

# Difficulties and Support of Out-of-Prefecture Evacuees—Due to the Great East Japan Earthquake and Nuclear Power Plant Accident

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**Abstract**—In March 2011, Japan suffered enormous damage from the magnitude 9 Great East Japan Earthquake and the nuclear accident. Among the residents affected by the disaster, there are concerns about the loneliness and fatigue of those who evacuated to other prefectures in wide areas. The purpose of this study is to clarify the difficulties faced by residents who continue to live outside their prefecture and the efforts and support they need to overcome these difficulties. Following the disaster, interviews were conducted with eight individuals who had relocated outside their home prefectures and were living in evacuation shelters. The results revealed that the primary reasons for choosing to evacuate outside their home prefectures were the inability to return to their pre-disaster homes because of the nuclear accident and concerns about radiation exposure. The difficulties of living outside the prefecture were identified as four factors: changes in living environment, loneliness from being away from home, prejudice and discrimination against evacuees, and health issues. In overcoming these adversities, the following four factors provided support: sharing feelings with family and friends, taking initiative to improve the situation, confronting discrimination and prejudice head-on, and maintaining connections with the local community and friends from before the disaster. Future challenges include collaboration and cooperation among local governments and other entities to provide emotional support and appropriate information dissemination to disaster victims, with consideration for their reconstruction of life and health management, as well as the maintenance of long-term support systems.

**Keywords**—mental health, disaster, evacuees outside the prefecture, difficulty, support

## I. INTRODUCTION

In March 2011, Japan suffered tremendous damage from the magnitude – 9 Great East Japan Earthquake and nuclear power plant accident. The area surrounding the nuclear accident was zoned as area to which returning will be difficult, and many residents evacuated from their familiar places. In 2022, the evacuation order was lifted in most of the areas except for a part of the hard-to-return zone. However, more than 13 years after the Great East Japan Earthquake, 19,420 people are still evacuated from Fukushima Prefecture [1]. Evacuees from the nuclear accident report that forced evacuation has destroyed community bonds and that mental health is the most important issue for them [2]. Thus, evacuees who have left their previous communities and moved to areas with different life and cultural spheres may experience changes in their mental health. Among the victims of the Fukushima nuclear accident, there is concern about loneliness and fatigue among those who evacuated to other prefectures in wide areas [3]. Consequently, numerous health surveys have been conducted by national and prefectural

government agencies in Japan. However, health surveys targeting evacuees outside the prefecture have rarely been conducted. It has been noted that the actual state of mental health and living conditions of evacuees outside the prefecture is largely unknown [4].

The objective of this study is to elucidate the challenges confronted by residents who continue to reside as evacuees outside their designated home prefectures, along with the efforts and support they exert to surmount these challenges. This will provide foundational data for implementing support tailored to the characteristics of evacuees outside their home prefectures.

## II. MATERIALS AND METHODS

### 1) Research design

Qualitative Descriptive Research.

### 2) Study participants

Study participants were adults who had moved out of the prefecture and were living as evacuees after the Great East Japan Earthquake and Fukushima nuclear power plant accident in March 2011.

### 3) Research methods

The purpose of this study was explained to public health nurses working at health centers in the areas surrounding the nuclear power plant that became difficult-to-return zones after the accident occurred. As a result, we were able to obtain consent from the health center at the municipal office as a research cooperative facility. We then explained the purpose and research methodology of this study in writing and orally to the out-of-prefecture evacuees referred to us by the public health nurses and obtained their consent. Semi-structured interviews were conducted face-to-face using an interview guide. The interview was designed to last 60 minutes. The content of the interview guide was “Reasons for choosing to live as an out-of-prefecture evacuee”, “Difficulties in living as an out-of-prefecture evacuee”, and “Things (ideas and resources) that have supported me in living as an out-of-prefecture evacuee”.

The interview content was recorded on an IC recorder with the approval of the study participants.

### 4) Analysis method

The data were transcribed into verbatim transcripts to obtain an overall picture of the research participants’ narratives. From the verbatim transcripts, we extracted narratives that could be read as “reasons for choosing to live as an out-of-prefecture evacuee”, “difficulties in living as an out-of-prefecture evacuee”, and “support (ideas and resources) in living as an out-of-prefecture evacuee”.

respectively, and separated them by a single coherent meaning, briefly expressed them, and created a code. The codes were then classified into categories by examining the similarities and differences among them.

The analysis process was supervised by a qualitative research specialist to ensure reliability. In addition, we discussed the results with public health nurses at the municipal offices in the disaster-affected areas, where the research was conducted, in order to ensure the verifiability of the results.

#### 5) Ethical considerations

In addition to explaining the purpose and methods of the study, participants were informed in writing and orally that their participation in the study was voluntary, that they could withdraw at any time, that they would not be disadvantaged whether or not they participated, and that their anonymity would be protected. This study was conducted with the consent of the Ethics Committee of my former university (R0582).

### III. RESULT

#### 1) Summary of study participants

There were 8 study participants, all of whom were female. The largest number of participants were in the 60 s (62.5%), and the average age was 59.3 years old. The current family size ranges were from 2 to 7 members, with an average of 3.12 members per family. There were no single-person households. Seven (87.5%) were used to working before the disaster, but only one (12.5%) was working after evacuating outside the prefecture due to the disaster. Four (50.0%) had friends in the out-of-prefecture evacuation area, and four (50.0%) had no friends, a 50/50 split.

#### 2) The situation of out-of-prefecture evacuees due to disaster

The situation of out-of-prefecture evacuees was organized in a qualitative descriptive manner from three aspects: reasons for choosing to live as evacuees outside the prefecture, difficulties in living as out-of-prefecture evacuees, and support in living as out-of-prefecture evacuees. Categories are in bold, and codes generated by summarizing specific narratives are in italics.

##### (1) Reasons for choosing to live as an evacuee outside the prefecture

About half of the respondents stated that the reason they had chosen to live as evacuees outside the prefecture was to escape from the effects of radiation. Immediately after the earthquake, they received evacuation instructions from the local government and initially stayed in evacuation shelters within the prefecture. However, when they saw the news of the nuclear power plant accident on television, they felt a sense of crisis about exposure to radiation, and after discussing it with their families, decided to evacuate far away. Another half had moved outside the prefecture in search of a safer place, encouraged by relatives and acquaintances who lived outside the prefecture. Then, after the earthquake, the area where their homes were located before the earthquake was designated as the interim storage facilities for storing waste contaminated by radioactive materials, and they were forced to give up their homes. The study participants initially moved between public housing, apartments, and rental houses, but seven years after the disaster, they purchased their own home and lived in it. The reasons they chose their

current location included that it was in a neighboring prefecture, close to their home before the disaster, highly convenient, and that they had old friends living there.

##### (2) Difficulties experienced while evacuating outside the prefecture

###### [Confusion over changes in living environment]

Many residents spoke about how relaxed their rural lifestyle was before the earthquake had suddenly changed to living in rented accommodation in urban areas where they had evacuated, how they did not know when they would be able to return to their hometowns, and how they were not used to living in apartments. They were confused and stressed by the changes in their living conditions after the earthquake.

*"The municipal apartment where we were evacuated renewed on annual basis, which was very short. We were anxious because we couldn't receive support for our evacuation life on a multi-year basis. That was a huge source of stress. (Case A)"*

*"Before moving to an evacuation site outside the prefecture, we stayed at a hotel within the prefecture. After that, we were told by the local government where to evacuate next. I kept wondering when we would be able to return to our hometown. (Case F)"*

*"Before the disaster, I lived in a single-family home and enjoyed maintaining the garden. Gardening was a source of comfort for me. Now that I live in an apartment, not having a garden is very difficult. (Case G)"*

###### [Feelings of loneliness living away from home]

Unable to return to their towns or homes due to radioactive contamination, residents felt lonely and homesick because they had to live outside the prefecture. Once living outside the prefecture, they had almost no access to information about the situation within the prefecture. Thus, when they ran into trouble, they had to deal with it on their own. Some people were envious of evacuees living within the prefecture in hotels, inns, and temporary housing within the prefecture.

*"Leaving my hometown makes me feel like I'm about to die. It was the land my ancestors had lived on for 400 years (Case A)."*

*"When I heard from a relative who had evacuated within the prefecture about how their hometown had been gradually recovering, I was so envious that I wanted to go back (Case B)."*

###### [Reputational damage and bullying experienced in evacuation areas]

All residents interviewed experienced reputational damage related to compensation payments and radiation. They had also heard stories of others around them suffering reputational damage.

*"When I was working part-time at a supermarket, a colleague asked me, 'You should be receiving a lot of compensation from the government for the nuclear accident, so why are you working?' I was very shocked, and my body started shaking." (Case H)*

*"When I was living in a rental house, a neighbor recognized me as an evacuee from my car's license plate, then told me, 'Don't take out the trash,' and damaged my car, so I called the police. After that, I changed my car's license plate so that I wouldn't be recognized as an evacuee." (Case E)*

[Health problems related to the disaster]

Some research participants experienced insomnia and vomiting after watching footage of the earthquake. Another research participant felt a mental burden watching family members suffer from mental health issues after the disaster. They struggled to obtain health support during the disaster for family members with mental health issues and disabilities.

*"When I was at home, there were several times to watch footage of the disaster repeatedly, and I really vomited. I'm going to the hospital. Everyone in my hometown area has already died in the tsunami (Case H)."*

*"My husband was shocked by the nuclear accident, as he was involved in the construction of the nuclear power plant. He didn't say anything and just kept drinking alcohol. It was a mental burden to keep an eye on my husband's stress (Case G)."*

*"My disabled son sat down the whole time at the evacuation center, except to go to the toilet, and his legs were weak. I contacted the local government to ask if they could provide support for people with disabilities. However, the local government told me that since the situation is so chaotic after the disaster, they were not in a position to provide support for people with disabilities now (Case F)."*

From the above, four categories were extracted as the difficulties faced by residents living outside the prefecture (Table 1): "confusion about changes in living environment", "loneliness from living away from home", "confusion about changes in living environment, damage to reputations and bullying in the evacuation area", and "health problems related to the disaster".

Table 1. Difficulties experienced while evacuating outside the prefecture

No.	Categories
1	Confusion over changes in living environment
2	Feelings of loneliness living away from home
3	Reputational damage and bullying experienced in evacuation areas
4	Health problems related to the disaster

(3) Support experienced while evacuating outside the prefecture

[Sharing feelings with family and friends]

Family members deepened their bonds by sharing various feelings and thoughts, such as the hard times and the happy times. Knowing the feelings and thoughts of their family members strongly drew out their motivation to do their best.

*"Originally, it was our family's way to talk about our worries and confide with each other. We shared the events of the day with my family. (Case F)"*

*"My husband was crying. So, I thought, 'No matter what happens, I'll do my best for my family.' I want to take care of my health not only for myself but also for my family. (Case A)"*

[Taking voluntary action to turn things around]

Residents took the initiative to take various actions to prevent themselves from becoming reclusive, such as going for walks, meeting with friends, actively participating in gatherings of disaster victims, and starting volunteer activities.

*"After the earthquake, my husband started complaining to me that nothing was fun anymore. I thought that if we stayed together any longer, we would both break down, so I started volunteer activities." (Case A)*

*"I think it's important to be able to switch our mindset. If one way doesn't work out, I'll try to find something else to enjoy." (Case B)*

*"I contacted the local government in the disaster-affected area to receive welfare services for my son with disabilities, but they said it was still too chaotic to handle. So, I consulted with the welfare officer of another local government, and they were able to assist us. They helped us find a day service center for people with disabilities." (Case F)*

[Conveying the correct facts about rumors and behaving confidently]

When they received rumors about their receiving compensation for the victims of the nuclear accident, the residents were shaken but responded by conveying the truth. They were firmly aware that there was nothing wrong with their actions and tried to avoid damaging their dignity by behaving confidently.

*I haven't received any compensation for the nuclear power plant. I told the people at my part-time job that I didn't say anything wrong. The colleague I had an argument with about the compensation apologized to me the next day. He said he was sorry. I replied with a smile that I didn't care. I did my best to hold back so we didn't fight any more. (Case H)"*

*"I've decided to invite friends I met in the evacuation area outside the prefecture to my home. I don't want to have to lie every time that I'm not a victim of the disaster, so I'm going to explain that I came to this area for a reason. (Case B)"*

[Maintaining the connections with the local community that had existed before the disaster]

Residents valued their interactions with friends from the communities where they had lived before the earthquake. These long-standing friendships allowed them to share their feelings with others who had been forced to evacuate suddenly, enjoy conversations without worrying about dialects, and relax. Even now, they continue to participate in events and gatherings in the communities where they lived before evacuating, at a pace that is not burdensome.

*"I speak in the dialect I used in my community before I evacuated, and I can communicate with you. That makes me happy. In the area where I live now, I hide the fact that I am an evacuee. We talked about how we are the same. I feel secure because I have friends with whom I can share such stories. (Case H)"*

From the above, four factors were identified as having supported evacuees outside the prefecture in overcoming the difficulties caused by the disaster (Table 2): "sharing feelings with family and friends", "taking voluntary action to turn things around", "conveying the correct facts about rumors and behaving confidently", and "maintaining the connections with the local community that had existed before the disaster".

Table 2. Support experienced while evacuating outside the prefecture

No.	Categories
1	Sharing feelings with family and friends
2	Taking voluntary action to turn things around
3	Conveying the correct facts about rumors and behaving confidently
4	Maintaining the connections with the local community that had existed before the disaster

#### IV. DISCUSSION

1) Reasons for choosing to evacuate outside the prefecture

The reasons why the study participants chose to evacuate

outside the prefecture were common: in addition to being unable to return to their homes in the long term because of the nuclear accident, they were concerned about radiation and wanted to live in a safe area. It is thought that they chose to rebuild their lives in other prefectures where the health effects of radiation were less severe. Fujita also indicate that radiation concerns are a significant factor in the anxiety of evacuees outside the prefecture [5]. Evacuees who evacuated with their families reported higher levels of radiation anxiety compared to those who did not. All participants in this study evacuated with their families, and some were parents of children with disabilities. Having a family, especially children, makes one worry about how radiation will affect them in the future. This reflects the feelings of parents who want to protect their families and ensure they can live safely and securely.

## 2) Difficulties experienced during evacuation

Four factors were identified as difficulties experienced by evacuees living outside the prefecture: confusion over changes in living conditions, loneliness from living away from home, rumors and bullying in the evacuation area, and health issues related to the disaster.

For residents who encountered an unexpected large-scale disaster, the main reason for evacuating to another prefecture was to protect themselves and their families from the anxiety caused by radiation from the nuclear disaster. However, when it came to leaving the place where they had lived until then and moving to a distant prefecture, they felt it was difficult to adapt to the various changes in their living environment. They felt disappointed that they could not continue living in their homes because of radiation and frustrated that they could not protect the homes that had been passed down from generation to generation. On the other hand, the situation of having to adapt to life in a new place is thought to have caused psychological conflict. Moving to one's place of residence outside the prefecture was an unavoidable choice due to the sudden earthquake and nuclear accident, but it also led to feelings of homesickness and loneliness among the study participants. Yamaguchi *et al.* [6] reported that social factors such as living conditions, housing environment, and neighborhood relations experienced by evacuees from outside the prefecture due to the earthquake and nuclear accident were strongly related to psychological stress responses. Similarly, the results of this study suggest that social factors such as changes in the housing environment and living conditions after the disaster are linked to psychological stress in the form of loneliness away from home. Furthermore, none of the research participants had disclosed their status as evacuees to the people living in their current area of residence. This is thought to be due to the background that during their long period of evacuation, residents suffered reputational damage in various places, such as their workplaces, among their neighbors, and at their children's schools. To protect oneself and one's family from further harm, one may find it necessary to be cautious in social interactions, which is likely to cause sustained mental stress. Such situations have been pointed out as leading to isolation for evacuees outside the prefecture in their new evacuation areas [6, 7]. According to Iwagaki *et al.* [4], it has been reported that disaster victims who have lost their homes and feel a sense of loss, as well as those who have

experienced discrimination or other unpleasant experiences at evacuation sites, are at higher risk of mental stress [8]. After carefully considering the feelings and needs of evacuees outside the prefecture, it was deemed necessary to take specific measures to provide appropriate support to prevent mental health issues caused by stress.

## 3) Factors that provided support during evacuation life

Four factors were identified as providing support to evacuees outside the prefecture in overcoming the difficulties caused by the earthquake: "sharing feelings with family and friends", "taking voluntary action to turn things around", "communicating with the correct facts about rumors and behaving confidently", and "continuing connections with the local community that existed before the earthquake". The relationship is shown in Fig. 1.

In their lives as evacuees outside their home prefectures, encouragement from family and friends was a source of support. At times, they shared their true feelings with each other as family members, which sometimes led to painful experiences. However, in such cases, they made efforts to ease the tension within the family by personally finding ways to relax such going for a walk. As evacuees outside their home prefectures, they experienced loneliness and anxiety from being separated from their hometowns, so they valued their close family and friends who could help them and maintain their relationships. In addition, in their new living areas, they faced the challenge of rebuilding their lives without any knowledge of the local area. When they encounter difficulties in their daily lives or health, they contacted their local government before the earthquake or their local government in their evacuation destination to seek ways to overcome their immediate challenges and supports to help them get through their daily lives. Recognizing that they could not protect their own lives by waiting for support from others, the residents actively acted on their own to improve their situation.

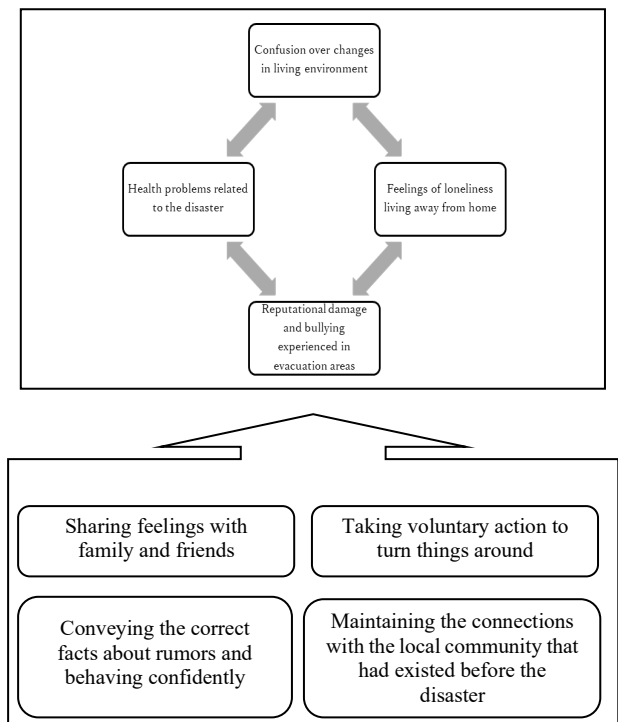


Fig. 1. Relationship between difficulties faced by evacuees outside the prefecture and helpful support.

And, while living outside the prefecture, many residents experienced defamation related to compensation and radiation from neighbors and coworkers. “Addressing reputational damage by conveying accurate facts and maintaining composure” served as a source of support, helping individuals avoid having their self-esteem compromised. On the other hand, reputational damage and discrimination against evacuees caused significant emotional distress, contributing to the inability to openly disclose one’s status as an evacuee. Despite this external tension, evacuees likely struggled to reconcile complex emotions to establish stable lives in their new locations outside the prefecture.

For those living in evacuation shelters outside the prefecture, “maintaining connections with the local community that existed before the disaster” was a great source of support. For residents who hid their status as evacuees in their daily lives, interacting with others who had experienced the same disaster provided a sense of security. Finding a place where they could express their true feelings helped them maintain their mental balance. The opportunities for resident interaction that local governments in the disaster-affected areas continued to provide were effective. The characteristics of the study participants included valuing connections with others, viewing difficulties in a positive light, and demonstrating a proactive attitude toward life. On the other hand, as disaster victims, they had suffered trauma and experienced many painful experiences. It was considered important to provide emotional support and accurate information to such evacuees from outside the prefecture to help them find clues to solving their problems. Matsumoto, who has provided support to evacuees outside the prefecture, points out the importance of building a flexible support system that combines individual support for evacuees with group support to meet the needs of disaster victims who wish to connect with one another [9]. Such psychosocial support has been reported to play a certain role in preventing mental ill health [10]. This finding is relevant to the experiences of the participants in this study.

Furthermore, while recognizing the stigma attached to evacuees, it was considered necessary to provide support that would enable them to develop new connections and relationships in their new communities. It is considered that maintaining a long-term support system that considers the reconstruction of evacuees’ lives and health management, through cooperation and collaboration between local governments in disaster-affected areas and those in areas where evacuees have relocated, will remain a challenge in the future.

## V. CONCLUSION

The reasons for choosing to evacuate outside the prefecture were due to the inability to return to their homes in the long term because of the nuclear accident and concerns about radiation. The difficulties of living outside the prefecture were identified as four factors: changes in living environment, loneliness from being away from home, prejudice and discrimination against evacuees, and health issues. In overcoming these adversities, the following four

factors provided support: sharing feelings with family and friends, taking initiative to improve the situation, confronting discrimination and prejudice head-on, and maintaining connections with the local community and friends from before the disaster. Future challenges include collaboration and cooperation among local governments and other entities to provide emotional support and appropriate information dissemination to disaster victims, with consideration for their reconstruction of life and health management, as well as the maintenance of long-term support systems.

## CONFLICT OF INTEREST

The author declares no conflict of interest.

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