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Child Disaster Mental Health Interventions: Therapy Components

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Abstract

Children face innumerable challenges following exposure to disasters. To address trauma sequelae, researchers and clinicians have developed a variety of mental health interventions. While the overall effectiveness of multiple interventions has been examined, few studies have focused on the individual components of these interventions. As a preliminary step to advancing intervention development and research, this literature review identifies and describes nine common components that comprise child disaster mental health interventions. This review concluded that future research should clearly define the constituent components included in available interventions. This will require that future studies dismantle interventions to examine the effectiveness of specific components and identify common therapeutic elements. Issues related to populations studied (eg, disaster exposure, demographic and cultural influences) and to intervention delivery (eg, timing and optimal sequencing of components) also warrant attention.

Keywords

children and adolescents; cognitive behavioral therapy; disaster; disaster mental health interventions; intervention components; mental health interventions; terrorism; trauma

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Introduction

Worldwide, children and families suffer physical and emotional consequences of disasters. Myriad public health and clinical interventions have been developed to address children's disaster reactions.¹⁻⁹ Many of these interventions are multimodal, comprised of various components associated with cognitive behavioral therapy (CBT).^{6,7} For the most part, child disaster intervention evaluation studies have not examined the benefit of specific intervention components. Thus, this report provides a review of the components included in available child disaster mental health interventions as a prelude to formal study of the effectiveness of these components.

Methods

The Compilation of Studies

The research on child disaster mental health intervention studies was identified through a literature search of EMBASE (Elsevier, Amsterdam), ERIC (US Department of Education, Washington, DC), Medline (US National Library of Medicine, Rockville, Maryland USA), Ovid (Ovid Technologies Inc., New York), PILOTS (US Department of Veterans Affairs, Washington, DC), PsycINFO (American Psychological Association, Washington, DC), and Social Work Abstracts (National Association of Social Workers, Washington, DC) conducted in July, 2013. The search was confined to English-language materials on children and adolescents, aged 0 through 17 years. The following terms were used: accident(s), adolescent(s), child(ren), disaster(s), intervention(s), terrorism, terrorist event(s), terrorist incident(s), treatment(s), and war. Identified titles and abstracts were reviewed to select material for potential inclusion in the analysis. To focus the review on disasters and terrorism, studies addressing accidents and war were excluded. Publications known to the authors that were not identified by the search were incorporated as appropriate. The reference sections of articles identified by the search were examined to identify other materials not already generated. The review included only intervention studies, not materials on the organization or delivery of services or qualitative descriptions of interventions not subjected to empirical testing. The process yielded a total of 50 publications on interventions with 35 (70.0%) using disaster samples, 10 (20.0%) using terrorism samples, three (6.0%) using heterogeneous samples, one (2.0%) using a hostage-taking sample, and one (2.0%) on disaster preparedness. Eleven (22.0%) studies used another intervention (as opposed to a waitlist) as the control group, resulting in 61 interventions included in this review.

Components

While there has been some effort to identify the practice elements used by providers in the field to address childhood trauma (eg Borntrager et al¹⁰), this work has not focused specifically on disaster interventions. Cohen and colleagues^{11,12} generated an acronym, "PRACTICE," to describe nine core trauma-focused CBT components used with child trauma survivors: (1) psycho-education; (2) parenting skills; (3) relaxation skills; (4) affective modulation skills; (5) cognitive coping and processing; (6) trauma narrative; (7) *in vivo* mastery of trauma reminders; (8) conjoint child-parent sessions; and (9) enhancing future safety and development. These components were endorsed in the American Academy

of Child and Adolescent Psychiatry (AACAP) practice parameter on posttraumatic stress disorder (PTSD).¹³ The nine components were examined in the studies in this review, with some modification. Affect modulation included techniques aimed at identifying, processing, or moderating emotions. Coping skill enhancement included any techniques focused on promoting adaptive coping in which coping skill development or enhancement was the objective. *In vivo* and *in vitro* desensitization were consolidated as exposure, and parenting skills and conjoint child-parent sessions were combined as parent involvement. With the reorganization, this review describes the following CBT intervention components: (1) psychoeducation; (2) relaxation skills; (3) affect modulation; (4) coping skill enhancement; (5) exposure; (6) trauma narrative; (7) techniques to enhance future safety and/or development; (8) garnering social support; and (9) parent involvement.

Rating Procedures

Two investigators (BP and PN) scored all interventions to identify the components used. To be scored, the component had to be explicitly mentioned in the description of the intervention, and any component mentioned in the report, even if minimally described, was scored as present. Moreover, while some studies described using the same interventions (eg Cohen et al¹⁴ and Jaycox et al¹⁵), these were counted separately to reflect the number of studies using the components rather than the intervention itself. For example, Cohen and colleagues¹⁴ reported using Trauma Focused-Cognitive Behavioral Therapy (TF-CBT) and Cognitive Behavioral Intervention for Trauma in Schools (CBITS), interventions also studied by Jaycox and colleagues,¹⁵ but Cohen's group described only the trauma narrative in their 2009 report. Thus, TF-CBT and CBITS were each scored more than once but only the trauma narrative was scored in the study by Cohen's group.¹⁴ The simple kappa coefficient estimate for inter-rater agreement of the identified components was 0.86 (95% CI, 0.80–0.91). Discrepancies were settled through consensus. Table 1 summarizes the number of interventions studied that included each component.

Two investigators (BP and PN) also scored the populations studied for each intervention using three categories. Clinically-indicated interventions were delivered to children receiving treatment for disaster-related clinical conditions, symptomatic children, or children identified through screening to receive the intervention. Selected interventions were delivered to children based on their disaster exposures. Universal interventions were delivered to all children, regardless of their disaster reactions or exposures. The simple kappa coefficient estimate for inter-rater agreement on populations was 0.83 (95% CI, 0.71–0.96).

Results

Two sets of results are presented. First is a presentation of summary data on the frequency of components used and of the populations receiving the interventions examined in this analysis of the research. Second is a qualitative description of the findings related to the nine components examined in the review.

Summary Data on the Frequency of Component Use and the Populations Served

Table 1 presents summary information on the frequency of components used in the interventions studied. Psychoeducation and affect modulation were the most commonly-used components, followed by relaxation and coping skill enhancement, and then enhancement of future safety and/or development, parental involvement, and exposure. Trauma narrative and social support were the least frequently-used components.

Therapeutic Components and Child Developmental Stage—As also shown in Table 1, most interventions included children of elementary and middle school age, with many fewer interventions for children of high school age. Among the intervention studies that included high school students, the most frequently employed components were affect modulation and psychoeducation. Five interventions were examined in four samples of preschool age children,^{16–19} with one study¹⁷ examining two interventions—eye movement desensitization and reprocessing (EMDR) and CBT. Not surprisingly, all interventions studied in preschool children included a parent component, though this was not the case with other developmental stages. Psychoeducation also was included in all interventions studied in preschool children. Exposure was used in four of the five interventions for this age group.^{16–19}

Therapeutic Components and Child Populations—The interventions were delivered to children with a range of exposures in research conducted in locations around the world. Table 2 displays the frequency of components according to the populations studied. The majority of interventions were delivered to children in treatment for clinical problems, symptomatic children, and/or children identified through screening (clinically indicated). Next most common was delivery to all children in the population regardless of symptoms or exposure (universal), and the fewest interventions were delivered to children identified as at risk due to their disaster exposures (selected). Strikingly, over one-half of the interventions studied for clinically-indicated populations used affect modulation, relaxation, and psychoeducation. Among interventions designed for selected populations, affect modulation and parent components were used in over one-half of the studies. Among interventions designed for universal populations, psychoeducation, affect modulation, coping skill enhancement, and techniques to enhance future safety and/or development were used in over one-half.

Therapeutic Components and Timing of Intervention Delivery—Descriptive statistics presented in Table 3 suggest that relaxation, affect modulation, and trauma narrative components were used more frequently as time since the disaster increased. It is possible that rather than due to timing since the event, the frequency of inclusion of some components was related to the differences in populations served. Indeed, while almost one-half ($n = 17$; 48.6%) of the clinically indicated interventions were delivered more than six months after the event, only 12.5% ($n = 1$) of the selected interventions, and one-third ($n = 6$; 33.3%) of the universal interventions, were reported to have been offered in the same time frame (Table 4).

Therapeutic Components and Effectiveness of the Interventions on PTSD

Reactions—The current analysis of outcomes focused on PTSD reactions because these were the most common outcomes measured in the child disaster mental health intervention research⁷ and because the components under investigation in this review were envisioned to address trauma reactions. Of the 61 interventions evaluated for this review, 49 (80.3%) examined PTSD reactions. Statistically significant pre/post intervention improvement in PTSD reactions was documented in 43 (87.8%) of the 49 interventions that measured PTSD reactions while six (12.2%) of the interventions resulted in no statistically significant change in PTSD reactions (Table 5). Noticeably, trauma narrative and parent involvement were not included in the interventions that reported no improvement over time. Additionally, exposure and coping skill enhancement were markedly less frequently described as components of interventions with no statistically significant change in PTSD reactions after intervention (16.7% and 33.3%, respectively) than in those with a statistically significant decrease in PTSD reactions (44.2% and 60.5%, respectively). Unfortunately, however, given the small number of studies in which there was no statistically significant change ($n = 6$), and given the prospect that some intervention components may have been offered to the study participants but not reported in the published manuscripts, no definitive conclusions should be drawn about which specific components were most effective.

Qualitative Analysis of the Components Studied

The quantitative data are difficult to interpret due to inconsistencies in the descriptions of components in the literature. A qualitative summary of the components, presented below, adds richer detail to the understanding of their use.

Psychoeducation—Psychoeducation, which typically provides health and behavioral health education, is a basic component of many interventions. Psychoeducation entails teaching children about disaster-specific issues (eg, describing weather events), common reactions to disasters, and healthy coping strategies appropriate to the child's age and culture and to the disaster situation and phase. Providing psychoeducation simultaneously to parents as well as children may facilitate parental support by educating parents about common disaster reactions, helping them to recognize reactions that warrant evaluation and intervention, clarifying expectations of intervention, and providing them information about available resources and services. This information and available educational resources can be disseminated through health and mental health programs, schools, other community outlets, and the media.

Most ($n = 39$; 63.9%) of the interventions reviewed used psychoeducation, delivering one or more sessions as a discrete component or integrating education throughout the intervention. For example, to provide empathy and to normalize children's reactions as well as to educate them about the intervention, Brown and colleagues²⁰ explained the connection among cognition, emotion, and behavior in one of the early sessions of their classroom intervention, while Giannopoulou and colleagues²¹ integrated psychoeducation using a hypothetical example of one child's experience with the disaster throughout the intervention.

In the most focused evaluation of psychoeducation for children in the disaster context, Sahin and colleagues²² tested an intervention that provided psychoeducation as the primary component for children and parents after a 1999 earthquake in Turkey. The investigators distributed information about normal disaster reactions and effective coping mechanisms through a variety of means, including brochures and seminars. Groups of children participated in the counselor-facilitated seminars in their school classrooms while their parents attended a seminar. Children who received psychoeducation scored no better on a quiz about earthquakes than the comparison group of children who did not attend the seminars, though the children and their parents reported the program to be beneficial. For children, perceived benefit was related to the number and variety of activities incorporated in the seminars; for parents, perceived benefit was related to the number of topics discussed. The authors recommended that future psychoeducation programs include greater use of participatory activities, concrete examples, role modeling of adaptive coping and communication skills, visual aids, repetition, and time for discussion.²²

Relaxation Skills—Behavioral stress management strategies typically involve building bodily awareness, practicing relaxation strategies, and/or learning controlled breathing techniques. Relaxation skills were used in more than one-half of all interventions across all ages. Many interventions incorporated specific breathing exercises used before, or in combination with, other intervention components. Muscle relaxation, typically progressive muscle relaxation, was commonly included. Some researchers highlighted the importance of alternative stress management and relaxation. For example, the intervention described by Vijayakumar and colleagues²³ used meditation and the one described by Catani and colleagues²⁴ used meditation in combination with relaxation exercises.

Weems and colleagues²⁵ implemented a 5-session intervention for adolescents exposed to Hurricane Katrina (USA, 2005) which focused on reducing elevated test anxiety. Youth first learned about manifestations of anxiety and test-taking skills and then participated in relaxation training, combined with gradual exposure to test-related stimuli. Interestingly, in addition to significant reductions in test anxiety and improvements in academic performance, the intervention contributed to diminished posttraumatic stress symptoms as a result of decreased test anxiety.

In addition to specifying relaxation techniques by that name, other studies described the use of techniques with similar goals; these were not included in the counts in the summary data presented in the tables. For example, Lesmana and colleagues²⁶ used spiritual hypnosis after a terrorist incident in Bali. In another study, Israeli children exposed to chronic terrorism learned to attend to stress-induced bodily sensations and to apply sensory-motor “bio-energy” strategies to manage stress.²⁷

Affect Modulation—The expression, processing, and modulation of painful trauma symptoms promote short- and long-term wellbeing of child disaster survivors. Thirty-nine (63.9%) interventions described affect awareness, emotional modulation, anxiety management, and/or anger management as part of the intervention being evaluated. Some researchers specifically identified emotional expression as a component of their intervention but did not emphasize techniques to modulate or cope with feelings. Some interventions

encouraged children to express their emotions through play, drawing, role-playing, and storytelling. Some had children identify and rate their emotions. Other interventions taught children specific techniques to manage their emotions. For example, March and colleagues²⁸ taught children diagnosed with PTSD a grading technique to quantify their distress levels across multiple situations and an interpersonal problem-solving procedure to regulate anger. In two Israeli studies, children first increased emotional awareness of anger and then learned to express and cope with it appropriately.^{27,29} Children also may develop emotion modulation skills as a result of learning and practicing other components even when affective-specific components are not included in an intervention.

Coping Skill Enhancement—Child disaster studies have begun to explore children's coping³⁰ and interventions have incorporated techniques to enhance coping. Coping skill enhancement was used in more than one-half ($n = 32$; 52.5%) of the interventions studied and was most commonly used in universal interventions ($n = 13$ out of 18 universal interventions; 72.2%; Table 2) and least commonly used in the interventions conducted within the first six months after the event ($n = 9$ out of 24 interventions; 37.5%; Table 3). Cognitive Behavioral Therapy approaches, by design, involve an exploration of children's attributions about their experiences, which may be important for their adaptation, and efforts to reframe them in healthy and beneficial ways. Cognitive restructuring was employed to address children's intrusive thoughts, cognitive distortions, misattributions, and harmful thought patterns. Several interventions using CBT or EMDR taught children to identify positive and negative cognitions (eg, Brown et al,²⁰ Chemtob et al,³¹ and March et al²⁸) and to counteract or replace negative trauma-related thinking, for example, by making specific positive statements to substitute for intrusive trauma-related images or thoughts²⁸ or by replacing the thoughts with more adaptive coping statements.²⁰ In EMDR, other therapeutic tasks, such as distracting eye movements, occur at the same time the child engages in this cognitive restructuring activity.

Other coping techniques were employed as well, including, for example, thought stopping, self-talk, and positive imagery. In their grief and trauma intervention, Salloum and Overstreet³² used several techniques to reinforce coping skills—children made coping puppets and collages, they role played using coping skills, and they constructed a book on coping to share with a caring adult.

Exposure—Exposure-based approaches involve repeatedly exposing the child to the thoughts, images, and feelings associated with the traumatic experience with the goal of processing the traumatic event, reducing distress, and promoting healing typically through desensitization to traumatic stimuli or memories, overcoming avoidance, creating new associations, and/or instilling a sense of control. Both *in vivo* and *in vitro* (imaginal) exposure techniques were used in the child disaster interventions studied ($n = 20$, 32.8%). These techniques were used in a high proportion of the studies involving preschool aged children.

To help them master distressing situations of increasing intensity, *in vivo* desensitization gradually exposes children to the actual feared stimuli with greater intensity over time. March and colleagues²⁸ devoted six of their 18 group therapy sessions to exposure

techniques. In one exposure session, the therapist assisted children in constructing their own personal stimulus hierarchies. Succeeding sessions introduced narratives, modeled a trial exposure task, and assigned *in vivo* desensitization as homework.

In *in vitro* exposure, sometimes referred to as imaginal exposure, children are exposed to anxiety and fear-provoking memories of the traumatic event starting with the least fearful memory and working up toward more distressing memories. *In vitro* exposure shares some elements with both the trauma narrative and *in vivo* exposure. Similar to the trauma narrative, *in vitro* exposure involves exposing children to memories of the traumatic event. Similar to *in vivo* exposure, *in vitro* exposure involves graduated exposure. Therapy approaches often incorporate one or more of these exposure techniques in conjunction with relaxation and breathing exercises to help children manage their anxiety while practicing exposure. For example, in their individual intervention, Brown and colleagues²⁰ delivered four sessions of imaginal exposure with relaxation and cognitive techniques used at the end of the exposure session to reduce anxiety.

Some interventions used both *in vivo* and *in vitro* (imaginal) techniques. For example, as part of a prolonged exposure intervention, Gilboa-Schechtman and colleagues³³ aided trauma victims in constructing an *in vivo* exposure hierarchy and assigned *in vivo* exposure exercises as homework. Imaginal exposure required the children to recount their traumatic memory verbally in the present tense; this was tape-recorded and participants were instructed to listen to the tapes daily at home.

Trauma Narrative—Approximately one-fourth ($n = 15$, 24.6%) of the interventions studied specifically identified a trauma narrative component. The trauma narrative involves talking and/or writing about one's experience to create a detailed description of the thoughts, feelings, and bodily associations that occurred before, during, and after the trauma. In some interventions, the trauma narrative component was conducted individually with children, while in some interventions, children openly discussed their traumatic experiences as a group or with their parents. In some studies, the narrative was conceptualized as a form of exposure, whereas in other studies, it was described as a mechanism for meaning-making or not described well.

To date, only one disaster study has attempted to examine the specific contribution of the trauma narrative to the efficacy of a trauma and grief-based intervention. Salloum and Overstreet³² studied children exposed to various traumatic events who participated in either a grief and trauma intervention with both a coping skills and a trauma and loss narrative component or a grief and trauma intervention including the coping skills component only (with no trauma and loss narrative). Because both intervention groups experienced similar reductions in distress, the results suggest that the trauma narrative did not add extra benefit. The authors noted, however, that even in the coping skills intervention, children talked about their experiences and engaged in emotional processing about the trauma. Children in the group receiving both the trauma narrative and coping skills components had more clinically-elevated distress scores pre intervention than did the group which did not receive the trauma narrative. Thus, the coping skills and trauma narrative group may have benefitted more from the combined intervention than they would have from the coping component alone. Future

studies should focus on determining the degree to which trauma narratives and emotional processing occur in the context of interventions that do not include a formal trauma narrative component. Additionally, specific features of the trauma narrative itself require further exploration to determine which techniques contribute to symptom reduction.

Techniques to Enhance Future Safety and/or Development

Enhancing future safety was a goal of a number of cognitive behavioral interventions. Some interventions included disaster-specific future planning (eg, preparing for future earthquakes or terrorist attacks). For example, Brown and colleagues²⁰ worked with children to develop a safety plan (eg, assemble phone numbers of significant adults and police departments). Some interventions focused on reinforcing coping skills and planning for a better future. For example, the intervention described by Salloum's group³⁴ incorporated education about safety and prevention and specific coping strategies for dealing with future trauma. An intervention studied by Brown and colleagues¹⁶ used a conjoint parent-child session to identify and develop plans to address upcoming challenges.

Few ($n = 3$, 4.9%) of the interventions in this review described components addressing the children's developmental trajectory. Goenjian and colleagues³⁵ identified missed developmental opportunities and promoted normal development by engaging the child survivors of a massive earthquake in discussions about the disaster's effects on their development and by actively helping them develop coping strategies. Goodman and colleagues³⁶ addressed issues of individuation in an adolescent who received client-centered therapy for traumatic grief after the September 11 attacks (New York, 2001).

Garnering Social Support—After a disaster, children are likely to require and benefit from a variety of supports. One-fifth ($n = 12$; 19.7%) of the interventions reviewed included a social support component. For example, interventions helped children learn to garner social support from family members.³⁷ Goenjian and colleagues³⁸ broadened potential sources of social support beyond the family and assisted children in identifying persons who could provide three different types of support—advice, counseling, and/or companionship. Wolmer and colleagues³⁹ implemented a teacher-facilitated group preventive intervention with Israeli children exposed to continuous rocket attacks emphasizing coping through the enhancement of communication with others. Similarly, Gelkopf and Berger²⁹ emphasized social support by leading children through activities designed to explore their social needs. Their intervention helped children to assess their own social needs and find ways to build and strengthen their support system by, for example, encouraging them to ask others for help and to practice empathy toward others.

Parent Involvement—Parents are central figures of caretaking and support for children and can influence their adjustment post disaster. Parents may function as agents of change for children by extending the therapeutic efforts of professionals. In addition, potential long-term benefits may emerge from increased parental ability to support their children as the children become more able to openly discuss feelings about the traumatic experience. Twenty-six (42.6%) of the interventions used a parent component, and it was included in all interventions for preschool children.

Parental psychoeducation was commonly used to teach parents about normal and maladaptive reactions to disaster, to deliver instruction on how to enhance their children's adaptive coping, to provide information about seeking further assistance if indicated, and to address expectations. Some interventions instructed parents about the various skills taught to their children so that parents could encourage their children to practice and use these skills between sessions. Interventions also offered supportive interactions and therapy for parents. A variety of approaches were used to involve parents, including parallel parent sessions, conjoint sessions, or a combination of the two. Giannopoulou and colleagues²¹ provided a 30-minute conjoint session at the end of each child group session to educate parents about techniques used during child sessions and to inform the parents of specific homework assignments. The intervention also created a supportive environment by providing a setting for parents to meet together informally while their children were being seen. An intervention studied by Scheeringa and colleagues¹⁹ used several approaches with maternal caretakers of traumatized preschool children. In some of the sessions, to help them become better attuned to their children, caregivers spent time observing their children on television to learn the material being taught. Part of the time, caretakers met alone with the therapists to help the therapists interpret the children's words and body language, to discuss homework, and to receive supportive therapy and advice.

Discussion

This review of nine components used in child disaster mental health interventions was intended as a preliminary step in creating a foundation and framework for future research, and ultimately, clinical work. Limitations in the extant literature and recommendations for the next generation of study are discussed below.

The quantitative findings are limited by inconsistencies and lack of detail in description of the interventions in some studies. To be scored as present, the component had to be mentioned in the intervention study, and the component was scored as present even if not well described. For example, in their description of two case studies related to Hurricane Katrina, Cohen and colleagues¹⁴ reported using TF-CBT and CBITS, both of which contain numerous CBT elements, but in this publication, they described only the trauma narrative and parent involvement for TF-CBT and only the trauma narrative for CBITS; thus, only those components were scored as present. Ronan and Johnston⁴⁰ called their brief control intervention the "exposure and normalizing condition" which was coded as exposure even though the description of the intervention raised doubt about the use of conventional exposure techniques. These rating procedures were chosen because the actual implementation of an intervention may not have included all components of the intervention and/or may not have conformed strictly to the specified intervention (ie, a question of fidelity). Moreover, it was felt that to be useful to readers, each study had to stand on its own.

The inconsistency in detail about the components included in the interventions studied is a major limitation in this analysis of the extant literature. A related issue is that the terminology used to describe intervention components was inconsistent. Clear definitions of

the components utilized in intervention studies would facilitate a more accurate review of accumulated knowledge and comparison among studies.

Investigators did not dismantle interventions to examine the effectiveness of specific components used. In their study of an intervention delivered to children during the Bosnian War (1992–1995), Layne and colleagues⁴¹ addressed dismantling when they compared children who received their full (psychoeducation, skill building, adaptive grieving, and adaptive development) and partial (psychoeducation and skill building only) interventions. Salloum and Overstreet³² concluded that the trauma narrative was not a necessary component of their trauma and grief intervention to enhance coping. While these findings suggest that some intervention components may not be essential for improved outcome, it is unclear which component, or components, of an intervention is, or are, the “active ingredient” responsible for benefit. For instance, in the present review, trauma narrative and parental involvement were not mentioned as components in any of the six interventions with no statistically significant change in PTSD reactions after the intervention. Fifteen (34.9%) and 24 (55.8%) of the 43 interventions that reported a statistically significant decrease in PTSD reactions after the intervention included trauma narrative and parental involvement respectively, however. Thus, the next generation of studies should dismantle interventions to examine and compare the efficacy of particular components.

While dismantling and examining the various CBT components is important, so is identifying common elements across various modalities that may be responsible for beneficial outcomes. These common elements include, for example, the sensitivity of human concern and the systematic focused attention on the child’s trauma history and symptoms. Moreover, it appears that multiple different approaches lead to improved outcome. For example, there is evidence of efficacy for exposure and narrative therapies,^{23,24,40} but it is unclear if these approaches are superior to others^{24,40} at least over time.³³ Thus, future studies should explore common elements associated with different approaches.

Researchers have yet to determine the ideal sequencing of the components within the available interventions. The trauma bereavement intervention used by Brown and colleagues¹⁶ recognized the importance of addressing trauma before the child can proceed through the grief process while Salloum and Overstreet⁴² noted that an “explicit” focus on grief and bereavement may facilitate the processing of trauma and decrease posttraumatic stress symptoms. The optimal sequence of intervention components may not be the same for all children or all situations and should be examined in future work.

The interventions reviewed in this analysis were administered to various populations of children. Some interventions were clinically indicated, some were delivered to children with specific exposures, and some were delivered to all children without consideration of their exposures or emotional status. The interventions were delivered to children across the age span from preschool age through adolescence but, unfortunately, the studies reported no analysis of age effects. Of interest, five of the interventions were delivered to preschool children.^{16–19} This attention and the alternative criteria for PTSD in this age group, recognized in the American Psychiatric Association Diagnostic and Statistical Manual (DSM 5),⁴³ promise increased attention to these young trauma survivors in the future.

Clearly, intervention components, such as psychoeducation and exposure, which were used in all and most of the interventions administered to preschool children, respectively, must be tailored to the child's developmental level.

Interventions were administered to children across all phases of disaster and in countries around the world. For the most part, studies have not addressed the importance of timing in intervention delivery.⁸ The findings of this review suggest that children from across cultures respond to disaster interventions but modifications may be needed to address specific cultural issues. For example, Berger and Gelkopf⁴⁴ explored emotional expression and processing in adapting an intervention for Sri Lankan children exposed to the 2004 Indian Ocean tsunami. They focused on body processes in emotional expression, encouraged acceptance, and included spiritual and religious practices (eg, meditation and prayer). Because of the influence of the spiritual world in their culture, Lesmana and colleagues²⁶ used spiritual hypnosis in the Balinese children they assisted following a set of bombings. In reporting the results of a play intervention used with Chinese children after an earthquake, Shen⁴⁵ noted problems with compliance because the culture does not value play.

Conclusion

This review of the extant literature constitutes a preliminary step to better understanding the essential mechanisms of action for child disaster mental health interventions. The analysis revealed considerable consistency in the components included in many multimodal interventions currently in use. To advance the field as it pertains to the constituent components of child disaster mental health interventions, future studies should define and operationalize the components, dismantle them for empirical evaluation, and distinguish them in discussions. Other issues related to intervention delivery that warrant attention include examining the exposure of the populations receiving the intervention, assessing demographic and cultural influences, and exploring issues related to intervention delivery such as timing and the optimal sequencing of components.

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Abbreviations

AACAP	American Academy of Child and Adolescent Psychiatry
CBITS	Cognitive Behavioral Intervention for Trauma in Schools
CBT	cognitive behavioral therapy
EMDR	eye movement desensitization and reprocessing
PTSD	posttraumatic stress disorder

TF-CBT Trauma Focused-Cognitive Behavior Therapy

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Table 1

Frequency Distribution of Intervention Components and Developmental Stages

Components	Total Interventions n = 61 (%)	Developmental Stages ^a			
		Preschool n = 5 (%)	Elementary School n = 39 (%)	Middle School n = 42 (%)	High School n = 20 (%)
Psychoeducation	39 (63.9)	5 (100.0)	25 (64.1)	29 (69.0)	13 (65.0)
Relaxation	32 (52.5)	3 (60.0)	23 (59.0)	26 (61.9)	11 (55.0)
Affect Modulation	39 (63.9)	3 (60.0)	25 (64.1)	28 (66.7)	15 (75.0)
Coping	32 (52.5)	3 (60.0)	23 (59.0)	26 (61.9)	10 (50.0)
Exposure	20 (32.8)	4 (80.0)	14 (35.9)	15 (35.7)	7 (35.0)
Trauma Narrative	15 (24.6)	2 (40.0)	11 (28.2)	13 (31.0)	5 (25.0)
Enhance Safety or Development	27 (44.3)	3 (60.0)	19 (48.7)	21 (50.0)	9 (45.0)
Social Support	12 (19.7)	1 (20.0)	7 (17.9)	10 (23.8)	4 (20.0)
Parental Involvement	26 (42.6)	5 (100.0)	17 (43.6)	17 (40.5)	9 (45.0)

^a Several interventions were used across different age ranges so the total number of components for the developmental stages exceeds 61 in some cases.

Table 2

Frequency Distribution of Intervention Components by Study Population

Components	Clinically Indicated n = 35 (%)	Selected n = 8 (%)	Universal n = 18 (%)
Psychoeducation	20 (57.1)	3 (37.5)	16 (88.9)
Relaxation	21 (60.0)	3 (37.5)	8 (44.4)
Affect Modulation	23 (65.7)	5 (62.5)	11 (61.1)
Coping	17 (48.6)	2 (25.0)	13 (72.2)
Exposure	16 (45.7)	1 (12.5)	3 (16.7)
Trauma Narrative	11 (31.4)	1 (12.5)	3 (16.7)
Enhance Safety or Development	16 (45.7)	1 (12.5)	10 (55.6)
Social Support	3 (8.6)	3 (37.5)	6 (33.3)
Parent Involvement	15 (42.9)	4 (50.5)	7 (38.9)

Table 3

Frequency Distribution of Intervention Components by Time Elapsed Since the Event

Component	Time Interval Since the Disaster				
	0-6 Months n = 24 (%)	7-12 Months n = 5 (%)	13-24 Months n = 12 (%)	>24 Months n = 7 (%)	Unspecified Time Interval n = 13 (%) ^a
Psychoeducation	15 (62.5)	3 (60.0)	8 (66.7)	4 (57.1)	9 (69.2)
Relaxation	10 (41.7)	3 (60.0)	7 (58.3)	6 (85.7)	6 (46.2)
Affect Modulation	14 (58.3)	4 (80.0)	9 (75.0)	7 (100.0)	5 (38.5)
Coping	9 (37.5)	4 (80.0)	7 (58.3)	6 (85.7)	6 (46.2)
Exposure	7 (29.2)	2 (40.0)	3 (25.0)	3 (42.9)	5 (38.5)
Trauma Narrative	2 (8.3)	1 (20.0)	7 (58.3)	3 (42.9)	2 (15.4)
Enhance Safety or Development	11 (45.8)	0 (0.0)	5 (41.7)	6 (85.7)	5 (38.5)
Social Support	4 (16.7)	1 (20.0)	2 (16.7)	2 (28.6)	3 (23.1)
Parental Involvement	10 (41.7)	2 (40.0)	5 (41.7)	3 (42.9)	6 (46.2)

^a Includes the two preparedness interventions ("usual condition" and "emergency management condition") implemented by Roman and Johnston.⁴⁰

Frequency Distribution of Populations Studied by Time Elapsed Since the Event, N = 61

Table 4

	Time Interval Since the Disaster				
	0-6 Months n = 24 (%)	7-12 Months n = 5 (%)	13-24 Months n = 12 (%)	>24 Months n = 7 (%)	Unspecified Time Interval n = 13 (%)
Clinically Indicated (n = 35)	10 (28.6)	4 (11.4)	7 (20.0)	6 (17.1)	8 (22.9)
Selected (n = 8)	5 (62.5)	0 (0.0)	1 (12.5)	0 (0.0)	2 (25.0)
Universal (n = 18)	9 (50.0)	1 (5.6)	4 (22.2)	1 (5.6)	3 (16.7)

Table 5

Frequency Distribution of Intervention Components by Intervention Effect on PTSD Reactions

Component	Statistically Significant Pre- Post-intervention Improvement n = 43 (%)	No Statistically Significant Difference between Pre- and Post-intervention n = 6 (%)
Psychoeducation	27 (62.8)	4 (66.7)
Relaxation	28 (65.1)	3 (50.0)
Affect Modulation	30 (69.8)	4 (66.7)
Cope	26 (60.5)	2 (33.3)
Exposure	19 (44.2)	1 (16.7)
Trauma Narrative	15 (34.9)	0 (0.0)
Enhance Safety or Development	22 (51.2)	2 (33.3)
Social Support	9 (20.9)	1 (16.7)
Parental Involvement	24 (55.8)	0 (0.0)