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Schools and Disasters: Safety and Mental Health Assessment and Interventions for Children

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Abstract This article draws on experiences and lessons from global disasters and utilizes the United Nations Comprehensive School Safety Framework to highlight the necessary role of safe schools in protecting children, as well as adult staff, from the immediate threats and long-term implications of disasters. Specifically, we focus on three well-established pillars of school safety: Pillar I: Safe Learning Facilities; Pillar II: Disaster Management; and Pillar III: Risk Reduction and Resilience Education. In addition, we propose a potential fourth pillar, which underscores the function of schools in postdisaster mental health assessment and intervention for children. We argue that schools offer a central location and trusted institutional space for mental health assessment and intervention after disasters. We also examine the important linkages between schools, child mental health, and household and family recovery. We conclude with recommendations for filling gaps in research and practice related to ensuring the safety of schools and the associated health and well-being of children in the face of future disasters.

Keywords Disasters · Children · Schools · Resilience · Risk reduction · Safety · Assessment · Intervention · Posttraumatic stress

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Introduction

Approximately 100 million children worldwide are affected by disasters each year each year [1••]. When disasters disrupt the functioning of schools, children's development, relationships, and health are threatened [2, 3]. Moreover, when children's educational processes are interrupted, they may fail to master important academic concepts and skills. In turn, this may contribute to a trajectory for a future of weak academic achievement, lower educational attainment, and diminished life outcomes. Thus, safe schools are needed to support the positive social and intellectual development of children after disasters. Safe schools are also needed to protect children, teachers, and other adult staff from death and injury, while simultaneously bolstering disaster risk reduction and overall community resilience [1••, 4–6].

In this article, we utilize the United Nations Comprehensive School Safety Framework (see Fig. 1), which includes three well-established pillars of school safety. This framework was developed by the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector and The Worldwide Initiative for Safe Schools [1••]. Here, we focus on school-

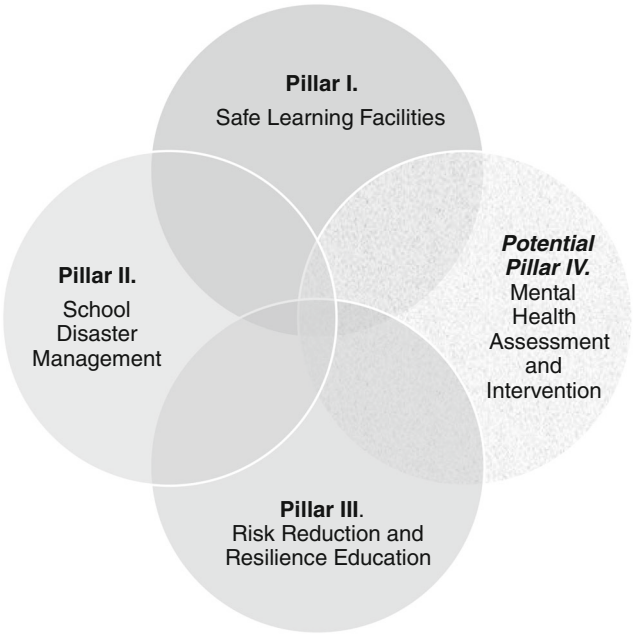

Fig. 1 Three pillars of school safety, from the United Nations Comprehensive School Safety Framework. A potential fourth pillar is proposed for schools as a central location for mental health assessment and intervention

aged children (kindergarten to grade 12) and utilize lessons learned from domestic and international disasters to:

(i) Highlight the importance of schools in terms of safety, disaster management, and risk reduction and resilience education;
(ii) Articulate a modified framework for including schools as a central site for mental health assessment and intervention for children after disasters; and
(iii) Identify gaps in research and practice that require further investigation.

Pillar I: Safe Learning Facilities

During disasters, unsafe facilities present grave danger to children and adult staff. As an example, the 2008 Sichuan earthquake in China struck mid-afternoon, when schools were in session. Schools in the area were not built to withstand a high-impact earthquake. As a result, more than 12,000 schools in Sichuan and 6,500 schools in Gansu were damaged or destroyed [4]. Over 70,000 people died in the disaster, many of them were children and teachers who were in school buildings that collapsed [7].

Beyond threats to life, unsafe learning facilities associated with short- and longer-term displacement can have additional negative consequences for children and families. The disruption caused by Hurricanes Katrina and Rita is illustrative. The hurricanes initially displaced approximately 372,000 students [8]. Of these, an estimated 50,000 kindergarten through 12th grade students remained displaced for an entire year and did not attend school during the 2005–2006 academic year [9]. The students who were most likely to experience prolonged displacement and disrupted schooling were primarily from low-income, disadvantaged families and neighborhoods prior to the disaster. Mounting research evidence suggests that children such as these who miss school as a consequence of a disaster may experience new or exacerbated academic difficulties [10, 11].

Unsafe learning facilities may also become a source of stress for children after disasters. School buildings as a physical location may be the object of a child's fear [12]. For children with disabilities, they may not have the opportunity to return to school because accessible spaces are often the last to be rebuilt [13]. When children return to their former schools, their fellow students and former teachers may not be there, due to injury or displacement. This may be deeply unsettling. Conversely, when children are forced to move to new schools in unfamiliar communities, they may experience bullying, peer victimization, isolation, or other negative ramifications [2].

Numerous child advocacy agencies, governmental agencies, and national and international non-governmental organizations (NGOs) have recognized the importance of creating safe learning facilities in advance of and in the aftermath of devastating disasters. For example, the United States Department of Education and several other federal partners have issued comprehensive guidance for managing school facilities, emergency planning, and emergency operations before, during, and after a disaster [14]. UNICEF, Save the Children, Plan International, and many other groups have refined and implemented child-friendly spaces in camps and temporary shelters to provide children with safe locations to learn and play during the day [4–6]. In addition, school administrators, staff, and counselors play an integral role in providing safe, inclusive, and nurturing environments, as discussed in the next section.

Pillar II: Schools and Disaster Management

Schools are essential to disaster management. During and immediately after disasters, school buildings are often a central location for providing residents with access to shelter, food, medical first aid, and psychological resources [15, 16]. Schools also provide an important point of access to households in terms of communication of vital information [17].

In the longer-term aftermath of disasters, schools may remain a focal point for helping children recover from extreme events. Reopening schools reestablishes normalcy and routines for children and families; returning children to such

established routines is widely recommended for helping children recover from disasters [18, 19]. In addition, schools can offer a renewed sense of community and a caring environment after disasters [12, 20–22].

The displacement following the devastating 2010 Haiti earthquake demonstrates the roles that schools can play in disaster management for school-aged children. South Florida became a host community for many Haitian children who were sent to live with family members and friends after the catastrophe. Interviews with representatives from school districts and community advocacy groups revealed that some of the displaced children were coming to the USA for the first time and did not know their family members well, while other children did not have the necessary immigration paperwork or immunization records [23–25]. School district officials dealt with this challenge by making appointments for students to get their immunization shots on the first day that they came to school [23]. School administrators held cultural sensitivity training for staff persons and brought in social workers of Haitian background. School administrators also hired school psychologists and bilingual/bicultural guidance counselors to help the displaced children adjust to a very different school and cultural setting, as well as to open up about their emotional feelings. This approach proved very important, especially in light of the stigma attached to meeting with psychiatrists in Haiti. Despite these efforts, Esnard and Sapat [23] reported many barriers still existed. For instance, the Haitian children were overwhelmed by common daily activities like school cafeteria lunch choices. Children were also distraught at times when required to wear school uniforms that included bright colors that would not typically be worn, for cultural and religious reasons, during the grieving and mourning process [24].

Pillar III: Risk Reduction and Resilience Education

To mitigate the future effects of disasters, the United Nations and other groups contend that children must be active in risk reduction and educated regarding resilience. This is crucial because children are the single largest group affected by disasters across the world [26] and thus, have a heavy stake in terms of engaging in disaster preparedness and risk reduction actions. Although adults sometimes overlook or underestimate the important role that youth may play in disaster risk reduction [27, 28], children who are prepared for emergencies may influence others and lead schools and communities. In addition, children who are informed regarding risks and risk reduction activities are more confident during actual emergencies [27, 29].

An increasing number of child-focused and child-led disaster programs now exist globally. Several agencies and NGOs have developed curricula for schools to educate children around the world about disasters and how to mitigate risks and losses [30]. For instance, the ActionAid Schools project, "Disaster Risk Reduction Through Schools," has focused on schools in seven countries (Ghana, Kenya, Malawi, Haiti, Bangladesh, India, and Nepal) [29]. The goal of the program is to promote disaster risk reduction through engaging students and the community in vulnerability assessments. Examples of these activities include discussing oral histories of past disasters, mapping out risk, and brainstorming solutions to present threats. As another example, the SHOREline project is a child-focused program with a school-based curriculum for "youth helping youth recover from disasters." The SHOREline project was designed in partnership with Columbia University, New York University, and Colorado State University, and is supported by the Baton Rouge Area Foundation [31]. School-aged students involved in the project identify a problem facing their school or community, and then develop a sustainable solution to help mitigate future risks and losses. As an example of the power of these efforts, UNICEF has documented case studies of youth programs across a range of disaster situations [28]. As discussed in one of these case studies, boy scouts in Algeria who had learned skills relevant to disaster response played a critical role in helping villages hit by heavy rain and flooding in October 2008. The scouts worked with other volunteers to distribute food and hygiene kits, remove debris, pump water, clear streets, and provide emotional support for others.

Potential Pillar IV: Mental Health Assessment and Intervention

The United Nations has obviously offered clear and widely accepted guidance for three well-established pillars of school safety. When working properly, these pillars, as described above, can save lives, help with the management of disasters, ensure educational continuity for children, educate young people on current and future threats, and mobilize youth to act in the face of rising environmental threats. We also argue, however, that there is a potential fourth pillar worthy of inclusion, one that focuses on schools as a site for mental health assessment and intervention. Schools are the place where children may come into contact with supportive adults and mental health practitioners who may be able to assess and respond to their needs. Social support received at school in general buffers against the development of mental health symptoms [32–34].

It is important to note that children present with a myriad of negative symptoms after disaster exposure. Indeed, a large and growing literature has linked disaster exposure with mental health symptoms associated with posttraumatic stress, depression, and anxiety [35, 36•, 37, 38••, 39–49]. After disasters, children may also report academic difficulties [2] and physical health problems [50, 51] that may be caused by, or contribute

to, emotional distress. These difficulties may persist for more than a year after disaster exposure [52, 53] and, in fact, could have lifetime ramifications in the most dire circumstances [54].

Locating assessment and intervention services in schools may be one effective and timely strategy for quickly screening and treating the large numbers of children affected by disasters each year [55, 56]. Globally, most children above the age of five attend schools, providing an important point of access to large numbers of children. It is important to note, however, that children in developing countries and war-torn regions are at risk for not being educated. In addition, girls and boys both experience risk for school drop-out, although this varies across regions and cultures. Children who are not in school are perhaps the most vulnerable children, and these children warrant specialized outreach and interventions. Even in light of these challenges, we still assert that schools remain a prime central location for assessing children's postdisaster needs and providing interventions. In the USA alone, roughly 98,500 public schools educate 50.1 million school children, which represent about 16 % of the total national population [57]. Below, we review key advantages of locating assessments and interventions within schools. We evaluate these advantages from a public health/clinical perspective, as well as a research perspective. We also summarize the current literature on postdisaster assessments and interventions.

Assessments

From a public health perspective, basing assessments within schools has numerous advantages in post-crisis and postdisaster situations. Assessments in schools may be administered to large groups of children at low cost. This is important, as broad assessments will likely need to include assessments of multiple domains including disaster exposure, mental health symptoms, and functional impairments. In addition, given that minimal training is required to administer screening questionnaires, assessments may be carried out by teachers, staff, or other personnel who are already working in schools.

From a clinical perspective, basing assessments in schools may provide access to information that is not available from other sources. For example, teachers are well situated to offer insights regarding how children functioned in the classroom before a disaster. Because school functioning is a sign of how children are coping with disasters [12], teachers can also assess how they are doing in the aftermath. School administrators, such as principals and vice principals, can often provide insights into policy changes that may affect children's school attendance (such as a start or an end to neighborhood bussing programs), and guidance counselors and school psychologists may be best positioned to speak to children's most immediate and pressing mental health needs (see [2]).

Basing assessments within schools also has advantages related to research. As noted earlier, schools provide an important point of access to large groups of children. Many studies assessing children's symptoms after disasters have been established in schools or have recruited children through schools [e.g., 37, 58–60]. Indeed, some of the largest epidemiologic cohort studies of children who have been exposed to disasters have been conducted in schools [61]. For example, Hoven et al. [62] examined the prevalence of mental disorders among New York City public school children in grades 4 through 12 after the 9/11 attacks on the World Trade Center towers. Of children screened, 28.6 % were identified as having one or more of six probable anxiety/depressive disorders.

Further, locating assessments in schools may allow researchers to obtain information from multiple informants. This is important because adults may under- or overestimate children's actual levels of distress, while some children may be too young to articulate the full scope of the effects of the disaster [3]. In a review of studies of children's reactions to three disasters (the 9/11 attacks, the 2004 Indian Ocean tsunami, and Hurricane Katrina), Pfefferbaum and colleagues [63•] found that only 45 (31 %) of 165 empirical studies reviewed collected data from more than one informant, which may indicate that we currently have a limited picture of children's functioning across multiple contexts in the aftermath of disasters.

Interventions

Once assessments have been conducted, it is important to match children with interventions that address their needs and current challenges. Postdisaster services may potentially be located in numerous settings, such as clinics, therapy offices, community health centers, and schools. However, schools offer many advantages as a primary location for the implementation of child-focused disaster services. Schools serve large numbers of children and families, and thus, services located in schools may quickly reach a large portion of the target audience. Compared to offsite clinical services, school-based services may be less intrusive for families, easier to utilize, and potentially delivered at lower cost, especially if implemented by teachers and school staff.

To date, a large number of interventions for children after disasters are administered in schools [64]. Jordans, Pigott, and Tol [65] conducted a systematic review of interventions for children affected by armed conflict. Of the 24 studies that were reviewed, 60 % of the associated interventions took place in schools. In addition, Pfefferbaum and colleagues [66] reviewed 48 studies of child disaster mental health interventions. Of the studies reviewed, 34 (71 %) were delivered in school sites. Evidence also indicates that disaster services for children may be more successful if they are based in schools versus clinics [67].

Postdisaster mental health services may be classified into three tiers, as described by Pfefferbaum and colleagues [68], based on work developed by Pynoos and colleagues [69, 70]. These tiers are progressive in nature. Higher tier interventions focus on more severe symptoms in order to deliver the most effective but least intrusive interventions necessary to children (see Table 1).

Tier 1 interventions are aimed at children with low to moderate levels of exposure to a disaster. Tier 1 interventions are broad, supportive interventions that are psychosocial in nature. The goal of Tier 1 interventions is to promote adjustment and normal development, while also preventing the onset of psychological, behavioral, and functional problems in children.

Basing Tier 1 interventions in schools has many advantages [68], as schools are well suited to accommodate large groups of children, such as all students in a classroom [12]. Tier 1 interventions can be implemented either as part of disaster preparedness or in the postdisaster phase. In both cases, these interventions focus on bolstering students' coping skills and preventing posttrauma symptoms. As an example of the former, Wolmer, Hamiel, and Laor [71] trained teachers to implement a 14-session preventive intervention to fourth and fifth graders in southern Israel. Through the intervention, which was informed by stress inoculation theory [72], students learned emotional processing and regulation skills that could be applied to a variety of stressful life events. Soon after students had completed the intervention, a 3-week armed conflict in the region exposed children to a series of rocket attacks. Compared to a control group of similarly exposed students who had not completed the intervention, students in the intervention group were found to have significantly lower posttrauma symptoms 3 months after the attack.

Another study of Israeli children showed that a universal school-based approach administered in the aftermath of terrorist attacks could also reduce symptoms [73] and prevent the onset of posttraumatic stress disorder [74]. In this instance, trained homeroom teachers administered the 12-session Enhancing Resilience Among Students Experience Stress (ERASE-Stress) program, which provides psychoeducation and training in a range of resiliency strategies. A population of seventh and eighth grade students who were not identified as symptomatic and who generally had not been directly exposed to the trauma took part in the sessions. Compared to a waitlisted control group, students who completed the program showed significant reductions in functional problems and posttraumatic stress, depression, and somatic symptoms 3 months post-intervention.

Tier two interventions are aimed at children who report moderate to severe exposure to disaster, including experiencing injury, death of a loved one, or life threat, for example. Based on their levels of exposure, these children are at elevated risk for maladaptive outcomes postdisaster. The goal of Tier 2 interventions is to decrease psychological distress and promote normal development.

School-based Tier 2 interventions have also shown promise in reducing symptoms among children at elevated risk. For example, Goenjian and colleagues [75, 76] evaluated a 3-week intervention that was administered in schools that were severely exposed to the 1988 earthquake in Gumri, Armenia. The intervention, which combined individual and group sessions, was led by mental health professionals from the USA and took place 1.5 years after the disaster. The intervention aimed to reduce children's symptoms via processing of traumatic experiences, enhancing coping skills, and encouraging positive future orientation. Compared to an untreated control group, students who completed the intervention showed significant reductions in PTSD and depression symptoms that persisted at both the 3- and 5-year postdisaster follow-up assessments [75, 76]. Significant reductions in posttraumatic symptoms have also been documented for universal school-based interventions administered in geographic areas with severe ongoing exposure to terrorism, including the Extended ERASE-Stress [77] and the Overshadowing the Threat of Terrorism [78] programs.

Tier three interventions are aimed at children with severe or persistent distress who may meet criteria for psychological disorders. The goal of Tier 3 interventions is to provide

Table 1 Tiers for postdisaster mental health services

Intervention tier	Target	Goals
Tier 1	Children with low to moderate levels of exposure to a disaster.	Promote adjustment and normal development, while also preventing the onset of psychological, behavioral, and functional problems in children. These are broad, supportive psychosocial interventions.
Tier 2	Children who report moderate to severe exposure to the disaster.	Decrease psychological distress and promote normal development. These interventions are more specialized to target children at risk.
Tier 3	Children with severe or persistent distress who may meet criteria for psychological disorders.	Provide psychological treatment and highly specialized interventions.

psychological treatment and specialized interventions. Although Tier 3 may be implemented in multiple contexts, the extant research suggests that schools may be an ideal context for Tier 3 interventions that target students suffering from severe and persistent posttrauma symptoms.

One example that underscores how important these interventions can be within school contexts was recorded by Jaycox et al. [67]. Fifteen months after the Hurricane Katrina, this team offered fourth through eighth grade students who screened positive for PTSD symptoms either a group intervention at school (Cognitive Behavioral Intervention for Trauma in Schools; CBITS) or an individual intervention at a mental health center (Trauma-Focused Cognitive Behavioral Therapy; TF-CBT). Although both the treatments were associated with a significant reduction in symptoms, intervention uptake was markedly different across contexts, with 98 % of children beginning CBITS and 37 % TF-CBT.

Also in the aftermath of Katrina, Salloum and Overstreet [79] found that the Project Loss and Survival Team (LAST), a 10-week school-based intervention that was administered either after school or during the school day, was associated with significant reduction in a range of posttrauma symptoms among elementary school students who had at least moderate PTSD symptoms, and that there were no significant differences whether the treatment was administered individually or in groups.

Significant symptom reductions via Tier 3 interventions have also been documented in the longer-term aftermath of disasters. For example, 2 years after the Hurricane Iniki, elementary school students with persistent PTSD symptoms who completed a 4-week individual or group intervention consisting of activities to restore a sense of safety, adaptively express emotions, and process losses, showed significant decreases in symptoms both posttreatment and at a 1-year follow-up assessment [80].

Barriers to Implementing Potential Pillar IV: Mental Health Assessment and Intervention

Unfortunately, numerous barriers make it difficult to implement mental health assessments and interventions in schools. A primary barrier is the fact that in most cases, several stakeholders and governing bodies are in charge of making decisions related to schools. This may make it difficult to find a "point of entry" into a school system, establish and maintain partnerships, identify key personnel, and understand the needs of schools after a disaster [81, 82]. In addition, it may be difficult to negotiate with these multiple stakeholders to prioritize child mental health after a disaster [82]. School administrators need to balance children's emotional needs with an academic mission [83, 84] and materials needs (e.g., enrollment, obtaining school uniforms, and desks) after a disaster [81].

Even when these challenges are overcome, there are additional barriers to implementing assessments and interventions in schools [84]. First, principals, teachers, and staff need to individually "buy in" to the need for mental health assessment and intervention within their own school. It is important to note that these adults may have their own disaster-related difficulties to manage, such as staff burnout, stressed communities, and disrupted critical infrastructure services [81, 83]. This may make it difficult to make decisions about implementing assessments and interventions postdisaster. Further, it may be difficult to communicate with parents after disasters [81]. Parents may have lost their jobs and changed phone numbers, and/or families may be displaced. In these cases, it may be a complex challenge to obtain parental consent. Yet, parental consent is essential before beginning a child assessment or mental health intervention [83]. Even when parents are contacted, they may not trust the intentions of researchers, mental health personnel, or school staff [83, 84]. An additional challenge is that schools may lack key resources for mental health services, such as private space, licensed mental health professionals, and funding [83]. To illustrate how limited funding may be in postdisaster situations, 160,000 children were affected by the Hurricane Katrina, and over 1/3 of these children reported elevated distress symptoms in the short-term recovery period. Yet, only 3.3 % of federal government dollars for Katrina were allocated to social services [85].

More work is needed to understand barriers and consequences of locating mental health assessments and interventions in schools. Indeed, various unresolved questions in this area remain. For instance, how do schools identify available assessment and intervention resources? How can schools better prepare for assessment and intervention in future disasters? The answer to these questions will obviously vary widely based on location, disaster type, and pre-existing community resources.

Other questions include the following: Who is responsible for conducting assessments and carrying out interventions—is it NGOs, the government, schools, or some other body? Related to this prior question, it is also important to ask who is best situated—interpersonally, ethically, and otherwise—to carry out school-based interventions? One potential avenue for increasing preparedness may be to train teachers to deliver school-based interventions in disaster prone areas. However, it is not currently clear how teacher-delivered interventions may influence children's reactions in the postdisaster environment. Teachers in disaster-affected schools are

often affected by the disasters themselves, and teacher responses may influence children's reactions [86]. Finally, it is important to acknowledge that locating services within schools may miss children who do not have access to schools or are home-schooled [83].

Conclusions

Schools are critically important sites for children, families, and communities. During disasters, the essential nature of schools is amplified. The United Nations has offered clear guidance on the roles that schools can play before, during, and after a disaster. In this article, we have advanced that argument by also identifying schools as a critical site for mental health assessment and interventions.

As evidence has accumulated over time, it is clear that gaps in knowledge and practice remain. Global leadership is needed to assess needs and spearhead efforts related to the established three pillars of school safety. Specific action points for doing so are described in the Comprehensive School Safety Framework [87] and the Hyogo Framework for Action [88]. Several key points include coordinating visible global leadership for school safety, conducting audits of new school construction, and developing education materials that meet the needs of different populations.

Adequate financial support, evaluation work, and policy work is needed to support all efforts related to the four pillars discussed here. To date, surprisingly little funding has been earmarked to support schools' preparation for, response to, and recovery from disasters [89]. The addition of a fourth pillar to the existing framework may help boost the effectiveness of schools in promoting children's postdisaster mental health worldwide.

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Compliance with Ethical Standards

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- •• Of major importance

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