Published in final edited form as:

Child Adolesc Psychiatr Clin N Am. 2014 April ; 23(2): 363–382. doi:10.1016/j.chc.2013.12.006.

Universal Preventive Interventions for Children in the Context of Disasters and Terrorism

Betty Pfefferbaum, MD, JD^a, Vandana Varma, MBBS^b, Pascal Nitiéma, MD, MPH, MS^c, and Elana Newman, PhD^d

Betty Pfefferbaum: Betty-Pfefferbaum@ouhsc.edu; Vandana Varma: Vandana-Varma@ouhsc.edu; Pascal Nitiéma: Pascal-Nitiema@ouhsc.edu; Elana Newman: Elana-Newman@utulsa.edu

^aGeorge Lynn Cross Research Professor, Paul and Ruth Jonas Chair, Professor and Chairman and Director, Terrorism and Disaster Center, Department of Psychiatry and Behavioral Sciences, College of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma 73126-0901; (405) 271-5121

^bAssociate Research Scholar, Terrorism and Disaster Center, Department of Psychiatry and Behavioral Sciences, College of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma 73126-0901; (405) 271-5121

^cResearch Biostatistician, Terrorism and Disaster Center, Department of Psychiatry and Behavioral Sciences, College of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma 73126-0901; (405) 271-5121

^dMcFarlin Professor of Psychology and Co-Director, Tulsa Institute of Trauma, Abuse and Neglect, University of Tulsa, Department of Psychology, 800 South Tucker Drive, Tulsa, Oklahoma 74104-3189; (918) 631-2836

Synopsis

This review addresses universal disaster and terrorism services and preventive interventions delivered to children pre and post event. The paper describes the organization and structure of services used to meet the needs of children in the general population (practice applications), examines screening and intervention approaches (tools for practice), and suggests future directions for the field. A literature search identified 17 empirical studies which were analyzed to examine timing and setting of intervention delivery, providers, conditions addressed and outcomes, and intervention approaches and components.

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Corresponding author: Betty Pfefferbaum, MD, JD, Department of Psychiatry and Behavioral Sciences, College of Medicine, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma 73126-0901; (405) 271-5121; Betty-Pfefferbaum@ouhsc.edu.

None of the authors of this manuscript have any actual or potential conflicts of interest. Points of view in this document are those of the authors and do not necessarily represent the official position of the National Child Traumatic Stress Network; the National Institute of Mental Health; the National Institute of Nursing Research; the Substance Abuse and Mental Health Services Administration; the Tulsa Institute of Trauma, Abuse and Neglect; the University of Oklahoma Health Sciences Center; or the University of Tulsa.

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Keywords

Children and adolescents; disaster; disaster interventions; disaster mental health services; preparedness; screening; terrorism; universal interventions

Introduction

Children are especially vulnerable to the effects of disasters and terrorism and they constitute an important focus of disaster mental health services. Because disasters threaten children's assumptions that the world is safe and predictable,¹ disaster services may be needed for children who reside in the general community where a disaster strikes as well as for those who are more directly affected by an event through physical presence, the experiences of significant others, damage to property, and/or exposure to secondary adversities. Preventive interventions are classified along a spectrum of risk and need with universal preventive interventions designed for the general population of children in a disaster community not identified for individual risk. These interventions are contrasted with selected preventive interventions for children who are at increased risk of developing a mental, emotional, or behavioral disorder based on biological, psychological, or social factors and with indicated preventive interventions for children at high risk and identified as being predisposed to, or having minimal detectable signs or symptoms that presage, a disorder.² Universal, selected, and indicated services can be linked through a stepped approach with assessment and sequenced interventions based on need.³

This paper addresses universal preventive interventions administered to general populations of children without consideration of their disaster experiences or emotional states. Thus, these interventions address children with a range of disaster exposures and conditions rather than focusing only on the needs of children who were directly exposed to an event, children whose significant others were directly exposed, or children whose prior experiences or pre-existing conditions increase their risk for adverse outcome. This report describes the organization and structure of services used to meet the needs of children in the general population (practice applications), examines screening and intervention approaches (tools for practice), and suggests future directions for the field.

Literature Search and Review

A systematic literature search on child disaster and terrorism mental health services and interventions was conducted in July 2013. See Figure 1. Much of the literature described services addressing multiple populations—universal, selected, and indicated—covering a variety of disasters and issues across disaster phases. These included empirical studies and descriptive works on disaster services in general (e.g., mental health services, crisis intervention, school-based activities) and on specific disasters.

Forty seven articles described empirical studies of interventions. In one study which described a two-phase trial,⁴ the two stages discussed were analyzed separately. Hence, the final sample of empirical papers for review included 48 intervention studies. These studies were classified as universal, selected, or indicated based on ratings by two authors (PN and VV). Universal preventive interventions were defined as those delivered to children regardless of their disaster exposures or experiences or their clinical or emotional or behavioral status. Inter-rater agreement (weighted kappa) for these ratings was 0.80 (95% CI=0.64 – 0.96). Discrepancies were resolved through consensus of the authors. Seventeen studies describing empirical research on universal preventive interventions were selected for analysis. See Figure 1.

Of the 17 empirical studies evaluating universal preventive interventions, 5 addressed preparedness and 12 addressed post-disaster situations. It is noteworthy that many of the studies were well designed with 14 implementing controlled trials and 7 of those using individual or cluster random assignment. See Table 1.

Practice Applications: Organization and Structure of Disaster Mental Health Services

The disaster system of care includes two components. The public health component emphasizes wellness and resilience and includes efforts to identify children who need services. The clinical component is designed to treat psychopathology and maladaptive emotional and behavioral reactions to the event and to secondary adversities including pre-existing psychopathology exacerbated by the disaster.²¹ Operational in the aftermath of an event, this system of care relies on a network of existing and new clinical, public health, education, faith-based, and community service systems to reach survivors with a range of needs. It may be difficult to implement services depending on the degree of destruction or damage to the community infrastructure and on the chaos and confusion that ensue.

Pre- and post-event interventions have addressed a variety of natural and human-caused disasters and have been delivered to children and adolescents across ages and in nations around the world. See Table 1. The choice of interventions depends on the disaster phase and on the availability of settings and providers as well as on the experiences and needs of the children being served. Each of these is addressed below.

Timing of Intervention Delivery

Universal services are applied across all phases of a disaster. Pre-event services are designed to enhance preparedness and resilience whereas post-event interventions are used to normalize reactions, reduce trauma and anxiety, and improve coping and recovery. Typically, screening and case finding activities are administered post event to capture information appropriate to the context and disaster phase. Interventions in the studies examined for this report were delivered pre disaster for preparedness efforts and from several months to over two years post disaster. See Table 1.

Pre-disaster preparedness interventions have been delivered to universal populations in geographic areas where disasters are likely to recur. Two types of preparedness programs have been tested. One approach provided instructions to children and their parents about disasters and disaster mitigation without directly addressing emotional issues.⁸ This approach increased children's hazard knowledge and hazard adjustments and decreased their hazard-related fears. Similar to post-disaster interventions, the second approach, used in the context of terrorism, focused directly on children's emotional health in the context of educational programming about the sociopolitical conflicts that led to the terrorist threat.^{5, 7} Specifically, two classroom interventions delivered to Israeli students attending schools in communities that had suffered repeated terror attacks employed psychoeducation, cognitive behavioral techniques, body awareness activities and meditation, and narrative approaches.^{5,7} These interventions resulted in improved emotional outcomes such as posttraumatic stress disorder (PTSD) symptoms, somatic complaints,^{5,7} anxiety,⁵ depression, and functional problems⁷ for participants.

Several interventions reviewed for this report were efficacious when administered within the first six months post disaster.^{14,18–20} In their controlled trial of an intervention delivered three months after exposure to volcanic eruptions, Ronan and Johnston¹⁴ found improvement in children's self-reported PTSD symptoms and coping ability with both of the brief interventions tested—a cognitive behavioral intervention and an exposure intervention—with no significant difference between the two interventions. Following a massive

earthquake in Turkey, Wolmer and colleagues found significant improvement in posttraumatic stress and dissociative symptoms, while grief symptoms increased significantly, following an intervention that combined psychoeducation, cognitive behavioral techniques, play activities, and maintaining a personal diary delivered four to five months after the earthquake.¹⁸ Approximately, three years after the intervention (three and one half years after the earthquake), the severity of posttraumatic stress, grief, and dissociative symptoms in the intervention and control groups were not significantly different, but the children who participated in the intervention were rated higher in adaptive functioning than the control group.¹⁹

Evidence suggests that interventions can be beneficial even if delivered many months or even years after a disaster with some evidence of long-term benefit. For example, Brown and colleagues⁴ administered their intervention more than two years after the September 11 attack with sustained benefit at four-to-six month follow up. Berger and Gelkopf¹⁰ demonstrated improvement in children's distress symptoms with their intervention administered 14.5 months after the 2004 Indian Ocean tsunami but did not conduct a long-term follow-up assessment to examine lasting benefit with the intervention. Goenjian and colleagues¹¹ found that their trauma- and grief-focused psychotherapy intervention, delivered to children 18 months after a massive earthquake in Armenia, resulted in reductions in posttraumatic stress. Moreover, the benefit was evident five years after the disaster when, in addition to greater improvement in PTSD symptoms, those who received the intervention showed improvement in depressive symptoms while those who did not experienced worsening of depressive symptoms.¹² Improvement in the PTSD score in the non-treatment group could be attributed to natural recovery while the much greater decrease in those who received the intervention suggests a clinically meaningful effect of the intervention on PTSD symptoms with a large difference in the changes in PTSD scores between both groups (Cohen's $d = 0.89$). The medium effect size of the difference in changes in depression scores between the two groups (Cohen's $d = 0.73$) also suggests a clinically meaningful effect of the treatment on depression.

It is unclear if either the number of sessions or the duration of an intervention is associated with lasting benefit. As evident in Table 1, the number of sessions across interventions ranged from 1 to 16, commonly delivered on a weekly basis. Hardin and colleagues¹³ implemented the most prolonged intervention, with three sessions per year over a three-year period. Perhaps most impressive was the sustained benefit with the intervention delivered by Goenjian and colleagues^{11,12} in four group and two individual sessions over three weeks.

In general, studies have not considered the importance of timing in their analyses of outcomes nor have they compared the efficacy of interventions delivered during different disaster phases. Moreover, the potential for natural recovery complicates the interpretation of results. Certain trauma-related stress symptoms may recede over time without any therapeutic intervention as observed in two non-treatment controls in the reviewed studies.^{12,13} Ronan and Johnston¹⁴ considered the possibility of natural recovery and thus assessed the effects of time in their comparison of brief exposure and cognitive behavioral interventions in children after a series of volcanic eruptions. The study included two phases: the first was a two-month observational period with no treatment and the second entailed administration of either the exposure or cognitive behavioral intervention. PTSD symptoms and coping scores improved significantly during each of the two study phases in both the full sample and the subset of participants with symptomatic PTSD. For participants with symptomatic PTSD in both treatment groups, the decrease in PTSD symptoms during the observational phase was greater than that of the post-treatment period, in contrast to coping scores which increased more after treatment than in the observational period. The study of a school-based public health intervention delivered to adolescents after Hurricane Hugo also

raised the possible influence of natural recovery when after increased distress in both the intervention and control groups in the first year, there was a steady decrease over the next two years for all groups.¹³ Hence, some, or all, of an observed treatment effect may reflect natural recovery. It also is possible for symptoms to remain stable or increase when no treatment is administered^{e.g., 11,12} or for recovery of non-treated children to occur at a slower pace relative to those who receive treatment. For example, it took more than 18 months after the baseline assessment to observe a significant decrease in posttraumatic stress symptoms in non-treated students who were exposed to the Armenian earthquake while those who received the intervention had significantly lower posttraumatic stress symptoms 18 months after the baseline assessment.^{11,12}

Delivery Sites

Universal disaster services are administered in community settings generally chosen to maximize access. These include for example, schools and pre-schools, day care programs, primary health care facilities, faith-based institutions, youth centers, volunteer organizations, and even shelters and refugee camps if other sites are unavailable. With respect to the interventions reviewed for this paper, all but one, which was administered in a community setting (L.Vijayakumar, written communication, September 2013), were delivered to children in schools. After reviewing 19 trauma intervention studies, including 8 on disaster interventions, Rolfsnes and Idsoe²² concluded that interventions in schools and by school personnel are beneficial for traumatized children.

Universal preventive interventions, which can be delivered in groups to relatively large numbers of children simultaneously, are especially suited for school settings, which provide access to children who are accustomed to shared experiences. Typically, schooling is one of the first services to be restored post event. Further, disaster-related problems are likely to emerge in school where children spend many of their waking hours. Schools not only foster development, achievement, and discovery, they constitute the primary socializing agent for children providing safe environments to acquire and build trusting relationships with adults and peers and to express and process their experiences and emotions. If not damaged or destroyed by the disaster, schools are a source of continuity, stability, and strength to teach safety and preparedness, normalize and monitor reactions, reestablish routines, clarify and process media coverage, restore expectations, teach coping, practice new skills, inspire hope and a focus on the future, and support recovery. Moreover, children derive support from their peers at school.

Services can be delivered in schools without the stigma commonly associated with mental health interventions, and parents and families know and generally trust school personnel and processes. While parents may not seek services for themselves, they may be receptive to services designed for their children. Thus, schools can be used to reach the broader community through public health activities such as preparedness, prevention, and universal interventions designed to deliver psychoeducation and social support, assess and monitor affected children, and identify and triage children with problems that warrant more comprehensive evaluation and more intensive professional attention.

A number of obstacles complicate the use of schools for delivering disaster services. School administrators must balance the importance of the academic mission with the emotional needs of children, teachers, and staff. Administrators sometimes minimize the effects of a disaster thinking that few children were affected and that those who were can readily be identified.²³ School personnel may be concerned that addressing the disaster will “re-traumatize” children, failing to see the distinction between re-exposing children to the actual threat as opposed to memories and information about the threat. Teachers and staff are likely to be stressed by the disaster; thus, addressing their needs must be a priority.²⁴ The school’s

response may be hindered if trauma-exposed parents question school policies and the ability of the school to protect their children.¹ Depending on school or school-district policies, active or passive parental consent may be required to conduct screenings and/or deliver services. Parents may be suspicious of services especially if coupled with research and they may be too busy attending to other primary needs to provide documentation of consent. Moreover, schools may lack certain resources needed to provide services that typically are found in clinical settings such as sufficient private space to meet with children and families, the availability of licensed mental health professionals, and the capacity and mechanisms to conduct comprehensive assessments and deliver treatment. Furthermore, classroom enrollment may change as a result of displacement creating challenges in finding children who may need services as well as potential problems integrating displaced children into schools which may lack the resources and preparation to address the needs of these children.¹ Finally, using classroom settings misses children who are denied access to school and/or those who are home schooled.

Providers

The choice of providers to deliver disaster interventions is determined by various factors including their availability, training, and experience as well as the goals and complexity of the intervention and the venue for intervention delivery. Noting that teachers can administer assessments, reinforce new skills, and provide feedback to students, Wolmer and colleagues¹⁸ prepared teachers as “mediators” to deliver a classroom-based intervention to children after an earthquake in Turkey. Teachers and school personnel have established relationships with children making them a natural source of support, they are familiar with child development and situational crises, and they are in a position to notice emotional and behavioral changes and changes in functioning. Yet at the same time, they may need additional support and guidance for addressing their own emotional responses. This support can be incorporated into teacher training to enhance their coping as well as their sense of self-efficacy and competence.²⁵

As evident in Table 1, all of the pre-event preparedness interventions reviewed for this report were delivered by trained teachers while most of the post-event interventions were delivered by mental health professionals. Pre-event situations are not typically designed to address clinical concerns while clinical problems may arise in post-event environments especially following catastrophic events. For example, Goenjian and colleagues¹¹ used therapists to deliver both their universal classroom-based group intervention and individual sessions with children after the Armenian earthquake. Vijayakumar and colleagues¹⁷ used psychologists and volunteers to deliver an intervention to children in a coastal village in India approximately one year after the 2004 Indian Ocean tsunami. Many of the children receiving these interventions were severely or moderately affected though over 40% were not affected by the disaster. On the other hand, noting the lack of trained mental health professionals, an intervention delivered to Sri Lankan children following the tsunami¹⁰ and one administered to children following an earthquake in Turkey^{18,19} were delivered by teachers who were trained and supervised.

Conditions Addressed and Outcomes

Universal services are delivered to children regardless of their disaster exposures, experiences, or reactions. The outcomes studied reflect the focus of the interventions and the characteristics of the children receiving them. Table 2 presents the outcomes examined in the universal preventive intervention studies reviewed for this report. Appropriately, given their application to children in the general population rather than to selected or indicated populations, most studies did not measure PTSD diagnostic outcomes and the six studies that did report PTSD outcomes used cut-off values on rating scales rather than clinical

assessment to establish diagnostic outcome.^{5-7,9,10,20} Notable pre-event exceptions were terrorism preparedness interventions with Israeli children, many of whom had been exposed to prior terrorist incidents,^{5-7,9} another post-event Israeli terrorism intervention study,²⁰ and an intervention delivered to Sri Lankan children following the 2004 Indian Ocean tsunami.¹⁰ The vast majority (95.8%) of the Sri Lankan children studied by Berger and Gelkopf¹⁰ after the tsunami were physically present at the disaster, 60.2% knew someone killed, and 27.1% knew someone injured in the disaster making it appropriate to address PTSD. Not only did the intervention result in a decrease in the number of probable PTSD cases in the intervention group compared to the waitlist control group, no new cases of probable PTSD were observed in the intervention condition while new probable cases emerged in the waitlist control.

As evident in Table 2, most interventions have demonstrated benefit in at least some of the outcomes measured including PTSD or posttraumatic stress reactions or symptoms,^{5-7, 9-12, 14,18-20} other anxiety reactions,^{5,6} depression,^{4,7,10-12} somatic complaints,^{5-7,10} anger,⁴ dissociative symptoms,^{18, 19} grief,¹⁹ hope,¹⁰ and functioning.^{5-7,10,19} Not all studies examined emotional or behavioral outcomes exclusively. Two investigations studied children's knowledge after interventions that delivered information about disasters.^{8,15} Ronan and Johnston⁸ found improvement in problem-focused areas such as hazard knowledge and hazard adjustment and in hazard-related fears after an emergency management education program though there was no improvement in the children's perceived emotional coping ability. Sahin and colleagues¹⁵ found no significant difference in earthquake knowledge between children who received a psychoeducation intervention and the no-treatment control condition though children who received the intervention reported it to be beneficial. Instead of measuring emotional or behavioral outcomes, Stewart and colleagues¹⁶ asked students who participated in their psychoeducational Hurricane Hugo intervention to rate their experience using written questions with five response options ranging from poor to excellent. Most students rated the experience favorably.

All but four studies^{8,13,15,16} assessed posttraumatic stress reactions or symptoms as an outcome though not all found improvement from pre to post assessment^{4,17} or superiority of the intervention over the control condition.^{17,19} See Table 2. For example, Vijayakumar and colleagues¹⁷ attributed their failure to find improvement in PTSD symptoms in children who participated in their intervention to the fact that the largely psychoeducation intervention was not intended to address trauma symptoms. The intervention focused instead on other behaviors including the expression of positive emotions and resisting peer pressure to smoke, both of which improved.

While universal preventive interventions are not intended for children who themselves are, or whose loved ones are, directly exposed to a disaster, these children may receive universal interventions intended for general populations of which they are a part. Study results may be skewed when interventions are delivered to universal populations that include large numbers of children with direct exposure or children with disaster-related losses. For example, following their universal teacher-mediated intervention for children after an earthquake in Turkey, Wolmer and colleagues¹⁸ found improvement in posttraumatic stress symptoms while grief symptoms increased perhaps because the resolution of trauma allowed the grief process to begin or because the intervention did not adequately address grief symptoms; there also may have been a reporting bias created by the participants' reluctance to acknowledge symptoms before the intervention and their willingness to do so after the intervention. In their follow-up study, these investigators¹⁹ found a significant decrease in posttraumatic stress, grief, and dissociation over the course of three years, but unfortunately, children in both the intervention and control groups still reported moderate (30-35%) or

severe (17–18%) levels of posttraumatic stress symptoms, and there was no significant difference in levels of posttraumatic stress symptoms between the intervention and non-treatment control groups. The investigators attributed these results to a combination of pre-disaster vulnerability, post-disaster stress, dysfunctional family life, and inadequate support for some children demonstrating the importance of referral for selected and/or indicated interventions for children at elevated risk for adverse outcome. Nevertheless, teacher-rated daily functioning in terms of academic performance, social behavior, and general conduct was significantly better in the intervention group compared to controls.

Important Tools for Practice: Screening and Intervention Approaches

Various approaches are used in universal services to administer preparedness and post-disaster interventions and to conduct screening and case-finding activities. These universal services are typically delivered to children in groups.

Screening and Case Finding

The goal of screening is to identify children who are at risk for maladaptive outcomes and/or those who may need formal evaluation and possible treatment. Screening is appropriate if large numbers of children were exposed to an event or if the level of exposure among a population is unknown. Screening is typically conducted in venues where children naturally congregate. For example, schools provide a popular and relatively convenient setting for screening.^{3,26} The appropriate timing of screening remains in debate especially given the ubiquitous distress that accompanies disasters;²⁷ screening must be reasonable in cost in relation to potential benefits;²⁸ and it should not be conducted in the absence of a mechanism to refer children for the services that the screening results suggest are needed.²⁹ Figure 2 outlines the steps associated with the screening process including indications for clinical evaluation and appropriate services.

Screening may set a low threshold to increase sensitivity (the likelihood of testing positive for an individual with the condition), while sacrificing specificity (the likelihood of testing negative for an individual who does not have the condition). False positives occur with children being incorrectly labeled as in need of services, which may subject children to unnecessary evaluation and treatment.³⁰ False negatives may occur if the instrument fails to detect the condition presented by the respondent (low sensitivity) or if children deny problems or as a result of natural fluctuation in trauma reactions post disaster.²⁷

Children who screen positive for psychiatric risk (most often PTSD or major depression) should be referred for a more comprehensive evaluation.^{31,32} See Figure 2. A school-based survey of middle and high school students conducted seven weeks after the Oklahoma City bombing underscored the importance of individual assessment for those identified as most distressed or symptomatic who may have suffered a pre-existing condition, experienced prior trauma, or possessed other risk factors.³³ While seeking counseling was related to exposure, to initial reactions, and to current posttraumatic stress, worry about safety, and trouble handling demands in general, few students with the highest posttraumatic stress levels sought counseling and there was no relationship between posttraumatic stress and seeking counseling for this group.³³ The findings also support the need for outreach and psychoeducation to inform families about when services may be needed and to link symptomatic children to those services.

For practical administration, screening tools should be brief, uncomplicated, and easy to administer and score; appropriate in content reflecting the context and disaster phase; and acceptable to those being screened.^{28,29} Screening instruments should reflect developmental and normative expectations, the language and culture of those being assessed, and the needs

of children with special health and mental health problems.³⁴ In the disaster context, screening tools for children typically query aspects of children's exposure and experiences (e.g., disaster-related injuries, losses, life disruptions, adversities, current needs) and their subjective reactions (e.g., horror/terror, general distress, posttraumatic stress reactions, anxiety, depression, changes in behavior, impaired functioning). These tools typically do not assess pre-disaster problems or the numerous individual, family, and social factors that may influence children's reactions.³²

A number of instruments have been used to assess children's reactions to traumatic events and conditions³⁵ that arise in the post-disaster environment such as PTSD symptoms, depressive symptoms, other anxiety symptoms, and behavior problems.³⁶ Table 3 presents the instruments used to measure selected outcomes in the universal child disaster interventions reviewed for this report. Unfortunately, while studies have been conducted on screening tools in Chinese³⁷ and Thai³⁸ samples, the sensitivity and specificity of most instruments for use in screening has not been well established in the context of disasters or terrorism.

Intervention Approaches and Components

Universal preventive interventions, administered pre and post disaster, are used for general populations of children whose disaster exposures and experiences may vary greatly. These public health interventions may benefit all children by normalizing disaster reactions, helping children process their experiences, fostering coping and adaptive skill development, enhancing future planning and preparedness, and promoting recovery.

All of the interventions reviewed for this report were administered to children in groups. The benefits of group application include learning from other group members and enhanced peer support. For example, Brown and colleagues⁴ attributed the improvement in depression with a September 11 classroom intervention in part to the social component of the intervention. Group interventions must be designed and implemented to avoid the potential for children to be overwhelmed by the experiences and reactions of other group participants, however.

Universal disaster interventions rely heavily on various cognitive behavioral techniques similar to those described for traumatized children in general.³² Table 4 displays summary data on the components used in the reviewed interventions based on author descriptions. Except for an emergency management preparedness intervention⁸ and a psychoeducation intervention,¹⁵ the interventions used a variety of multimodal approaches.

The summary data presented in Table 4 reveal the prominence of coping skill development (n=15, 88.2%), affect processing techniques (n=14, 82.4%), social support (n=13, 76.5%), psychoeducation (n=12, 70.6%), and stress management (n=12, 70.6%) in universal disaster and terrorism mental health interventions. Parents were included in more than one-half of the interventions (n=10, 58.8%). In some interventions, parents provided assessments of their children,^{8,19,20} and in some, parents received psychoeducation^{5-7,15,18} and/or participated in other intervention activities. For example, several studies included parents in homework assignments^{5,6,8,10} and one delivered family intervention to students and parents when indicated.¹² The studies have not examined or compared the relative benefit of various intervention components.

Future Directions

Despite increased attention to the disaster-related needs of children and a growing evidence base for disaster mental health interventions, a number of areas warrant attention. To unite universal preparedness and post-disaster interventions, it would be helpful for all studies to

include assessments of disaster knowledge and preparedness as well as emotional and behavioral indicators. While the theory links pre and post interventions as stepped processes in community response and preparedness, the research literature evaluating these interventions does not use similar assessments.

The extant literature has not clarified which, if any, specific intervention approach or component is responsible for benefit. In fact, only one of the studies in this review compared two interventions finding no significant difference in outcome using the two.¹⁴ It is possible that some common factor, or factors, among interventions (e.g., the therapeutic relationship, the expectation of therapeutic success, acknowledgement of difficulties, the process of facing the trauma, the opportunity to ventilate and/or gain mastery over the problem)⁴⁸ is, or are, responsible for the success of the various approaches used in the interventions studied. Thus, future studies will need to compare intervention approaches, dismantle multimodal interventions to identify the elements that are responsible for benefit, and address the effects of natural recovery. Future studies also must be methodologically rigorous using control groups and other elements of well-designed studies such as clearly defined target symptoms, reliable and valid measures, blinded evaluators, assessor training, replicable interventions, random assignment, and treatment adherence measures.⁴⁹ Studies with longer follow-up assessments are important and preparedness interventions should be evaluated post incident.

The next generation of studies should identify and examine various child, intervention, and situational factors that may influence intervention delivery and outcomes. For example, culture is rarely discussed though it should be a consideration in intervention development and delivery. Berger and Gelkopf¹⁰ described in some detail the steps they took to adapt their intervention, which had been administered to Israeli children exposed to the chronic threat of terrorism, to the cultural differences in Sri Lankan children exposed to the 2004 Indian Ocean tsunami. The adaptation required the investigators to explore emotional expression and processing in the Sri Lankan population and to modify intervention activities to better represent and incorporate the social and spiritual beliefs and practices of this population.

While the science of universal intervention evaluation advances so must attention to service delivery issues. Many universal preventive interventions are administered in school settings where children are accessible in groups. Efforts to equip schools and other venues as well as personnel are essential. For example, the importance of models and materials for recruiting and training teachers and others to deliver these interventions cannot be overstated. Those planning services should consider adopting a stepped care approach where some services, such as universal public health interventions, are provided to all children in a disaster setting, with referral to selected and indicated services determined by children's clinical status and needs.

Conclusions

As part of the public health component of the disaster system of care, universal preventive services are used for children in general populations who have a range of exposures, experiences, and needs. These services include screening and case finding as well as both preparedness and post-event interventions. Universal activities typically are administered in a group format in settings where children naturally convene such as schools. A number of instruments are available to screen children for a variety of outcomes though these have not been well studied in the disaster context. Most pre- and post-disaster interventions have addressed children's emotional and behavioral reactions though some have focused on children's disaster knowledge and disaster management. Most interventions are multimodal incorporating common elements to educate children, normalize their reactions, process their

emotions and manage stress, enhance coping, and provide social support. The field awaits research on a number of key issues related to the relative efficacy of intervention approaches and components, the timing and setting of intervention delivery, and the preparation of providers. Also important will be closer attention to the interface of universal, selected, and indicated services.

Acknowledgments

Acknowledgements and Disclosures

This work was funded in part by the National Institute of Mental Health, the National Institute of Nursing Research, and the Substance Abuse and Mental Health Services Administration (5 R25 MH070569) which established the Child and Family Disaster Research Training and Education Program at the Terrorism and Disaster Center (TDC) at the University of Oklahoma Health Sciences Center. TDC is a partner in the National Child Traumatic Stress Network and is funded, in part, by the Substance Abuse and Mental Health Services Administration (1 U79 SM57278).

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Key Points

Universal disaster services are used for children in general populations without consideration of their disaster exposures, experiences, or reactions.

Universal disaster services include screening and case finding as well as preparedness and post-event preventive interventions.

Universal services typically are administered in a group format in settings where children naturally congregate such as schools. Most universal preventive interventions delivered to children pre and post disaster are multimodal and rely heavily on cognitive behavioral techniques.

Most universal preventive interventions have demonstrated benefit for at least some of the outcomes measured.

The field awaits research on a number of key issues related to the relative efficacy of universal preventive intervention approaches and components, the timing and setting of intervention delivery, and the preparation of providers.

Figure 1.

Flow Diagram of the Literature Search and Research Reviewed

^aTwo stages of one study which described a two-phase trial⁴ were analyzed separately, resulting in 46 interventions for review.

Figure 2.

Flow Diagram of the Screening Process

^aScreening instruments with established high sensitivity and specificity in children similar to the ones being screened (e.g., similar socio-demographic characteristics, culture, trauma, environmental context) should be used.

^bChildren receiving only universal interventions should be reassessed periodically.

Characteristics of Studies Assessing Universal Interventions

Table 1

Study	Disaster/Time interval between event and intervention	Age and/or Grade	Location/Provider	Type of intervention	Number of sessions/duration of the intervention	Type of Control	Random assignment
Preparedness Interventions							
Berger et al (2007) ⁵	Terrorism ^d /Ongoing	Grades 2–6	School/Teacher	Eclectic with CBT	8 sessions	Waitlist	Yes ^b
Berger et al (2012) ⁶	Terrorism ^d /Ongoing	11–13 years	School/Teacher	Eclectic with CBT	16 weekly sessions	Waitlist	Yes ^b
Gelkopf and Berger (2009) ⁷	Terrorism ^d /Ongoing	Grades 7–8	School/Teacher	Eclectic with CBT	12 sessions	Waitlist	Yes
Ronan and Johnston (2003) ⁸	Pre-event preparedness/No disaster	11–13 years	School/Teacher	Emergency management hazard education	1 class period per day over six weeks for usual education; NS for homework with parents	Usual hazard education	Yes ^b
Post-disaster Interventions							
Wolmer, Hamiel and Laor (2011) ⁹	Pre-event prevention/No disaster	Grades 4–5	School/Teacher	Eclectic with CBT	14 weekly modules	NTC	No
Berger and Gelkopf (2009) ¹⁰	Tsunami/14.5 months	9–14 years	School/Teacher	Eclectic with CBT	12 weekly sessions	Waitlist	Yes ^b
Brown et al (2006) ⁴ (Classroom)	Terrorist Attack/30 months	8–13 years	School/Mental health professional	Eclectic with CBT	10 weekly sessions	NA	NA
Goenjian et al (1997) ¹¹	Earthquake/18 months	Grades 6–7	School/Mental health professional	Eclectic with CBT	4 group and 2 individual sessions over 3 weeks	NTC	No
Goenjian et al (2005) ¹²	Earthquake/18 months	15–17 years	School/Mental health professional	Eclectic with CBT	4 group and 2 individual sessions over 3 weeks	NTC	No
Hardin et al (2002) ¹³	Hurricane/NS	13–18 years	School/Mental health professional	Eclectic with CBT	3 sessions per year for 3 years	Assigned non-treated & Nonparticipants	Yes ^b
Ronan and Johnston (1999) ¹⁴	Volcanic eruption/3 months	7–13 years	School/Mental health professional	Eclectic with CBT	1 session	Exposure	Yes ^b
Sahin et al (2011) ¹⁵	Earthquake/10 months	NS/NS	School/Mental health professional	Psychoeducation	NS	NTC	No
Stewart et al (1992) ¹⁶	Hurricane/NS	13–17 years	School/Mental health professional	Eclectic with CBT	1 session	NA	NA
Vijayakumar et al (2006) ¹⁷	Tsunami/12 months	11–14 years	Community setting/Mental health professional and volunteer	Eclectic with CBT	6 sessions over 6 months	NTC	No

Study	Disaster/Time interval between event and intervention	Age and/or Grade	Location/Provider	Type of intervention	Number of sessions/duration of the Intervention	Type of Control	Random assignment
Wolmer et al (2003) ¹⁸	Earthquake/4.5 months	Grades 1–5	School/Teacher	Eclectic with CBT	8 twice-weekly sessions	NA	NA
Wolmer et al (2005) ¹⁹	Earthquake/4.5 months	9–17 years	School/Teacher	Eclectic with CBT (follow up of 2003 study)	8 twiceweekly sessions	NTC	No
Wolmer et al (2011) ²⁰	Terrorism ^a /5 months	8–12 years Grades 3–6	School/Teacher	Eclectic with CBT	15 weekly Modules	Waitlist	No

^aStudy participants had been exposed to repetitive terrorist attacks in the context of armed conflict.

^bCluster randomization.

Abbreviations: CBT = Cognitive behavioral therapy; NA = Not applicable; NS = Not specified; NTC = Non treatment control; NWE = Not well established treatment.

Table 2

Outcomes Assessed in Studies of Universal Interventions^a

Study	Event	PTSD diagnosis or caseness	PTSS	Anxiety	Depression	Coping	Functioning	Somatic complaints	Other outcomes
Preparedness Interventions									
Berger et al (2007) ⁵	T	IMP, SUP	IMP, SUP	IMP, SUP	-	-	IMP, SUP	IMP, SUP	
Berger et al (2012) ⁶	T	IMP, SUP	IMP, SUP	IMP, SUP	-	-	IMP, SUP	IMP, SUP	Separation anxiety: IMP, SUP
Gelkopf and Berger (2009) ⁷	T	IMP, SUP	IMP, SUP	-	IMP, SUP	-	IMP, SUP	IMP, SUP	
Ronan and Johnston (2003) ⁸	PE	-	-	-	-	NC, NSD	-	-	Hazard adjustments: IMP, SUP EM knowledge: IMP, SUP Hazard fears: IMP, NSD
Post-disaster Interventions									
Wolmer, Hamiel and Laor (2011) ⁹	T	SUP	SUP	-	-	-	-	-	Stress/Mood: SUP
Berger and Gelkopf (2009) ¹⁰	ND	IMP, SUP	IMP, SUP	-	MP, SUP	-	IMP, SUP	IMP, SUP	Hope: IMP, SUP
Brown et al. (2006) ^{b, 4} (Classroom)	T	-	NC	NC	IMP	-	-	-	Anger: IMP
Goenjian et al. (1997) ¹¹	ND	-	IMP, SUP	-	NC, SUP	-	-	-	-
Goenjian et al (2005) ^{c, 12}	ND	-	IMP, SUP	-	NC, SUP	-	-	-	-
Hardin et al (2002) ¹³	ND	-	-	-	-	-	-	-	Mental distress: IMP, SUP
Ronan and Johnston (1999) ¹⁴	ND	-	IMP, NSD	-	-	IMP, NSD	-	-	-
Sahin et al (2011) ¹⁵	ND	-	-	-	-	-	-	-	Earthquake knowledge: NSD Perceived benefit: SUP
Stewart et al (1992) ^{d, 16}	ND	-	-	-	-	-	-	-	Evaluation of intervention
Vijayakumar et al (2006) ¹⁷	ND	-	NC, NSD	NC, NSD	-	-	-	NC, NSD	Behavior difficulties: NC, NSD Affective problems: NC, NSD

Study	Event	PTSD diagnosis or caseness	PTSS	Anxiety	Depression	Coping	Functioning	Somatic complaints	Other outcomes
Desist smoking: SUP									
Wolmer et al. (2003) ¹⁸	ND	-	IMP	-	-	-	-	-	Grief: WR Dissociative symptoms: IMP
Wolmer et al. (2005) ¹⁹	ND	-	IMP, NSD	-	-	-	SUP	-	Grief: IMP, NSD Dissociative symptoms: IMP, NSD
Wolmer et al. (2011) ²⁰	T	IMP, SUP	IMP, SUP	-	-	-	-	-	Stress/Mood: IMP Parent concern: NC Teacher satisfaction with classroom atmosphere: IMP

^aTypes of intervention and controls are presented in Table 1.

^bThere was a significant pre-/post improvement in total PTSD score for 22 participants identified as having PTSD, but the difference was not significant for the full sample.

^cThe decrease in mean depression score in the treatment group was not statistically significant.

^d82% of the participants rated the small group component as "very good" or "excellent" and 70% rated the large group component as "very good" or "excellent."

Abbreviations: EM= Emergency management; IMP = Pre-/post improvement in the intervention group; NC= No significant change in outcome after the intervention; ND = Natural disaster; NSD = No significant difference between intervention and control; PE = Pre-event no disaster; PTSD = Posttraumatic stress disorder; PTSS = Posttraumatic stress symptom or reaction; SUP = Intervention superior to control; T = Terrorism; WR = Pre-/post worsening of symptoms.

Table 3
Instruments Used to Measure the Principal Outcomes Assessed in Studies of Universal Interventions

Outcome	Instrument	Studies
PTSD/PTSS (n=13)	Post-Traumatic Stress Disorder Reaction Index (PTSDRI, Steinberg et al 2004) ³⁹	Berger et al (2007) ⁵
		Berger et al (2012) ⁶
		Berger and Gelkopf (2009) ¹⁰
		Gelkopf and Berger (2009) ⁷
		Goenjian et al (1997) ¹¹
		Goenjian et al (2005) ¹²
		Ronan and Johnston (1999) ¹⁴
		Vijayakumar et al (2006) ¹⁷
		Wolmer et al (2003) ¹⁸
		Wolmer et al (2005) ¹⁹
Anxiety (n=4)	Child PTSD Symptom Scale (CPSS, Foa et al 2001) ⁴⁰	Wolmer et al (2011) ²⁰
		Wolmer, Hamiel and Laor (2011) ⁹
		Brown et al (2006) ⁴
		Berger et al (2007) ⁵
		Berger et al (2012) ⁶
Depression (n=5)	Screen for Child Anxiety-Related Emotional Disorders (SCARED, Birmaher et al 1997) ⁴¹ Multidimensional Anxiety Scale for Children (MASC, March et al 1997) ⁴² Youth Self Rating scale (YSR, Achenbach 1991) ⁴³ Brief Beck Depression Inventory (Beck and Beck 1972) ⁴⁴ Children's Depression Inventory (CDI, Kovacs 1985) ⁴⁵ Depression Self-Rating Scale (DSRS, Asamow and Carlson 1985) ⁴⁶	Brown et al (2006) ⁴
		Vijayakumar et al (2006) ¹⁷
		Berger and Gelkopf (2009) ¹⁰
		Gelkopf and Berger (2009) ⁷
		Brown et al (2006) ⁴
Functioning (n=5)	Diagnostic Interview Schedule or Children/Diagnosis Predictive Scale(DISC/DPS, Lucas et al 2001) ⁴⁷	Goenjian et al (1997) ¹¹
		Goenjian et al (2005) ¹²
		Berger et al (2007) ⁵
		Berger et al (2012) ⁶
		Berger and Gelkopf (2009) ¹⁰
		Gelkopf and Berger (2009) ⁷

Outcome	Instrument	Studies
	Instrument devised by study authors	Wolmer et al (2005) ¹⁹
Somatic complaints (n=5)		Berger et al (2007) ⁵
		Berger et al (2012) ⁶
	Diagnostic Interview Schedule or Children/Diagnosis Predictive Scale (DISC/DPS, Lucas et al 2001) ⁴⁷	Berger and Gelkopf (2009) ¹⁰
		Gelkopf and Berger (2009) ⁷
	Youth Self Rating scale (YSR, Achenbach 1991) ⁴³	Vijayakumar et al (2006) ¹⁷

Table 4

Components Included in the Universal Interventions Reviewed

Component	Preparedness interventions (n=5)	Post-disaster interventions (n=12)	Total n=17 (%)
Psychoeducation	4	8	12 (70.6)
Exposure /Narrative	3	6	9 (52.9)
Relaxation skills	3	2	5 (29.4)
Stress management	4	8	12 (70.6)
Affect awareness/Modulation	5	9	14 (82.4)
Coping	5	10	15 (88.2)
Social Support	4	9	13 (76.5)
Future safety and/or future plans	5	6	11 (64.7)
Parent	4	6	10 (58.8)