Disaster-Related Mental Health Needs of Women and Children

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ABSTRACT

Since the events of September 11, 2001 and Hurricane Katrina, the world has become more acutely aware of disasters and their sequelae, and efforts have been made to improve preparedness-related skills of healthcare professionals. One area that requires more skill building concerns the ability to deal with mental health–related needs. Although the appearance of postdisaster psychological symptoms in adults varies, the incidence of psychopathology in women and children is high after disasters. Children are disproportionately affected by disasters, and their special needs have only recently begun to be understood and considered in disaster-related planning. Categories of psychological effects include distress symptoms, risk behaviors, and psychiatric disorders. These issues require ongoing care, not single interventions. This article describes how maternal child health nurses can develop and use the requisite skills to effectively assist families to optimize their mental health status and prevent sequelae after a disaster.

Key Words: Emergency preparedness; Children; Stress; Psychological; Women.


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A disaster is a "calamitous event that affects a large population and generally results in injury, death, and destruction of property" (Agency for Healthcare Research and Quality [AHRQ], 2006, p. 1). It can be caused by terrorism, unintentional, or natural events. Since the days of Florence Nightingale, nurses have played a critical role on the front lines of disaster response. Many resources and efforts have focused on the physical effects of a disaster—both on individuals and communities. It is only in the recent past that attention has focused on the psychological effects of disasters and factors that can mitigate or exacerbate this aspect (Engel, Berkowitz, Wolff, & Yehuda, 2005; Goldenberg & Matheson, 2005; Gurwitch et al., 2004; Mills, Edmondson, & Park, 2007). Although historical references to the mental health effects of trauma date back many centuries, it was the mental health sequelae of soldiers returning from 20th century wars that precipitated attempts to identify and treat posttraumatic stress disorder (PTSD), a serious posttrauma condition. Treatment for mental health responses to trauma such as PTSD continues to evolve; this diagnosis has only been included in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-III) since 1980 (Lasiuk & Hegadoren, 2006).

Since the events of September 11, 2001 and Hurricane Katrina, the United States has become more acutely aware of disasters and their sequelae, and efforts have been made to improve preparedness-related skills of healthcare professionals. One area that requires more skill building is that of mental health needs (National Child Traumatic Stress Network and National Center for PTSD, 2006). Across the country, there has been concern that the level of skill and competency in this area needs to be improved (Center for the Study of Traumatic Stress, 2007a).

Disaster-Related Psychological Sequelae

Stress and grief are postdisaster psychological symptoms and are considered normal reactions to abnormal situations from which most people recover. The appearance of these and other postdisaster psychological symptoms in adults (including anxiety disorders and PTSD) can vary according to gender (women have a significantly higher incidence than men), the disaster's unique characteristics (including whether it is natural or human initiated), mental health status, education level, loss of property, being evacuated, trauma history, one's overall outlook on life, and experiencing a threat of violence during or after a disaster (Goldenberg & Matheson, 2005; U.S. Department of Health and Human Services [DHHS], 2003).

The psychological effects of disaster can include the following:

- Distress symptoms, such as marital conflict, grief, fear, anxiety, sadness, sleep disturbances, concerns regarding relocation, the need to talk about events/feelings, and the need to feel part of a community (DHHS, 2003; Giarratano, Orlando, & Savage, 2008)
- Risk behaviors, such as increase in use of alcohol, tobacco, and/or substance use (legal and illegal)
- Psychiatric disorders acute stress disorder (ASD) and

PTSD in about 25% to 30% of persons exposed (Yehuda, Resnick, Kahana, & Giller, 1993) {/BL}

Acute Stress Disorder and Posttraumatic Stress Disorder

ASD is a short-term phenomenon and can be diagnosed between 2 days and 4 weeks after the event. It is characterized by dissociative symptoms (problems with recalling significant parts of the trauma, having a sense of disconnectedness or feeling unreal). PTSD is diagnosed if symptoms remain more than 4 weeks after the event. Adverse psychological symptoms can last for more than a decade after exposure to a disaster, and some specific characteristics of a disaster (e.g., physical injuries, fear of death, and loss of property) can better predict subsequent adverse symptomatology than disaster type (Briere & Elliott, 2005). For people who have experienced prior traumatic events, disasters can lead to the emotional re-experiencing of these events (DHHS, 2003). Symptoms of PTSD are listed in Table 1. Table 2 describes when formal mental health services should be utilized.

Although various interventions have been used for the treatment of PTSD, there is little agreement regarding effective modalities for successfully treating this disorder. A panel of experts reported on the results of multiple randomized clinical trials, pharmacotherapy studies, and psychotherapy studies of PTSD (Institute of Medicine [IOM], 2007). Although this report was developed specifically about military veterans, it is the only consensus statement available regarding efficacy of interventions for women or other specific populations. The panel determined the following:

- The scientific evidence is inadequate to determine that psychopharmacologic agents are effective in treating PTSD.
- Exposure therapies are efficacious in treating PTSD. For individuals postdisaster, exposure therapy involves having the client imagine certain aspects of the feared situation concurrently with relaxation. It generally exposes the client to the feared situation in a gradual manner (IOM, 2007).
- Other psychotherapeutic modalities often used are cognitive restructuring (examining assumptions behind thought patterns), eye movement desensitization and reprocessing, coping skills training, and group format psychotherapy.

Disasters and Women's Mental Health

Most of the studies that have been conducted on the mental health effects of disasters have concerned responses to natural disasters such as floods, fires, and earthquakes (Briere & Elliott, 2005; Giarratano et al., 2008; Leon, 2004; Mills et al., 2007). Until recently, most people might have thought that disasters affected all persons equally, but now we know that is not so. Women's health, particularly their mental health, is at risk during this time. For example, after the Oklahoma City bombing, women survivors had a 55% incidence of postdisaster psychopathologic diagnosis (vs. 34% for men, $p = .004$), and after Hurricane Katrina they had a 79% incidence of PTSD (vs. 53% for men, $p < .01$) (Mills et al., 2007; North et al., 1999). Although it can be surmised that the loss of family, community, and faith-

Table 1. Posttraumatic Stress Disorder

Although PTSD symptoms can appear shortly after the traumatic event, they can disappear and then reappear months or years later. Symptoms include:

- Re-experiencing the traumatic event (flashbacks, nightmares regarding the event, and exaggerated reactions to triggers that remind one of the event)
- Emotional numbing and avoidance (extreme avoidance of things that are related to the traumatic event, detached feelings, decrease in interest in enjoyable activities)
- Increase in arousal (difficulty sleeping and concentrating/remembering daily information, irritability, angry outbursts, exaggerated startle response)

Note. Adapted from Briere and Elliott (2005) and U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (2000).

Table 2. When Are Formal Mental Health Services Required?

The following behaviors and symptoms, if they are ongoing, indicate a need to link survivors with appropriate formal mental health services:

- Disorientation (dazed, unable to give date/time/location, recent recall severely impaired)
- Depression (pervasive feelings of hopelessness and despair, withdrawal, inability to engage in productive activity)
- Anxiety (constant feeling of being on edge, agitated, unable to sleep)
- Severe mental illness (auditory or visual hallucinations, preoccupation with idea or thoughts)
- Inability to care for oneself (not changing clothing, unable to manage daily activities)
- Suicidal or homicidal thoughts or plans
- Problematic substance use
- Domestic violence

Note. Adapted from U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (2000).

The vastly different psychological needs of children require special attention in a disaster.

based support places enormous stress on women, gender-related responses to trauma have not been systematically included in disaster studies or in interventions (Hegadoren, Lasiuk, & Coupland, 2006).

There is some evidence that pregnant women exposed to disasters may be at greater risk of mental health sequelae and compromised pregnancy outcomes. A study of pregnant women who survived an earthquake revealed a 29% incidence of psychiatric morbidity, with a significant amount of PTSD. In the study, spouse casualty was significantly associated with low birthweight in pregnant women (Chang, Chang, Lin, & Kuo, 2002). One research study of women who delivered full term infants in New York City in the month after September 11, 2001 revealed a significant increase in shorter gestation, birthweight, and length. The authors suggested that stress may have played a role in this effect (Lederman et al., 2004). After September 11, pregnant survivors diagnosed with PTSD were shown to give birth to infants with significantly lower head circumferences ($p = .01$) (Engel et al., 2005).

Cortisol levels have been linked with PTSD in pregnant survivors (and their offspring) of the September 11 disaster, and animal models suggest that the stress response of the hypothalamic-pituitary-adrenal axis and cortisol are involved in this effect on the pregnant woman and fetus (Talge, Neal, & Glover, 2007; Yehuda et al., 2005).

Mental Health Interventions for Women

Interventions for women to help improve mental health after a disaster include preparation/prevention, immediate psychological first aid, maintaining routines, being careful with responses, and being alert for mental health cues.

Preparation and Prevention

The psychological care and recovery of women after a disaster is an ongoing process, not one resolved by a single intervention. Most women emotionally heal after a disaster, and the resiliency of individuals, families, and communities prevails (Walser et al., 2004). The literature states that one of the cornerstones of preventing disaster-related stress and associated adverse sequelae is prevention, because before disasters such as hurricanes there may be hours and days in which plans can be made for a family's safety. Evacuation or safety plans can prevent extremely stressful disaster-related experiences and the mental trauma that can last for years and adversely affect women's long-term ability to function. Cultural and social factors that disproportionately affect women (e.g., poverty and social inequities) can have an adverse impact on protective health behaviors (Hewins-Maroney, Schumaker, & Williams, 2005).

Immediate Psychological First Aid

The underlying objectives of providing immediate psychological first aid are to establish safety, identify safe areas and behaviors, maximize persons' ability to care for themselves and their family and provide measures to allow individuals and families to be successful in these efforts, teach and promote skills to calm and maintain natural body rhythms (e.g., exercise, nutrition), facilitate family and socially significant support to the maximum extent possible, and foster hope and optimism while not denying the seriousness of the current situation and risk.

Maintain Routines

It is important to establish and maintain routines. For example, adequate and restful sleep, mealtimes, and sleep/wake cycles should be kept intact if at all possible (Center for the Study of Traumatic Stress, 2007a).

Provide Information

It is essential that efforts be made to keep families together, try to ensure that children are with parents or close relatives, and provide as much information as possible to women about their family members. Some specific strategies for providing information include providing repeated, simple, accurate information about how to obtain food, shelter, and emergency care, listening to individuals who want to share their stories and emotions, letting them know there is no right or wrong way to feel (that their feelings are normal), helping them to realize that they will feel better and things will get better, and providing accurate disaster and relief effort information.

Be Careful With Responses

It is important *not* to force people to share their stories, especially personal details they would rather keep confidential. One also should not use clichés or provide simple reassurances such as *"you will be OK," "at least you are alive," "it could have been worse,"* or *"I know how you feel."* These statements can increase anxiety. People should not be told how they should be feeling, thinking, or doing or what they should have done earlier. One should not make promises one cannot keep, and it is important not to criticize services or relief activities in front of the recipients (National Child Traumatic Stress Network and National Center for PTSD, 2006). It has been a popular practice to conduct debriefing after traumatic events and disasters, whereby small groups involved in the event meet to share feelings and experiences, but this has not been shown to prevent PTSD, and the efficacy of this modality is highly debatable (Center for the Study of Traumatic Stress, 2007b).

Be Alert to Mental Health Issues

It is important to be alert for pre-existing mental health conditions such as depression, schizophrenia, other serious mental illness, or substance abuse. Women who are addicted to alcohol or other substances may begin to withdraw from the drug(s) and may exhibit detoxification symptoms. Interruption of medications such as psychotropics may precipitate a crisis days or weeks after a disaster. After a disaster, people might not recognize themselves as needing mental health services and many not seek help, but they typically respond to genuine interest and concern; social support systems are critical to recovery (DHHS, 2003). Survivors should be told that it is normal to experience some symptoms after a disaster, but if the symptoms become difficult to manage or interfere with daily living after a period of time, they should seek professional counseling with someone who is familiar with PTSD. If symptoms of PTSD are present, women and their family members should be educated regarding the etiology, anticipated symptoms, and counseling options. If women have experienced prior traumatic events, it is important to acknowledge their trauma experiences, recognize their success at survival, affirm their strengths, and encourage recovery of control (DHHS, 2003).

Disasters and Children's Mental Health

The vastly different psychological needs of children require special attention in a disaster. It is common for children to be unable to verbalize feelings; they depend on others for the basics of life and their responses to trauma and stress. Well-intentioned professionals can fail to take these factors into account when dealing with children, perhaps due to lack of knowledge, experience, or expertise.

Infants and young children are disproportionately affected by disasters, and their special mental health needs have only recently begun to be understood and considered in disaster-related planning (Gurwitch et al., 2004). They are especially vulnerable to a number of adverse sequelae that may occur after disaster, including anxiety stress disorders. They also have a 30% risk of developing PTSD and can develop PTSD symptoms when they observe or hear about a traumatic event (Gurwitch et al., 2004). Children's reactions depend on their developmental level and include developmental and behavioral regression, an increase in fear and anxiety, difficulties with academic performance, and a denial of the severity of a disaster-related event. Most children recover over time with the appropriate interventions (AHRQ, 2006; Gurwitch et al., 2004).

Children can be unnecessarily traumatized by repetitive television and news broadcasts concerning an event, even when that event has occurred in a distant place. Their stress level can be exacerbated by seeing their parents' reaction or maladjustment to an event (AHRQ, 2006). Their experienced trauma also might be intensified in the following circumstances:

- Persons close to them are victims.
- They directly witnessed an event.
- They felt their life was in jeopardy.
- They were separated from their parents.
- Their environment was disrupted.
- They had a prior history of traumatic experiences or psychopathology.
- They had a lack of familial supportive communication style.
- There is a lack of community-based resources to provide support (AHRQ, 2006).

Because young children may be unable to provide identification information, it is important to plan for identification with name tags. In Hurricane Katrina, 5,000 children were dislocated from their parents; some of them were preverbal. It took a total of 7 months from the date of the disaster for all children to be reunited with their families (Broughton, Allen, Hannemann, & Petrikin, 2006). These unfortunate events point to the need for children and their parents to be kept together during and after disasters whenever possible, including for the duration of evacuations. Clearly, the lack of doing so can result in unnecessary and often long-term mental trauma.

Children may only exhibit symptoms related to trauma for short, intermittent periods, and at other times they play or engage in other normal activities, but this can often hide grief reactions. They may resist talking about their feelings because they may not have the words to describe what they are feeling (National Child Traumatic Stress Network and National Center for PTSD, 2006). Additional developmentally based reactions and interventions are shown in Table 3.

Children's reaction and severity of psychological symptoms vary according to the type of disaster and exposure,

Table 3. Children and Disasters, by Developmental Stage of Child

Stage	Related Behaviors and Research	Interventions
Infants	Depend on trusted adults to provide for basic needs and protection Quality of attachment to primary caretakers is integrally woven into mental health status and responses to stress No research done with infants regarding postdisaster mental health symptoms	Provide safety and security for infant Find other adults to help if possible
Preschoolers	May not understand that destruction and death are permanent and may think the dead can return May blame themselves If a parent has been lost, they are especially vulnerable Behavioral regression is a common reaction (loss of toilet training skills, not sleeping, bed wetting, thumb sucking, fear of the dark, loss of language achievement, loss of appetite, tics, angry outbursts, and withdrawal)	Keep preschoolers with people with whom they are familiar and comfortable Maintain routines such as bedtime, if possible Allow child to sleep in the parents' room in the short term Encourage child to express feelings and emotions via drawing, puppet shows, story telling, play Limit postdisaster media exposure for this age group
School-age children	Can be preoccupied with safety, disasters, weather, and fear of losing a loved one May exhibit regression School performance may decline, and school avoidance may occur May act out, have change in appetite, headaches, stomach aches, and/or sleep disturbances May become hyperactive, silly, or aggressive	Encourage parents to give child extra attention Encourage child to express thoughts and feelings through play and conversation Help parents set firm and consistent limits on acting-out behaviors Listen to a child's repeated verbalization of the trauma Point out positive human interaction during the event, such as kind deeds of others Help parents understand they can temporarily relax expectations of the child's performance at home and at school

Note. Data are from Zero to Three (2007); Lieberman (2004); Zeanah, Boris, and Scheeringa (1997); U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration (2000, 2002); National Child Traumatic Stress Network and National Center for PTSD (2006); and Chemtob, Nakashima, and Hamada (2002)

interventions, and how much time has elapsed since the event. Children usually respond to concern and care from the adults around them. Healthcare professionals should provide reassurance to parents, advise parents as to effective coping mechanisms they can use to cope more effectively, minimize exposure to traumatic aspects of a disaster, be cognizant of a child's emotional functioning and developmental needs, and restore a daily routine as soon as possible (AHRQ, 2006). Parents should focus on assisting their child to both comprehend and cope with their experiences. The healing process is an evolving state for most children, and it happens over a period of time. Unfortunately, the lack of systematic trials of interventions with children after disaster has hampered consensus regarding uniform treatment recommendations (Henderson & Martin, 2007).

Clinical Implications

Hurricane activity and other natural disasters are predicted to increase in the years and decades to come, both in terms of the numbers and severity (Webster, Holland, Curry, & Chang, 2005). Similarly, human-initiated disasters such as terrorism are increasing due to complex geopolitical factors. These trends underscore the need for nurses who work with women and children to build disaster-related mental health skills. The Gallup Poll has consistently reported over the past decade that the public perceives nurses to be more honest and ethical than any other professions by a sizeable margin (Gallup Poll, 2007). Nurses are clearly a group of healthcare professionals who can intervene successfully to assist families to optimize their mental health status after a disaster, providing they become informed and are motivated to do so.

The mental health needs of women and children have too often been overlooked in disaster preparedness; further scrutiny of these needs is necessary. It is important that nurses, professionals who have broad access to women and children in many settings, become more knowledgeable about mental health assessment and culturally competent interven-

Suggested Clinical Implications:

- Maternal child nurses should receive more education about disaster-related mental health skills
- Interventions for women and children need to be sensitive to the norms, beliefs, traditions, customs, and language of individuals and families
- Additional nursing research is needed to evaluate effectiveness of mental health interventions suitable for disaster-related emergencies

tions for women and children. This endeavor does not involve a single solution but rather is a long-term dynamic process that requires fundamental changes and flexibility of organizations, systems, and approaches to mental health.

Mental health continues to require attention for months and years following a disaster. If assessment and intervention is provided in a timely manner, the impact can be felt for a lifetime by women, children, families, and entire communities. Additional research is necessary in order to better identify individuals at risk for postdisaster mental health sequelae and factors related to effective treatment modalities for various population subgroups, including women and children. ✣

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References

Agency for Healthcare Research and Quality. (2006). Pediatric terrorism and disaster preparedness: A resource for pediatricians. AHRQ publication No. 06(07)-0056-1. Rockville, MD: Author.

Briere, J., & Elliott, D. (2005). Prevalence, characteristics, and long-term sequelae of natural disaster exposure in the general population. *Journal of Traumatic Stress, 13,* 661-679.

Broughton, D. D., Allen, E. E., Hannemann, R. E., & Petrikin, J. E. (2006). Reuniting fractured families after a disaster: The role of the national center for missing & exploited children. *Pediatrics, 117,* s442-s445.

Center for the Study of Traumatic Stress. (2007a). *Hurricane Katrina: Evacuee mental health and care.* Retrieved March 6, 2008, from www.centerforthestudyoftraumaticstress.org/

Center for the Study of Traumatic Stress. (2007b). *The debriefing debate.* Retrieved March 6, 2008, from www.centerforthestudyoftraumaticstress.org/

Chang , H. L., Chang, T. C., Lin, T. Y., & Kuo, S. S. (2002). Psychiatric morbidity and pregnancy outcome in a disaster area of Taiwan 921 earthquake. *Psychiatry & Clinical Neuroscience, 56,* 139-144.

Chemtob, C. M., Nakashima, J. P., & Hamada, R. S. (2002). Psychosocial intervention for postdisaster trauma symptoms in elementary school children: A controlled community field study. *Archives of Pediatric Adolescent Medicine, 156,* 211-216.

Engel, S. M., Berkowitz, G. S., Wolff, M. S., & Yehuda, R. (2005). Psychological trauma associated with the world trade center attacks and its effect on pregnancy outcome. *Paediatric Perinatal Epidemiology, 19,* 334-341.

Gallup Organization. (2007). *Annual poll on honesty and ethics of people in different professions.* Retrieved March 6, 2008, from www.gallup.com/poll/1654/Honesty-Ethics-Professions.aspx

Giarratano, G., Orlando, S., & Savage, J. (2008). Perinatal nursing in uncertain times: The Katrina effect. *MCN The American Journal of Maternal Child Nursing, 33,* 249-257.

Goldenberg, I., & Matheson, K. (2005). Inner representations, coping, and posttraumatic stress symptomatology in a community sample of trauma survivors. *Basic Applied Social Psychology, 27*, 361-369.

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

Hegadoren, K. M., Lasiuk, G. C., & Coupland, N. J. (2006). Posttraumatic stress disorder Part III: Health effects of interpersonal violence among women. *Perspectives in Psychiatric Care, 42,* 163-173.

Henderson, S. W., & Martin, A. (2007). *Interventions following mass violence and disasters: Strategies for mental health practice.* New York: Guilford Press.

Hewins-Maroney, B., Schumaker, A., & Williams, E. (2005). Health seeking behaviors of African Americans: Implications for health administration. *Journal of Health & Human Services Administration, 28,* 68-95.

Institute of Medicine. (2007). *Treatment of posttraumatic stress disorder: An assessment of the evidence.* Washington, DC: The National Academies Press.

Lasiuk, G. C., & Hegadoren, K. M. (2006). Posttraumatic stress disorder part I: Historical development of the concept. *Perspectives in Psychiatric Care, 42,* 13-20.

Lederman, S. A., Rauh, V., Weiss, L., Stein, J. L., Hoepner, L. A., Becker M., et al. (2004). The effects of the world trade center on birth outcomes among term deliveries at three lower Manhattan hospitals. *Environmental Health Perspectives, 112,* 1772-1778.

Leon, G. R. (2004). Overview of the psychosocial impact of disasters. *Prehospital and Disaster Medicine, 19,* 4-9.

Lieberman, A. F. (2004). Traumatic stress and quality of attachment: Reality and internalization in disorders of infant mental health. *Infant Mental Health Journal*, 25, 336-351.

Mills, M. A., Edmondson, D., & Park, C. L. (2007). Trauma and stress response among hurricane Katrina evacuees. *American Journal of Public Health, 97,* S116-S123.

National Child Traumatic Stress Network and National Center for PTSD. (2006). *Psychological first aid: Field operations guide* (2nd ed.). Retrieved March 6, 2008, from www.nctsn.org

North, C. S., Nixon, S. J., Shariat, S., Mallonee, S., McMillen, J. C., Spitznagel, E. L., et al. (1999). Psychiatric disorders among survivors of the Oklahoma City bombing. *Journal of the American Medical Association, 282,* 755-762.

Talge, N. .M, Neal, C., & Glover, V. (2007). Antenatal maternal stress and long-term effects on child neurodevelopment: How and why? *Journal of Child Psychology & Psychiatry, 48,* 245-261.

U.S. Department of Health and Human Services. (2003). Developing cultural competence in disaster mental health programs: Guiding principles and recommendations. DHHS Pub. No. SMA 3828. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration.

U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration. (2000). *Field manual for mental health and human service workers in major disasters.* Retrieved March 6, 2008, from http://mentalhealth.samhsa.gov/publications/allpubs/ADM90-537/

U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration. (2002). *Tips for talking to children in trauma: Interventions at home for preschool to adolescence.* Retrieved March 6, 2008, from http://mentalhealth.samhsa.gov/publications/allpubs/NMH02-0138/default.asp

Walser, R. D., Ruzek, J. I., Naugle, A. E., Padesky, C., Ronell, D. M., & Ruggiero, K. (2004). Disaster and terrorism: Cognitive-behavioral interventions. *Prehospital and Disaster Medicine, 19,* 54-63.

Webster, P., Holland, G., Curry J., & Chang, H. (2005). Changes in tropical cyclone number, duration, and intensity in a warming environment. *Science, 309,* 1844-1846.

Yehuda, R., Engel, S. M., Brand, S. R., Seckl, J., Marcus, S. M., & Berkowitz, G. S. (2005). Transgenerational effects of posttraumatic stress disorder in babies of mothers exposed to the world trade center attacks during pregnancy. *Journal of Clinical Endocrinology & Metabolism, 90,* 4115-4118.

Yehuda, R., Resnick, H., Kahana, J., & Giller, E. (1993). Long-lasting hormonal alterations to extreme stress in humans: Normative or maladaptive? *Psychosomatic Medicine, 55,* 287-297.

Zeanah, C. H., Boris, N. W., & Scheeringa, M. S. (1997). Psychopathology in infancy. *Journal of Child Psychology and Psychiatry, 38,* 81-99.

Zero to Three. (2007). *Helping young children and families cope with trauma in a new era.* Retrieved March 6, 2008, from www.zerotothree.org