

Frontiers in Disaster Nutrition: Evidence to Action

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Summary The need for food and nutrition assistance has increased due to the frequent occurrence of disasters and pandemics, such as coronavirus disease 2019 (COVID-19). However, after a disaster, food and nutrition are insufficient in terms of quantity and quality. In the case of the Great East Japan earthquake, the improvement factors for food and nutrition at emergency shelters included 1) emergency shelter size and equipment, 2) provision and content of meals, 3) collaboration among professionals, and 4) cooperation between shelters. However, there were hygiene and oral health problems, and dispatched dietitians had problems with nutrition assistance. The hygiene problems included 1) food, 2) cooking environment, 3) water supply and discharge, and 4) living space. In addition, oral health problems included 1) difficulty swallowing, 2) difficulty chewing, 3) environmental degradation, and 4) degradation of the oral condition. The problematic points of dispatched dietitians included the support provided not necessarily being consistent with needs, operational deficiencies at both the dispatching and receiving sides, and the short period of support. “Enthusiasm” can be a source of encouragement and a burden. To solve these problems, a training system for disaster dietitians and certification systems for disaster food have been established in Japan. Since the Great East Japan earthquake, various kinds of evidence and actions have been taken, and nutritional problems after disasters have gradually improved. Therefore, it seems that advanced actions and standards should be set not only in Japan but also globally.

Key Words disaster, emergency shelter, hygiene, oral health, vulnerable people

In recent years, the need for food and nutrition assistance has increased due to the frequent occurrence of natural disasters and pandemics, such as coronavirus disease 2019 (COVID-19) (1, 2). After a disaster, food and nutrition are insufficient in quantity and quality (3). Japan is one of the countries at high risk of disasters, such as earthquakes and typhoons. Therefore, the Global Disaster Nutrition Section was established in the National Institutes of Biomedical Innovation, Health, and Nutrition in 2018 (4). This is the first section to deal with disaster nutrition, and it has the slogan, “Evidence to action.” This section provides information based on the experiences and evidences learned from previous disasters worldwide. The mission is to research the reduction in nutritional disparities and health problems associated with disasters. In addition, this section provides logistic support based on scientific evidence. This mini-review specifically aimed to publish evidence and actions disseminated by Japan worldwide.

EVIDENCE

What factors were important for dietary improvement?

An article search was conducted to clarify methods to improve food and nutrition at emergency shelters to improve health and nutrition after disasters and pan-

demics (4). Seven articles were extracted for review based on the literature search. The following four major improvement factors extracted were associated with food and nutritional problems in the emergency shelter after the disasters from the article review: 1) the emergency shelter size and equipment, 2) the way of provision and contents of meals such as mass feeding, lunch box and dietitians created menu, 3) collaboration of the professionals such as dietitian, self-defense force and school lunch center, and 4) cooperation between the shelters (Fig. 1).

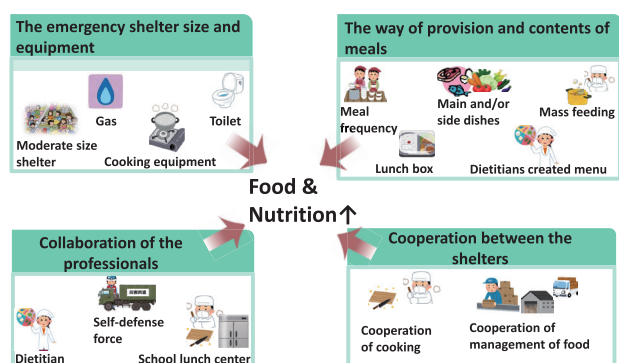


Fig. 1. Associated factors to improve nutritional problems in emergency shelters.

Hygiene problems

To clarify hygiene problems at the emergency shelters, we analyzed reports of dietitians dispatched to areas affected by the Great East Japan earthquake (5). Hygiene problem cases were extracted from the text and analyzed using qualitative descriptive analysis. Hygiene problem cases were divided into four categories: 1) food problems: expired food supply, inadequate food stock, excess food supplies, and uneven distribution; 2) cooking environment: unhygienic kitchen and inadequate hygiene system; 3) water supply and discharge: unsanitary toilets and inability to use sewers; and 4) living spaces: narrowness and discomfort. For example, the “water supply and discharge problem” included that the soup of cup noodles was not thrown away because the sewerage system could not be used, and the evacuees were forced to drink all the soup. This analysis identified hygiene problems to organize a support system for evacuees by dietitians and public health professionals in the future affected areas.

Oral health problems

To clarify specific oral health problems after the disaster, we analyzed an activity report from dietitians dispatched to areas affected by the Great East Japan earthquake (6). Oral health cases were extracted from the text and analyzed using qualitative descriptive analysis. Oral health issues were classified into four categories: difficulty swallowing, difficulty chewing, environmental degradation, and degradation of the oral condition. The category of difficulty swallowing included the need for soft meals due to dysphagia, the need for a thickening agent due to choking, and aspiration. The category of difficulty chewing included the need for chopped meals due to reduced mastication and degradation of dietary intake due to loss of denture. The categories of environmental degradation included overeating of snacks, an increase in dental caries and obesity, and the impossibility of brushing teeth. The category of degradation of the oral condition included stomatitis, sputum production, and dry mouth. For future disasters, an oral health support system by health professionals is necessary for eating assistance after a disaster.

Effective or problematic points for disaster dietitians

To develop effective nutrition assistance systems for future disasters, we analyzed how dietitians in the affected areas felt about dispatched dietitians' activities (7).

This study surveyed dietitians in areas affected by the Great East Japan earthquake. Their free descriptive comments on the topic “effective or problematic points of support activities by dietitians dispatched from other areas” were analyzed using qualitative descriptive analysis, and effective points and problematic points were extracted.

The effective points included the usefulness of dietitians' skills after disasters and assistance from dietitians who provided mental support. The problematic points

included that the support provided was not necessarily consistent with needs, operational deficiencies on both the dispatching and receiving sides, and the short period of support. “Enthusiasm” can be a source of encouragement and a burden.

These findings suggest the need to revise the systems on both the dispatching and receiving sides. Therefore, the Japan Dietetic Association (JDA) created the Japan Dietetic Association-Disaster Assistance Team (JDA-DAT) in 2012 to provide nutritional assistance after a disaster (8).

Who is in charge of mass feeding?

We examined the meal provision system, which included those in charge of mass feeding for evacuees and menu creators, using a dataset obtained from a dietary survey at emergency shelters after the Great East Japan earthquake (9).

The number of evacuees dedicated to mass feeding support was higher than that of the self-defense forces and volunteers. The rate of evacuees who took on the role of mass feeding at the emergency shelter was 66.3% for months after the Great East Japan earthquake. The number of evacuees serving as menu creators was also high compared with that of the self-defense force, volunteers, and dietitians.

After the disaster, most evacuees took on the role of mass feeding and menu creation. Therefore, it is necessary to provide speedy and effective support from disaster dietitians.

ACTION

Various actions to improve health and nutrition after disasters, such as certification of disaster food, promotion of stockpile disaster food, development of disaster dietitians, and nutrition standards for disasters, have started in Japan.

Disaster food certification system

Japan has a certification system unique to the world. The Japan Disaster Food Society created a certification system for stockpiling disaster food in 2014. These standards demand room temperature storage, tough packaging, and hygiene management in facilities. It also emphasizes habitual food and easy eating. The best date was ≥ 6 mo for the Japan Disaster Food.

Furthermore, Japan has an advanced certification system. It is a certification system for “Omoiyari disaster food” for vulnerable people who need special meals. There were four categories: low-protein diets, soft diets, hydration, and food allergies. At emergency shelters, the groups most identified as needing special nutritional assistance in the acute phase were infants and elderly (10). “Allergy” was extracted also in the surrounding area in the acute and mid-to-long-term phases (11). Therefore, the logo mark of this certification system, which is specialized for vulnerable people who need special care, is very important. Figure 2 shows the logo of the Japan Disaster Food and Omoiyari Disaster Food certifications.

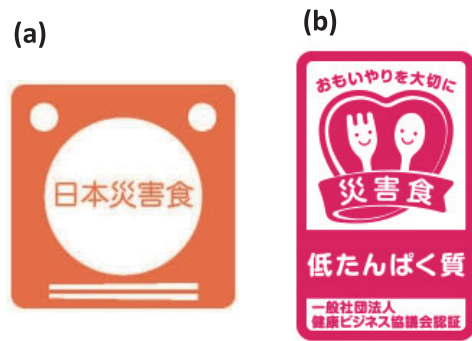


Fig. 2. Logo for Japan Disaster Food (a) and Omoiyari Disaster Food (b) certifications.

CONCLUSION

Since the Great East Japan Earthquake, various evidence and actions have emerged, and nutritional problems after disasters have gradually improved. It seems that advanced actions and standards should be set not only in Japan but also globally. At the same time, it is important to disseminate knowledge. Therefore, a curriculum incorporating food into disaster prevention education in elementary and junior high schools is being created. It is hoped that disaster prevention will become common knowledge from an early age.

Disclosure of state of COI

No conflicts of interest to be declared.

Acknowledgments

This work was supported by JSPS KAKENHI “Grant Number 21K11641” and “Grant Number 21K02569.”

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