



# Psychiatric Effects of Earthquakes on Children and Adolescents

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## ABSTRACT

Earthquakes have a negative impact on the mental health of children and adolescents. This article aimed to review common psychiatric reactions in children and adolescents after earthquakes, common psychiatric disorders such as acute stress disorder and post-traumatic stress disorder, grief, psychological first aid, child psychiatric consultation services during earthquakes, and preventive mental health approaches before earthquakes. In the first phase after an earthquake, children may experience normal acute stress reactions. Grief reactions due to loss of life may also be observed. Early psychological first aid is recommended for all child affected by an earthquake. The development of mental disorders such as post-traumatic stress disorder in children with severe and prolonged acute stress reactions and in high-risk populations warrants attention and early intervention. Post-traumatic stress disorder is a severe psychiatric disorder which can have long-term negative consequences. Appropriate use of child psychiatric inpatient services may be beneficial. Delirium is an urgent neuropsychiatric condition which requires careful management in this patient group. To reduce the impact of earthquakes on children's mental well-being, preventive mental health services should be strengthened.

**Keywords:** Earthquake, natural disaster, trauma, child mental health, consultation-liaison

## Introduction

Psychological trauma is witnessing or learning that death, the threat of death, serious injury or threats to physical integrity have happened to you or to a loved one. Trauma occurs in three different ways: natural events (earthquakes, floods, fires, storms), man-made events (wars, abuse, murders), and accidental events. Disasters are traumatic events that cause physical and socioeconomic casualties. The consequences of disasters such as earthquakes can be acute and unpredictable (1). Major earthquakes can result in mass casualties. Children and adolescents in regions with active fault lines may be at risk of loss and trauma from earthquakes (2). In this context,

it is important to have information about common psychiatric reactions in children and adolescents after earthquakes, their grief, required psychological first aid, any psychiatric disorders which may occur, and interventions.

## Normal psychiatric reactions and psychiatric disorders after an earthquake

The psychological reactions of children and adolescents in the first few days after a natural disaster occur along a spectrum (3). Common symptoms include avoidance, altered perceptions of reality, re-experiencing, and separation anxiety in children who have experienced trauma (4). Patients may have problems with sleep and appetite, physical complaints, frequent crying, restlessness,

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irritability, and unresponsiveness. Other psychological symptoms include sadness, guilt, attention and memory problems, nightmares, loss of acquired skills (regression), and enuresis (5,6). The reactions which can occur in the first few days after a natural disaster are, "a normal response to an abnormal situation" and are referred to as "acute stress reactions" in the International Classification of Diseases. Acute stress reactions are a condition which often subside within two weeks. These are not considered to be a disorder or disease (4). Several psychiatric symptoms must be considered in trauma-related psychiatric diagnoses, such as repeated flashbacks of earthquake-related experiences, severe distress and avoidance of situations reminiscent of trauma, social isolation, incapacity to experience positive emotions, and extremely negative emotions such as sadness, guilt, and shame (6). In such cases, children should receive close supervision and support (7). Individual characteristics, family characteristics, social support, and trauma-specific characteristics all contribute to the severity and duration of symptoms (8). Differences in coping mechanisms may affect psychiatric outcomes (9). If the acute stress reactions are severe or prolonged, psychiatric disorders should be considered.

Psychiatric disorders commonly observed in children after earthquakes include acute stress disorder (ASD), post-traumatic stress disorder (PTSD), complicated grief reaction, depression, anxiety, and sleep disturbance (6-10). The most common post-earthquake condition in children is ASD (50.8%) (11). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, defines ASD as a cluster of five symptoms: involuntary thoughts and memories, negative mood, dissociation symptoms, avoidance, and arousal due to actual or threatened death, serious injury, or sexual assault. Symptoms have been reported to last from three days to one month after the event (12). If the symptoms of ASD persist for more than one month, it is defined as a PTSD (13). PTSD is a serious mental health condition which can lead to loss of personal, family, and social functioning for many years (14). In the first two years after an earthquake, the rate of PTSD in children ranges from 19.2% to 24.4% (15). These percentages can vary depending on sample sizes, differences in study methodology, length of time after the event, and extent of destruction (6). In a study conducted during the Marmara earthquake, approximately 72% of children had moderate to severe symptoms of PTSD six months after a major earthquake (16). In another study, 74% of primary school children showed symptoms of PTSD in a survey performed approximately one year after the earthquake (17). PTSD in children and adolescents can lead

to additional problems which impair functioning, such as alcohol and drug addiction, suicide, conduct disorder, risky sexual behavior, and difficulty concentrating (14). PTSD has been identified as a psychiatric diagnosis which should be approached most cautiously after disasters, as it is a predisposing factor for the development of depression (18). Supportive interviewing and use of psychopharmacological agents are recommended as interventions for PTSD (19).

There is a need for psychiatric screening, identification of at-risk groups, and effective use of intervention resources in mass disasters such as earthquakes (20). Vulnerable groups included children with pre-existing psychiatric disorders, those with special needs, and those who have experienced parental loss. In view of the negative consequences of further loss in vulnerable groups, early identification of the development of ASD and early intervention are important (21). According to a study from Japan, direct exposure to the earthquake, damage to the home, mode of evacuation after the earthquake, shelter conditions, loss, especially loss of the mother, and bereavement were strongly associated with post-earthquake psychiatric symptoms (22). A Greek study found that anxiety and PTSD were more common among children directly exposed to earthquakes than among those indirectly exposed to earthquakes. Female gender and younger age were found to be associated with PTSD. The severity of perceived danger at the time of the earthquake may predict PTSD, post-earthquake distress may predict depression, and female gender may predict anxiety disorders (20). A lack of mental health care for children with post-disaster psychological distress may be linked to negative long-term outcomes, according to a study which tracked trauma symptoms for ten years after disasters (23). After an earthquake in Armenia, adolescents who went untreated for post-earthquake symptoms were at risk of PTSD and depression, and short-term treatments (trauma-focused CBT) can prevent PTSD from developing (24). To conclude, we recommend that more attention should be paid to children with high risk factors for PTSD and other mental disorders and that those at risk should receive early intervention.

#### **Psychological first aid after an earthquake**

Psychological first aid is recommended as the first intervention for any earthquake-affected child (25). This means trying to give children a sense of security, peace, self-efficacy, attachment and hope (26). Ensuring their physical safety, providing them with nutritional support and keeping them in touch with relatives are some of the things which are recommended (27). When the safety and basic needs

of the children have been met, it is recommended that a relationship be established with them, as far as they will allow it. Children should be listened to with patience and sincerity; they should not be forced to have a conversation if they do not want to. The child's emotional expressions, such as silence, crying, anger, and self-blame, should be anticipated by those providing support (28). Playing and drawing can be used to share their feelings with young children (29). At the same time, it may be beneficial to provide physical contact to calm them and meet their nutritional and sleeping needs. Disasters can damage children's sense of control and trust. Questions such as, "What food do you want to eat? What picture do you want to draw?" or "What do you want to do now?" can be used to rebuild these feelings (30). The restoration of routines in the aftermath of a disaster is a critical intervention for the normalization of daily life (31). In this context, playgrounds and schools where communication between peers is established are of great importance (32). Reducing exposure to traumatizing stimuli, such as social media and television, is also recommended (33) (Figure 1).

### Loss and grief in earthquakes

Earthquakes introduce many children to the concept of death. The loss of family members can lead to an increase in psychiatric problems, impairment in school and peer functioning, social withdrawal, behavioral problems, and physical symptoms. The important thing is to understand the normal grief reactions of children after loss and to recognize any pathological grief reactions. According to the model introduced by Kübler and Ros, grief goes through five stages: shock and denial, anger, bargaining, depression, and acceptance (34). Young children may find it difficult to understand concepts as abstract as the idea of death. They

may believe that the deceased might return, that they might be hurt, or that they might see the deceased and miss them. Older children may understand that death is both universal and irreversible. Explain to the bereaved child, in language that, they can understand that the person they lost will not return and that their body has gone (35). You can help children live through their grief without suppressing it by listening to them with patience and sincerity (18). Supporting the establishment of daily routines and giving children the opportunity to talk about their memories with their mother, father and siblings are some of the things that can be done. The child's pain may diminish over time as new relationships are formed and social life is normalized. Therefore, school and peer relationships should be supported and external support resources for children should be improved (36).

Complicated (pathological) grief comes to mind in cases where grief reactions are prolonged and complex situations are added (37). Research has shown that children who experience complicated grief after a disaster are at greater risk of developing depression, anxiety, and PTSD in the long term (38). Trauma-focused bereavement therapy may be useful in cases of complicated grief (39). There is evidence that trauma-focused cognitive behavioral therapy can help prevent PTSD and depression from developing (40). Major earthquakes can cause physical and environmental losses. All of these individual and social losses may be experienced as grief reactions in children. Therefore, by recognizing that losses are not confined to a single area, multi-dimensional support can be important in the event of devastating earthquakes (41).

### Pediatric psychiatric consultations after the earthquake

Many children are admitted to pediatric wards after earthquakes (42). Considering that children who experienced disasters were healthy without mental disorders before the earthquake, psychological first aid should be provided to hospitalized children. Children with pre-earthquake mental disorders, special needs, physical losses from the earthquake, loss of family members, or a history of trauma should be referred to psychological support systems (43). Child psychiatric support may be useful when any psychiatric symptom is experienced intensely, stressors are high, or social support is low. If suicidal ideation, psychotic symptoms, disruptive behavior and/or substance abuse are observed, interventions should be prompt (7). In the early stages of a disaster, there is often a trend towards a reduction in the severity of psychiatric symptoms. Therefore, focus on psychoeducation in the consultation.

«To Do's» and «Not To Do's» in Psychological First-Aid	
✓ Checking the security	✗ Forcing children to talk about the trauma
✓ Support meeting basic needs	✗ Critical and offensive attitudes
✓ Perform psychological triage	✗ Early psychopharmacological interventions
✓ Listen respectfully and empathetically	✗ Transboundary interventions
✓ Inform according to the developmental stage	✗ False hopes and false information
✓ Preventive approach to child abuse	✗ Abuse of assisted children
✓ Provide social support	✗ Not keeping records well enough

**Figure 1.** The "Do's and Don'ts" in psychological first aid  
\*Created by the authors based on the literature

Close monitoring of symptoms with recommendations for behavior may be beneficial. It is recommended to be cautious about psychopharmacological interventions (44) (Figure 2). Delirium associated with head trauma and crush syndrome may be observed in children hospitalized after an earthquake (45). Delirium can complicate the differential diagnosis of pediatric clinical conditions due to its acute and fluctuating course (46,47). Impaired consciousness and orientation, distraction, sleep disturbances, hallucinations, irritability, inability to be comforted, loss of acquired skills, and decreased eye contact are the symptoms observed in children with delirium (19-47). The clinical situation can be improved by treating the underlying causes and controlling the pain and agitation (48). Lighting, providing a quiet environment, frequently reminding children of places, times, and people, regulating sleep hygiene, reducing immobility, reassuring children that they are safe, and keeping some of their favorite objects with them are some of the things which can be done. Psychopharmacological treatment includes antipsychotics. Opioids, anticholinergics, and benzodiazepines should be avoided. Melatonin may be used to regulate sleep problems (49). Research shows that within three months of discharge, 30% of children who experience delirium in the hospital present with symptoms of PTSD (50). Identifying delirium and intervening promptly to prevent further traumatization in children admitted to the hospital after trauma are important (47).



**Figure 2.** Post-traumatic psychological first aid and psychiatric consultation stages in trauma

*\*Created by the authors based on the literature*

### Preventive mental health studies before earthquakes

Pre-earthquake programs to improve preventive mental health can be useful. Educating children about how natural systems work and how disasters occur is recommended prior to such disasters. Emergency plans for older children (e.g. earthquake drills at home and school) may be useful. When faced with predictable situations, children's coping skills may increase (51). In large-scale situations like disasters, it is important to recognize that social action plans can be provided (52). Following an earthquake in Haiti, studies have highlighted the need to address issues arising from the country's unstable environment, to strengthen families psychologically, and to prioritize child protection legislation to safeguard children's mental health. In addition, research has shown that unequal access to resources after a disaster can negatively affect children's mental well-being. Research on survivor dissatisfaction and inequalities in the recovery process is critical for understanding the mental health of children (17).

### Conclusion

Severe earthquakes can affect several children and adolescents. Understanding common psychiatric symptoms and knowing how to provide psychological first aid can reduce the negative psychological impacts. Particular attention should be paid to ASD and PTSD and interventions should not be delayed patients with severe symptoms. The mourning processes of children and adolescents who have experienced loss should be emphasized. Therefore, support systems should be established. Efficient use of child psychiatric consultation systems in the post-earthquake phase in hospital inpatient units will benefit patients and the medical team. The most effective way to prevent mental illness after an earthquake is to protect children's mental health before disasters.

### Ethics

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