

# Approaches to the Assessment of Children in the Context of Disasters

Betty S. Lai<sup>1</sup> · Eva Alisic<sup>2</sup> · Rayleen Lewis<sup>1</sup> · Kevin R. Ronan<sup>3</sup>

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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 relatively 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, and stressors, and to 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.

**Keywords** Disasters · Assessment · Children · Posttraumatic stress

## 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.

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✉ Betty S. Lai  
blai@gsu.edu

Eva Alisic  
eva.alisic@monash.edu

Rayleen Lewis  
rlewis35@student.gsu.edu

Kevin R. Ronan  
k.ronan@cqu.edu.au

<sup>1</sup> Georgia State University, 1 Park Place, Atlanta, GA 30303, USA

<sup>2</sup> Monash University Accident Research Centre, Monash University, Clayton Campus, 21 Alliance Lane, Clayton, Victoria 3800, Australia

<sup>3</sup> School of Human, Health, and Social Sciences, CQUniversity Australia, Bruce Highway, Rockhampton, Queensland 4701, Australia

## 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. [8] 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. 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, but most children do not report elevated mental health symptoms after disasters [21–24]. At the same time, only a relatively small minority of children with elevated symptoms report chronic, persistent mental health symptoms over time [12, 25–27].

Post-disaster assessment approaches must carefully consider the fact that there is wide variability in children's post-disaster symptom presentation and severity. To meet children's needs in a disaster context, current research and expert opinion support the principle of administering the "least intrusive" intervention, as opposed to interventions that encourage people to delve into thoughts, feelings, and events related to potentially traumatic events (e.g., Critical Incident Stress Debriefing/Management), which may be ineffective or

even harmful [28]. Another important principle is trying to "do more with less," as disasters often impose severe capacity constraints and cause widespread effects and resultant need. This might include, for example, group- or school-based interventions. Group- or school-based interventions are likely to reach larger groups of children at lower cost than individual therapy. In addition, these types of interventions could be run by teachers or other school professionals, as opposed to needing to be run by clinical psychologists or social workers.

## Multiple Gating Stepped Care Model

The Multiple Gating Stepped Care assessment and intervention model has gained ascendancy over time and incorporates (a) assessment using multiple gates, (b) interventions that begin at a basic level (e.g., providing self-help information) and become more complex and intensive (e.g., individual therapy or family therapy), and (c) a self-correcting feature designed to monitor and help children who may not have been assisted by an earlier gate [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 [29]. 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 USA and elsewhere, including Australia [30].

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) [31], 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 relatively 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. In addition, it would be inappropriate to conduct a full clinical evaluation on children who are only indirectly exposed to a 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].

Screening should be conducted when appropriate resources are available to assist children. Children who report moderate levels of distress may need referrals for psychosocial support [35]. Children who report elevated levels of distress may need clinical evaluations and interventions.

**Measurement Issues** Screening is often done on a self-report, questionnaire basis. There are some concerns that screening questionnaires may overestimate the presence of PTSD symptoms in children [36•], but as a first step, these instruments serve in selecting those children who are at risk of pathology and should be clinically assessed. Two particularly well-established screening measures used 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 instruments 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 cross-cultural validation takes place. In particular, one would expect qualitative research to be conducted on measures, along 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 of the child and family during the recovery period, and social support. In particular, coping skills and social support are emerging as protective factors for children [10, 47]. Similarly, identifying areas in children's daily lives where they report feeling successful or happy may provide information on children's competencies, which may also 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 as a tool in the mental health screening process. 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. Smartphone apps and web-based questionnaires may create expanded 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 practice [56].

Other more intensive methods may be on the horizon. For example, experience sampling methods are methods in which

information about participants' daily experiences are collected in real time [57]. Experience sampling methods are facilitating our understanding of daily interaction processes. In this regard, observational assessments, such as the Electronically Activated Recorder (EAR) [58, 59] and actiwatchers for measuring activity levels, may provide opportunities to understand post-disaster behavior, assess how reported mental health problems are expressed in daily life, and 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) [60]. Actiwatchers 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 actiwatchers may be warranted, given the association between disaster exposure and changes in children's activity levels and sleep patterns [46, 61].

### Sources of Information

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 may not 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 mother and child self-reports of actual life threatening events (e.g., window breaking, trees falling). Mothers and children reported their own experiences, and only dyads that were together during Hurricane Katrina were examined. Discrepancies in reports predicted higher levels of child posttraumatic stress symptoms. For the purposes of treatment planning, clinicians may want to consider evaluating both parent and child experiences of a disaster, as discrepancies in reports may be related to higher levels of child distress. Further, parents may need help recognizing stressors experienced by children during and after disasters.

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. For example, in a study by Honkanen and colleagues [67], teacher reports of child emotional problems at age 8 predicted withdrawal and emotional problems in children at age 16. 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 information. However, the value of multiple assessments 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

Clinical evaluations will identify children who may need clinical services. Under the Multiple Gating Stepped Care approach, clinical services should utilize a feedback-informed service delivery approach. Feedback-informed service delivery was pioneered by Michael Lambert and colleagues [33, 34]. Feedback-informed service delivery involves utilizing periodic assessments throughout therapy. Results from these assessments provide information on whether (a) important outcomes are being achieved, and (b) clients are satisfied with services received. As an example of what feedback-informed service delivery might entail, Anker, Duncan, and Sparks utilized feedback-informed service delivery in a family therapy

program. During the program, couples completed assessments. Results from these assessments were discussed with clients during sessions in order to address goals and satisfaction with therapy [68]. When Anker and colleagues compared results from couples in a feedback-informed service delivery condition to a treatment as usual condition, couples in the feedback-informed service delivery condition reported significantly greater improvement [68]. In other studies, utilizing a feedback-informed service delivery approach has boosted effect sizes as compared 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 administering 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 in the final session.

### Conclusions

The Multiple Gating Stepped Care model is a flexible, sensitive approach to assessing children's needs after disasters. Based on a Multiple Gating Stepped Care model, assessment after disasters should begin with screening, followed by more in-depth clinical evaluations for children who report elevated symptoms. For children identified by clinical evaluations as needing more intensive treatment, feedback-informed service delivery should guide treatment and treatment planning.

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 in the effects of disasters on children and how to help children exposed to disasters (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.

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#### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

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