

# Children's Psychosocial Experiences after Long-Term Evacuation Following the Fukushima Nuclear Disaster: A Qualitative Study

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**How to cite this paper:** Sumiyoshi, T., Iwasa, Y. and Nishikata, M. (2025) Children's Psychosocial Experiences after Long-Term Evacuation Following the Fukushima Nuclear Disaster: A Qualitative Study. *Health*, 17, 1366-1383.  
<https://doi.org/10.4236/health.2025.1711091>

**Received:** September 29, 2025  
**Accepted:** November 3, 2025  
**Published:** November 6, 2025

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## Abstract

On March 11, 2011, the Great East Japan Earthquake and subsequent tsunami, compounded by the Fukushima Daiichi Nuclear Power Plant accident, triggered widespread devastation and prolonged evacuations. While the general mental health impacts of this disaster have been widely studied, little is known about the long-term psychological consequences for children who experienced extended displacement and later returned to their hometowns as adults. This qualitative study explored the psychosocial experiences of individuals who were elementary school students residing in Namie Town, Fukushima Prefecture, at the time of the disaster and who voluntarily returned after long-term evacuation. Between July and September 2024, semi-structured interviews were conducted with six such individuals. Data were analyzed using a modified grounded theory approach (M-GTA). Participants' narratives revealed a complex psychological trajectory involving confusion and distress during the acute phase, strengthened family cohesion, stigma related to being nuclear disaster evacuees, and difficulties associated with repeated school transitions. A central emergent theme was a sense of maladjustment in host communities. The desire to reclaim lost time and reestablish identity played a key role in participants' decisions to return to their hometowns. Children who experienced long-term evacuation developed a multifaceted psychological response that persisted into adulthood. Their decision to return home was shaped by both adverse psychosocial experiences and a strong motivation to reconnect with their roots and lost continuity of life. The findings underscore the critical need for sustained, developmentally sensitive mental health support for children exposed to disasters, especially those facing prolonged displacement. Disaster recovery efforts must prioritize not only physical recon-

struction but also social reintegration, stigma reduction, and educational stability to support long-term psychological resilience.

## Keywords

Great East Japan Earthquake, Tsunami, Fukushima Daiichi Nuclear Power Plant Accident, Children Affected by Disaster, Japan, Evacuation

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## 1. Introduction

The Great East Japan Earthquake, which occurred on March 11, 2011, caused widespread devastation, prolonged evacuation of large populations, and significant anxiety regarding radiation exposure, resulting in severe mental health challenges for those affected [1] [2]. The Fukushima Daiichi Nuclear Power Plant experienced a series of equipment failures across multiple units due to the devastation caused by the magnitude 9.0 Tōhoku earthquake and the subsequent tsunami. These failures led to the release of radioactive materials into the atmosphere and seawater. As a result, the incident was classified as Level 7 (severe accident) on the International Nuclear and Radiological Event Scale (INES) and was recognized as a nuclear accident of global significance. In response to the nuclear disaster, the Japanese government established three evacuation zones based on the air radiation levels: the “difficult-to-return zone” (annual radiation level  $\geq 50$  mSv), the “restricted residential zone” (20 - 50 mSv), and the “prepared for lifting evacuation orders zone”. With the advancement of decontamination efforts, most evacuation orders for the restricted residential zone and the prepared-for-evacuation orders zone were lifted by April 2017 [3]. However, as of December 2024, radioactive decontamination in the difficult-to-return zone remained incomplete, and residents from these zones, covering seven municipalities in Fukushima Prefecture, have been legally prohibited from returning home for over 14 years following the disaster.

Namie Town, located in Futaba County, is 4 - 30 km from the Fukushima Daiichi Nuclear Power Station. Before the earthquake, the town’s population was approximately 21,500. However, after the evacuation, the population temporarily dropped to zero. As of 2024, approximately 2200 individuals had returned and are currently residing in the town [4] [5]. Among these returnees were survivors who were schoolchildren at the time of the earthquake and have since grown up to establish their own families.

Although studies since the Great East Japan Earthquake have reported improvements in overall mental health [6], some evidence indicates that prolonged evacuation and displacement exacerbated mental health issues, particularly among children [7] [8]. Similar situations were observed after the Chernobyl nuclear power plant accident in 1986; however, the main themes were health problems among children and the incidence of leukemia and thyroid cancer [9] [10]. Currently, there is insufficient knowledge on the psychological impact of long-term evacuation and relocation after a nuclear power plant accident on children as disaster victims. As

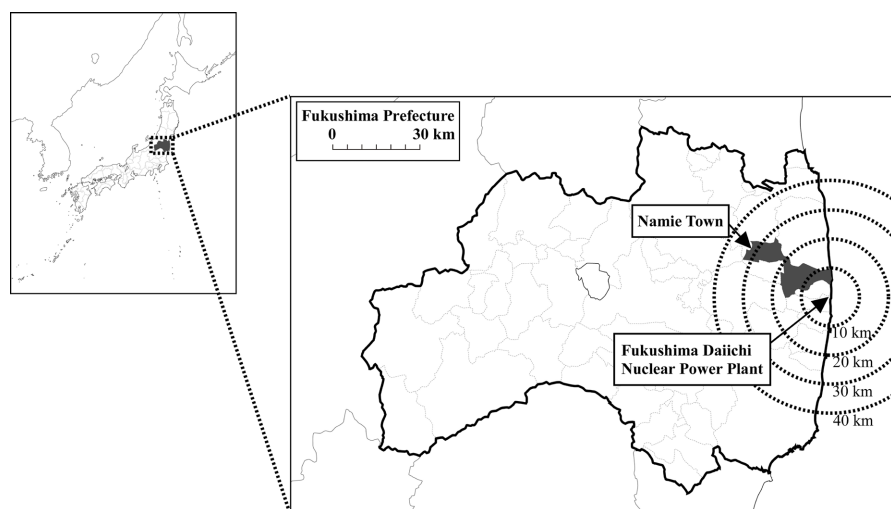
mentioned above, although the evacuation order was lifted, more than 90% of the people have not returned to Namie Town [11]. This trend is similar to the surrounding towns and villages, making the depopulation problem even more serious.

In particular, certain individuals who were born in Namie Town and evacuated during their school years have voluntarily decided to return to their hometown in adulthood. However, limited scholarly attention has been given to how these individuals processed and internalized their disaster-related experiences during childhood, or to the psychosocial and contextual factors that influenced their decision to return. This study seeks to elucidate the lived experiences of those who underwent prolonged evacuation as school-aged children following the nuclear accident and subsequently repatriated to their hometown. The findings contribute to a deeper understanding of the long-term psychosocial consequences of disaster exposure, inform the provision of appropriate mental health support for affected populations, and offer valuable insights for writing effective policies on regional reconstruction and community resilience.

## 2. Materials and Methods

### 2.1. Participants

The participants were selected through theoretical sampling based on the following inclusion criteria. Eligible participants were individuals aged 18 years or older who had experienced the Great East Japan Earthquake on March 11, 2011, in Namie Town, Fukushima Prefecture; were in elementary school at the time of disaster; had undergone a prolonged evacuation period; and had voluntarily returned to their hometown. In total, six participants agreed to participate in the study and share their experiences. A map of Namie Town is shown in **Figure 1**. Recruitment was conducted through posters and word-of-mouth, and participation was voluntary. Before enrollment, the participants were provided with written and verbal explanations of the study, and informed consent was obtained through signed consent forms.



**Figure 1.** Location of Namie Town, Futaba District, Fukushima Prefecture. Concentric circles indicate the distance from the Fukushima Daiichi nuclear power plant.

## 2.2. Data Collection

A descriptive and qualitative research design was used. Semi-structured interviews were conducted between July and September 2024. Each participant was interviewed for approximately 45 minutes. In appreciation for their time, all participants were given a prepaid card valued at approximately 7 USD. Public health nurses and nurses with specialized knowledge of mental health conducted the interviews. The content of the interviews was based on basic attributes as well as memorable events at the time, events or incidents that changed their feelings about the disaster, happy or troubling events from the time of the disaster to the present, and things that they felt were connected to the present. We asked the participants to speak freely about these issues.

The interviews were recorded and transcribed verbatim. The data collection ended after theoretical saturation. The interviewer (first author), a nursing researcher experienced in post-disaster mental health studies, had no prior relationship with participants. Reflexive memos were maintained to identify and minimize potential preconceptions related to the researcher's professional background and disaster-related experiences.

All interviews were conducted in Japanese and transcribed verbatim. English quotations were translated by the authors and checked by a professional bilingual translator experienced in qualitative research. A back-translation procedure was conducted for key excerpts to ensure semantic equivalence and preserve cultural nuances.

## 2.3. Data Analysis

This qualitative study adhered to the COREQ and SRQR guidelines [12] using the modified grounded theory approach (M-GTA) based on Glaser and Strauss's grounded theory approach [13]. Both share the core principles of theory generation grounded in data, empiricism, deep interpretation, and verification through application. However, the M-GTA has two key differences that enhance its applicability.

First, the M-GTA focuses on an analytical theme derived from the perspective of an "analytically focused person". This ensures that the analysis aligns with specific human actions, emotions, and influencing factors, making the findings applicable to real-world settings [13] [14].

Second, M-GTA does not employ strict coding procedures that fragment data into smaller chunks, as proposed by Strauss [12]. Instead, it uses worksheet-based analysis to directly form concepts, avoiding the loss of context in participants' statements or actions. This approach preserves the broader meaning of the data and enhances its practical applicability.

This study describes the internalization process of children who experienced an earthquake, and this analysis method was considered suitable. The procedure was as follows:

A verbatim record was created from the audio data of each interview.

Semantic text related to “interaction with others” was identified. The meaning of the text was interpreted and recognized as a “concept”. This concept was then defined.

Additional variations were identified and used as supplementary data by analyzing and comparing the verbatim records. Similar and opposing data related to this concept were investigated. Where necessary, the concept name was modified.

As the analysis progressed, the relationships between the concepts were investigated. Categories were generated from the related concepts. The data was then compared again. Data collection was terminated when no new concepts or categories emerged from successive analyses, indicating theoretical saturation. Although six participants were included, repeated cross-case analysis within the modified grounded theory approach (M-GTA) allowed for sufficient theoretical density.

Finally, a diagram was created to elucidate the relationships between categories. The study was supervised by a co-author specializing in disaster relief and qualitative research, and the analysis was checked for reliability. All data were originally in Japanese and were translated into English by the authors, with further verification by native English-speaking researchers.

## 2.4. Ethical Considerations

This study was approved by the Ethics Committee of Niigata University (Approval No. 2024-0002). The application for ethical approval included a detailed explanation of the study’s objectives and clarified that participation was entirely voluntary. Participants were informed of their right to decline participation or to withdraw from the study at any time without incurring any disadvantage. Confidentiality was assured, and all personal data were protected in accordance with institutional guidelines. The researchers explained the data management protocols, including rigorous security measures and the procedures for data destruction following the completion of the study and publication of the results. Written informed consent was obtained from all participants in the presence of an independent third-party witness. All participants were adults; no minors were included in the study. Recruitment took place between June 20, 2024, and March 31, 2025, via the distribution of informational flyers.

## 3. Results

### 3.1. Characteristics of the Participants

The demographic characteristics of the six participants (two men and four women) are presented in **Table 1**. All participants were in their 20s, with an average age of 23.8. At the time of the interview, all participants were unmarried. All the participants were elementary school students (range: 8 - 12 years) at the time of the disaster and lived in areas designated as difficult-to-return zones because of radiation exposure. All voluntarily returned to their hometowns of origin and found employment there.

**Table 1.** Characteristics of the participants and disaster situation.

	Gen-der	Age at time of disaster	Age at time of interview	Occupation at time of interview	Place of residence at the time of the disaster	Damage to the house
A	F	8	22	Public servant	Fukushima prefecture/Restricted areas with limited return access	The house was half destroyed
B	M	12	25	Public servant	Fukushima prefecture/Restricted areas with limited return access	The house was half destroyed
C	M	11	25	Public servant	Fukushima prefecture/Restricted areas with limited return access	The house was completely destroyed
D	F	11	24	Public health nurse	Fukushima prefecture/Restricted areas with limited return access	Almost no damage to the house
E	F	9	22	Public health nurse	Fukushima prefecture/Restricted areas with limited return access	Almost no damage to the house
F	F	12	25	Public servant	Fukushima prefecture/Restricted areas with limited return access	Almost no damage to the house

The process by which those who experienced long-term evacuation as children owing to the Great East Japan Earthquake and the nuclear disaster decided to return to the disaster area was conceptualized in three distinct phases, structured along a temporal axis, and reflective of the children's psychological reconstruction over time.

During the acute phase of the Great East Japan Earthquake, children were exposed to the devastating effects of the earthquake and tsunami, which obliterated the familiar landscapes that had shaped their daily lives. Compounding the trauma, the simultaneous accident at the Fukushima Daiichi Nuclear Power Plant disrupted transportation infrastructure and supply chains, forcing families into evacuation shelters under severely constrained conditions. Despite the psychological strain, these circumstances often fostered stronger intra-family bonds. This period was considered the "Earthquake acute stage".

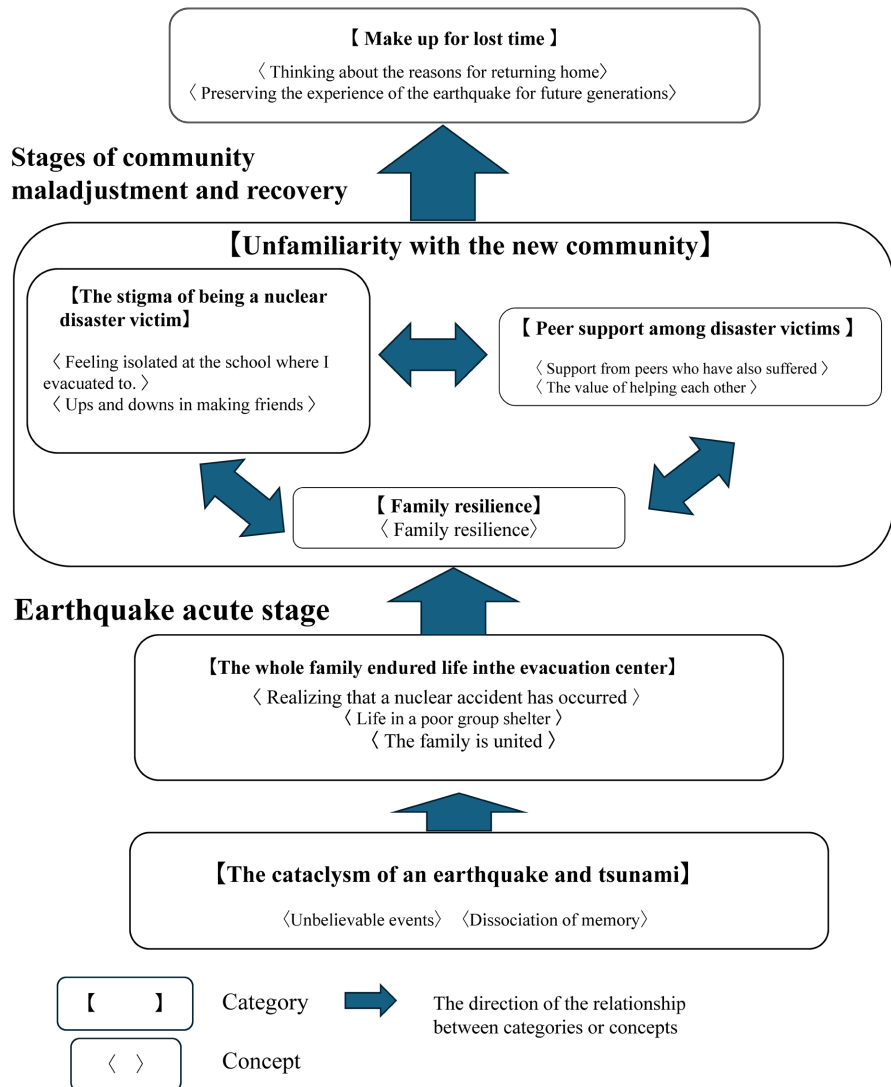
What followed was a prolonged evacuation lasting over a decade, during which families were frequently relocated across multiple regions. For many children, school life in these unfamiliar locations became a source of distress, as they were sometimes stigmatized by classmates for being "nuclear accident victims". Families also faced persistent challenges in adapting to their new environments.

Amid these difficulties, unfamiliarity with the new community emerged as a central psychological theme. Many survivors reported a pervasive sense of not belonging and a longing for the life they had lost. These feelings were further exacerbated by the loss of a previously joyful and stable childhood. However, emotional support from fellow evacuees and long-standing friends offered moments of reassurance and connection. This period was considered the "Stages of community maladjustment and recovery".

As time passed, this sense of dislocation led survivors to reflect on their identity, their future, and their place in society. The desire to "regain lost time" became a motivational force, particularly among those who began to consider returning to

their hometowns. Ultimately, it was this profound sense of estrangement from the host communities—rooted in the theme of unfamiliarity with the new community—that played a pivotal role in shaping decisions to return to the disaster-affected areas. This period was considered the “Stages of deciding to return home”. The process is illustrated in **Figure 2**. Furthermore, the categories and concepts are presented in Supplementary **Table S1**.

### Stages of deciding to return home



**Figure 2.** The process story consists of six categories and one central category.

### 3.2. Categories and Concepts

The central category identified is “Unfamiliarity with the new community”, which represents an objective awareness that initiates the process of reconstructing one’s identity in the context of psychological growth following traumatic experiences. For individuals attempting to make up for lost time and derive meaning from their return to the disaster-affected area, this category signi-

fies a critical turning point—a moment at which they begin to clearly recognize their sense of place and belonging in the world.

Category 1: The cataclysm of an earthquake and tsunami

The participants experienced a disaster so great that the earthquake and tsunami completely destroyed the landscape they had known until then. Furthermore, the impact of the disaster was so significant that they were unable to remember it as they grew up. There have been many earlier reports of post-traumatic stress disorder (PTSD) caused by disasters [15] [16]. Psychological dissociation has also attracted considerable attention [17] [18]. The experience of the disaster, which was caused by a series of events, including the earthquake, tsunami, and nuclear power plant accident, showed that there were gaps in their memories.

Unbelievable events. The destruction caused by the disaster—including collapsed buildings, ruptured and elevated roadways, and entire towns erased by the tsunami—constituted a profoundly shocking and traumatic scene for the children.

*“The familiar scenery has been completely changed, with the house collapsing like this. (A)”*

*“The tsunami washed away the house, exposing the building’s foundation. The state of affairs is that nothing is left. (D)”*

Dissociation of memory. When asked about their living conditions and contacting their family members on the day of the disaster, three of the six participants exhibited fragmented or incomplete recollections, indicating disruptions in memory associated with the traumatic experience.

*“I do not remember that at all. (C)” “I cannot remember it. (A, E)”*

Category 2: The whole family endured life in the evacuation center

The participants reported that the evacuation center where they took shelter with their family was cold, the food was unsatisfactory, and the overcrowded conditions created a stressful atmosphere. They also witnessed adults losing their composure due to stress, making the atmosphere confusing for the children. The explosion at the nuclear power plant was broadcast on a large TV at the evacuation center, adding to the anxiety. Amidst all of this, they felt uncertain about what would happen next. However, they also noted that the bonds between family members deepened during this difficult time.

Realizing that a nuclear accident has occurred. At the time, large television screens installed in evacuation centers repeatedly broadcast footage of the nuclear power plant explosion and real-time reports on radiation levels. While these scenes provoked widespread alarm internationally, children at evacuation centers only a few kilometers away from the accident showed limited awareness of the potential danger.

*“A member of parliament came to the evacuation center and told the adults that the nuclear power plant was in danger. (F)”*

*“The police came around wearing protective clothing and gas masks and told*

*us that we could not stay here. At the time, we did not know what was happening. (D)*”

Life in a poor group shelter. During the Great East Japan Earthquake, the extensive destruction of transportation infrastructure—including roads, bridges, and railway systems—combined with severe fuel shortages and the widespread nature of the damage, significantly hindered the delivery of adequate support. These logistical challenges were later identified as critical issues in the disaster response. In addition, the evacuation shelters were found to be particularly unsuitable environments for children.

*“At the evacuation center, we were at a place where only one bun was distributed per family per day. (B)”*

*“The hygiene conditions at the evacuation center were bad, and there were cases of gastroenteritis and other infectious diseases. There were no partitions to ensure privacy. (F)”*

The family is united. Due to the impact of the nuclear accident, families were compelled to relocate repeatedly from one evacuation center to another. However, the ability to remain together as a family served as a vital source of psychological stability and resilience for the children.

*“Whether it was about where to evacuate or move, we went to the place our parents decided upon. It is natural for family members to be together. (E)”*

Category 3: The stigma of being a nuclear disaster victim

After the earthquake, children from “difficult-to-return” zones were repeatedly relocated and had to transfer between schools. They often faced stigma as evacuees of the nuclear disaster and felt anxious about how classmates perceived them. This led to hesitation in forming new relationships and difficulty adjusting to different academic environments. The quality of friendships significantly influenced their well-being, and some wished for fellow evacuees to attend the same school for mutual support. Frequent relocations also placed a heavy burden on families. Children who recognized their parents’ stress often suppressed their own struggles with school life, enduring them in silence.

Feeling isolated at the school where I evacuated to. At their new school, the children were perceived as “transfer students who had evacuated from a nuclear disaster”, and reported feeling subject to both curiosity and prejudice from others. Furthermore, they experienced a psychological dilemma: a self-protective mechanism stemming from the fear of future relocation hindered their ability to form deep interpersonal connections.

*“I am already seen as a complete transfer student. It is difficult to make friends and even more difficult to keep them. (A, B)”*

Ups and downs in making friends.

*“I was shy and did not want to move to a new school. The people around me were kind, and somehow I managed to get through school without any problems. (B)”*

*“I thought I would be in big trouble if I did not make any friends. I was saved*

*when the other person approached me. (F)*”

#### Category 4: Peer support among disaster victims

The support of other survivors in the same situation helped them cope with their current self-objectification and future decision-making. Mutual help generated feelings of gratitude.

Support from peers who have also suffered.

*“For some reason, I play with my friends from primary school. I can express myself honestly(D).”*

The value of helping each other.

*“It is a simple thing, but having people listen and talk to me about things made me happiest. I am glad we understand each other(C).”*

#### Category 5: Family resilience

Despite the adversity of living in evacuation shelters, each family member made efforts to cope with and manage the associated stress. The children appeared to observe their parents—who were experiencing psychological instability due to life in an unfamiliar environment—with composure and exhibited behaviors that suggested they were attempting to regulate their own stress in response to their parents’ emotional state.

Family resilience.

*“My mother said she couldn’t get used to the place where we had evacuated. When I heard that, I realized that my parents were also struggling with the evacuation. (A)”*

*“I’m sure it was tough for my parents to live in the evacuation center, but they always tried to keep us kids in good spirits. (B)”*

#### Category 6: Make up for lost time

The children felt they had lost precious time because of the earthquake and tsunami and wanted to return for a fresh start and think about building their future. This sentiment was felt strongly when interacting with other disaster victims.

Thinking about the reasons for returning home. Following progress in the radioactive decontamination work, many evacuation orders were lifted in April 2017, six years after the disaster. Those who had been evacuated for a prolonged period during early adolescence decided to return to the affected areas of their own free will. They provided reasons for returning home.

*“After all, I prefer familiar places. For now, I just want to go home. (D)”*

*“I often think about what my life would have been like if the earthquake had not happened. (C)”*

*“I want to go back to that time. (A)”*

Preserving the experience of the earthquake for future generations. The participants felt that they had a responsibility to share the stories of the damage caused by the earthquake and tsunami because it was a generational experience. They also found purpose in repaying those who had helped them when they were affected by the disaster.

*“I want to repay those who helped me during the disaster. (E)”*

## 4. Discussion

This study is the first to describe the process by which school children affected by the Great East Japan Earthquake, tsunami, and nuclear accident internalized their experiences of the disaster and returned to their hometowns. One novel finding of this study is that children who experienced long-term evacuation due to a major disaster became aware of their inability to adapt to their new communities and, when they thought about their future, chose to return to their hometowns to reclaim lost time. These characteristics were identified using exploratory and inductive approaches as well as qualitative methods. The participants were in distinct situations in terms of the disasters they experienced and their subsequent evacuation destinations. However, the identification of the underlying commonalities in their development and voluntary return to their birthplace supports the reliability of the interpretation and ongoing analysis of the interviews.

The participants' narratives demonstrate how post-disaster recovery may involve not only the alleviation of trauma symptoms but also the search for meaning, identity reconstruction, and the reclaiming of lost continuity in life—elements central to post-traumatic growth theory [19].

This study focused on interviews with school-age children affected by the disaster, as many adults were hesitant to return to their hometowns. Previous research has identified barriers for adult returnees after the Fukushima Daiichi Nuclear Power Plant accident, including limited job opportunities, housing challenges, inadequate shopping access, and concerns about radiation exposure [20]. Decisions to return are also shaped by factors such as home ownership and property damage [21], with fear of radiation often outweighing emotional attachment to the area [22].

Despite government-led decontamination and reconstruction efforts through designated revitalization centers [23], the return rate remains low. Although 80% of Namie Town residents remain registered there, fewer than 10% have actually returned, largely due to limited decontamination and persistent concerns about radiation.

Despite these challenges, the children who chose to return to the disaster-affected area exhibited several distinct characteristics.

This study conceptualized the process in three distinct phases, defined by both a temporal framework and the psychological reconstruction experienced by the children. Numerous studies have emphasized the importance of identifying risk factors that increase the likelihood of acute stress disorder (ASD) or post-traumatic stress disorder (PTSD) in children during the acute phase of an earthquake—such as the loss of family members, destruction of homes, and physical injuries—and providing timely and appropriate psychosocial support [24]. Furthermore, children who perceived an intense sense of threat during the disaster are more susceptible to severe PTSD symptoms [25].

In the specific context of the earthquake examined in this study, public mental health support for affected children was found to be insufficient. It was later re-

ported that some children developed dissociative amnesia—a symptom cluster often associated with PTSD. One protective factor that contributed to the children’s emotional resilience was cohesion within the family unit. Recent literature has emphasized that initial psychological first aid for disaster-affected children should prioritize the restoration of safety, calm, a sense of self-efficacy, and continued connection with family members [26]. In this study, participants noted that, despite the adversity of life in evacuation shelters, being able to remain with their families helped them endure and psychologically process the acute stages of the disaster.

There are psychological processes characteristic of the “Stages of community maladjustment and recovery”. During prolonged displacement, children experienced repeated school transfers, leading to disruptions in their learning and psychological adjustment. These challenges were compounded by the stigma associated with being nuclear disaster evacuees. Nevertheless, the resilience fostered within the family unit, along with peers providing mutual support, served as critical protective factors during this period.

There have been several reports on the changes in the educational environment due to disasters and a decline in children’s academic abilities [27]. The causes include the psychological developmental impact of the trauma caused by the disaster, as well as factors such as the continuous stress of relocation and building collapse [28]. Although no academic performance surveys have been conducted on elementary school students who have experienced prolonged evacuation, it is reasonable to predict that repeated school transfers may lead to academic delays. Additionally, it has been shown that the number of times students change schools is associated with negative developmental risks such as poor grades and problem behaviors [29] [30]. This issue is of significant concern, and support providers need to address it appropriately.

The next challenge is related to interpersonal relationships. Adolescent friendships are delicate, and it can be assumed that the stress of joining a new community is high. In the interviews, participants commented that they were hesitant to disclose that they were evacuees from the earthquake-affected areas. This disaster was characterized by a serious nuclear accident, and it was a major discovery that both adults and children experienced radiation stigma [7]. Discrimination has a significant impact on mental health after a disaster, and the experience of social rejection can exacerbate PTSD [31] [32]. It is important to recognize that many incidents and challenges occurring within school settings often remain unnoticed. Children forced to evacuate and integrate into new communities may encounter difficulties beyond those caused directly by the disaster.

Family resilience also played a pivotal role in shaping psychological outcomes. There have been many reports of a strong link between parental depression and anxiety after a disaster and children’s mental health [33] [34]. However, there is limited evidence to suggest that parental depression over more than 10 years after a disaster can have a negative impact on children. Previous research has demon-

strated that while exposure to natural hazard-caused disasters is inherently stressful, more severe and long-term mental health consequences are strongly correlated with environmental factors, such as loss of life, threats to personal safety, and property destruction [35] [36].

The nuclear disaster and the establishment of the difficult-to-return zone by the Japanese government have forced numerous families to live in evacuation shelters for long periods. In addition to the many deaths, the damage to land and housing assets has led to a long and stressful situation.

As a family unit, overcoming the psychological stress associated with displacement required time. Children found a sense of reassurance through mutual support with fellow disaster victims, and communication within the family was recognized as essential for maintaining a sense of stability in daily life. Through this process, children gradually developed the capacity to view themselves objectively within unfamiliar environments.

The final phase involves the “Stage of deciding to return home”. This period is characterized by a strong desire to reclaim the time lost due to the disaster, and it marks the point at which individuals began making decisions to return to the affected areas. One additional motivation for returning was a sense of moral obligation to repay those who had offered support during the disaster. Prior research has demonstrated that participation in volunteer activities by disaster survivors contributes significantly to enhancing their psychological resilience [37].

In the present study, participants’ difficulty in adapting to their new environments served as a turning point for psychological recovery, ultimately facilitating the restoration of their identity and the reconstruction of their post-disaster lives. This process can be interpreted as an individualized trajectory toward healing and resilience.

This study provides important insights for medium- to long-term disaster support, particularly regarding children, who are developmentally and socially vulnerable. A critical concern is protecting them from repeated exposure to traumatic imagery and information, which has been shown to adversely affect mental health. In this study, continuous broadcasts of tsunami and nuclear accident footage, as well as adult distress in shelters, were linked to dissociative symptoms in some children. Media communication is vital during disasters; however, it is equally important to shield children from psychologically harmful content.

To address prolonged displacement, stability in school life must be prioritized. Schools receiving evacuee children require institutional support, including mental health services tailored to their needs. Developing such systems is key to maintaining children’s long-term psychosocial well-being and educational continuity.

Policymakers and educators should minimize school transitions and establish trauma-informed school environments. Additionally, ethical media guidelines are needed to protect children from distressing visual content during emergencies.

This study focused on individuals who chose to return to Namie Town. Their experiences may differ from those who decided not to return, introducing a potential selection bias. Previous studies have reported that among non-returnees,

younger individuals and women were more likely to remain in their new communities due to ongoing concerns about radiation exposure and health risks [38]. Future comparative studies involving both groups could provide deeper insights into the determinants of return decisions and long-term adaptation processes.

Future research will need to conduct comparisons with those who chose not to return, based on differences in their perception of radiation risks and attachment to the community.

### Limitations

This study has some limitations. The study focused on individuals who returned to areas affected by a nuclear disaster; however, it did not compare their experiences with those who chose to relocate permanently. Additionally, this study did not account for individuals who struggled to overcome the psychological and social challenges associated with the disaster.

Moreover, concerns regarding radiation exposure were minimally mentioned by the participants and were not included in the analysis. Furthermore, the study did not examine the scale of the disaster experienced by each participant or other critical factors that may have contributed to the decline in mental health, such as the loss of close family members.

Because interviews were conducted approximately 13 years after the disaster, recall bias may have influenced how participants reconstructed their past experiences. However, this temporal distance also allowed participants to integrate earlier emotions with their current life perspectives, providing valuable longitudinal insight into psychosocial adaptation.

Future research could benefit from analyzing these background factors to elucidate unique patterns in the process of return and adaptation. Further refinement and examination of this model are necessary to gain a more comprehensive understanding of the experiences of those who underwent long-term evacuation following the Great East Japan Earthquake and nuclear disaster.

### 5. Conclusion

The phenomenon of children who experienced the Great East Japan Earthquake, tsunami, and the nuclear power plant disaster returning to their hometowns voluntarily as adults was regarded as them “regaining lost time”. This was done to overcome the impact of repeated school transfers during adolescence and the stigma of being victims of nuclear accidents. Furthermore, it was highlighted that while the family was united during the evacuation, the children were affected by their parents’ stress. This study highlights the need for ongoing mental health surveys for people living in evacuation shelters for long periods, as well as social compensation and the strengthening of human, social, and public aspects of disaster areas.

### Acknowledgements

The authors would like to thank all those who participated in this study. This work

was supported by a grant from the Naito Foundation (No. 2024), which provides grants for assistance in the wake of the Great East Japan Earthquake, and Grant-in-Aid for Challenging Exploratory Research (No. 24K22203).

## Conflicts of Interest

The authors declare no conflict of interest.

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## Supporting Information

**Table S1.** List of categories and concepts.

Central category	Categories	Concept
Unfamiliarity with the new community	The cataclysm of an earthquake and tsunami	Unbelievable events
		Dissociation of memory
	The whole family endured life in the evacuation center	Realizing that a nuclear accident has occurred
		Life in a poor group shelter
		The family is united
	The stigma of being a nuclear disaster victim	Feeling isolated at the school where I evacuated to
		Ups and downs in making friends
	Peer support among disaster victims	Support from peers who have also suffered
		The value of helping each other
		Family resilience
	Make up for lost time	Thinking about the reasons for returning home
		Preserving the experience of the earthquake for future generations