Prioritizing Mental Health Issues of Community Residents Affected by Fukushima Daiichi Nuclear Power Plant Accident

Yukako Komasa, Akiko Kitamura Hasebe, Masao Tsuboi, Masamine Jimba, Shinzo Kimura

Abstract

Mental health consequences of the Great East Japan Earthquake and the Fukushima Daiichi Nuclear Power Plant Accident in Fukushima in 2011 may be observed in a longer term. In this report, lessons learned from the past disasters in Japan, and the present overview of experiences, mental and psychological distress among the people living in Fukushima are discussed. Development of a scale concerning radiation and mental health, referring to previously developed scale in Chernobyl, would be helpful in determining the degree of the distress as burnout and PTSD-like symptoms triggered by fears around radiation have been already witnessed in our preliminary study. A long-term monitoring and follow-up will be required not only by taking advantage of the scale but also by learning from the attitudes of and interactions with the residents.

Key words: mental health, disaster, nuclear power plant accident, fear, psychological distress, long-term follow-up

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Introduction

Reconstruction of infrastructure has been comparatively easy in Fukushima, Japan, but it is not the same for the concerned community people after the March 2011 disaster. Next March, in 2014, will be the start of the fourth year since the Great East Japan Earthquake hit the Tohoku regions of Japan. Residents of Fukushima are still experiencing fear and feeling unsafe because of the nuclear disaster that took place following the earthquake, and there is no doubt much more work needs to be done. This article describes an overview of the mental health situations of Fukushima Daiichi Nuclear Accident based on key literature reviews and our direct experience during our field investigations from March 2011 to today.

Japan and disaster

Japan is a disaster-prone country. In its history, Japan has faced a great deal of situations caused by either man-made or natural disasters, and the people have experienced different types of psychological distress (Nishimoto and Matsumoto 2002). For example, when Japan experienced the devastation of atomic bombing in Hiroshima and Nagasaki in 1945, the victims and their families had to face mental health consequences in addition to physical health problems caused by radiation exposure (Asukai et al. 2012). As of 1996, estimated 19.6% of the atomic-bomb survivors exposed to radiation were diagnosed with psychiatric disorders (Mine et al. 1996). Radiation is not visible, and its effect may occur only in a longer term, which distinguishes nuclear disasters from other public health emergencies (International Atomic Energy Agency 2005, World Health Organization 2000, Matsuoka et al. 2012). According to Loganovskiy, radiation-related PTSD in Chernobyl includes “flashforward” phenomena as well as anticipating stress, projection of fear and danger to the future, (Loganovskiy 2013) and those symptoms are being observed even today, 27 years after the accident. It suggests that long-term psychological and psychiatric care would be necessary in Fukushima, too. At the Tokai-mura Criticality Accident in Japan in 1999, the people affected by the accident have consulted health professionals about a variety of health problems for 10 years and more after being exposed to radiation (Minoshita and Satoh 2012) (table 1).

Radiation may not be the only factor causing the mental health consequences; rather, it can also be a...
factor that fosters the emergence of those. Five months after the Chuetsu Offshore Earthquake in Japan in 2004, which nearly resulted in a nuclear disaster, the following factors were identified to prevent the residents’ recovery of mental health status: being with unfamiliar member(s) during the night after the earthquake; house being seriously damaged; living in temporary shelter or at a relative’s home after the earthquake; and finally, physical illness after the earthquake (Kuwabara et al. 2008).

In Fukushima, the residents may face serious mental health problems in the future too. The nuclear accident in Fukushima Daiichi resulted in 140,000 evacuees as of November 2013, (Reconstruction Agency 2013) and the radiation leak still reportedly continues as of December 2013 (Japan Nuclear Regulation Authority 2013). Considering the impact of continuing radiation threats, combating mental health consequences yet to come should indeed be a priority for the Fukushima residents.

Psychological and mental distress after Fukushima Daiichi nuclear accident

We have noticed that the type of psychological and mental distress differs significantly depending on one’s evacuation status. According to our recent survey, the evacuation patterns of Fukushima residents at the time of the Fukushima Daiichi Nuclear Accident can be roughly categorized by an objective aspect and a subjective aspect: the level of radiation at their hometown and one’s willingness to continue living in the hometown (Inagaki 2012). As for the objective aspect, re-classification of all the evacuation zones as of August 2013 had a substantial impact on people’s decisions whether to evacuate. The new classifications included 1) Difficult-to-return Zone (over 50mSv/year), 2) Residence Restricted Zone (20-50mSv/year), 3) Preparatory Zone for Lifting the Evacuation Order (under 20mSv/year). Evacuation patterns and classification of evacuation zones are together shown in Figure 1 (Japan Ministry of Economy, Trade and Industry 2013). Those whose hometown was severely contaminated by radioactive substances but wishing to return to their hometown someday, they were more likely to evacuate within Fukushima prefecture, while many other families decided to leave Fukushima to start a new life elsewhere. On the other hand, many of those whose hometown was not as severely contaminated as other areas chose to stay in Fukushima while the others decided to flee from Fukushima voluntarily.

Table 1. Timing and Subject of Professional Consultation after Tokai-mura Criticality Accident

<table>
<thead>
<tr>
<th>Timing of Professional Consultation</th>
<th>Subject of Consultation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Within 2 years of the accident</td>
<td>High anxiety</td>
</tr>
<tr>
<td>2 Within 2 years of the accident</td>
<td>Abusive attitudes of the community members</td>
</tr>
<tr>
<td>3 Within 2 years of the accident</td>
<td>Development of psychiatric disorders</td>
</tr>
<tr>
<td>4 Within 3 years or longer</td>
<td>Pregnancy and having young children in family</td>
</tr>
<tr>
<td>5 Within 4 years or longer</td>
<td>Alcohol consumption</td>
</tr>
<tr>
<td>6 Within 4 years or longer</td>
<td>Fatigue due to litigation</td>
</tr>
<tr>
<td>7 Within 4 years or longer</td>
<td>Financial constraints and lost family links</td>
</tr>
<tr>
<td>8 Within 10 years or longer</td>
<td>Ageing and possibility to develop cancer</td>
</tr>
</tbody>
</table>

Figure 1. Evacuation Patterns and Classification of Evacuation Zones
One of the growing issues among the affected is a sense of divided feelings between the evacuated and the remaining residents (United Nations 2013). It is becoming more difficult for the one to place him/her in other’s position to understand the difficult times that they are going through under different circumstances. For example, evacuees within Fukushima and residents who chose to stay in Fukushima experience less fear for current situation of Fukushima including the level of radiation. On the other hand, evacuees outside Fukushima and voluntary evacuees are psychologically more disrupted. Those feelings result in the community’s different attitudes toward government’s policies on economic compensation, evacuation, radioactive wastes or medical examination systems as well as in a more complicated conflict within people. As far as we understand, this is probably the primary characteristic of Fukushima Daiichi Nuclear Accident in comparison to other nuclear disasters that occurred in Japan in the past.

Children and adolescents are one of the most vulnerable populations after the disaster (Takeda 2011). According to The Health Administration Survey for Fukushima prefectural residents, 14.6% of the adolescents had high nonspecific distress measured by K6 scale, and 22% of elementary school children and 16.2% of junior-high school student presented higher prevalence of behavioral problems measured by “The Strength and Difficulties Questionnaire (SDQ)” (Radiation Medical Science Center for the Fukushima Health Management Survey 2013, Niwa 2012). Additionally, children and adolescents may be affected by their parents’ mental health status: we have witnessed severe cases of mental distress of parents, such as alcohol abuse, child abuse and fatigue. Our current concern is that all of those conditions have appeared earlier than we had initially expected. Investigations on the psychological and mental distress should be carried out as soon as possible to make a statistical assessment and to protect the health and well-being of the people affected by the nuclear disaster.

Developing a scale for measuring Fukushima Nuclear Accident-derived Psychological Distress: Referring to Radiation PTSD of Chernobyl

In order to grasp the overview of psychological and mental distress that may be developed over a long period of time, we have implemented a preliminary study in Fukushima and Niigata prefectures in November 2013. The quantitative tool was developed by translating and partially modifying the “Radiation” PTSD questionnaire developed previously by the researchers in Chernobyl (Loganovsky 2013).

To determine which items of radiation-related PTSD scale should be included in the scale, we have reviewed a previous health concern survey on the people affected by the nuclear disaster in Fukushima, conducted in March 2013 by Kuwano Kyoritsu Hospital in Koriyama City, Fukushima. The results well demonstrated the core values of general Japanese, which is to prioritize their family members’ health over their own (Tsuboi 2012). According to the survey, 17.1% of the 820 respondents had “concerns over the future health condition of myself”, while 24.1% had “concerns over the future health condition of my family or child” and 18.5% had “concerns over the future health condition of others in terms of employment or marriage”. In response to this, we added 10 items regarding “Family” and “Community” to the translated version of the “Radiation” PTSD questionnaire, to improve the scale. We named the questionnaire “Fukushima Psychological Distress Scale”, tentatively.

In the same preliminary study, we have additionally used Pines Burnout Scale to measure the burnout symptoms in this preliminary study process, given that burnout symptoms were often reported after Great Hanshin Earthquake in Japan in 1995, especially among women who were raising children. (Yamanishi 1997) Among the women we interviewed in Fukushima, some were found to experience burnout symptoms. Moreover, we have already identified two potential burnout cases of evacuees from Okuma Town, where Fukushima Daiichi Nuclear Power Plant is located. Even though they did not present symptoms of burnout or any significant psychological distress as of November 2013, they were diagnosed with depression and had partial hair loss in the beginning of 2011. It is important to note that the timing of presenting symptoms of psychological or mental varies by individual. We will continue to test the validity and reliability of the newly developed scale for Fukushima, and the results will be reported as soon as they become available.

Implications of scientific investigations in the field of nuclear disaster

To improve the mental health status of the residents, researchers must work together with community people. According to Bromet, one of the Three Mile Island and Chernobyl’s researchers, it is important that 1) consensus must be built with the affected community as well as receiving full partnership in all steps in the design, and 2) directly sharing the findings together with local partners prior to publishing the results elsewhere are strongly recommended when carrying out researches in the field (Bromet 2012). Many residents in Fukushima have a sense of distrust over public agencies including the government, related research institutions and local researchers. This is because the residents have not experienced sufficient benefit from their performance. For researchers, face-to-face communication might be more appropriate to approach the community people instead of analyzing only statistical data and build a trusting relationship to better understand their situations. To overcome such distrust, we have held more than 100 lectures and research feedback sessions in the last two and a half years with the local communities and have conveyed the latest information by field research outcomes, which have ultimately resulted in better partnerships and opportunities to collaborate.

Rapport is a key to a successful research for the benefit of community. A long-term monitoring and follow-up will be required on the psychological and mental impact of the nuclear disaster. To keep along with the people who live in Fukushima, it is essential to build stronger relationships with local communities, governments, non-governmental organizations and medical institutions. Our short-term goal for now is to develop and finalize “Fukushima Psychological Distress Scale” to make an assessment on the mental health status of the people in Fukushima, but it is important to remember that we can learn substantial information not only from the scale but also from the attitudes of and interactions with the residents. We would like to thank the community of Fukushima for their support and commitment to our work so far, and we also appreciate the interest of the international scientific community on this matter.
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References


