

Exploratory Study on the Preparation Required for Public Health Nurses Responding to a Radiation Accident

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We interviewed seven public health nurses who responded to the radiation disaster at the Tokai Village JCO nuclear accident in 1999 to learn about their experiences and determine the type of training that would be helpful in the future. This study was approved by the Committee of Medical Ethics of Hirosaki University Graduate School of Medicine, Hirosaki, Japan. Interviews ranged in duration from 45 minutes to 1.5 hours and were conducted on November 24 and 25, 2010. Data were compiled from all interviews and analyzed qualitatively. Three primary categories and nine subcategories summarizing experiences and need for future training were identified. The three primary categories were: (1) activities for reducing residents' anxiety; (2) mental attitude toward a radiation disaster; and (3) training of public health nurses as representatives of the local government. Results showed that one of the most critical roles of public health nurses after a radiation accident is to control and calm anxieties experienced by residents living in the area. By establishing training strategies based on experience gained in the JCO accident, we will be able to prepare inexperienced persons who may need to respond to future emergencies.

Key words: radiation disaster, public health nurse, health crisis management, preparation

1. Introduction

Immediately after the fatal accident that occurred in 1999 at the Tokai uranium conversion plant operated by JCO Co. Ltd. (known as the JCO accident), approximately 128 public health nurses provided mental health care to residents at shelters, first-aid stations, and health centers¹⁾. A small number of public health nurses had attended special training

lectures before providing this care. However, most public health nurses did not have any experience handling this type of emergency. Many public health nurses who reported to work immediately after the accident received a short lecture about radiation and associated mental health care¹⁾. However, in general, the responding public health nurses felt insecure and somewhat bothered by the state of confusion at the disaster site²⁾.

This study attempted to reconstruct the experience of public health nurses who responded to this radiation disaster based on an analysis of narrative accounts. Our goal was to learn from their experiences and develop appropriate training programs for public health nurses who may respond to these types of disasters in the future.

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2. Methods

Procedure

This study targeted seven public health nurses who worked in healthcare centers in the area where the JCO accident occurred. Study requests were mailed to the health section of each local government ($n = 4$) and the health center in the area ($n = 2$). The main points of the study, its purpose, and content were included in the document. Consent from each local government and health center was obtained by mail. Organizations that expressed their intention to take part in the study were asked to provide names and telephone numbers of candidates for the study.

A cooperation request document was mailed to the potential candidate interviewees before the interviews began. The main points of the study, purpose, details of the study, and ethical considerations were specified in the document. After obtaining written informed consent to participate via a signature on the returned document, we coordinated the time and place to interview the candidates.

We provided a verbal and written explanation of the ethical considerations to the candidate at the time of the interview. This study was approved by the Committee of Medical Ethics of Hirosaki University Graduate School of Medicine, Hirosaki, Japan.

Participants

Study participants included two public health nurses from Naka City, one public health nurse from Hitachinaka City, one public health nurse from Hitachi-Omiya City, two nurses from Ibaraki Hitachinaka Health Center and one public health nurse from Ibaraki Hitachi-Omiya Health Center. The public health nurses who participated in the interview had provided care after the JCO accident. A public health nurse from Tokai Village also was interviewed. However, her data were not included in this analysis because, in Tokai Village, support and information offered differed from other autonomies at the JCO accident, and the village office was also developing its own disaster prevention system.

Interview content

Participants were asked to talk about the disaster prevention activities at the time of JCO accident and recall past activities based on personal written records at the time of the accident. The following three questions were asked during the interview: (1) Is the role of the public health nurse defined for an emergency drill? (2) What should the role of a public health nurse be at the time of a disaster, such as a critical radiation leak? (3) How can the public health nurse's previous experience with disasters be used in future disasters? Ideas about preparation for everyday disasters were also solicited. Interview questions were provided in a written format before the interview so that each participant could talk without interruption and the interviewer could listen attentively.

Survey data

Data were analyzed qualitatively. Each public health nurse's narrative was recorded, and material related to everyday care measures, regrets, mental conflict, mental attitude, mental clarity, and effective activities was extracted. Next, extracted data with similar meanings were grouped into three primary categories and additional subcategories. Categories were determined by researchers with qualitative study experience who strove to maintain the validity of data.

3. Results

Five institutions in Ibaraki provided names of nurses to interview: Naka City, Hitachinaka City, Hitachi-Omiya City, Ibaraki Hitachinaka Health Center, and Ibaraki Hitachi-Omiya Health Center. Study participants included five public health nurses from Cities, and three public health nurses from the Ibaraki Health Center. However, as stated earlier, data from one nurse was excluded from the analysis. Nurses worked in three cities around the JCO accident: Naka City, Hitachinaka City, and Hitachi-Omiya City. All public health nurses were female. Five participants were in their 50s, and two were in their 40s at the time of the interview. Each interview ranged from 45 to 90 minutes (mean, 58.8 minutes).

As a result of our analysis, 3 primary categories and 9 subcategories regarding nursing care emerged (Table 1). The first category identified included "activities for reducing residents' anxiety." The role of the public health nurse in relieving the anxiety of residents was a priority in the JCO accident. Their role in general public health services was halted so that they could work in the shelters to provide mental health support to affected residents, survey the effect of the radiation, and provide consultation services. This support role continued after the disaster at the request of the affected residents.

The second category identified was "mental attitude toward a radiation disaster." After the JCO accident, public health nurses were better able to understand the difficult decisions faced by residents and to provide mental health care to those in need. Public health nurses indicated that in order to provide better support to residents, they needed as much information as possible about the accident, including the effect of radiation on the residents in the area, and in particular, on children.

The last category identified was "training of public health nurses as representatives of the local government." Many public health nurses did not have disaster training or any procedural guidelines to follow prior to the JCO accident. Ten years after the JCO accident, public health nurses have been given the opportunity to continue their training in radiation disasters as members of an organization, because radiation disasters could occur in the future. As such, the next generation of public health nurses who have not experienced such an accident first-hand have the opportunity to receive training based on the expertise of public health nurses who did experience this type of disaster. This training may include knowledge about radiation, installation of a first-aid station, contamination protection, etc.

Table 1. Three categories and nine subcategories derived from the interviews

Category	Subcategory
Activities for reducing residents' anxiety	<ul style="list-style-type: none"> · Health support in a shelter · Survey and consultation have top priority · Consultation by the public health service
Mental attitude toward a radiation disaster	<ul style="list-style-type: none"> · To actively desire to support residents · To maintain a channel of information · To learn from a situation where prior training or experience proved insufficient
Training of public health nurses as representatives of the local government	<ul style="list-style-type: none"> · Nurses had to impart the information calmly that a radiation-related disaster had occurred · The role as a member of an organization was borne · The public health nurse was undergoing continual training in radiation disasters

4. Discussion

Based on interviews with public health nurses who cared for residents after the JCO accident, it became clear that the priority for these nurses was to help control and calm residents' anxieties. In the early phase of the JCO accident, the health section of each local government set up specific sites in which residents could have their level of radiation monitored, and those staffing the health sections were in charge of guiding the residents into the screening sites. Public health nurses had to cancel their normal scheduled duties to provide support to the residents after the accident. Although they could gradually resume their original public health services as fewer residents came to have screenings, they continued to provide health consultations related to radiation exposure as part of their normal health services at the request of the residents. The staff of the Tokai Village health center visited residents who had received evacuation orders, providing support at 1 week and 1 year after the accident³⁾. In the cities, towns, and villages around Tokai Village, however, such programs were not implemented, and the main services provided to the residents consisted of consultation services when the residents requested them. Nevertheless, the survey found that these cities still supported the residents by providing "mental consultations" 10 years after the accident. A critical radiation disaster tends to affect residents for a long period. Thus, public health nurses should have a long-term role when they are involved in activities related to this type of disaster.

By continuing training based on the experience gained in the JCO accident, we can prepare inexperienced persons who may need to respond to future emergencies. Although fewer opportunities currently exist for training public health nurses regarding radiation disasters compared with just after an accident, public health nurses from cities, towns, and villages continue to be given training as long as it does not interfere with their normal activities. However, it is difficult to transmit the knowledge acquired by experience among public health nurses because the incidence of large-scale disasters has been low; thus, there is a large gap in public health nurses' experience⁴⁾. Before the Fukushima nuclear disaster, the general public did not really believe that a radiation disaster could occur. In contrast, the public health nurses who had experienced the JCO accident

thought that such an accident could occur again. However, in prefectures with a nuclear power plant and in surrounding prefectures, previous research found that public health nurses' training was inadequate⁵⁾. Those who experienced the JCO accident tried to keep their experiences as fresh as possible by continuing their training, and gave staff who were inexperienced in nuclear disasters the opportunities to receive training at their respective centers.

The most useful documents used to help provide support to residents at the time of the accident were those distributed in training courses conducted before the accident. A manual of medical services, which was created in 1993, is provided to public health nurses in each prefecture. The interviewees reported that they could use this manual as a reference and implement activities for residents, using this document as a check list.

Public health nurses should be prepared to provide services to protect the health of residents in a radiation disaster, just as in natural disasters. However, our study revealed that public health nurses' knowledge about radiation was insufficient. Therefore, they concentrated on collecting information required in order to support residents. However, a note written by a public health nurse at a health center at the time of the accident showed that the only information they could obtain from the village's public health nurses was what was already written on the whiteboard. Because they had little information, they were in a situation in which they did not understand how to support the residents⁶⁾. These public health nurses of the cities, towns, and villages, having seen the situations during the disaster in which the flow of information appeared to be cut, placed great importance on securing information sources by contacting health centers for any information available. This was a hard-learned lesson based on their experiences in which they learned about the situation in their area from the media news services before they obtained any information from the local governments.

The public health nurses also thought that their job was to communicate with residents, to think together, and to suffer together. This attitude toward their job contributed to their pride as specialists.

The experiences of public health nurses who provided care after the JCO accident have led to the establishment of services that place a priority on relieving the anxieties of residents, through ensuring that public health nurses

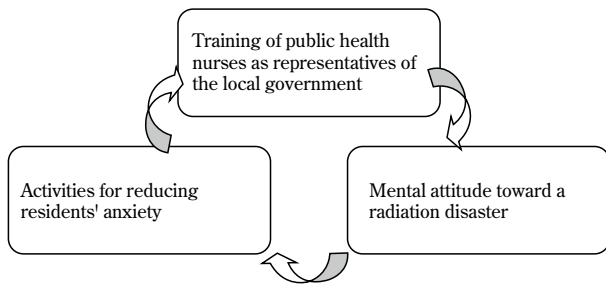


Fig. 1. Positive feedback among aspects of training, response, and action.

continue their training as representatives of an organization that is well-prepared to respond to radiation disasters. These activities have raised awareness that further training is necessary, and will give the nurses motivation to improve their expertise through the positive feedback mechanisms of training, response, and action (Fig. 1).

This study was conducted before the March 2011 nuclear power plant accident in Fukushima. Therefore, it is likely that the role of the public health nurse has become better recognized. A future research goal is to investigate the changing role of public health nurses and identify the importance and priorities of that role.

5. Conclusion

We identified three major needs of public health nurses dealing with a critical radiation disaster: 1) reduce the anxiety of residents; 2) improve their mental attitude toward a radiation disaster; and 3) increase their training to perform as representatives of the local government.

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