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Approaches to the Assessment of Children in the Context of Disasters

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**Abstract**

Children exposed to disasters are a vulnerable population, making the assessment of children post-disaster an important issue. Utilizing a Multiple Gating Stepped Care framework, we highlight recent literature related to post-disaster assessment and intervention for children. In particular, we focus on screening, clinical evaluation, and feedback informed service delivery. Screening allows large populations of children to be assessed at a low cost. Children identified by screening as being at risk may then be assessed through more in-depth clinical evaluations, in order to assess clinical symptoms, strengths, stressors, and make determinations about appropriate interventions. Continued assessment during therapy provides important feedback for the delivery of appropriate care. New formats for assessment, as well as issues related to identifying sources for assessment, are discussed. Recommendations for future directions are provided.

Key Words: Disasters; assessment; children; posttraumatic stress
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Introduction

Disasters, including natural and man-made disasters, present a major threat to the healthy functioning of children. Over 100 million youth are affected by disasters each year [1], and evidence indicates that the impact and scope of disasters are increasing [2]. Children, given their age and development, may be especially susceptible to experiencing adverse events during and after disasters [3]. Examples of such events include being separated from caregivers during the disaster, home damage, experiencing or witnessing life threatening events, disrupted schooling, or moving away from friends. Thus, it is not surprising that children have been identified as the most vulnerable demographic group for developing psychosocial reactions after disasters [4].

Assessment is fundamental to identifying and meeting children’s unique needs in disaster situations. However, disaster situations present serious challenges to assessment. Disasters themselves are unpredictable and distress communities, and resources are often limited after disasters [5]. In this paper, we review approaches to assessing children in the context of disasters. Within each section, we critically evaluate recent literature to emphasize new findings that impact how the field approaches the assessment of children after disasters.

An Overview of Children’s Symptoms After Disasters

In order to assess children’s symptoms after disasters, it is important to understand the symptoms with which children typically present. Disasters are associated with impaired functioning in children across a variety of domains. The majority of research on children’s reactions to disasters has focused on acute stress disorder symptoms and posttraumatic stress disorder (PTSD) symptoms as the central psychopathology that emerges in children after disasters [6, 7]. Children have also reported many other mental health symptoms after disasters. In fact, Hoven et al. found that among children in New York City 6 months after 9/11, agoraphobia symptoms and separation anxiety symptoms were the most prevalent symptoms, followed by PTSD symptoms [8]. Alongside mental health symptoms, children may experience feelings of shame and guilt [9], and the effects of disasters may extend to physical health problems, alcohol and drug use, and academic difficulties for children [10-13]. Further, children may experience interpersonal difficulties such as increased levels of peer victimization in school [14].

Many children report comorbid symptoms post-disaster [12,15-17]. In particular, PTSD and depression are often comorbid [12,17]. Adams et al. [18] found that 3.7% of adolescents who survived a tornado showed comorbid PTSD and a Major Depressive Episode; as a comparison, 3.5% met criteria for PTSD only in that study. Recently, Scheeringa suggested that comorbid symptomatology among children after trauma may be driven by initial posttraumatic stress symptoms [19••, 20]. In an analysis of 284 young children exposed to a single trauma, Hurricane Katrina, or repeated trauma, non-PTSD disorders rarely evolved in the absence of substantial PTSD symptomatology. This may justify an initial clinical focus on PTSD.

At the same time, it is of note that recent work has documented wide variability in the intensity and severity of children’s individual responses to disasters. Many children report elevated mental health symptoms after disaster exposure [21-24]. Yet, only a relatively small minority of children with elevated symptoms report chronic, persistent mental health symptoms
over time [12,25-27]. Further, most children are resilient and do not report elevations in mental health symptoms after disasters.

**Multiple Gating Stepped Care Approach**

Given the variability in children’s post-disaster symptom presentation and severity, the manner in which assessment and intervention is made available is a key consideration. Current research and expert opinion support the principle of administering the “least intrusive” intervention, as opposed to a model of intervention (e.g., Critical Incident Stress Debriefing/Management) that encourages people to delve into thoughts and feelings, including trauma and distress. For some, these more intrusive models of interventions have been shown to make matters worse [28]. Another important principle is trying to “do more with less” in assessment and intervention, as disasters often impose severe capacity constraints and cause widespread effects and resultant need.

The Multiple Gating Stepped Care assessment and intervention model has gained ascendancy over time and incorporates these principles:

The model itself involves the following components: (a) assessment using multiple gates, (b) interventions that are sequenced and start at a more basic level and move progressively to those that are more intensive and family and individually-focused, and a (c) self-correcting feature designed to assist those not helped at earlier gates. This self-correcting idea is summarized by Davison [29]: “[a]n inherent feature and advantage of Multiple Gating Stepped Care Model is that it self-corrects; that is, it forces one to monitor constantly the effects of one’s interventions and to adjust subsequent strategies based on what has just happened (p. 582) [5, p.66].

When a Multiple Gating Stepped Care model is operationalized (e.g., in the Australian state of Queensland), it typically has different levels of assessment (i.e., gates) and intervention (i.e., steps of care), usually starting with a screening and psychological first aid informed approach as the least intrusive/least resource intensive gate and “step” or level of care [30]. It then typically finishes at the top “step” with formal psychological interventions. Generally, at least one intermediate step focuses on services “stepped up” from psychological first aid but not a fully formal psychological intervention. For example, an intermediate step or level of care would be Skills for Psychological Recovery, developed after Hurricane Katrina and used in a number of post-disaster contexts in the US and elsewhere, including Australia [31].

In this paper, we follow a Multiple Gating Stepped Care philosophy. We focus on different forms of screening as the first assessment gate and more formal clinical evaluations as later gates. To assist with enhancing the self-correcting feature discussed above (i.e., the ability to adjust later strategies based on feedback) [29], a feedback-informed service delivery approach to addressing children’s post-disaster needs is also discussed. This approach has shown encouraging findings related to more effective and efficient interventions for children and families [32-34].

**Screening**
As an early gate in the Multiple Gating Stepped Care model, screening allows for broad assessments of children who may be at risk for developing difficulties after a disaster. Broad assessments are necessary, given the large numbers of children who may have direct or indirect exposure to a disaster and given the fact that many children and families may not seek help independently. Screening has several important advantages as an early gate. Advantages include low cost, low burden, and low training requirements for administrators. Thus, screening is desirable in cases where it is not feasible to conduct a full clinical evaluation on all children exposed to the disaster, or in cases where there may be a large population of children who are indirectly exposed to the disaster.

Screeners for children need to be brief, while still including questions about key psychological symptoms (e.g., posttraumatic stress, depression, anxiety). Screeners also need to assess children’s exposure to disaster. It is of note that physical proximity does not necessarily determine a child’s exposure to a disaster. Children in close proximity to a disaster may vary widely in their experiences, such as what they witnessed and how they perceived the situation. Thus, it is important to assess events witnessed by a child (e.g., destruction), loss experienced (e.g., loss of a loved one or pet), and perceived threat experiences (e.g., thinking that you might die), all of which have been associated with children’s post-disaster functioning \[7, 27\].

Measurement Issues. Screening should be conducted when appropriate resources are available to assist children. Children who report some levels of distress may need referrals for psychosocial support \[35\], while children who report elevated levels of distress may need clinical evaluations and interventions. There are some concerns that questionnaires may overestimate the presence of PTSD symptoms in children \[36••\], but as a first step, they serve in selecting those children who are at risk of pathology and should be clinically assessed.

Screening is often done on a self-report, questionnaire basis. Two particularly well-established screening measures in the American and European context are the Children’s Revised Impact of Events Scale (CRIES) \[37\] and the UCLA Posttraumatic Stress Disorder Reaction Index (PTSD RI) (both of these scales also have parent-report versions) \[38\]. Although these have been used in non-Western contexts as well \[39\], there is a relative dearth of cultural adaptations of child self-report measures. This is concerning, as non-Western contexts may be especially vulnerable to the effects of disasters \[40\]. An exception to the lack of cultural adaptations of child self-report measures is a recent validation of brief self-rating scales for common mental health problems among children in Burundi \[41\]. In general however, very little in-depth validation takes place. In particular, one would expect qualitative research to be conducted in concordance with standard psychometrics to assess the cultural relevance and acceptance of these measures.

In terms of reliability and validity, the CRIES and PTSD-RI usually do quite well. For example, the CRIES-8 and CRIES-13 (alternate versions of the CRIES) showed good specificity and sensitivity \[42\]. The CRIES focuses on intrusion and avoidance irrespective of DSM criteria. A DSM-5 version of the UCLA PTSD RI is now also available \[43\].

Clinical Evaluations

When screeners identify children who are potentially experiencing clinically significant psychological symptoms, a clinical evaluation serves as a subsequent gate in the Multiple Gating Stepped Care model. Clinical evaluations serve as later gates, as they are more costly, time-
intensive, and intrusive, and they require larger amounts of personnel and training. The goals of a clinical evaluation are: a) to identify whether children meet criteria for psychological disorders, and b) to inform treatment planning [35].

To inform treatment plans, clinical evaluations need to assess children’s psychological symptoms in depth, including the degree to which symptoms impair functioning. Clinical evaluations also need to obtain more detailed information on children’s disaster exposure experiences. Further, evaluators should identify potential risk and protective factors in children’s lives.

Key factors that may influence children’s post-disaster functioning include: pre-disaster characteristics of the child, disaster exposure, and the recovery environment. Several pre-disaster characteristics of children have been associated with children’s post-disaster functioning. In a meta-analysis of 96 studies on disasters and youth, Furr, Comer, Edmunds & Kendall [7] found that female gender was associated with higher levels of posttraumatic stress symptoms. Other studies have also found that pre-disaster anxiety is associated with post-disaster functioning [44, 45]. Children’s recovery environment may also play a large role in children’s long-term functioning after disasters. Recovery environments may mediate the relationship between disaster exposure and children’s post-disaster functioning [46]. Important areas to consider include major life events that occur during this time, coping skills, and social support. In particular, coping skills and social support are emerging as protective factors for children [10, 47]. Similarly, aspects of daily life where children experience strengths or benefits may provide input on competencies that can be utilized to support recovery [48].

Recent work outside of disaster research further suggests that peri- and post-trauma factors may play a large role in the development of psychological distress [36 ••]. In a recent meta-analysis of 64 studies, Trickey and colleagues [49] examined risk factors for PTSD in children and adolescents. They found small to medium effect sizes for the relationship between PTSD and pre-trauma variables. In contrast, medium to large effect sizes were found for PTSD and peri-trauma and post-trauma factors, suggesting that peri- and post-trauma factors (e.g., thought suppression, low social support, poor family functioning) play a large role in determining whether a child develops PTSD. It is important to obtain information on these areas in order to guide treatment planning.

Measurement Issues. Few clinical interviews have been validated for the DSM-5 at this point, but for the DSM-IV-TR, a number of PTSD assessments have been validated. In particular, well-established interviews are the Clinician Administered PTSD Scale for Children and Adolescents (CAPS-CA) [50], the Anxiety and Depression Interview Schedule for Children (ADIS-C) [51], the Diagnostic Interview for Children and Adolescents–Revised (DICA-R) [52], the Schedule for Affective Disorders and Schizophrenia for School-Age Children Present and Lifetime version (K-SADS) [53], and the Children’s PTSD Inventory (CPTSDI) [54].

Assessment Formats and Sources

Formats. While screening and clinical evaluation have traditionally been conducted through questionnaires and interviews, new formats are emerging and can be utilized at various gates in the Multiple Gating Stepped Care model. In particular social media and smartphones offer new opportunities for assessment post-disaster. While social media such as Facebook and Twitter are now frequently used during emergencies to inform citizens about risks (e.g., fires),
resources (e.g., safe places), and community actions, they are also increasingly used for mental health screening approaches. For example, Ben-Ezra et al. [55] used Facebook to recruit Japanese citizens for mental health screening after the Fukushima disaster. The increased use of apps on smartphones as well as web-based interactive questionnaires provide quick assessment options for psychosocial symptoms, with the additional possibility to obtain and provide users with immediate feedback. This may create opportunities to conduct screening among adolescents and parents. Not every technological innovation is used by every population however, and user experiences and preferences should be systematically studied to inform clinical practice [56].

Other more intensive methods may be on the horizon. For example, experience sampling methods, which have participants indicate their emotions and experiences in real time [57], are facilitating our understanding of daily interaction processes. In this regard, observational assessments such as the Electronically Activated Recorder (EAR) [58, 59•] and actiwatches for measuring activity levels, may provide opportunities to understand post-disaster behavior and assess how reported mental health problems are expressed in daily life, or give opportunities for understanding patterns in interactions among family members post-trauma. The EAR is an app available for iPhones that records short “snippets” of sounds on set intervals during the day, capturing the EAR-user’s daily life. It can give insights in factors that are currently emerging as key predictors of recovery, including social support and self-efficacy. One of the main advantages of the EAR is that it can be used with children who would otherwise not be able to participate in standard assessment (e.g., due to age and limited attention span issues) [60]. Actiwatches record activity, sleep, and wake data. To our knowledge, they have not been used in post-disaster research with children to date. However, obtaining objective data in the form of actiwatches may be warranted, given the association between disaster exposure and changes in children’s activity levels and sleep patterns [46, 61].

**Sources.** Given that disasters may affect children’s functioning in multiple domains, it may be beneficial to obtain assessments from multiple respondents (e.g., the child, parents, teachers) at various gates of the Multiple Gating Stepped Care model. Each respondent may offer unique information about the child. However, the value of additional information must be weighed against the cost and time associated with obtaining additional assessments. A primary consideration in deciding whom to query is the age of the child.

**Very Young Children.** Very young children lack the verbal skills to discuss disaster reactions, and they do not have the cognitive awareness to identify internalizing symptoms. Children in this age group are also unable to recognize the development of externalizing symptoms. Due to these factors, it is common practice for parents to serve as a proxy for young children during assessment [62, 63].

**School Aged Children.** Unlike very young children, school-aged children are capable of reporting and discussing trauma [64]. For internalizing symptoms, children are often the ideal informant in post-disaster situations because children are able to report internalizing symptoms that parents are unable to observe. Internalizing symptoms may be particularly difficult for parents to recognize if parents’ reactions to a disaster differ from their child’s reaction [65•].

Parent and child reports generally have low concordance, whether families are reporting on internalizing symptoms or disaster-related experiences. A recent study by Lai et al. [65•] examined agreement between parent and child reports of actual life threatening events (e.g.,
window breaking, trees falling) and subjective life threatening experiences (e.g., thinking that you might die). Discrepancies in reports predicted higher levels of child posttraumatic stress symptoms. Parents may need help recognizing stressors experienced by children during and after disasters. This suggests that for the purposes of treatment planning, clinicians should evaluate both parent and child experiences of a disaster.

In addition, teachers may serve as important informants of children’s behaviors. Disasters may have negative effects on children’s school behavior and performance [66], and teachers may be able to observe symptoms (e.g., school behavior) that parents may not have opportunities to observe. In addition to post-disaster symptoms, teachers are also able to report on pre-disaster risk factors such as inattentiveness and poor academic skills [44]. Teacher assessments have been found to be predictive of children’s mental health concerns [67]. Further, post-disaster mental health services are frequently administered in schools, and teachers are often involved in the dissemination of mental health services.

In summary, assessments in multiple formats and through multiple sources may provide valuable additional information. However, this must be weighed against the burden they place on families taxed by disasters, as well as the additional time and cost of assessing multiple sources. When it is only possible to obtain information from one informant, prioritize the child where possible.

Feedback Informed Service Delivery Principles and Practices

After clinical evaluation, feedback should inform service delivery. This self-correcting feature is a key benefit of the Multiple Gating Stepped Care model. Feedback informed service delivery is an approach to assessment and intervention pioneered by Michael Lambert and colleagues [33, 34]. This simple idea is based on behavioural models as well as more client-centred approaches. Getting continuous feedback can allow for assessment that ensures a) important outcomes are being achieved, and b) clients are satisfied with services received. For example, in a family therapy program, in-session measures are introduced to clients as part of a discussion of their goals and choices combined with the value of their feedback, including the facilitative role of both positive and negative feedback [68]. The use of formal feedback in adult treatment samples has been found to boost efficiency (e.g., in marital therapy) [68] and effectiveness of services [33, 34]. This includes boosts to treatment as usual in the range of .34-.92 of an effect size [34]. Preliminary evidence also supports the facilitative role of ongoing feedback in youth treatment, including in public mental health service delivery settings [32].

Thus, in following the Multiple Gating Stepped Care principle of self-correction, children and families may see increased benefits by incorporating ongoing assessment feedback in service delivery. It should be emphasized that implementing feedback-focused assessment tools is easy to do. Assessments, such as a simple 3 item Goals Tracking Form [69] and the Session Rating Scale [70], can be used to focus on the outcomes or goals during the beginning session and the level satisfaction at the final session.

Conclusions

In conclusion, the Multiple Gating Stepped Care model is a flexible, sensitive approach to assessing children’s needs after disasters. In this article, we have highlighted recent research
related to screening, clinical evaluations, formats and sources of assessment, and feedback informed service delivery principles and practices.

However, in order to meet children’s post-disaster needs, steps should also be taken now to prepare for future disasters. These steps include increasing awareness of the potential effects of disaster exposure on children. One way to do this quickly and efficiently might be to train teachers (e.g., through short format lectures in teacher training programs). In addition, it is important that disaster managers be aware of the unique needs and vulnerabilities of children [3]. This may be accomplished through continuing education sessions at disaster management conferences. Finally, as recently reviewed in a special issue of Current Psychiatry Reports, involving children themselves in pre-disaster preparedness and resiliency education programs has been shown to confer benefits that may well extend into the post-disaster response and recovery period for children (and their families), reducing the need for more formal interventions [71]. By taking these more prevention-focused directions in the future, the unique needs of children in the context of disasters may be addressed effectively and appropriately.


New insights regarding comorbidity, suggesting that PTSD symptoms are driving comorbid symptoms


34. Lambert MJ. "Yes, it is time for clinicians to routinely monitor treatment outcome". The heart and soul of change: Delivering what works in therapy (2nd ed.). Washington, DC, US: American Psychological Association; 2010. p. 239-66. 

Meta-analysis of 43 independent samples regarding the incidence of PTSD in trauma-exposed children and adolescents, assessed with well-established diagnostic interviews. Provides benchmarks for DSM-5 and ICD revisions.


Key paper on the development, methodology, and potential of the Electronically Activated Recorder. Provides practical insights into use of this method in psychosocial research.


Paper examining concordance between child and parent reports of disaster experiences.


70. Miller S, Duncan B, Johnson L. The session rating scale V.3.0. Chicago, IL2002.