Trauma healing for children affected by the Pasaman, West Pasaman earthquake

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Abstract. This study focuses on trauma healing interventions for children affected by the Pasaman earthquake in February 2022, which led to significant psychological issues such as trauma, stress, and sleep disturbances. The research involved direct observations and interventions in several evacuation camps. A team from the Department of Pediatrics, Faculty of Medicine, Andalas University, conducted trauma healing sessions, including cognitive behavioral therapy (CBT) and play therapy, in affected areas. The intervention programs targeted children aged 3 to 18 years and were complemented by educational efforts for parents on how to provide at-home trauma healing support. The study highlights the importance of early psychological interventions, such as CBT, to prevent the long-term effects of post-traumatic stress disorder (PTSD), depression, and anxiety in children. Observational data revealed that about 57.9% of the children experienced sleep disturbances post-earthquake, with significant improvements following the trauma healing activities. Additionally, parent-child engagement during therapy sessions helped strengthen family support systems, which are crucial in the psychological recovery process. These findings underline the necessity of including psychosocial support in post-disaster recovery plans and stress the need for further research and implementation of trauma-informed care in affected communities to support both immediate and long-term psychological recovery for children.

1 Introduction

Disaster, according to Law No. 24 of 2017, is defined as an event or series of events that threaten and disrupt the lives and livelihoods of the community, caused by natural and/or non-natural factors, including human actions (due to conflict or terrorism), resulting in loss of human lives, environmental damage, property loss, and psychological impact. Indonesia is one of 35 countries with a high disaster risk worldwide. In 2023, Indonesia experienced 5,400 disaster events, with 99.35% dominated by hydrometeorological disasters and the remainder by geological disasters. The number of casualties recorded in 2023 includes 275 fatalities and 5,795 injuries [1].

The earthquake in Pasaman, which occurred in February 2022, is one of the disasters that took place in Indonesia. According to the report from the Regional Disaster Management Agency (BPBD) of West Sumatra province, four people died in West Pasaman regency, 37 people sustained serious injuries, 310 people suffered minor injuries, and fewer than 10,000 people evacuated to 35 shelters located in Talamau district.

One of the most vulnerable groups affected by disasters is children. This is due to their physical and mental development still being in progress. The impact on children can manifest as fear, anxiety, and traumatic stress due to the disaster. These effects may last for some time and subside spontaneously in some children, but if left untreated, they can lead to long-term conditions [2].

Trauma in children can cause disorders such as post-traumatic stress disorder (PTSD), anxiety, depression, and behavioral problems. The process of trauma recovery aims to help children overcome their traumatic experiences, restore their mental health, and return to their daily lives in a better state [3].

Trauma healing for children is a crucial process to address the negative impacts of traumatic experiences. The trauma healing approach involves various methods, including cognitive-behavioral therapy, play therapy, counseling, and family interventions. Cognitive-behavioral therapy helps children change negative thought patterns and develop healthy coping skills. Play therapy allows children to express their feelings through play, which is often easier for them than talking directly about their trauma [4, 5].

Counseling and family support are also essential in the trauma healing process. Family involvement helps create a safe and supportive environment for the child, allowing them to feel loved and accepted. Early intervention is critical in healing trauma in children, as the sooner they receive help, the greater the chance of recovery and the reduction of future mental health problems [6].

2 Methods

A direct observation study conducted to observe in real-time how trauma healing is applied to children who are victims of natural disasters. Researchers will be present at

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the location where trauma healing interventions take place, such as play therapy sessions, Cognitive Behavioral Therapy (CBT), and Parent-Child Interaction Therapy (PCIT). Through this observation, researchers can see how children interact during therapy sessions, how they respond to the activities provided, and how their behavior and emotional states change over time (Fig. 1).

Fig. 1. Community service for the earthquake in Pasaman

3 Results

The Pasaman earthquake in February 2022 caused various issues, including psychological stress and trauma, with the most common manifestation being sleep disorders. A study by Dr. Rahmi Asman found that 57.9% of children affected by the earthquake experienced sleep disturbances. Additionally, Dr. Destri's research showed that 55% of children suffered from emotional and mental disorders after the disaster. Therefore, trauma healing for children affected by the earthquake is crucial. Trauma healing activities were conducted at several evacuation camps, including Malampah Kajai, Kampung Aur, and Timbo Abu. Activities included play therapy, drawing, coloring, quizzes, and storytelling. Around 30 children participated in each session, ranging from ages 3 to under 18. Parents were also educated on how to perform trauma healing at home or in the evacuation camps. Both children and parents actively participated and expressed joy during the activities.

A team of pediatric volunteers from the Faculty of Medicine implemented activities as part of the disaster module on March 12-13 and 27-28, 2022. These included screening for illnesses such as dermatitis, impetigo, tinea, measles, and respiratory infections, as well as trauma healing through singing and playing. The team distributed masks, school supplies, and sandals for children and provided education on breastfeeding and complementary feeding (MP-ASI). They coordinated with field leaders to raise awareness of the risks of measles, chickenpox, and diarrhea due to poor hygiene. Handwashing and hygiene education were conducted at each evacuation tent, along with data collection on the emotional conditions, trauma, and sleep disorders in children. The team also offered activities that served as healing therapy and educated parents on self-conducted healing practices for their children (Fig. 2).

Fig. 2. Trauma healing for children in refugee tent

Table 1. Characteristics of research subjects

Post Name	Health Service Patients (n)	Refugees (n)	Households (n)	Children under 18 (n)
Kampung Aur	- Respiratory Tract Infection (RTI): 4 people - Dermatitis: 2 people - Play Therapy: 32 people	161	35	50
Reslement	- RTI: 1 person - Cyanotic Congenital Heart Disease + RTI: 1 person - Play Therapy: 41 people	0	20	53
Timbo Abu	- RTI: 6 people - Measles: 6 people - Impetigo: 2 people - Atopic Dermatitis: 1 person - Fever: 2 people - Gingivitis: 1 person - Play Therapy: 34 people	400	80	125
Reslement	- Trauma Healing: 30 people - Treatment: 0 person	0	18	40

Another entry for Reslement indicates that 30 people received trauma healing services, although no other treatments were provided at that time. This particular entry recorded 18 households and 40 children under 18, with no refugees reported (Table 1).

4 Discussion

4.1 Social impact of disasters on children

After experiencing a traumatic event, many children display temporary psychological symptoms. These can include becoming easily tearful, anxious, overly attached to others, or withdrawn. They might have difficulty focusing or sleeping, relive the event through play or drawings, avoid talking about it, complain of headaches or stomach aches, or become irritable as they try to manage their emotions. These reactions are normal responses to trauma and typically fade within a few weeks. However, if these symptoms last for more than a month and start to interfere with a child's social functioning, such as school performance or interactions with peers, the child may meet the criteria for a psychiatric diagnosis [7].

One common condition resulting from trauma is post-traumatic stress disorder (PTSD). In PTSD, the brain processes trauma memories in an abnormal way, leading the child to relive the event through distressing memories or nightmares, especially when triggered by reminders of the traumatic context. Although dissociative symptoms like flashbacks are less common in children, these re-experiencing symptoms can be highly disruptive. They may lead children to develop avoidance behaviors, such as keeping busy or steering clear of people and places that remind them of the trauma. While avoidance may provide short-term relief, it does not prevent the long-term re-experiencing of trauma and can even stop the child from enjoying activities they used to love. Children with PTSD often display signs of hyper-arousal, which means they feel constantly threatened and on high alert, resulting in irritability, trouble concentrating, and sleep difficulties [7].

One in four children exposed to trauma will develop PTSD by the time they turn 18, with a lifetime prevalence rate of 4.7-7.8% in the general population. The rate is significantly higher among displaced children and those exposed to armed conflict. The risk of PTSD in children is influenced by several factors, particularly the nature of the trauma. Trauma involving direct interpersonal violence, such as physical or sexual abuse, is the most strongly associated with psychological disorders. Children with PTSD are at a higher risk of self-harm and aggression. They are eight times more likely to harm themselves and ten times more likely to attempt suicide compared to children without PTSD. Additionally, children with PTSD are three times more likely to commit violent offenses, with one in ten having a record of violent behavior. They are also three times more likely to struggle with education, employment, or training compared to their peers [7].

Although the link between childhood trauma and mental health issues is well-documented and likely causal, the mechanisms driving this relationship are still the focus of ongoing research. Traditionally, it has been believed that childhood trauma triggers a "toxic stress response" that alters brain function and contributes to mental health disorders. However, recent findings suggest that psychopathology is more strongly linked to subjective memories of childhood trauma rather than the trauma itself. This points to psychological mechanisms like memory bias, core beliefs, and decision-making processes. On the other hand, the connection between childhood trauma and cognitive deficits likely stems from non-causal factors, such as pre-existing cognitive differences that increase the risk of exposure to various types of trauma [7].

The high prevalence and complexity of mental health issues related to childhood trauma highlight the urgent need for increased specialist training and clinical capacity in this area, which is often insufficient. Misdiagnosis or underdiagnosis is common, leading to ineffective treatment. While natural recovery may occur in some cases, many children do not improve without intervention. If left untreated, chronic or recurring psychiatric disorders can develop, becoming more difficult to treat as time goes on [7].

4.2 Trauma healing for children's victims of natural disasters

Trauma healing is a crucial process for children who have experienced natural disasters, helping them recover from psychological issues such as anxiety, panic, and other mental health challenges. One of the most effective treatments for these children is Cognitive Behavioral Therapy (CBT), a structured, evidence-based approach designed for children aged three to 18 who show symptoms of post-traumatic stress related to traumatic events they have experienced or witnessed. It's important to note that a full diagnosis of PTSD is not required for a child to undergo CBT. This therapy typically spans 12 to 16 weekly sessions and is widely regarded as the most effective evidence-based practice [8].

For younger children, particularly those aged three to five, CBT has proven successful in reducing symptoms of PTSD, depression, anxiety, and behavioral problems. In addition to directly benefiting the child, CBT also enhances parenting skills, improves parental support, and reduces parental stress. Key elements of CBT include psychoeducation about trauma, teaching parenting skills, developing relaxation techniques and coping mechanisms, helping the child identify and manage emotions, understanding the relationship between thoughts, feelings, and behavior, processing the traumatic events through narrative work, gradual exposure to trauma reminders, joint caregiver-child activities, and safety or prevention skill-building [8].

The structure of CBT often involves splitting time between individual sessions for the child and the caregiver, although some sessions bring them together with the therapist. This structured approach directly

addresses the impact of traumatic stress and aligns with widely accepted principles of cognitive-behavioral therapy, exposure therapy, and effective parenting practices in mental health care [8].

Another effective therapy, Parent-Child Interaction Therapy (PCIT), is a structured, evidence-based treatment designed for children aged two to seven who have behavioral problems, including those related to trauma and post-traumatic stress symptoms, along with their caregivers. PCIT has demonstrated its effectiveness in reducing disruptive behavioral problems in children [8].

PCIT not only helps in reducing disruptive behaviors, but it also strengthens parenting skills, enhances the warmth of the caregiver-child relationship, and reduces parenting stress. Beyond addressing disruptive behavior, PCIT also helps lessen other trauma-related symptoms in children without requiring modifications to the treatment model [8].

PCIT is divided into two phases, each focusing on different skill sets for the caregiver. During the first phase, called Child-Directed Interaction (CDI), the focus is on teaching caregivers how to give positive attention and reinforce the warmth in their relationship with the child. The second phase, Parent-Directed Interaction (PDI), emphasizes helping caregivers learn consistent and appropriate discipline techniques, including the use of a specific time-out method as a response to the child's non-compliance. Throughout both phases, the therapist provides real-time coaching during play situations, helping caregivers master these techniques effectively [8].

Each phase of PCIT is based on skill mastery rather than a fixed timeline, so the duration varies from family to family. However, it is generally estimated to last 12 to 16 weekly sessions. The process starts with a teaching session for the caregiver alone, while all subsequent sessions involve both the child and caregiver, as PCIT centers around their interaction. Caregivers are also assigned "homework"—five minutes of daily playtime—during which they practice the positive attention skills they are learning through PCIT [8].

For younger children, Child-Parent Psychotherapy (CPP) is a relationship-based intervention aimed at addressing emotional and behavioral issues in children aged 0 to 5 who have experienced trauma. CPP has been shown to improve attachment quality, enhance cognitive development, reduce symptoms of PTSD, depression, and behavioral problems in children, regulate physiological responses, and decrease symptoms of depression and PTSD in caregivers [8].

Typically conducted over 20 to 25 weekly sessions, CPP can take place in a variety of settings, including the home, outpatient clinics, or school environments. CPP is divided into three main phases: the Foundational Phase (Assessment and Engagement), the Core Intervention Phase, and the Recapitulation and Termination Phase. During the Foundational Phase, the therapist builds a collaborative relationship with the caregiver, collecting important information such as the reason for referral, demographic details, specific symptoms in both the child and caregiver, as well as any risk and protective factors present in the family system [8].

In the Core Intervention Phase, the therapist introduces the child to CPP and helps them understand their behavior within the context of trauma. This phase involves discussing how the traumatic experiences have influenced the child's emotional and behavioral reactions, creating a space for the child to express their feelings. The therapist takes advantage of natural moments during the sessions to facilitate progress and help the child move toward treatment goals. The main objectives of CPP include restoring the child's developmental path, strengthening the parent-child dyadic response to perceived threats, rebuilding trust in the body's physical sensations, re-establishing reciprocity in relationships, normalizing trauma responses, helping the child differentiate between reliving trauma and remembering it, and reframing traumatic experiences in a more manageable perspective [8].

In the Recapitulation and Termination Phase, the focus shifts from addressing problems to recognizing the positive changes that have taken place during therapy. This phase acknowledges that the therapy is coming to an end and helps process the emotions related to closure. Key strategies used in CPP include encouraging developmental progress through play, physical contact, and language; offering reflective guidance; modeling protective behaviors; interpreting emotions and actions; providing emotional support and empathy; as well as crisis intervention, case management, and practical assistance [8].

Play therapy is a vital tool, particularly for early intervention following traumatic events. Approximately 40% of children are at risk of developing long-term PTSD symptoms, and play therapy helps them express their emotions through activities like play, drawing, and storytelling. This form of therapy, designed to address psychological issues caused by trauma, has been shown to lower levels of traumatic stress in children in school settings, both before and after the intervention, in comparison to control groups that did not receive the therapy. It allows children to express themselves through enjoyable activities, helping to reduce psychological challenges, especially the stress they experience after a disaster [9].

Play therapy can also help children cope with issues like anxiety, frustration, and internal emotional barriers, ultimately improving their behavior. Drawing therapy provides an outlet for children to express their inner conflicts. Through drawing, they can convey their thoughts, feelings, imagination, and creativity, making it an effective way to address psychological issues such as anxiety. Storytelling therapy, especially when related to traumatic e xperiences, can alleviate the emotional burdens children carry. Sharing their stories fosters a sense of solidarity and may help them feel less alone, encouraging recovery from trauma and reducing anxiety [10].

In addition to traditional play therapy, block play therapy has been used to predict behavioral problems in children following the 2011 earthquake in Japan. Problems identified included total behavioral issues (25.9%), internalizing problems like somatic complaints and anxiety/depression (27.7%), and externalizing

problems such as delinquent or aggressive behavior (21.2%). A study involving 78 children aged 4-6 years from three schools in Miyagi Prefecture found that the style of block play varied according to the type of trauma-related problems the children faced. Those with total behavioral problems tended to exhibit a "falling" style, while aggressive behavior was linked to "falling" and "shaking" styles. Internalizing problems, such as anxiety and depression, resulted in shorter playtime and difficulty concentrating. Other forms of play therapy, like singing, playing with balloons or marbles, playing snakes and ladders, and coloring, help build trust and positively influence a child's personality development after a disaster. Puzzle games can also help detect psychosocial trauma in children following disasters [11].

Group play therapy has proven effective in reducing post-traumatic stress symptoms in children. Play is a fundamental part of a child's world, allowing them to engage in extensive imagination through various activities. Group play therapy works by storing traumatic memories in the child's subconscious and gradually reducing the trauma they experience [9].

Trauma counseling therapy is also used as an intervention to address psychological issues in children who are victims of disasters. This counseling typically includes physical examination, trauma healing methods, and play therapy, such as collective prayers and Cognitive Behavioral Therapy (CBT). Additionally, trauma healing activities for children are often integrated with religious practices, such as reading the Qur'an, group prayers, listening to stories of exemplary Islamic figures, and participating in remembrance (dzikir) [9].

Instructional therapy can also aid in the development of a child's cognitive skills by using educational media in a playful learning process. It's essential to balance cognitive and affective aspects in therapy, as this balance is key to the child's psychological development, motivating them to learn. When a child is focused and engaged in these activities, they are better able to distract themselves from the problems they face [9].

Parent education is another crucial element. Parents need to understand the emotional, physical, and mental impacts of trauma on children. Recognizing common symptoms, such as anxiety, nightmares, and behavioral changes, is essential for identifying early signs of trauma. Parents must also learn to manage their own emotions and stress to serve as positive role models for their children. Techniques like meditation and deep breathing can help parents in this process. Open communication is key—parents should encourage their children to express their feelings and listen empathetically without judgment. Additionally, creating a safe and stable home environment is important. This includes minimizing exposure to frightening news or images that might remind the child of the disaster, helping them feel more secure [12].

5 Conclusion

Disasters are events or a series of events that disrupt people's lives and livelihoods, caused by both natural and man-made factors, including human actions like conflict or terror. These events result in the loss of life, environmental destruction, property damage, and psychological impacts. Trauma refers to an experience that triggers intense physical and emotional stress responses, perceived as dangerous or threatening, and can have long-lasting negative effects on a person's physical, social, emotional, or spiritual well-being. Trauma healing is essential for restoring the psychological well-being of children affected by disasters. Therapies such as Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) and Eye Movement Desensitization and Reprocessing (EMDR) have proven effective in reducing symptoms of PTSD, anxiety, and depression, promoting emotional recovery, improving mental and physical health, and enhancing social relationships. Disasters can have a significant psychological impact on children, often leading to conditions like PTSD, anxiety, and depression. Professional therapy, such as TF-CBT and EMDR, is vital for helping children recover, while parents play an important role in offering emotional support and helping manage their children's trauma responses. The disaster process follows five main phases, collectively known as the disaster cycle: prevention, mitigation, preparedness, response, and recovery. In the trauma healing process, individuals and their families are first educated about trauma, followed by professional therapy, such as TF-CBT and EMDR. These therapies help reduce PTSD symptoms through regular weekly sessions that focus on teaching coping strategies and relaxation techniques.

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