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Mass Trauma: Disasters, Terrorism, and War

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Mass Trauma: Disasters, Terrorism, and War

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KEYWORDS

- Child development • Children • Disasters • Mental health • Terrorism
- Mass trauma • War

KEY POINTS

- Mass-exposure events, such as disaster, terrorism, and war, have unique impacts on children.
- Effective conceptual approaches must balance risk and resilience from a developmental perspective.
- Models of mass trauma effects and exposures include exposure dose, cumulative risk, determinants, and moderators.
- Children are a special needs population particularly vulnerable to the impact of mass trauma due to a lack of experience, skills, and resources to independently meet their mental and behavioral health needs.
- The National Commission on Children and Disaster's Report recommends a greater focus on the disaster mental and behavioral health needs of children throughout planning, training, exercises, and response and recovery effort.
- Higher-intensity exposures lead to worse outcomes.
- Parental and social support are critical protective factors as moderators of negative outcomes in children exposed to mass trauma.

Abbreviations	
CBT	Cognitive behavioral therapy
CHASM	Community Health and Service Missions
PFA	Psychological first aid

INTRODUCTION

Mass trauma experiences that have an impact on children and adolescents include natural disasters, human-made disasters (including intentional [ie, terrorism] and unintentional [ie, chemical and nuclear accidents] disasters), and wars. Increasingly, there are several factors that have evolved to create a frequency and severity of mass trauma not previously seen. These factors include the rapid growth of populations, globalization of communication and commerce, industrialization of underdeveloped countries, and rapid changes in weather patterns spawning major storms. These challenges are often superimposed on global regions already destabilized by conflict and warfare. Consequently, millions of children every year are exposed to mass trauma both directly and through the indirect effects on families, communities, and societies. This article focuses on the large groups and populations of children and families who are affected by mass trauma within a relatively short period of time.

Important to an understanding of the psychological effects of mass trauma are the definitions of the following terms—disaster, primary and secondary stressors, acute and chronic stress reactions, resilience, and cumulative risk.[1]

According to the World Health Organization,[2] *disaster* is defined as a severe ecological and psychosocial disruption that greatly exceeds the coping capacity of the community. Disasters are dynamic events that have phases (preimpact, impact, and postimpact) and can be subdivided into natural disasters or human-made intentional and unintentional disasters.[3]

There are *primary and secondary stressors* that result from disasters that can contribute to both acute and chronic stress reactions. Primary stressors are part of the direct exposure to harm or threat of harm during the disaster impact and secondary stressors occur as consequences of the disaster impact (ie, adversities in the aftermath, such as loss of home, school or injury, or the need to relocate). In a majority of cases, recovery is the naturally expected outcome of acute stress responses (which include regressed or disrupted behavior, tearfulness, sleep or appetite problems, and other signs of distress) after a disaster when adequate support is available. *Resilience* according to the UNISDR is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner.[4]

In the wake of disaster, resilience indicates the ability to rapidly restore to predisaster levels of function and psychological equilibrium. For children, this requires a host of family/parent and community/social support at a developmentally appropriate level. Given this reliance on external support, children's resilience is more variable and dependent on their caretakers. In contrast, chronic stress reactions often result in pathologic outcomes and in children are manifested by anxiety, depressed mood, interpersonal and social problems, and diminished performance at school. Such chronic traumatic responses can lead to loss of developmental and psychosocial gains.[5]

Cumulative risk refers to the added challenge resulting from the accumulation of multiple traumatic experiences. An individual has an increasing risk of subsequent

emotional and behavioral problems and negative adaptation with increasing trauma exposures. A dose-response effect occurs with repeated exposure to traumatic events because a child is more likely to experience posttraumatic stress symptoms with higher exposure.[1]

Bearing in mind these important definitions, attention is focused on the *National Commission on Children and Disasters 2010*[6,7] report to the President and Congress, which highlights the unique vulnerability and needs of children in disasters. These findings include the following:

- Children may experience long-lasting effects, such as academic failure, post-traumatic stress disorder (PTSD), depression, anxiety, bereavement, and other behavioral problems, such as delinquency and substance abuse.
- Children are more susceptible to chemical, biologic, radiological, and nuclear threats and require different medications, dosages, and delivery systems than adults.
- During disasters, young children may not be able escape danger, identify themselves, and make critical decisions.
- Children are dependent on adults for care, shelter, transportation, and protection from predators.
- Children are often away from parents, in the care of schools, childcare providers, Head Start, or other child congregate care environments, which must be prepared to ensure children's safety.
- Children must be expeditiously reunified with their legal guardians if separated from them during a disaster.
- Children in disaster shelters require age-appropriate supplies, such as diapers, cribs, baby formula, and food.

VULNERABLE PEDIATRIC POPULATIONS
Disaster

In order to effectively intervene with child populations in times of disaster, child-specific risks and vulnerabilities must be recognized by responders and planners. Within the general population of children are those with special needs who deserve unique attention as the most vulnerable to secondary stressors associated with violence, abuse, and opportunistic crimes. They require a priority for intervention and referral. These special needs children include "those exposed to maltreatment or poverty; children from minority backgrounds; refugee and immigrant children; children from families with limited language proficiency; children residing in foster care homes, halfway houses, shelters for domestic violence, and youth hostels; homeless and runaway children; children confined to juvenile detention centers; and children with medical illnesses, developmental disabilities, mobility challenges, and psychiatric disorders".[7] The special needs category cannot be fully predefined, however, prior to a disaster. Often individual children and families are directly impacted by the disaster and consequent adversities, leaving them with special needs.[1]

War and Terrorism

Beyond disasters, children and their families are faced with a significant rise in war and terrorism as a common occurrence in their lives. As Williams[8] summarized in his 2007 review, "Children and families are now in the front line of war, conflict and terrorism as a consequence of the paradigm shift in the nature of warfare and the growth of terror as a weapon." The impact of these traumas is both direct and indirect along with youth being both victims and perpetrators of violence (child soldiers). In addition, recent US

participation in combat efforts has exposed a large population of American children to war through the experience of their service member parents.

Pine and colleagues[9] described terrorism as "a form of undeclared war that often targets the civilian population as well as, or instead of, the military… combination of targeted hate and random violence that is particularly frightening. Terrorism combines 2 threats: deliberate harm to a child's community and random harm to children and their families. These characteristics pose special challenges to the emotional balance of a community, and they require unique responses from communities and care providers." Despite these unique features of terrorism, there are many common elements to other traumas, which are discussed in this article.[9]

This article uses a risk and resilience framework informed by developmental systems theory and the related core principles of contemporary developmental psychopathology to discuss the impact of mass trauma on children. Specific features of each traumatic event and degree of life threat and physical injury in turn form children's reactions to disasters, war, and terrorism and also are discussed. Impact on children is complex because mass trauma events occur across a timeline and in a complex array of contextual factors at multiple levels.

REVIEW
Epidemiology

Although children and adolescents, as discussed previously, are a special needs population particularly vulnerable to disaster, exposure to some form of trauma during childhood has been documented in epidemiologic studies of general populations as more common than most investigators realize. Mass trauma, often including multiple forms of trauma exposure both direct and indirect, poses the greatest risk for the development of serious mental health disorders and associated impairments.

Disasters

The frequency of natural disasters is also noted to be rising. The number of natural disasters around the world has increased by more than 4 times in the past 20 years, according to a report released by the British charity Oxfam.[10] Additionally the United Nations Office for Disaster Risk Reduction notes that between the years 2000 and 2012 there were 2.9 billion people affected by and 1.2 million people killed by natural disasters. Earthquakes and storms are the major causes of these casualties. A yearly average of 790 disasters between 2001 and 2011 was noted.[11] High estimates of psychiatric symptom prevalence have been reported in studies of children and adolescents exposed to various types of disasters that affected entire communities. In a representative sample of 2030 US children aged 2 to 17, 13.9% reported lifetime exposure to disaster, and 4.1% reported experiencing a disaster in the past year.[12]

Two years after Hurricane Katrina, 14.9% of children and adolescents had a serious emotional disturbance, with 9.3% estimated to have serious emotional disturbance directly attributable to the hurricane.[13] This is in contrast to prevalence estimates of serious emotional disturbance at 4.4% to 7.47% in studies of communities across the country.[14] Kelly and colleagues report that 13% of children exposed to Hurricane Katrina had posttraumatic stress symptoms at 3 to 7 months in the immediate aftermath of the disaster. The presence of these symptoms right after the hurricane was also a predictor of the presence of chronic symptoms at 14 to 17 months after impact of the study. The hurricane was also found a direct contributor to the symptoms even in the presence of a history of previous trauma.[14]

The Great East Japan Earthquake (the Tohoku earthquake) has been described as "an unprecedented triple disaster: an earthquake followed by a devastating tsunami

and, finally, the destruction of a major nuclear power plant with the leaking of large amounts of radiation… Children and adolescents younger than 19 years accounted for 6.5% of the deaths, and there were 229 survivors younger than 18 years who lost both their parents in the disaster and 1295 who lost one of their parents."[15] Analysis of more than 11,000 Japanese children's traumatic symptom questionnaire responses after the 2011 Great East Japan Earthquake and Tsunami revealed that children whose houses were damaged or who experienced separation from family members had higher scores than children who did not experience environmental damage. Likewise, many children who experienced evacuation or bereavement had elevated trauma symptom scores. Although such findings may not be surprising given the nature of items assessed, investigators speculated that collecting information about environmental damage experienced by children and correlating this with stress questionnaire scores may result in a more accurate prediction of who may have an elevated risk for developing PTSD.[16]

War

Unfortunately, mass trauma seems to be rapidly escalating on a global basis. The scope of the impact of war on children is immense. As reported in the UNICEF publication, *Machel Study 10-Year Strategic Review: Children and Conflict in a Changing World*,[17] "Globally, it is estimated that over one billion children live in countries or territories affected by armed conflict – almost one sixth of the total world population. Of these, some 300 million are under the age of five. They suffer from both the direct consequences of conflict, as well as the long-term effects on their development and well-being." "They are not only caught in the crossfire, they are often the intended targets of violence, abuse and exploitation," said UNICEF Executive Director Ann M. Veneman.[18] "Over the past decade, children have been the victims of attacks on schools and hospitals, and they continue to be killed or maimed by landmines and other explosive devices. In conflict zones, their vulnerabilities often increase because violence claims their first line of defense: that is their parents."[18] Current reports by the United Nations are that more than a million children have been displaced from the civil conflict in Syria to refugee camps.[19] In a review by Wilson and Thomson[20] of the epidemiology of international terrorism from 1994–2003 data for 21 "established market economy" countries and 18 "former socialist economies of Europe", a total of 32 international terrorist attacks causing fatalities were identified over the 10-year period. During this decade, no statistical trend in the number of attacks was found but the number of deaths per attack (severity) increased.[21]

In a recent study sponsored jointly by Bahçeşehir University, New York University, and the Norwegian Institute of Public Health, *Bahçeşehir Study of Syrian Refugee Children in Turkey*[22] evaluated 301 of 1000 children attending school. The Syrian child refugees reported a variety of direct and indirect war related experiences (ie, bombing, shooting, and social upheaval prior to coming to the refugee camp). After having spent an average of half a year in the Islahiye refugee camp in Gaziantep, the Syrian refugee children showed the following findings:

- "On the positive side: 71% of the girls and 61% of the boys had strong close relationships they trusted for help and support (experiences from other studies have shown that strengthening parents' potential for care and supportive relationships with their offspring may be the most valuable intervention in a refugee camp context).
- 74% of the children had experienced the death of somebody they cared strongly about, and 50% had been exposed to 6 or more traumatic events.
- The mental health problems associated with the war experiences were very serious—60% had symptoms of depression, 45% PTSD, 22% aggression, and

65% psychosomatic symptoms—to a degree that seriously reduced the children's level of functioning. Of course, many children suffered from 2 or more of these mental health problems."

The role of children in war has been a major source of added concern that has more recently been highlighted by the United Nations Children and Armed Conflict section. It is estimated that between 250,000 and 300,000 children are functioning as soldiers at any given time.[23] A vast majority of wars being fought today are intrastate conflicts in the poorest areas of the world.[24] It is in these wars that children are widely used as soldiers.[25] Historically, children currently defined as younger than age 18 have always been used as soldiers, and many historical accounts of battles and armies have amply documented this. Even the American Civil War had an estimated 100,000 boys in the Union Army.[7] The Coalition to Stop the Use of Child Soldiers estimated in 2008 that there were 300,000 child soldiers in global armed conflicts.[26] Since Western countries have actively banned the use of child soldiers in their armies, the role of children in armed conflicts has shifted to the developing countries, where the laws against the recruitment and use of children in armed conflict are ignored and where "societal chaos" exists. Consequently the role and experience of these child soldiers are both of perpetrators and victims, further compounding the trauma scenario.

Children of contemporary US military families are also a special population effected by war. Of all potential stressors in the life of a child, parental deployment to a combat zone is considered by some investigators among the most stressful.[27] Children of deployed US service members have been studied to assess the potential impact of such experiences on military families. After the initial Persian Gulf War in 1990–1991, a study of children whose parents had deployed indicated higher levels of self-reported depressive symptoms compared with a control group of children of nondeployed parents.[28] Nevertheless, when compared with community samples of nondeployed parents, elevations in clinically significant or pathologic psychological symptoms were not noted, suggesting an inherent resiliency in this child population. In another study of children of parents who deployed as part of the first Persian Gulf War, increased tearfulness, disciplinary challenges in the home setting, and attention-seeking behaviors in children were noted.[29]

Since 2001, more than 2 million Americans have deployed to Iraq and Afghanistan, with more than 45% of these service members having children.[30] A study of children ages 3 and 5 years old with a deployed parent revealed increased externalizing scores compared with same-aged peers without a deployed parent after controlling for a caregiver's stress and depressive symptoms.

Terrorism

Exposure to terrorism is now an everyday threat with more frequent occurrence in the United States. Examples of recent terrorist attacks studied include those on the Murrah Federal Building on April 19, 1995, and the World Trade Center and Pentagon on September 11, 2001. Six months after the September 11 attack, a survey of a random sample of more than 8000 New York City children in grades 4 through 12 six months showed that 28.6% of the children had 1 or more anxiety/depressive disorders.[31] Developmental analysis of the findings showed that younger children (6–11 years) were more likely to present with anxiety, problems concentrating, social isolation, and withdrawal, whereas older children (12–17 years) were more likely to exhibit numbing, avoidance reactions, and substance abuse.[32]

The overarching dynamic to the epidemiology of these areas of mass trauma is the confluence/interplay of these catastrophes taken together. All too often there is

a simultaneous occurrence of major weather disasters in war zones, which often has the effect of restricting efforts for international aid organizations to deliver medical supplies, food, and supplies to those in dire need.

Phenomenology

Mass trauma's main effect is best understood in terms of groups of individuals/families and populations. Individual stress reactions and trauma effects are addressed elsewhere in other articles in this issue by Harriet Macmillan, Laura Murray, and Matthew Kliethermes. The developmental level of children and associated family functioning along with the intensity of primary and secondary stressors are important factors in determining the impact of mass trauma on groups and populations. The disruption of family functioning (ie, daily household activities, social support of parents, or loss of family members) results in a loss of family resilience. The loss of family support network has been shown to effect adult parenting and in turn a child's distress. The role of media exposure to coverage of mass trauma has been shown in studies by Pfefferbaum[33] and Schuster[21] to play a role in the development of stress reactions in children who were not directly affected by the trauma.

In contemporary US military families, parental deployment was shown to have a cumulative effect on 6- to 12-year-old children that extended beyond the deployment period, with increased risks for depression, anxiety, and externalizing symptoms noted after their return.[34] Similar findings have been observed with adolescents contending with parental deployment to combat zones. Among adolescents experiencing parental deployment to Iraq, perceived stress levels (in addition to elevated measured heart rates) were noted compared with civilian controls of adolescents without a deployed parent.[29] In a separate study, after controlling for family and service-member characteristics, 11- to 17-year-old children were noted to have more emotional difficulties compared with national samples. Older youth and girls of all ages reported significantly more school, family, and peer-related difficulties with parental deployment.[35] Likewise, factors, such as length of parental deployment and poorer mental health of the nondeployed parent, were associated with a greater number of challenges for adolescents both during deployment and during subsequent reintegration. In an analysis of children with a currently deployed parent, the most significant predictor of child psychosocial functioning was the parental level of stress.[36]

Such findings are not reflected only in studies of children of American service members. A survey of British families contending with the deployment of a father to Iraq indicated 61% of wives reporting "negative changes" in their children's behaviors, including issues, such as "tantrums, displays of aggression, sleeping problems, enuresis, being more emotionally upset, general insecurity, and fixations with death."[35]

Clinical Outcomes

The topics of exposure to mass violence and children's exposure to conflict, war, and terrorism and children as combatants have been increasingly reported and studied.[37] As discussed previously, the types of exposure can be direct or indirect, both as perpetrators and victims. Despite their distress, "Children are, inevitably, in the process of developing resilience when and if they are engaged in violent and disastrous circumstances."[8] Studies investigating risk and resilience in populations of children who experienced mass trauma have found a set of factors that have been associated with better neurobiological and psychosocial outcomes. Called *promotive factors* (predictors of better outcomes under high- as well as low-risk conditions) and *protective factors* (particularly relevant under high-risk conditions), these include an array of elements, "such as self-control and problem-solving skills, close relationships with

competent caregivers or good schools and safe neighborhoods", which depend "to a large extent on fundamental human adaptive systems embedded in individuals, relationships, families, friends, communities, and cultures."[37] These findings are particularly important because there are also vulnerability factors for children, which may include genetic predispositions to anxiety and depression when exposed to trauma (ie, gene-environment interaction).[38] Gender differences have also been noted in reviews of disaster studies, with adolescent girls more likely to manifest posttraumatic stress symptoms then boys.[30,37,39,40] **Box 1** displays individual, family, and community factors that enhance resilience in children and adolescents.

Early researchers found that "trauma exposure could have lasting effects on children, though often the effects were short term; that loss and injury to loved ones had greater effects than material losses; and that parent availability, function, and support played significant roles in the responses of children."[37]

Disaster

A review of children's reactions to disaster is well described by the National Child Traumatic Stress Network Web site (http://www.nctsn.org/) as follows: "Children react differently, during and after an act of terrorism or other crisis, depending on their age, developmental level, and prior experiences. Some will respond by withdrawing, while others will have angry outbursts. Still others will become agitated or irritable. Parents should attempt to remain sensitive to each child's reactions." **Box 2** displays typical reactions children might exhibit after any act of terrorism or other disaster.

Shannon and colleagues[41] did a large-scale survey of school-aged children 3 months after Hurricane Hugo, which struck the United States on the evening of September 21, 1989. The findings of this study highlighted the reliable and strong variations in the expression of posttraumatic symptoms, symptom clusters, and presence or absence of the posttraumatic stress syndrome in children affected by a large-scale disaster. Children's reactions were found dependent on a race, gender, and age. African American children were more likely than were white or other minority children to report that they experienced anhedonia, attentional difficulties, and omen formatio, and engaged in hazardous or reckless behavior. Female children were more likely than male children to experience symptoms associated with emotional processing and emotional reaction to the trauma. In contrast, male children were more likely than female children to experience symptoms related to cognitive or behavioral factors. Within the adolescent groups, age was not strongly related to the experience of bad dreams, repetitive thoughts of the trauma, psychological distress associated with thoughts and/or reminders of the trauma, behavioral avoidance, or fear of reoccurrence. In contrast, the experience of repetitive images, emotional isolation or detachment, and guilt was related to age even within the adolescent group.

Grouped by age group, examples of potential psychological responses to trauma noted in the literature are listed in **Box 3**.

War and Terrorism

War and terrorism pose particular challenges to understanding the impact of mass trauma on children. In contrast to natural disasters or unintentional human accidents, intentional acts of violence, destruction, and psychological terror tend to have a more severe and lasting effect. It is estimated that more than 300,000 children (40% girls) are child soldiers around the world. Their roles include fighters or noncombatant purposes, including sexual. Studies of former child soldiers reveal that injuring or killing others and rape are common and can have a particularly toxic effect on their long-term psychosocial adjustment. One study by Betancourt and associates found the

Box 1
Factors that enhance resilience in children and adolescents
Individual protective factors
The capacity to recognize opportunities in adversity
Ability to elaborate problem solving and emotional coping skills
Good social skills with peers and adults
Personal awareness of strengths and limitations
Feeling of empathy for others
Internal locus of control—a belief that one's efforts can make a difference
Sense of humor
Positive self-concept
Self-reliance
Cognitive flexibility
Positive emotions (optimism, sense of humor, interests, joy)
Ability to interact positively with others
Active coping
Physical exercise
Religion
Family protective factors
Positive family ambience
Good parent-child relationships
Parental harmony
A valued social role in the household
Community protective factors
Strong social support networks
Supportive extended families
A close relationship with unrelated mentor
Good peer relationships
Community influences that offer positive role models
Positive school experiences
Valued social role, such as a job or volunteering
Membership in a religious or faith community
Extracurricular activities
Adapted from Shaw JA, Espinel Z, Shultz JM. Children: stress, trauma & disaster. Tampa (FL): Disaster Life Support Publishing; 2007.

degree of the maladjustment far outweighed the protective effects of community reintegration.[42]

Remarkably, "most child survivors of war who participated in long-term follow-up studies report no significant relationships between adverse experiences during the

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Box 2
Typical reactions children might exhibit after an act of terrorism or other disaster

- Fear and worry about their safety or the safety of others, including pets
- Fear of separation from family members
- Clinging to parents, siblings, or teachers
- Worry that another attack will come
- Increase in activity level
- Decrease in concentration and attention
- Withdrawal from others
- Angry outbursts or tantrums
- Aggression to parents, siblings, or friends
- Increase in physical complaints, such as headaches and stomachaches
- Change in school performance
- Changes in sleep patterns
- Changes in appetite
- Lack of interest in usual activities, even playing with friends
- Regressive behaviors, such as baby talk, bedwetting, or tantrums
- Long-lasting focus on the attack, such as talking repeatedly about it or acting out the event in play
- Increase in risky behaviors for teens, such as drinking alcohol, using substances, harming themselves, or engaging in dangerous activities

From the National Child Traumatic Stress Network. Earthquakes: Children's reactions. Available at: http://www.nctsn.org/trauma-types/natural-disasters/earthquakes#q3. Accessed December 16, 2013.

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war and enduring patterns of emotional distress."[43] Furthermore, the presence of psychological distress associated with PTSD symptoms developed later was not correlated with disability or psychosocial impairments. The protective factors found to moderate the impact of war adversities for children include "a strong bond between the primary caregiver and the child; the mother's mental health; the availability of additional caregivers, such as grandparents and older siblings; the social support of members in the community who are exposed to the same hardships, especially teachers and peers, a shared sense of values; a religious belief that finds meaning in suffering; the assumption of responsibility for the protection and welfare of others; an internal locus of control, and the use of humor and altruism as defense mechanisms."[43]

Terrorism has unique features, which create complicated scenarios of harm. The objectives of terrorists vary. **Box 4** lists some of these objectives.

Terrorism has also been characterized as using "targeted hatred and random violence" to create the threats of "deliberate harm to a child's community and of random harm to children and their families," which "pose special challenges to the emotional balance of a community, and they require unique responses from communities and care providers."[9] Beyond these specific features, terrorism has many that are common to other forms of trauma. The potential effect on the psychological health of children is related to "(1) the degree of exposure to the event (victim, member of victimized group; victim of event's consequences (eg, famine following war), friend

Box 3
Potential psychological responses by age group

Preschool children

Sleep and appetite disturbance

Fear of the dark

Separation anxiety

Nightmares

Regressive behaviors

Hypervigilence

Behavioral reenactments

Clinging/dependent behavior

School-age children

Re-experiencing symptoms

Disorganized or confused behaviors

Somatic complaints

Arousal symptoms

Disruptive symptoms

Anxiety symptoms

Decreased academic perfomance

Adolescents

Anxiety

Depression

Guilt, anger, fear, disillusionment

Fears of a foreshortened future

Flight into pleasurable activity

Substance abuse

Adapted from Shaw JA, Espinel Z, Shultz JM. Children: stress, trauma & disaster. Tampa (FL): Disaster Life Support Publishing; 2007.

Box 4
Objectives of terrorists

Creating mass anxiety, fear, and panic

Fostering a sense of helplessness and hopelessness

Demonstrating the incompetence of the authorities

Destroying a sense of security and safety

Provoking inappropriate reactions from individuals or the authorities (eg, repressive and/or incompetent legislation or the excessive use of violence against suspect individuals and organizations)[44]

From Alexander DA, Klein S. The psychological aspects of terrorism: from denial to hyperbole. J R Soc Med 2005;98(12):557–62; with permission.

killed; witness to horrific events; exposure through media); (2) the amount of family support available during the experience and in the aftermath (parents killed, parents psychologically unavailable, parents supportive); (3) the amount of life disruption (orphan refugee, refugee with family, home and/or school damaged, little effect on home/school life); and (4) the amount of social disorganization (social order collapses into chaos, emergency systems overwhelmed, or work effectively)."[9]

Using a developmental resilience framework, Pine and colleagues[9] gave the following fundamental principles for understanding the impact of terrorism on children:

> Principle 1: The nature of the threat must be considered—children, like adults, show a dose gradient in response to direct threat. More severe reactions occur in response to events that threaten basic security (eg, a parent is killed, injured, or terrified), body, and self-integrity (eg, a child is tortured, raped, or injured, or threatened with such) and to threats perpetrated by human design rather than natural disaster (for children old enough to understand). Secondary exposure via media and rumors is an increasing concern for children because of the degree of exposure to media among children in modern societies and the intensity of the live coverage that is now commonplace. Perceived exposure is important; studies find high symptom levels in children and adolescents who believed they had been exposed to a toxin but had not.
>
> Principle 2: Developmental timing of the terrorism will influence child and family reactions, protections, and developmental sequelae—younger children are protected from full psychological exposure to terrorism by their cognitive immaturity; most adolescents, on the other hand, are capable of apprehending the full horror of such events. Children gauge threats based on caregiver responses, a propensity termed, *social referencing*…separation can be more stressful to children than the traumatic event itself.
>
> Principle 3: The experiences and consequences for children in the context of terrorism are mediated and moderated by family, peer, and school systems and particularly by the quality of relationships in these systems—effective adults function as highly adaptable protective systems for children in their care.
>
> Principle 4: Individual differences in vulnerabilities and capabilities influence child responses and recovery patterns—children functioning well prior to the experience and who have more resources available during the experience manage well under extenuating circumstances, reflecting fundamental human adaptive systems. Children lacking such protections may face the highest need for intervention.[9]

Family Issues

The impact of disaster, terrorism, and war can affect both the cohesiveness and resiliency of families. A family's ability to maintain unity in the face of disaster may be predictive of the potential for the development of a child's psychopathology, regardless of the nature of the trauma. Predictors of a child's response to a disaster include variables, such as their family's structure, cohesiveness, communication patterns, parental response to the disaster, and overall family level of functioning after the significant event.[1] In brief, an intact family (or body of caregivers) in the face of overwhelming trauma affords a certain degree of protection. Family/caregiver cohesion may have a profoundly positive impact on a child's progress through developmental stages, because a young child may be unable to integrate a new or shocking experience into his or her schema and may rely on a parent or caregiver to provide a safe environment, an age-appropriate interpretation of a confusing or unfamiliar event, and an appropriate degree of reassurance. Such an approach may decrease the

ultimate development of child psychopathology, regardless of the type of disaster is experienced by the family. Given these issues, a child's geographic separation from parents in the midst of natural disaster or military conflict or due to sudden refugee status can present both acute and chronic stressors that may lead to psychopathology if reunification with primary caregivers cannot be effected in a timely manner. In a refugee population, the degree of family support and maternal well-being have been shown predictive of a child's long-term emotional response.[40]

It is well known that children often reflect parental responses and attitudes to a disastrous or traumatic event. Factors that influence a child's short-term or long-term maladaptive response to such an event include disaster-related parental psychopathology, negative family emotional tone, a distressed family environment, parental overprotectiveness, reversal of dependency role, and excessive parental prevention of regressive behaviors.[45] Likewise, children with their own past history of trauma may experience a re-emergence of previous PTSD symptoms in the face of a new trauma, such as a disaster.[46] In some families, parental unawareness of these issues may lead in increased difficulties for such children.

It is well established that for traumatized children, the level of exposure to an acutely dangerous event predicts risk for the development of subsequent psychiatric symptoms.[47] This association has been noted along the full spectrum of trauma, from war to human-made and natural disasters to abuse. Regardless of which type of trauma a child experiences, families contending with either elevated degrees of social disruption or elevated psychiatric symptoms in care-giving adults have an increased risk for development of child psychiatric symptoms.[47]

A child's reaction to stressors is influenced by the effects of the traumatic event on the family.[5] Children's responses to the stressors of war or significant natural disasters (for instance, hurricanes, flooding, or earthquakes) may be influenced by the fact that their parents are often contending with the same immediate, stressful environment and possible losses (such as the loss of home, the death of a family member, the need to suddenly relocate, the destruction of a school, or the loss of a pet). Parents in mass trauma are often participants or victims in the disaster itself, which can have a distinct impact on children and their ability to be cared for. This dynamic is often absent when a child experiences individual trauma, which may not directly affect a parent or caretaker.[40]

Systems Issues

Community and social supports for children and families are essential for protection and resilience in recovery from mass trauma. Consequently postdisaster community health is considered essential for resilience of families. It "depends in part on the effectiveness of organizational responses, and ultimately the purpose of disaster management is to ensure the safety and well-being of the public."[48] The concept of community resilience was introduced by Norris and colleagues[48] in 2008 in an extensive review of multiple disciplines' literature that concluded with a definition of resilience as "a process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance," with emphasis on "the process linking resources (adaptive capacities) to outcomes (adaptation)." A model of community resilience (a process linking a set of networked adaptive capacities to a positive trajectory of functioning and adaptation in constituent populations after a disturbance) based on Dohrenwhend's[49] earlier psychosocial model of stress and updated to include contemporary models of stress was created. In this model, "resilience occurs when resources are sufficiently robust, redundant, or rapid to buffer or counteract the effects of the stressor such that a return to functioning, adapted to the altered environment,

occurs. For human individuals and communities, this adaptation is manifest in well-ness. Vulnerability occurs when resources were not sufficiently robust, redundant, or rapid to create resistance or resilience, resulting in persistent dysfunction. The more severe, enduring, and surprising the stressor, the stronger the resources must be to create resistance or resilience."[48]

Incorporating these principles, Pfefferbaum and colleagues,[50] in the American Academy of Child and Adolescent Psychiatry Practice Parameter on Disaster Preparedness, includes the following information: "Disaster System of Care-The disaster system of care is built on existing systems. It includes both a public health component, which emphasizes resilience focusing on identifying those in need of services, and a clinical component, which is designed to treat posttraumatic stress or maladaptive emotional and behavioral responses that result from the disaster and secondary adversities. Mental and behavioral health considerations should be integrated into public health, medical, and pediatric disaster management.

In developing an effective response system to considerable disasters, there are select groups in the child and adolescent population that should be taken into consideration. Children with developmental or intellectual disabilities, residents of group homes or foster homes, those with severe psychiatric illness, those for whom sudden separation from psychotropic medication may result in acute decompensation, pregnant youth who may have already less than ideal access to prenatal services, children with communicative difficulties (including those who are not primary English speakers and therefore may have difficulty expressing needs in times of disaster), and those of lower socioeconomic class who may have contended with considerable stress prior to the onset of a calamity should not be overlooked in the disaster planning process.

Another unique system that continues to evolve serves the needs of US military families and children. In response to extensive American military combat deployments over the past 12 years, robust behavioral health interventions have been developed and refined across the military health care system. In implementation of such programs on military installations, in medical and behavioral health clinics, through educational and outreach programs in military communities, in schools serving military children, and through programs targeting active duty, guard, and reserve components, both preventive and treatment approaches have been utilized.

Continued optimization of support services to military families remains essential, particularly in light of increased child maltreatment rates noted during periods of deployment of select populations. In a study of families of enlisted soldiers in the US Army with substantiated reports of child maltreatment, rates were elevated when soldiers were on combat-related deployments.[17] Increased levels of child neglect were noted during 2 large-scale deployments of US Army troops both during the initial Persian Gulf War (1991) and during the early years of US deployments to Iraq and Afghanistan (2002–2004), whereas national rates of child neglect showed little change.[11]

Community Response Strategies

Community resilience relies on a public health approach to the well-being of a population of people. It has been adapted by many governmental agencies in the United States[51,52] and abroad (ie, United Kingdom *Strategic National Framework on Community Resilience* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/60922/Strategic-National-Framework-on-Community-Resilience_0.pdf).

Schreiber and colleagues[53] report in a recent article that no strategy or concept of operations linking best practices for disaster response is currently in place. They note, however, that the National Children's Disaster Mental Health Concept of Operations,[54] which details the essential elements needed for an interoperable, coordinated

response for the mental health needs of children by local communities, counties, regions, and states to better meet the needs of children affected by disasters and terrorism incidents, is a new effort to redress this deficiency.

The Department of Health and Human Services noted in the *2011 Update on Children and Disasters*: *Summary of Recommendations and Implementation Efforts*[55] that the National Disaster Medical System has begun training all personnel (approximately 7200) in psychological first aid (PFA) so they may be better able to address the emotional and behavioral health needs of disaster responders and survivors, including children. The US Public Health Service Commissioned Corps includes PFA training in its entire field training activities, including its Community Health and Service Missions (CHASM) initiative. Recent CHASM missions have specifically incorporated emergency preparedness for children, including day care and childcare facility preparedness. An example also cited for a strategic therapeutic response was as follows.

In response to the Joplin, Missouri, tornado disaster of May 2011, the Administration for Children and Families, along with the state of Missouri and community-based groups, created the Joplin Child Care Task Force, which consolidated federal, state, local, and nonprofit efforts to provide emergency childcare and to reconstitute the childcare infrastructure of the community. Through the efforts of this task force, 510 of the 670 childcare slots needed were immediately provided through a coordinated referral system. The Joplin experience provides an important model for other communities that experience severe damage to childcare systems due to disasters.

On October 29, 2012, Superstorm Sandy made landfall in New Jersey, resulting in more than 60% of the population being without power as well as gas shortages. Superstorm Sandy was responsible for 697 childcare provider closures and 86 Head Start center closures spanning the states of Connecticut, New Jersey, and New York. This severe disruption of the government offices and community's childcare capacity jeopardized the recovery of thousands of families with children. Shortly after the disaster, partners formed the New Jersey State–led Children's Task Force and New York Children's Task Force to address children's and families' needs caused by Superstorm Sandy's disruption of the community's infrastructure. The task forces' purpose was to identify issues and needs of children and families in the state; to develop immediate, short-term, and long-term needs of children and families impacted by the storm; and to coordinate response and actions across federal, state, local, and nongovernmental organization partners. Among several activities provided were the movement of families out of congregate care shelters to housing by providing targeted services for families with children in the Federal Emergency Management Agency Transitional Sheltering Assistance program and coordination of behavioral health resources and expertise to mitigate possible behavioral health issues that arose, to build resilience for the future and to prepare for future disasters.[24]

Challenges

Schreiber and colleagues[53] note that significant deficiencies exist in the community response to "mental health needs of children and families across the continuum of disaster phases (ie, preparedness, response, and recovery)," which is a national challenge. They comment, "Both the National Advisory Committee on Children and Terrorism and the National Commission on Children and Disasters have concluded that more must be done to specifically address the mental health needs of children in the context of disasters and terrorism."

Given that the community response to a disaster is a complicated quilt of local, state, and federal agencies and both governmental and nongovernmental agencies, the coordination of agency responses and adequate resourcing of these agencies is

a major challenge. The reliance in many instances on citizen volunteers further complicates this challenge. Adequate training in a designated role as a mental health responder in itself requires an additional commitment beyond the usual scope of practice for community providers. This poses a not insignificant challenge at all levels of preparedness, response, and recovery.

Community resilience may be further improved by "matching of interventions and services to specified mental health outcomes (eg, psychiatric illness vs disaster-related distress) for exposed and unexposed groups, encouraging the use and integration of appropriate assessment and referral, and evaluating the effectiveness of the interventions and services offered."[56]

IMPORTANT TOOLS FOR PRACTICE

Participation in a disaster response does not equate to the direct application of clinical skills to a traumatized group of individuals. As discussed previously, the role of a mental health clinician is to participate in a disaster system of care that is careful organized and coordinated and provides supportive responses that emphasize the basic care and protection of the most vulnerable (ie, children and families). There are dizzying arrays of unproved techniques of intervention promoted at times of disasters, which can cause more harm than good if applied inappropriately. The American Academy of Child and Adolescent Psychiatry has published a Practice Parameter on Disaster Preparedness,[50] which has well-researched and evidence-based rated principles for child mental health clinicians to follow. Many of these principles are reviewed in this article.

In addition to this important document, there is an excellent resource provided by the National Child Traumatic Stress Network, which gives an updated review of empirically supported treatments and promising practices. The following link contains fact sheets linked from this page, which describe some of the clinical treatment and trauma-informed service approaches implemented by National Child Traumatic Stress Network centers, with the common goal of reducing the impact of exposure to traumatic events on children and adolescents: http://www.nctsn.org/resources/topics/treatments-that-work/promising-practices.

Of the ones listed, the following have been adapted by many national disaster response agencies:

PFA is an evidence-informed approach for assisting children, adolescents, adults, and families in the aftermath of disaster and terrorism. In addition to the English-language edition of the *Psychological First Aid Field Operations Guide*, there are versions in Spanish, Japanese, and Chinese. Developed by Melissa Brymer at the National Child Traumatic Stress Network, it is now in its second edition and can be fully accessed at http://www.nctsn.org/content/psychological-first-aid.

The core actions
- Contact and engagement
- Safety and comfort
- Stabilization
- Information gathering: current needs and concerns
- Practical assistance
- Connection with social supports
- Information on coping
- Linkage with collaborative services

Along with the several language translations, National Child Traumatic Stress Network members have worked to develop PFA adaptations for community religious

professionals, Medical Reserve Corps members, and staff at facilities for families and youth who are experiencing homelessness.

- PFA for Schools
- PFA Field Operations Guide for Community Religious Professionals
- PFA Medical Reserve Corps Field Operations Guide
- PFA for Families Experiencing Homelessness
- PFA for Youth Experiencing Homelessness

Online training is available for free at http://learn.nctsn.org/course/category.php?id=11.

Skills for Psychological Recovery

Skills for psychological recovery (SPR) is a skills-training intervention designed to accelerate recovery and increase self-efficacy. SPR utilizes several core skill sets that have been found helpful in a variety of posttrauma situations. Research suggests that a skills-building approach is more effective than supportive counseling. SPR differs from mental health treatment in that it does not assume pathology but places emphasis on helping a survivor regain a sense of control and competence. Although SPR was not designed to address severe psychopathology, it may be augmented by specific services that do so. Unlike PFA, SPR requires training and certification to ensure compliance with this more complex intervention.[57] Online training sponsored by the International Society for Traumatic Stress Studies was done on February 6, 2013, and a recording is available.[58] Key components of SPR can be found in **Box 5**.

FUTURE DIRECTIONS

Wright and colleagues,[59] in their review of resiliency research of the past 40 years, commented that a robust database has been developed that has provided a strong

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Box 5
Key components of SPR

Gathering information and prioritizing assistance help identify a survivor's primary concern and suggest an action plan.

Building problem-solving skills teaches survivors to break a problem into manageable components and identify the steps to addressing the problem.

Promoting positive activities offers a structured, behavioral means to reduce depression by increasing positive or meaningful activities.

Managing reactions assists in managing distress via several skills, such as breathing retraining, writing about one's experiences, and identifying and planning for triggers and reminders.

Promoting helpful thinking helps identify the common maladaptive appraisals made after a disaster/emergency and to rehearse more adaptive, helpful appraisals.

Rebuilding healthy social connections teaches people to access and enhance social and community supports in a practical way.

From Pennsylvania State University. Skills for Psychological Recovery. Available at: http://www.militaryfamilies.psu.edu/programs/skills-psychological-recovery. Accessed December 16, 2013. The information from the fact sheet was excerpted from www.nctsn.org and Forbes D, Fletcher S, Wolfgang B, et al. Practitioner perceptions of Skills for Psychological Recovery: A training programme for health practitioners in the aftermath of the Victorian bushfires. Aust N Z J Psychiatry 2010;44(12):1105–11.

knowledge of adaptive systems and processes that are associated with resilience, including risk and protective factors. The focus on psychological and interpersonal areas is now shifting to address biologic and cultural levels in a "fourth wave of research." The goals remain the same—learn the mechanisms of risk reduction and key ingredients of successful interventions to promote resilience among vulnerable children and their families. This requires elucidation of the conditions for effective interventions, noting the strategic and cost-effective targets and timing for interventions while exploring natural reparative processes. This requires integrative approaches, which span systems and disciplines. Despite the awareness that resilience in youth is dependent on others and has multiple levels of influence that interact synergistically, there is a lack of knowledge for proved models of clinical intervention that incorporate the biologic, psychological, interpersonal, and cultural elements. This integrative approach would apply the increasing levels of knowledge about resilience in development to populations of vulnerable children and their communities in mass trauma. Policy decisions on when, where, and how to make strategic plans for effective interventions to promote positive adaptations in communities impacted by mass trauma are increasingly crucial to the increasing demands for global relief efforts.

In a recent editorial, Asarnow[60] raised the issue of building stress resistance and resilience in war- and trauma-exposed communities. She noted the urgent need for data to inform public health and clinical programs to maximize program effectiveness. Commenting on a study by Wolmer and colleagues[13] using a controlled trial for teacher-based, resilience-focused intervention (a step forward in the development of an evidence-based practice), she noted that there is a lack of effectiveness trials to inform community practice.

In addition to the need for more rigorous research to inform the development of prevention and intervention practices after mass trauma, the public health approach taken by the community resilience metaphor proposed by Norris and colleagues[48] has focused attention on the need to incorporate a population-based approach to mitigate vulnerabilities, reducing negative health consequences, and rapidly restoring community functioning. This is now considered a cornerstone of national health security[51] in the United States, the United Kingdom,[61,62] and Australia.[63]

Finally there is recognition of the need to study the long-term consequences of exposure to mass trauma during war. To meet this objective, "longitudinal studies that recruit representative samples, establish the cultural relevance and validity of the instruments used, and provide input from multiple informants are needed."[43] Further study of military families to determine the impact of parental deployment through repeated and/or extended absences in harm's way is also needed to help determine the effectiveness of programs designed to provide support.

SUMMARY

Mass trauma, encompassing disasters, war, and terrorism, can destroy all dimensions of a child's ecology, causing both direct and indirect lasting effects for individuals, families, and whole communities. There are now overlapping forms of mass trauma, such as the triple disasters recently in Great East Japan Earthquake—earthquake followed by a devastating tsunami and, finally, the destruction of a major nuclear power plant. Even in these circumstances, research informs that an important modifiable predictor of child outcomes is adult reactions and behaviors. Parents' own anxieties can have a profound impact on their children by exacerbating their fears.[9]

Beyond the realm of natural disasters, the most toxic environment for children subjected to mass trauma is one where a prolonged exposure to war and terrorism

undermines a civil society. Examples of this are notable in Belfast, Mozambique, and refugee camps in the many civil war arenas today. In these circumstances, the recruitment of children into armed conflict further threatens to traumatize generations.

In the face of these mass traumas, a series of consensus recommendations have been developed to address the need to protect and intervene with vulnerable populations of children (themselves at risk as a group). Due to the dearth of empirically supported evidence to recommend specific interventions for populations exposed to mass trauma, a group of international experts concluded that there are 5 empirically supported intervention and prevention principles to guide practices and programs at the early to midterm stages of disaster recovery. These are aimed at promoting (1) a sense of safety, (2) calming, (3) a sense of self- and community efficacy, (4) connectedness, and (5) hope.[64]

A child's social ecology is a central feature of resilience, which has been linked to a community resilience model.[48] In a recent publication on this topic, Noffsinger and colleagues[39] note, "The Macro system affects disaster response and recovery indirectly through intangible cultural, social, economic, and political structures and processes. Children's responses to adversity occur in the context of these dynamically interconnected and interdependent nested environments, all of which endure the burden of disaster."

In keeping with this approach, Masten and Narayan[37] recently recommended "training of all disaster-response personnel on special needs and issues of children; recognition of parents, teachers, and care providers as first responders who also need training; avoiding separation of children from caregivers and reuniting separated families; careful monitoring of media exposure in children; and rapid restoration of routines, schools, and opportunities to play or socialize with peers."

Focusing more specifically on individual children, Pine recommended identifying and monitoring children at high risk for psychiatric symptoms after exposure to trauma. A trial of cognitive behavioral therapy (CBT) for children manifesting trauma-related anxiety and mood symptoms is also recommended. A lack of response to CBT for anxiety or mood symptoms or the presentation of other psychiatric symptoms is an indication for the use of other treatments, including the use of psychotropic medications that have proved efficacy for the treatment of these symptoms/disorders.[45,65]

The role of psychotropic medications in the treatment of children and adolescents in a mass trauma recovery period is limited. A literature review in 2010 concluded, "extant data do not support the use of SSRIs [selective serotonin reuptake inhibitors] as first-line treatments for PTSD in children and adolescents. There is limited evidence that the brief use of antiadrenergic agents, second-generation antipsychotics, and several mood stabilizers may attenuate some PTSD symptoms in youth."[66] The appropriate use of psychotropic medications for continued treatment of previously diagnosed psychiatric disorders is the most likely indicated use. Extreme caution is urged for the use of these agents in a mass trauma circumstance.[65]

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