there are high comorbidity rates among PTSD, depression, and anxiety symptoms of adolescents. For example, 35% of the adolescents had both PTSD and depression symptoms and 28% of them had both PTSD and anxiety symptoms.

PTSD has been considered as an important type of post-disaster response among adolescents and accordingly has been examined in several disaster studies. Pynoos and colleagues (1993) evaluated 231 children and adolescents 18 months after the Armenian earthquake. Findings indicated a clear dose of exposure with the children closest to the epicenter reporting higher PTSD scores. Specifically, 92% of the children who were living in Spitak (i.e., closest city to the epicenter) experienced severe to very severe levels of PTSD compared to 68% of those from Gumri (i.e., 20 miles away) and 24% of those from Yerevan (i.e., 47 miles away). Similarly, two and a half years after the earthquake Najarian, Goenjian, Pelcovitz, Mandel, and Najarian (1996) investigated three groups of adolescents: (a) high exposure to the earthquake and remained in the earthquake city ($n = 24$), (b) high exposure to the earthquake but relocated to another city ($n = 25$), and (c) a nonexposed control group ($n = 25$). There were higher rates of PTSD, depression, and behavior problems for both earthquake-exposed groups as compared to the control group.

In addition, Garrison et al. (1995) studied the prevalence of PTSD in a group of adolescents six months following Hurricane Andrew. Data were collected via 40-minute telephone interviews from 400 adolescent-parent pairs. Interviews focused on emotional reactions, disaster related losses, recent stressful events, and psychiatric symptomatology. Results indicated that 7% of the adolescents reported symptoms consistent with a diagnosis of PTSD. In another hurricane study, Goenjian et al. (2001) studied the posttraumatic stress symptoms of 158 Nicaraguan adolescents following Hurricane Mitch. Findings showed that 90% of the adolescents in Posoltega (the most affected area), 55% in Chinandega (moderately affected area), and 14% in Leon (the least affected area) showed PTSD symptoms indicating the importance of impact level. Finally, findings from the 2004 tsunami disaster in India indicated that 72% of the younger adolescents (ages 12–14) and 79% of the older adolescents (ages 15–18) reported PTSD symptoms (John, Russell, & Russell, 2007).

Adolescents may exhibit confrontational acts and lack of affection as well as antisocial behaviors such as truancy, drug/alcohol use, and premature sexual activity, as a form of trauma reenactment (Gaffney, 2006). Involvement in these kinds of risk-taking behaviors can be life threatening and have adverse consequences to adolescents' social life, education, and interpersonal relationships. Peer relations, an important source of social support for adolescents, are likely to be negatively affected. Thus, the disturbance in peer relations or peer rejection is an important risk factor for the adjustment of an adolescent during the post-disaster period (Pynoos, Steinberg, & Wraith, 1995). In turn, the disruption of peer contacts can be associated with increased posttraumatic stress symptoms including a reduction of interest in daily activities and a tendency to stay home (Pynoos & Nader, 1990). All of this can be compounded when adolescents experience a temporary or permanent relocation of residence that interrupts peer relations.

In sum, adolescents may appear to be comparatively self-sufficient and less vulnerable to further trauma after disaster due to being physically and psychologically more capable than younger children. However, they may experience an additional emotional disturbance with the loss of community, home, friends, possessions, and displacement from home or geographic relocation. All of these issues contribute to the adolescents' emotional response and may interfere with their normal developmental tasks (Sugar, 1999).

SUMMARY

Current disaster literature presents some overall trends regarding the developmental level of an individual. Preschool children exhibit higher levels of trauma-specific fears, regressive toileting habits, temper tantrums, crying, disobedience, and internalizing behaviors including dependency, separation anxiety, and social withdrawal. Findings suggest that parental reaction to a disaster is likely to predict preschool-age children's post-disaster symptoms. School-age children exhibit fears, somatic concerns (e.g., headaches, stomachaches), sleep problems, decreased school performance, and PTSD symptoms. Adolescents tend to show more adult-like PTSD symptoms as well as extreme behavior changes (e.g., withdrawn, rebellious), decreased energy, depression, increased anxiety, and belligerence. These findings indicate that the nature of the trauma response changes with age and that older children are expected to exhibit higher rates of PTSD symptoms (Green et al., 1991). Table 1 presents post-disaster responses sorted by broad age groupings. Differences found across age groups make sense developmentally; they reflect differential adaptation to adverse events as a function of developmental age and associated capabilities, and age-associated societal challenges.

Nurses, pediatricians, and psychologists are professionals who consistently work with child and adolescent victims of disasters. It is imperative that these professionals consider the developmental level of the child during mental health assessments and when developing interventions (Murray, 2006b). Nurses, especially, are in a unique position to assist parents in

TABLE 1
Age-Specific Reactions to Disasters/Traumatic Events

Preschoolers (Ages 2–5)
Somatic: sleep disturbances (e.g., recurring nightmares, night terrors, sleepwalking, refusing to sleep alone), eating problems, dizziness
Cognitive: magical explanations for the event, repeated retelling of the event, unpleasant memories of trauma, persistent fears
Emotional: crying, difficulty in identifying feelings, emotional upsets, excessive clinging, irritability, sadness, separation anxiety, stranger anxiety, trauma related and generalized fears
Behavioral: anxious behaviors (e.g., fingernail biting), posttraumatic play, regressive behaviors (e.g., bed wetting, thumb sucking), temper tantrums, hyperactivity
School-Age Children (Ages 6–11)
Somatic: loss of energy, physical complaints (e.g., headache, stomachache), sleep disturbances
Cognitive: believing in supernatural forces, distractibility, distortions about causes of disaster, intrusion of unwanted images, sounds, smells, and memories, poor concentration, poor school performance and grades, vulnerability to anniversary reactions
Emotional: anger, denial, expression of guilt over past activities, helplessness, loss of interest in pleasurable activities, moodiness, sadness, self-blame, tearfulness, trauma related and generalized fears, worry
Behavioral: startle response, aggressive behaviors (e.g., fighting), hyperactivity, hypervigilance, problems in peer relations, repeated retelling of trauma and trauma related play, social and emotional withdrawal
Adolescents (Ages 12–18)
Somatic: eating disturbances, loss of energy, physical complaints (e.g., headache, stomachache) sleep disturbances (e.g., insomnia)
Cognitive: attention and concentration problems, poor school performance, memory problems, recurrent intrusive visual images, thoughts, sounds, and smells
Emotional: anxiety, belligerence, denial, fear of growing up, grief reactions, guilt for being alive, shame, humiliation, depression, resentment, suicidal thoughts, wish for revenge, poor impulse control, rage, despair
Behavioral: startle response, acting-out behaviors, accident proneness, disruption of peer relations, premature entrance into adulthood, social withdrawal and isolation, deviance, delinquency, school refusal, lack of responsibility, loss of interest in pleasurable activities, alcohol/drug use
Self: sense of hopelessness, isolation, increased self-focusing and self-consciousness, loss of self-confidence, low self-esteem, negative self-image, personality changes, pessimistic world view, high level of worries and concerns about future, a sense of foreshortened future

Note. Adapted from Lystad, 1984; Miller, Kraus, Tatevosyan & Kamenchenko, 1993; Monahon, 1993; Murray, 2006a; Norris et al., 2002; Pynoos & Nader, 1993; Sugar, 1999; Zubenko, 2002.

recognizing children's normal responses to disasters, explain the impact of disasters in children and adolescents, and teach strategies to cope with post-disaster events (Gurwitch et al., 2004; Starr, 2002). In addition, nurses as well as other mental health professionals, take an active role in developing and implementing developmentally sensitive and culturally competent interventions for children and adolescents who have the misfortune to experience disasters around the world (Corrarino, 2008).

Declaration of interest: The author reports no conflicts of interest. The author alone is responsible for the content and writing of the paper.

REFERENCES

Baggerly, J., & Exum, H. A. (2008). Counseling children after natural disasters: Guidance for family therapists. *The American Journal of Family Therapy*, *36*, 79–93.

Barnard, P., Morland, I., & Nagy, J. (1999). *Children, bereavement, and trauma: Nurturing resilience*. Philadelphia: Jessica Kingsley Publishers.

Brooks, B., & Siegel, P. M. (1996). *The scared child*. New York: John Wiley and Sons.

Brown, E. J. (2005). Clinical characteristics and efficacious treatment of post traumatic stress disorder in children and adolescents. *Pediatric Annals*, *34*, 138–146.

Coffman, S. (1994). Children describe life after Hurricane Andrew. *Pediatric Nursing*, *20*, 363–370.

Coffman, S. (1998). Children's reactions to disaster. *Journal of Pediatric Nursing*, *13*, 376–382.

Corrarino, J. E. (2008). Disaster-related mental health needs of women and children. *The American Journal of Maternal Child Nursing*, *33*(4), 242–248.

Davis, L., & Siegel, L. J. (2000). Posttraumatic stress disorder in children and adolescents: A review and analysis. *Clinical Child and Family Psychology Review*, *3*(3), 135–153.

Dogan-Ates, A., & Camparo, L. (2004, March). Future orientation of adolescents following a major natural disaster: A developmental approach. Poster presented at the annual meeting of the Society for Research on Adolescence, Baltimore, MD.

Dollinger, S. J. (1986). The measurement of children's sleep disturbances and somatic complaints following a disaster. *Child Psychiatry and Human Development*, *16*, 148–153.

Dollinger, S. J., O'Donnell, J. P., & Staley, A. A. (1984). Effects on children's fears and worries. *Journal of Consulting and Clinical Psychology*, *52*, 1028–1038.

Dyregrov, A., & Yule, W. (2006). A review of PTSD in children. *Child and Adolescent Mental Health*, *11*(4), 176–184.

Eksi, A., Braun, K. L., Ertem-Vehid, H., Peykerli, G., Saydam, R., Toparlak, D., & Alyanak, B. (2007). Risk factors for the development of PTSD and depression among child and adolescent victims following a 7.4 magnitude earthquake. *International Journal of Psychiatry in Clinical Practice*, *11*(3), 190–199.

Eth, S., & Pynoos, R. S. (1985). *Post-traumatic stress disorder in children*. Washington, DC: American Psychiatric Press.

Gaffney, D. A. (2006). The aftermath of disaster: Children in crisis. *The Journal of Clinical Psychology: In Session*, *62*(8), 1001–1016.

Galante, R., & Foa, D. (1986). An epidemiological study of psychic trauma and treatment effectiveness for children after a natural disaster. *Journal of the American Academy of Child Psychiatry*, *25*(3), 357–363.

Garrison, C. Z., Bryant, E., Addy, C., Spurrier, P. G., Freedy, J. R., & Kilpatrick, D. (1995). Posttraumatic stress disorder in adolescents after Hurricane Andrew. *Journal of American Academy of Child and Adolescent Psychiatry*, *34*, 1193–1201.

Gleser, G. C., Green, B. L., & Winget, C. (1981). *Prolonged psychosocial effects of disaster: A study of Buffalo Creek*. New York: Academic.

Goenjian, A. K., Molina, L., Steinberg, A. M., Fairbanks, L. A., Alvarez, M. L., Goenjian, H. A., & Pynoos, R. S. (2001). Posttraumatic stress and depressive reactions among Nicaraguan adolescents after hurricane Mitch. *American Journal of Psychiatry*, *158*, 788–794.

Goenjian, A., Pynoos, R. S., Steinberg, A., Najarian, L., Asarnow, J. R., Karayan, I., Ghurabi, M., & Fairbanks, L. (1995). Psychiatric comorbidity in children after the 1988 earthquake in Armenia. *Journal of American Academy of Child and Adolescents Psychiatry*, *34*(9), 1174–1184.

Green, B. L., Korol, M., Grace, M. C., Vary, M., Leonard, A., Gleser, G. C., & Smithson-Cohen, S. (1991). Children and disaster: Age, gender, and parental effects on PTSD symptoms. *Journal of American Academy of Child and Adolescents Psychiatry*, *30*, 945–951.

Gurwitch, R. H., Kees, M., Becker, S. M., Schreiber, M., Pfefferbaum, B., & Diamond, D. (2004). When disaster strikes: Responding to the needs of children. *Prehospital and Disaster Medicine*, *19*(1), 21–28.

Houlihan, D., Ries, B. J., Polusny, M. A., & Hanson, C. N. (2008). Predictors of behavior and level of life satisfaction of children and adolescents after a major tornado. *Journal of Psychological Trauma*, *7*(1), 21–36.

John, P. B., Russell, S., & Russell, P. S. S. (2007). The prevalence of posttraumatic stress disorder among children and adolescents affected by tsunami disaster in Tamil Nadu. *Disaster Management & Response*, *5*, 3–7.

Kar, N., & Bastia, B. K. (2006). Post-traumatic stress disorder, depression and generalized anxiety disorder in adolescents after a natural disaster: A study of comorbidity. *Clinical Practice and Epidemiology in Mental Health*, *2*, 17.

Kolaitis, G., Kotsopoulos, J., Tsiantis, J., Haritaki, S., Rigizou, F., Zacharaki, L., Riga, E., Augoustatou, A., Bimbou, A., Kanari, N., Liakopoulou, M., & Katerelos, P. (2003) Posttraumatic stress reactions among children following the Athens earthquake. *European Child Adolescent Psychiatry*, *12*, 273–280.

Korol, M., Green, B. L., & Gleser, G. C. (1999). Children's responses to a nuclear waste disaster: PTSD symptoms and outcome prediction. *Journal of American Academy of Child and Adolescents Psychiatry*, *38*(4), 368–375.

La Greca, A. M., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (1996). Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology*, *64*(4), 712–723.

Lystad, M. H. (1984). Children's responses to disaster: Family implications. *International Journal of Family Psychiatry*, *5*(1), 41–60.

McFarlane, A. (1987). Family functioning and overprotection following a natural disaster: The longitudinal effects of post-traumatic morbidity. *Australian and New Zealand Journal of Psychiatry*, *21*, 210–218.

McFarlane, A. C., Policansky, S. K., & Irwin, C. (1987). A longitudinal study of the psychological morbidity in children due to a natural disaster. *Psychological Medicine*, *17*, 727–738.

Miller, T. W., Kraus, T. W., Tatevosyan, A., & Kamenchenko, P. (1993). Post-traumatic stress disorder in children and adolescents of the Armenian earthquake. *Child Psychiatry and Human Development*, *24*(2), 115–123.

Monahon, C. (1993). *Children and trauma: A guide for parents and professionals*. New York: Lexington.

Murray, J. S. (2006a). Addressing the psychosocial needs of children following disasters. *Journal for Specialists in Pediatric Nursing*, *11*(2), 133–137.

Murray, J. S. (2006b). Understanding the effects of disaster on children: A developmental-ecological approach to scientific inquiry. *Journal for Specialists in Pediatric Nursing*, *11*(3), 199–202.

Nader, K., Pynoos, R., Fairbanks, L., & Frederick, C. (1990). Children's PTSD reactions one year after a sniper attack at their school. *American Journal of Psychiatry*, *147*(11), 1526–1530.

Najarian, L. M., Goenjian, A. K., Pelcovitz, D., Mandel, F., & Najarian, B. (1996). Relocation after a disaster: PTSD in Armenia after the earthquake. *Journal of American Academy of Child Psychology and Psychiatry*, *35*(3), 374–383.

Neuner, F., Schauer, E., Catani, C., Ruf, M., & Elbert, T. (2006). Post-tsunami stress: A study of posttraumatic stress disorder in children living in three severely affected regions in Sri Lanka. *Journal of Traumatic Stress*, *19*(3), 339–347.

Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry*, *65*(3), 207–239.

Ollendick, D., & Hoffman, S. (1982). Assessment of psychological reactions in disaster victims. *Journal of Community Psychology*, *10*, 157–167.

Ponton, L. E., & Bryant, E. C. (1991). After the earthquake: Organizing to respond to children and adolescents. *Psychiatric Annals*, *21*, 539–546.

Proctor, L. J., Fauchier, A., Oliver, P. H., Ramos, M. C., Rios, M. A., & Margolin, G. (2007). Family context and young children's responses to earthquake. *Journal of Child Psychology*, *48*, 941–949.

Pynoos, R. (1990). Post-traumatic stress disorder in children and adolescents. In B. D. Garfinkel, G. A. Carlson, & E. B. Weller (Eds.), *Psychiatric disorders in children and adolescents* (pp. 48–63). Philadelphia: W. B. Saunders.

Pynoos, R., Frederick, C., Nader, K., Arroyo, W., Steinberg, A., Eth, S., Nunez, F., & Fairbanks, L. (1987). Life threat and post-traumatic stress in school-age children. *Archives General Psychiatry*, *44*, 1057–1063.

Pynoos, R. S., Goenjian, A., Tashjian, M., Karakashian, M., Manjikian, R., Manoukian, R., Steinberg, A., & Fairbanks, L. (1993). Post-traumatic stress reactions in children after the 1988 Armenian earthquake. *British Journal of Psychiatry*, *163*, 239–247.

Pynoos, R., & Nader, K. (1990). Mental health disturbances in children exposed to disaster: Preventive intervention strategies. In S. E. Goldston, J. Yager, C. M. Heinicke, & R. S. Pynoos (Eds.), *Preventing mental health disturbances in childhood* (pp. 211–234). Washington, DC: American Psychiatric Press.

Pynoos, R. S., & Nader, K. (1993). Issues in the treatment of posttraumatic stress in children and adolescents. In J. P. Wilson & B. Raphael (Eds.), *International handbook of traumatic stress syndromes* (pp. 535–549). New York: Plenum.

Pynoos, R. S., Steinberg, A. M., & Wraith, R. (1995). A developmental model of childhood traumatic stress. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology: Vol. 2. Risk, disorder, and adaptation*. New York: John Wiley & Sons.

Roussos, A., Goenjian, A. K., Steinberg, A. M., Sotiropoulou, C., Kakaki, M., Kabakos, C., Karagianni, S., & Manouras, V. (2005). Post-traumatic stress and depressive reactions among children and adolescent after the 1999 earthquake in Ano Liosia, Greece. *American Journal of Psychiatry*, *162*(3), 530–537.

Salmon, K., & Bryant, R. A. (2002). Posttraumatic stress disorder in children: The influence of developmental factors. *Clinical Psychology Review*, *22*, 163–188.

Saylor, C. F., Swenson, C. C., & Powell, P. (1992). Hurricane Hugo blows down the broccoli: Preschooler's post-disaster play and adjustment. *Child Psychiatry and Human Development*, *22*, 139–149.

Seroka, C. M., Knapp, C., Knight, S., Siemon, C. R., & Starbuck, S. (1986). A comprehensive program for post-disaster counseling. *Social casework: The Journal of Contemporary Social Work*, *1*, 37–44.

Shannon, M. P., Lonigan, C. J., Finch, A., & Taylor, C. (1994). Children exposed to disaster: I. Epidemiology of post-traumatic symptoms and symptom profiles. *Journal of American Academy Child and Adolescent Psychiatry*, *33*(1), 80–93.

Shaw, J. A., Applegate, B., & Schorr, C. (1996). Twenty-one-month follow-up study of school-age children exposed to Hurricane Andrew. *Journal of American Academy Child and Adolescent Psychiatry*, *35*(3), 359–364.

Shaw, J. A., Applegate, B., Tanner, S., Perez, D., & Rothe, E. (1995). Psychological effects of Hurricane Andrew on an elementary school population. *Journal of the American Academy of Child and Adolescent Psychiatry*, *34*, 1185–1192.

Silverman, W. K., & La Greca, A. M. (2002). Children experiencing disasters: Definitions, reactions, and predictors of outcomes. In A. M. La Greca, W. K. Silverman, E. M. Vernberg, & M.C. Roberts (Eds.), *Helping children cope with disasters and terrorism* (pp. 11–34). Washington, DC: American Psychological Association.

Starr, N. B. (2002). Helping children and families deal with the psychological aspects of disaster. *Journal of Pediatric Health Care*, *16*, 36–39.

Sugar, M. (1999). Severe physical trauma in adolescence. In M. Sugar (Ed.), *Trauma and adolescence* (pp. 183–201). Madison, WI: International University Press.

Sullivan, M. A., Saylor, C. F., & Foster, K. Y. (1991). Post-hurricane adjustment of preschoolers and their families. *Advances in Behavior, Research, and Therapy*, *13*, 163–171.

Swenson, C. C., Saylor, C., Powell, M. P., Stokes, S. J., Foster, K. Y., & Belter, R. W. (1996). Impact of a natural disaster on preschool children: Adjustment 14 months after a hurricane. *American Journal of Orthopsychiatry*, *66*, 122–130.

Terr, L. C. (1983). Chowchilla revisited: The effects of psychic trauma for years after a school-bus kidnapping. *American Journal of Psychiatry*, *140*, 1543–1550.

Turkel, S. B., & Eth, S. (1990). Psychopathological responses to stress: Adjustment disorder and PTSD in children and adolescents. In L. E. Arnold (Ed.), *Childhood stress* (pp. 52–71). New York: John Wiley & Sons.

Vernberg, E., La Greca, A. M., Silverman, W. K., & Prinstein, M. J. (1996). Prediction of posttraumatic stress symptoms in children after Hurricane Andrew. *Journal of Abnormal Psychology*, *105*(2), 237–248.

Vogel, J. M., & Vernberg, E. M. (1993). Children's psychological responses to disasters. *Journal of Clinical Child Psychology*, *22*, 464–484.

Yule, W. (1992). PTSD in child survivors of shipping disasters: The sinking of the Jupiter. *Psychotherapy and Psychosomatic*, *57*, 200–205.

Zubenko, W. (2002). Developmental issues in stress and crisis. In W. Zubenko & J. A. Capozzoli (Eds.), *Children and disasters* (pp. 85–100). New York: Oxford University Press.