

Psychological consequences of earthquake traumatized children and adolescents in Yushu

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AUTHOR BIO

Doris Xu is a senior at Branksome Hall High School who plans to study psychology at university. At school, Doris is a dedicated member of her school's dance club and varsity volleyball team. In her free time, Doris loves participating in philosophical conversations with her peers and listening to music. Doris also actively engages in volunteering opportunities to better the lives of others, especially members of minority groups. In 2018, Doris traveled to Yushu, China, to help uplift the spirits of young earthquake survivors from the 2010 earthquake. Her connection with adolescents in Yushu sparked her early interest in psychology. In 2023, Doris returned to Yushu to host workshops and activities to provide hope and spread positivity within the community. After her second visit to Yushu, Doris furthered her interest by conducting this psychology review on Yushu adolescents post-earthquake.

ABSTRACT

This review dives into the ramifications of the Yushu earthquake on adolescents, exploring their vulnerability to psychological distress. The Yushu earthquake, also known as the 2010 Earthquake, was a devastating event that struck Yushu, Qinghai Province, China, on April 14. This earthquake had a magnitude of 6.9 and caused widespread destruction in the region. This earthquake serves as a catalyst for deeper explorations into the psychological outcomes of adolescents. In the review, psychological effects were pronounced, with studies revealing the prevalence of anxiety and PTSD within adolescents as an urgent matter. Biological insights into the hypothalamic pituitary–adrenal axis (HPA), hippocampus, amygdala, and prefrontal cortex provide a scientific understanding of this issue. This review also discovers educational challenges faced by the Yushu earthquake survivors, as schools were severely damaged, disrupting learning routines and affecting adolescents' daily lives. While substantial, government recovery efforts encountered challenges due to the isolation of Yushu County and the limited resources available to aid survivors. Furthermore, this report features survivors' testimonies, highlighting the urgent need for physical and psychological support. The Yushu earthquake serves as a reminder of the importance of comprehensive disaster recovery strategies, addressing both immediate physical support and long-term psychological well-being therapy.

Keywords: *Yushu, Earthquake, Adolescents, PTSD, Anxiety, Psychological, Trauma.*

INTRODUCTION

Adolescents, individuals between the ages of 10 and 19, are more vulnerable to psychological distress due to their less mature cognitive capacities and lower adaptability (Dongling et al., 2017). Given the susceptibility of adolescents to psychological distress, it is important to discuss how events such as the Yushu earthquake can have a profound impact. The Yushu earthquake that struck the Qinghai province in China in April of 2010 was a devastating disaster that deeply impacted the region and its people. Victims of the Yushu earthquake made up mostly of the Tibetan population, many of whom were already living in poverty and struggling to make ends meet. During previous psychological studies on earthquake victims, the prevalence of PTSD reported in victims ranged from 10% to 87% (Altindag et al., 2005). In another study on Yushu earthquake victims, within three months, individuals in the most severely impacted zone of Yushu County exhibited PTSD prevalence rates ranging from approximately 33.7% to 38.6% (Zhang et al., 2012). Adolescent victims of these earthquakes experienced various psychological effects, including Post-Traumatic Stress Disorder (PTSD), anxiety, depression, survivor guilt, etc. It is predicted that adolescents who experienced the Yushu earthquake registered a PTSD prevalence of 9.3%, as observed four years after the incident (Xie et al., 2019). It is important to note that the psychological consequences on adolescents who were victims of the Yushu earthquake can vary widely and depend on several factors, including age, gender, family situation, and individual coping mechanisms. The complexity of the post-disaster psychological state urges the necessity of tailored support and interventions that address the unique needs of each survivor. Many victims reported intense fear and panic during the disaster, and sentiments of panic and

anxiety endured well beyond the earthquake, demonstrating a prolonged psychological impact on the victims.

IMMEDIATE IMPACT AND LONG-TERM CONSEQUENCES OF THE YUSHU EARTHQUAKE

With a magnitude of 6.9, the Yushu earthquake caused widespread damage, including the collapse of schools, buildings, and homes. According to an official report, at least 85% of houses collapsed in Yushu County (Zhang et al., 2012). Most structures in the area were constructed using a combination of rocks and mud. The collapse of these materials significantly harmed the residents, leaving at least 2,000 people dead and over 12,000 injured (Pallardy, 2023). Renowned for its profound Tibetan cultural heritage and abundance of Buddhist temples and monasteries, Yushu sites of religious and cultural importance also faced vulnerability to destructive occurrences such as earthquakes (Pumin, 2010). The earthquake also damaged historical buildings, traditional Tibetan homes, and structures with cultural and historical importance. Public buildings that provided essential services, such as government buildings, schools, hospitals, and other public facilities, were also damaged. An estimated 100,000 people were displaced from their homes (International Campaign for Tibet, 2010). This displacement forced individuals to seek temporary shelter, often in overcrowded camps or even in tents in public parks and fields (Xin, 2010). For families with children, the displacement also led to interruptions in their education. In an article published by UNICEF, reporter Xu Xin recalls teachers leading a group of students who had lost their family members to live under small tents even weeks after the disaster struck (Xin, 2010). Children could not attend school due to the lack or collapse of facilities. More importantly, many students suffered the loss of loved ones as they witnessed firsthand their bodies buried under materials of collapsed buildings. The emotional toll of such distressing experiences can be especially traumatic for adolescents.

19.5% of adolescents met the criteria on the PTSD checklist five years after the earthquake (Liu et al., 2019). A research article from 2020 indicates that the Yushu earthquake will have an impact on adolescents even after 7 years (Zhao et al., 2020). The findings from these studies are significant because they show the lasting effects of the Yushu earthquake on adolescents' mental health and well-being.

PSYCHOLOGICAL IMPACT, PTSD, AND ANXIETY AMONG ADOLESCENTS

Not only are the symptoms of PTSD distressing, but an individual with PTSD may also be more likely to develop other mental disorders, such as anxiety disorders, beyond the stage of adolescence (Jin et al., 2014). In 2015, a psychiatry study discovered that three years after the earthquake disaster in Yushu, approximately 49.3% of adolescent samples were found to have existing anxiety symptoms (Jin et al., 2014). Symptoms of PTSD can have a strong effect on a person's life. The fact that a substantial portion of adolescents continued to experience anxiety symptoms even three years after the earthquake highlights the enduring psychological impact of the earthquake. This statement highlights the importance of appropriate support for these victims. It suggests that unresolved trauma might set the stage for a cascade of mental health challenges throughout a person's life if not adequately addressed. Adolescents with anxiety may struggle with concentrating in school; forming relationships with others, including parents; and participating in normal social activities, even simple day-to-day conversations. According to the Child Mind Institute, students with anxiety symptoms experience struggles not only limited to general anxiety but also social anxiety, separation anxiety, and other specific phobias (Ehmke, 2023). Recognizing that anxiety symptoms can help educators and parents to tailor their support interventions to better address the specific needs of individual students. Furthermore, high school students were found to have scored higher rates for anxiety than middle school students (Jin et al., 2014). Researchers in this 2014 study suggested that it is caused by the stress of high school students facing college entrance

examinations at the time of the earthquake (Jin et al., 2014). The earthquake caused a severe and sudden disruption in their studies, and the need to relocate and pause their studies increased their level of anxiety. Other studies suggest that the reason for the high rate of anxiety and PTSD in high school students is their ability to cognitively and emotionally process traumatic experiences on a deeper level than younger students (Wang et al., 2014).

A study conducted in 2017 observed Post-Traumatic Stress Disorder and its predictors among bereaved Tibetan adolescents four years after the Yushu earthquake found that survivors who witnessed a burial, injury or death of a relative or loved ones were most likely to have post-traumatic stress disorder symptoms (Dongling et al., 2016). Data within this 2017 study found that adolescents who had lost their mothers had the highest scores of PTSD severity. Researchers hypothesize that this is likely because, for most Tibetan adolescents, fathers often worked and were away from home, while mothers are the closest loved parent within the family. It has been identified that the severity of psychiatric distress is associated with the degree of closeness to the lost parents (Dongling et al., 2016). Furthermore, a study in 2015 found that adolescents who had suffered a bereavement (the experience of losing someone important) were nearly three and a half times more likely to exhibit PTSD symptoms compared to individuals who had not (Jin et al., 2015). In 2010, a reporter from CNN interviewed locals, with a focus on boarding school teachers and students, to understand the severity of the earthquake. 17-Year-old survivor Samdrup Gyatso told CNN reporter a vivid description that illustrates the traumatic experience of those who survived, witnessing their peers trapped and buried in the ruins. "There are 10 people in my family, and only four of us escaped. One of my relatives died. All the others are buried under the rubble," said Samdrup (CNN, 2010). His firsthand perspective shows the emotional anguish, grief, and trauma that survivors like him endured. The consequences of PTSD on orphans are especially severe, as a report from 2020 indicated that left-behind children have been found to demonstrate more negative and

unhealthy behavior patterns than children who were still in contact with their parents post-earthquake (Zhao et al., 2020). These studies underscore the importance of support necessary for these young survivors. The findings of these studies state that witnessing the loss of loved ones, particularly the significant role of mothers within the family, can magnify the severity of post-traumatic anxiety disorder symptoms. The consequences of PTSD, especially among left-behind children, accentuate the urgency of tailored interventions for these survivors.

BIOLOGICAL IMPACT

The development of PTSD after witnessing a parental death is associated with hypothalamic pituitary–adrenal (HPA) axis hyperactivity (Dongling et al., 2016). Usually, the human body releases a hormone called hydrocortisone when we're stressed (Watson, 2023). But in adolescents of the Yushu earthquake, even when they weren't stressed, their bodies had higher levels of hydrocortisone. In addition, their bodies didn't regulate this hormone properly – it didn't decrease when it should have. This suggests that these grieving teenagers might feel more stressed in their day-to-day lives because their stress response is not working as it should (Dongling et al., 2016). Adolescents with PTSD may have a reduction in the size of the hippocampus, a brain region that is essential for memory and emotion regulation. This reduction in the hippocampal volume has been associated with intrusive memories and flashbacks, which are common symptoms of PTSD. Not only is the hippocampus affected as an outcome of earthquake exposure, but individuals with PTSD may also have increased activity in the amygdala, a brain region involved in processing fear and emotion. This increased activity in the amygdala can contribute to hypervigilance, avoidance behaviors, and an exaggerated startle response. In this stage of adolescence, the prefrontal cortex is still rapidly developing, and the amygdala and hippocampus are heavily relied on in this developmental stage. Studies have shown that adolescents with PTSD have reduced connectivity between the

prefrontal cortex, which is involved in executive function and decision-making, and the amygdala. This reduced connectivity can contribute to difficulties with emotion regulation and impulse control. Teenagers might rely more on the amygdala to make decisions and solve problems than adults. An impact on the hippocampus causes an obstacle in a child's learning and memory.

EDUCATIONAL CHALLENGES AND GENDER DISPARITIES

Roughly half of the schoolchildren in the Yushu earthquake-affected area attend boarding schools. For these students, the school serves as more than just an educational institution; it also functions as a place where they eat, sleep, interact with friends, and, thus, contribute to their overall well-being. An interruption in their learning would have represented a significant setback for their education and lives. A report posted by UNICEF found that in the aftermath of the Yushu earthquake, 80% of primary and 50% of secondary schools in the Yushu Country had been severely damaged, causing a severe disturbance to over 200,000 students and around 1000 teachers (UNICEF, 2020). Studies have shown that 30.7% of adolescents adapt poorly to school five years after the earthquake (Liu et al., 2019). This finding was crucial as it shows the necessity of government intervention and support towards long-term support programs for school-aged populations who have experienced traumatic events in China (Liu et al., 2019).

In a 2014 study that surveyed 1000 students aged between 11-20, girls were found to have a higher rate (9.6%) of PTSD than boys (8.1%) (Jin et al., 2014). This result is supported by a later study performed in 2019, where female adolescents were found to have higher average PTSD scores than males (Xie et al., 2019). Xie and her team suggest that this is because women have a stronger tendency to engage in contemplative rumination (repetitive thinking or dwelling on negative feelings) as they tend to be more religious (Xie et al., 2019). This is further supported by the hypothesis that females at puberty tend to have a heightened

susceptibility to deal about negative life events (Xie et al., 2019). On the contrary, according to another study performed in 2016, scores of PTSD severity was equally the same between boys and girls, showing participants of both genders face similar conditions (Dongling et al., 2016). This is consistent with the findings in Jin's study in 2014, where gender and PTSD scores had no significant differences. due to similar responsibilities and obligations of girls and boys under the Buddhist religion (Jin et al., 2014). An explanation for this is that the participants being surveyed in this study has influences of Buddhism in all aspects of their life, and the effects of the Buddhist belief were the same regardless of gender, resulting in a similar result of PTSD severity for both. According to Liu's study in 2019, male students were more likely to experience poor school adaptation after the earthquake over the long term. Lu's study in 2020 discovered that being female was a negative factor for resilience (Lu et al., 2020). According to Lu and his team, girls are more sensitive to stress responses than boys, which can lead to impaired resilience (Lu et al., 2020).

RECOVERY EFFORTS

A total of 29,218 new houses were constructed by the Chinese government and delivered to earthquake survivors (Jin et al., 2015). The government also sent out over 5000 foundations, charity associations, and Red Cross organizations involving the general public (Liu et al., 2011). One year post-disaster, 11,665 houses were built in 19 towns within Yushu (Liu et al., 2011). Despite all this support, it was not enough to support the Yushu population. An earthquake survivor mentioned that Yushu was highly isolated from other cities in China. He said, "The most important thing now is that this place is far from everything, with few accessible rescue troops available...I feel like the number of dead and injured will keep going up." (Jacobs, 2010). The words of the earthquake survivors show the extreme difficulty in providing prompt and adequate assistance to the are, especially faced with isolation and limited resources.

Furthermore, these words revealed the complexities of disaster relief and the difficulties in reaching and assisting all affected survivors. The Chinese government's assistance also fell short in addressing the psychological aspects of the disaster's aftermath. Researchers suggest that interventions for post-traumatic stress must be carried out in adolescents 2–6 months after the traumatic events (Lie et al., 2019). According to the Health Status of Adolescents of Yushu study, only 53.81% of adolescents had received psychological escape training and counseling (Liu et al., 2017). In Liu's study in 2017, researchers stressed the importance of Earthquake-related health education, suggesting that it can bring positive changes to the population, especially as Yushu is prone to and at high risk of earthquakes (Liu et al., 2017).

CONCLUSION

Due to their less mature cognitive capacities and lower adaptability, adolescents are more vulnerable to psychological distress in the aftermath of traumatic events such as earthquakes. The devastating impact of the Yushu earthquake, alongside the isolation of the region and limited resources, led to significant psychological challenges among the affected population. The analysis of PTSD, anxiety, and emotional challenges from numerous studies shows the severity of the trauma. At the same time, the insights into the biological impact added a scientific layer to the comprehension of the adolescent psychological state. Despite the numerous efforts made by the Chinese government to provide physical reconstruction and assistance, the psychological toll on survivors, especially adolescents, remained a constant concern. The emotional and psychological needs of the Yushu earthquake survivors are often overlooked. The Yushu earthquake serves as a reminder that addressing trauma and promoting resilience among adolescent victims is crucial for their long-term well-being and future physical and psychological success.

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