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ORIGINAL ARTICLE

A Research Study on the Disaster Prevention and Disaster Risk Reduction of the Rehabilitation Facilities for the Disabled

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ABSTRACT

When disasters occur, the disabled who are vulnerable to disasters are supposed to flee to the rehabilitation facility for the disabled. Therefore, the disaster drills need to be steadily and regularly conducted for the smooth execution of emergency evacuation. This study aimed to improve the coping ability of the rehabilitation facility for the disabled and provide with the information necessary for the establishment of developmental countermeasures against disasters in the future by understanding the current situation of disaster drill in the rehabilitation facilities for the disabled in Japan and analyzing the awareness of emergency evacuation from disasters.

It is almost impossible to forecast how severely disasters will give damages and where and when they will occur. Therefore, we need to prepare for the worst conditions due to disasters. Needless to say, the high level of disaster consciousness of the staff of rehabilitation facilities for the disabled will be useful for rapid and smooth evacuation from disasters. The future countermeasures against disasters should consider the unique characteristics of the disabled and the disaster prevention planning needs to be established according to the types of facilities and their sizes and locations.

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Rehabilitation facility for the disabled in Japan, disaster drill, disaster consciousness
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Ⅰ. Background

Even though social infrastructure such as health care and welfare system has been excellently established, people's life and property can be demolished at once by natural disasters. If the areas are prone to the occurrence of disasters, this kind of risk may become bigger and severer; the countermeasures against disasters for emergency evacuation are required urgently.

According to the White Paper on Disaster Management 2010, Japan is located in the circum-Pacific mobile zone where seismic and volcanic activities occur constantly. Although the country covers only 0.25% of the land area on the planet, the number of earthquakes and distribution of active volcanoes is quite high. The land of Japan is also subjected to very severe natural conditions including heavy rainfall, heavy snow, steep topography and vulnerable geological features, resulting in a higher propensity for the occurrence of natural disasters. When summer comes after spring, the seasonal rain front stays on Japan and causes heavy rain. The typhoons that goes north from tropical regions during summer and fall influence the weather of Japan, and cause rainstorms, because they arrive in or approach Japan every year. During winter, the dry and cold air from Siberia that is supplied with steam in the coasts of Japan causes heavy snow and rains near the shore, which afflicts Japan. Moreover, the topography of Japan has caused many sediment disasters; the land of Japan includes a lot of rugged mountains, valleys and steeps, which produces dry avalanche by the occurrence of earthquakes and volcano activities. Most of earthquakes occur in the border between plates. Japan is located on the borders among Pacific Plate, Philippine Sea Plate, North American Plate and Eurasian Plate; this is the reason that 10% of total number of earthquake on earth occurs in Japan(Cabinet office, Government of Japan 2010). As for the earthquake, recently the Great East Japan Earthquake caused the huge loss of life and property and also the radiation leak as its second disaster startled the world; among the secondary disasters, the fire caused by earthquake did harm greatly. The large scale of fire that was caused by the Great Hanshin Earthquake in 1995 completely destroyed 7,000 buildings and 9,000 households[1].

Recently the importance of disaster prevention management has been on the rise, as the scales of disasters have become bigger and so does those of damages. The disaster prevention measures have become the most important among other administrative ones to enable people to keep their life and property safe from disasters. However, when any other large scale of disasters occur, it is not enough to cope with disasters only by running disaster prevention system, even though every government of cities and prefectures does its best. For the disaster prevention measures for vulnerable group in disasters, public organizations, facilities for the disabled or the elderly, or self-government associations

[1] Wikipedia「Han - Shin Awaji Earthquake disaster」search

that are equipped with emergency evacuation system need to work together organically. Vulnerable group in disasters refers to the persons who needs assistance due to certain disabilities, when disasters occur, including persons with physical disabilities or diseases or injuries, the elderly, infants, pregnant women and foreigners who are not good at speaking Japanese (Niigata Prefectural Government 2010).

Particularly in the vulnerable group, persons with disabilities usually have the limited ability to move or travel; persons with intellectual disability or autism would get into a panic due to excessive information from the changes of sound, smell, temperature, etc.; persons with intellectual disabilities have to take medications regularly; persons with respiratory organ impairments among those with internal organ impairments cannot walk up the stairs or walk fast or can be vulnerable to the change of temperature: and, persons who need dialysis could be killed, if they were not able to be on dialysis three times a week (Bureau of Social Welfare and Public Health, Tokyo Metropolitan Government 2012).

Welfare facilities for the elderly or rehabilitation facilities for the disabled can be temporarily used as a refuge for the vulnerable group in disasters. Therefore, rehabilitation facilities for the disabled have to establish emergency support system for the disabled who cannot secure safety by themselves and have to maintain facilities in the necessary conditions for disaster prevention. Pursuant to the standards of rehabilitation facilities for the disabled and their operations in 2006, rehabilitation facilities for the disabled have to implement the evacuation drill regularly and increase the staff in charge of emergency evacuation when they are on fire (Ministry of Health, Labour and Welfare 2006). While currently the response guideline for disasters of rehabilitation facilities for the disabled has been reported (Saitama Prefectural Government 2011, Fukuoka Prefectural Government 2012, Yamanashi Prefectural Government 2005), the studies on their response for disasters have not been sufficiently conducted and the current situations of the preparation to cope with disasters have not been fully explored.

This study aimed to improve the coping ability of the rehabilitation facility for the disabled and provide with the information necessary for the establishment of developmental countermeasures against disasters in the future by understanding the current situation of disaster drill in the rehabilitation facilities for the disabled in Japan and analyzing the awareness of emergency evacuation from disasters.

Ⅱ. Research Overview

This research that surveyed the consciousness of disaster prevention and disaster risk reduction had been conducted for the rehabilitation facilities for the disabled from December in 2009 to February in 2010 for three months. The questionnaires were sent to

2,455 facilities and the return rate was 38.0 percent. Subject facilities among total 932 facilities that returned questionnaires included long-term care facilities for the physically disabled (176 facilities, 18.9%), workplaces for the physically disabled (124 facilities, 13.3%) and welfare centers for the physically disabled (68 facilities, 7.3%) (See table 1).

<Table 1> Types of Facilities

Types of Facilities	Number of Facilities	Percentage (%)
Long-term care facility for the physically disabled	176	18.9
Rehabilitation Facility for the physically disabled[2]	25	2.7
Workplace for the intellectually disabled[3]	40	4.3
Support center for community living for the mentally disabled	10	1.1
Workplace for the physically disabled	124	13.3
Day service facility for home care for the disabled	66	7.1
Welfare workshop for the physically disabled	7	0.8
Workplace for the mentally disabled	8	0.9
Welfare center for the physically disabled	68	7.3
Braille library for the blind	29	3.1
Welfare home for the physically disabled	19	2.0
Others	385	41.3
Unable to classify	33	3.5
Total	932	100.0

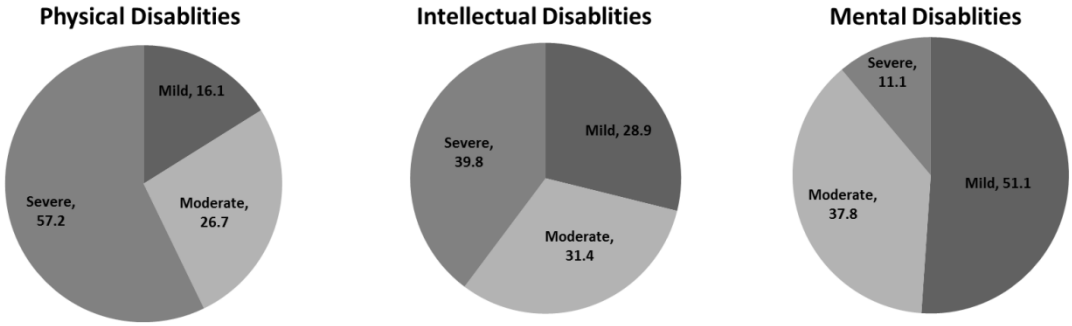
The users of facilities for the disabled are divided into persons with physical, intellectual or mental disablities and the degrees of disablities are also into mild, moderate and severe levels.; among persons with physical disablities, more than a half of them (57.2%) had severe level of disabilities; persons with intellectual disabilities were evenly distributed into mild, moderate and severe levels of disablities; and, more than a half of persons with mental disabilities (51.1%) had mild level of disablities (See figure 1).

The questionnaire is comprised of total 42 questions; 8 questions for the demographic information of respondents, 4 questions for the experiences of natural disasters, 27 questions for the current situation of disaster prevention management and 3 questions for the consciousness of disaster prevention. The data that were collected from this research were analyzed by PASW(SPSS) Statistics 18.0.

This research was conducted only for the facilities that agreed to respond the

[2] This rehabilitation facility has the function to lead the disabled into the right path as well as to provide them with safe place to stay.
[3] Workplace for the disabled is the workspace where the disabled work while commuting from their home.

questionnaire after reading the purpose of this research and the policy of privacy protection.

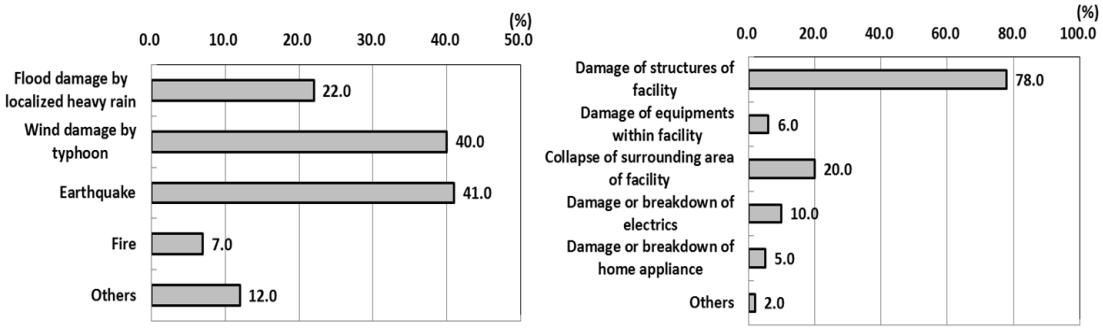


<Figure 1> The Degrees of Diabilities of Users of the Facilities

Ⅲ. The Results of the Research on the Consciousness of Disaster Prevention and Disaster Risk Reduction

1. Damages to Rehabilitation Facilities for the Disabled from Natural Disasters

Among total 932 facilities, 100 facilities (10.7%) answered that they have the experiences that they have been damaged from disasters; damages to the facilities were mostly caused by earthquakes, typoons and heavy rain in decending order and among the damages, the destruction of structures was the biggest one (See figure 2). As for the casualty, one person was injured lightly in one facility and six persons were killed in three facilities; most of the casualties were injured or killed by earthquakes and fires.

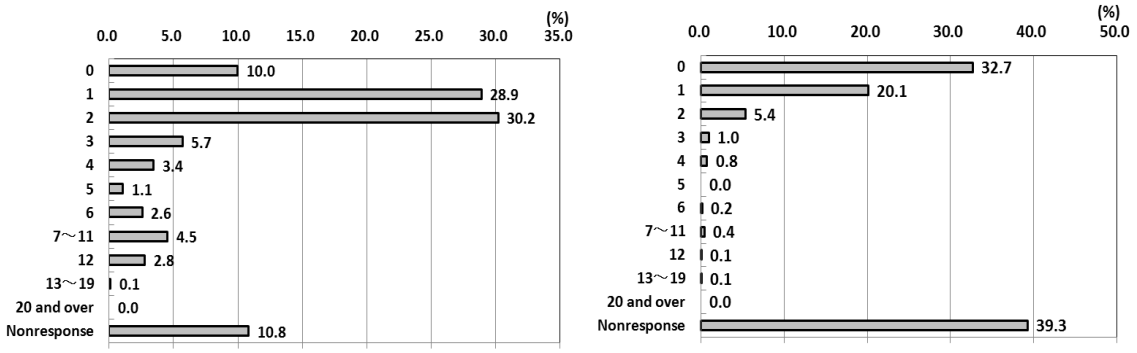


<Figure 2> The Types of Disasters that Have Caused Damages to Rehabilitation Facilities for the Disabled and the Types of Damages

2. Disaster Drill of Rehabilitation Facilities for the Disabled

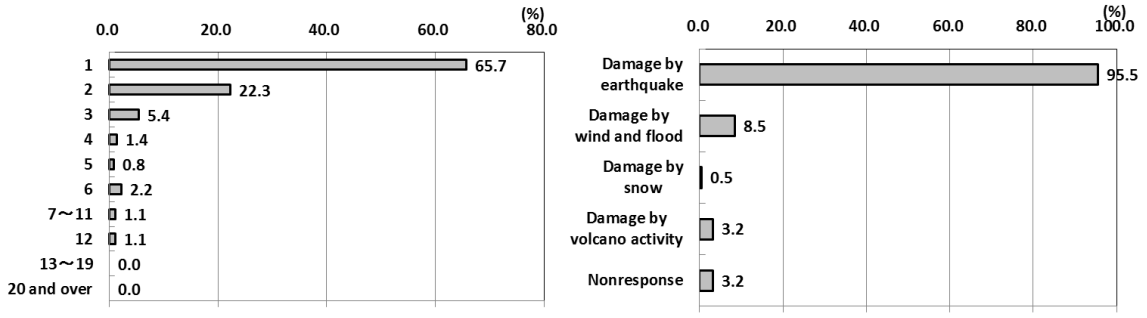
932 rehabilitation facilities for the disabled have been generally conducting disaster drill once or twice per year (See Figure 3. The left chart). Night disaster drill has been

conducted less frequently than disaster drill during the day; most of facilities are likely to conduct it once a year or less (See Figure 3. The right chart).



<Figure 3> Frequency of Disaster Drill during the Day (left chart) or Night (right chart)

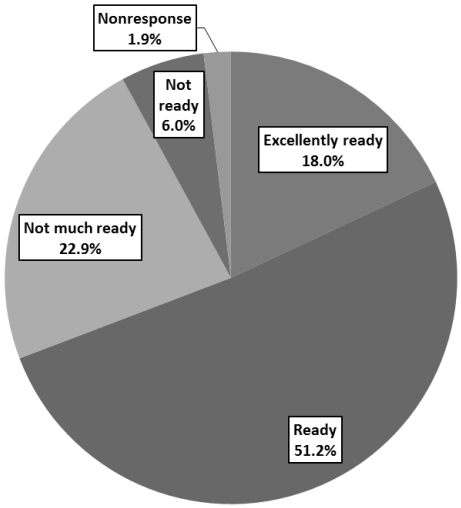
In the meantime, 367 facilities (39.4%) among 932 rehabilitation facilities for the disabled have carried out according to the types of natural disasters. They have conducted tailored disaster drills according to the types of disasters once to thrice per year (See Figure 4. The left chart) and the disaster drills for earthquakes (95.5%) have been most frequently conducted among the natural disasters such as earthquakes, storm and flood, heavy snow and volcano activities (See Figure 4. The right chart).



<Figure 4> The Frequency and the types of Tailored Disaster Drills

3. The Preparation for the Emergency Evacuation in Disasters of Rehabilitation Facilities for the Disabled

Among 932 rehabilitation facilities for the disabled, 645 facilities (69.2%) answered that they are ready for emergency evacuation in disasters and 269 facilities (28.9%) answered that they are not ready for it (See Figure 5).



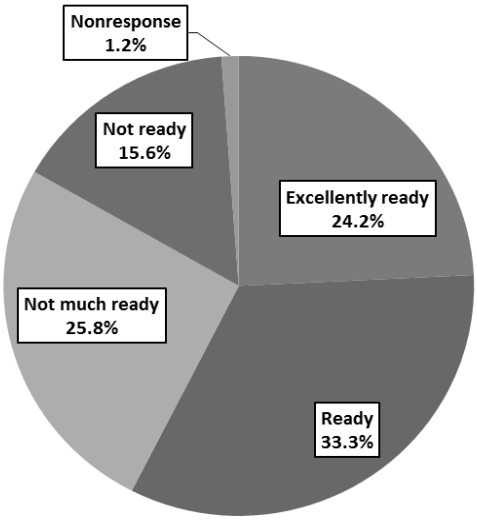
<Figure 5> The Preparation for Emergency Evacuation in Disasters

4. The Types of the Preparation for Disasters of Rehabilitation Facilities for the Disabled

How rehabilitation facilities for the disabled respond for disasters were searched including conducting disaster drill by linking with community, maintaining emergency evacuation system and its operation, securing the emergency supplies, acquiring information on disasters and finding emergency shelters in addition to rehabilitation facilities for the disabled.

1) Linking with Community for Disaster Drill

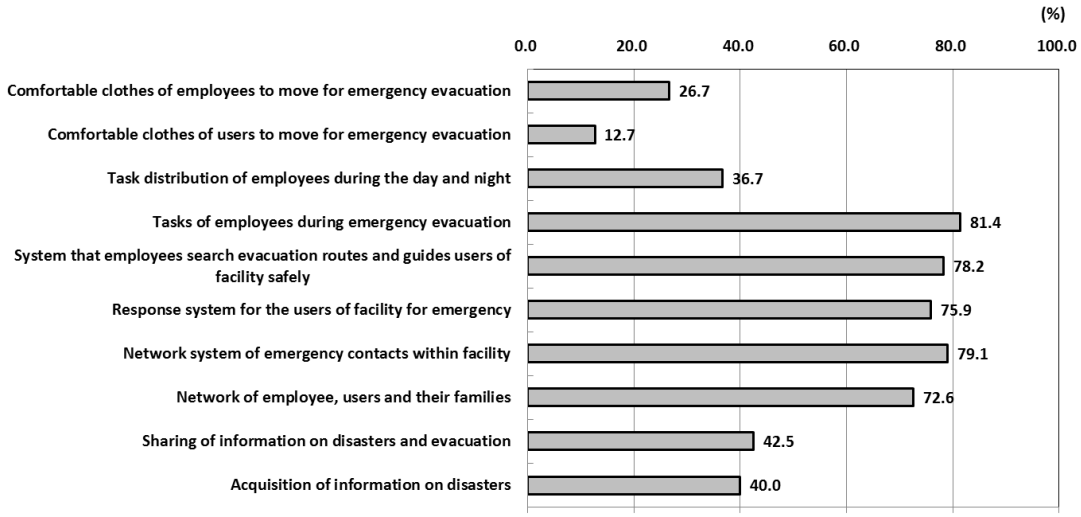
536 facilities (57.5%), which is more than a half of total 932 rehabilitation facilities for the disabled, have conducted disaster drill by linking with local residents, public facilities and fire station in the community (See Figure 6).



<Figure 6> Linking with Community for Disaster Drill

2) Emergency Evacuation System and its Operation

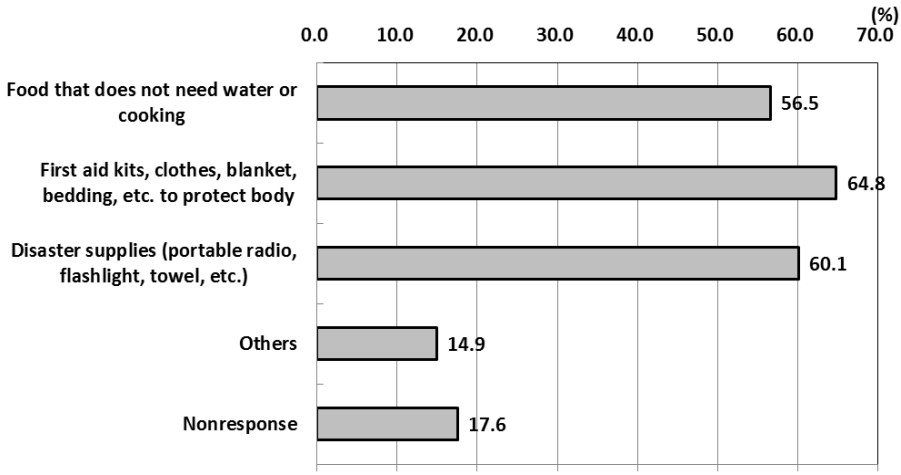
Rehabilitation facilities for the disabled have an emergency evacuation system including task distribution system that is operated by employees for emergency evacuation (81.4%), network system of emergency contacts within facility (79.1%), the system that employees search evacuation routes and guides users of facility safely (78.2%), the response system for the users of facility for emergency (75.9%) and network system of emergency contacts among employees of facilities, users and users' families (See Figure 7).



<Figure 7> Emergency Evacuation System and its Operation

3) Emergency Supplies

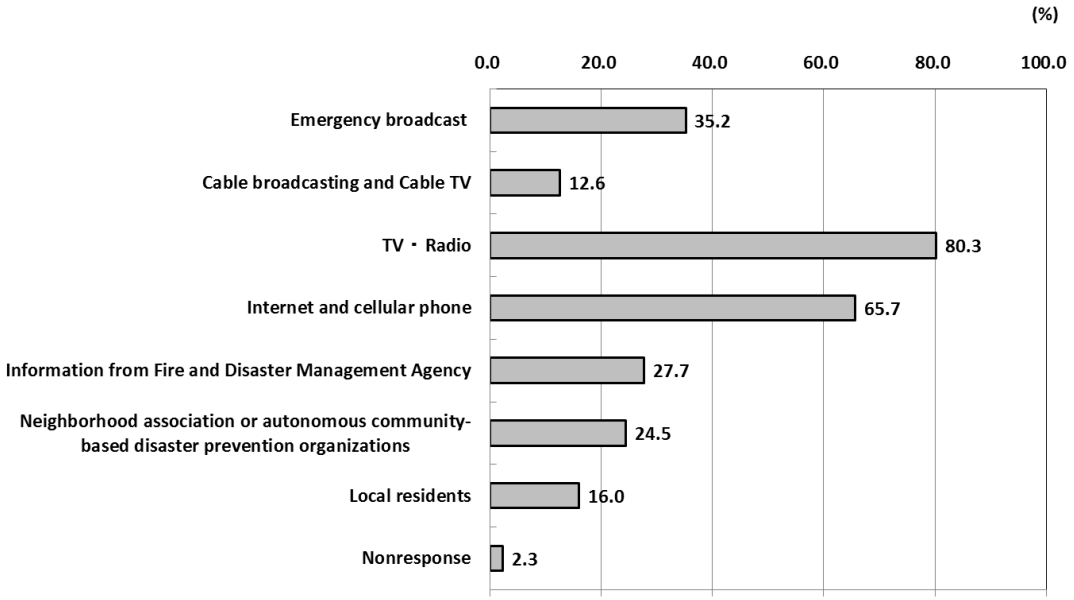
Rehabilitation facilities for the disabled are more likely to be equipped with items to protect body such as first-aid kit, clothes, blanket and bedding (64.8%), disaster supplies (60.1%), water and emergency food that requires no cooking (56.5%) (See Figure 8).



<Figure 8> Emergency Supplies

4) Acquisition of Information on Disasters

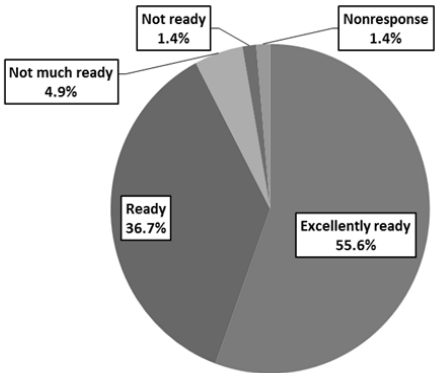
Rehabilitation facilities for the disabled have usually utilized TV and Radio (80.3%) and internet and mobile phone (65.7%). In addition, information from emergency broadcast, Fire and Disaster Management Agency, neighborhood association or autonomous community-based disaster prevention organizations have been utilized (See Figure 9).



<Figure 9> Acquisition of Information on Disasters

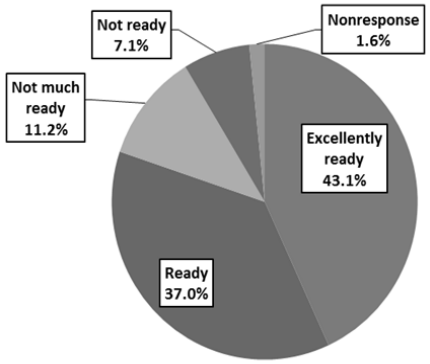
5) Emergency Shelters in addition to Rehabilitation Facilities for the Disabled.

Figure 10 shows whether rehabilitation facilities for the disabled know where they can find emergency shelters and related information when disasters occur in addition to their facilities; 860 facilities (92.3%) out of 932 rehabilitation facilities for the disabled knew the location of emergency shelters. Figure 11 shows whether rehabilitation facilities for the disabled know the evacuation route to emergency shelters; 747 facilities (80.1%) out of 932 rehabilitation facilities for the disabled know the evacuation route. Figure 12 shows whether rehabilitation facilities for the disabled secured safety of evacuation route; 714 facilities (76.3%) out of 932 rehabilitation facilities for the disabled answered that they know that they are supposed to avoid the risky place such as roads and bridges along rivers. Figure 13 shows whether rehabilitation facilities for the disabled collaborate with local residents in escaping from disasters; 435 facilities (46.7%) out of 932 rehabilitation facilities for the disabled answered that they have the plan to collaborate with local residents for emergency evacuation in disasters.



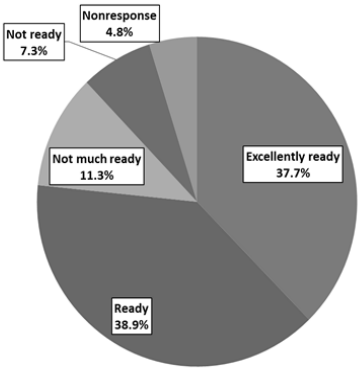
<Figure 10>

Emergency Shelters in addition to Rehabilitation Facilities for the Disabled



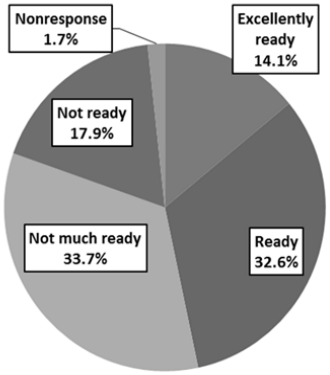
<Figure 11>

Evacuation Route to Emergency Shelters



<Figure 12>

Securing the Safety of Evacuation Route to Emergency Shelters



<Figure 13>

The Collaboration with Local Residents during Emergency Evacuation

Ⅳ. Considerations and Conclusions

The research that has been conducted on the consciousness of disaster prevention and disaster risk reduction for three months found that 100 facilities out of 932 rehabilitation facilities for the disabled have experienced the damages from disasters; the damages have mostly caused by earthquakes, typhoons and heavy rains that have occurred frequently due to the geographical and meteorological reasons. Even though Figure 2 showed that the damages by earthquakes have been bigger than those by typhoon, it is assumed that the damages by rainstorms are more likely to have been induced by typhoons than earthquakes, for typhoon usually accompanies rainstorms. Fires may be caused by the secondary damages from natural disasters or accidents; it is assmued that the results of this study were from the secondary damages from natural disaster.

As for the frequency of emergency evacuation drill of rehabilitation facilities for the disabled, they have conducted the drills during the day or night once or twice a year and during the drills, they collaborated with community including local residents, public organization or fire station. It was found that rehabilitation facilities for the disabled have generally complied with the guideline on disaster prevention plan for rehabilitation facilities for the disabled, which suggests that they should prepare for the sediment disaster and river flood in addition to fires and earthquakes with collaboration with local residents and fire station. However, as for the night drill, over 30% of facilities answered that they have never conducted disaster drills or showed no response. Disasters may occur at any time regardless of cloudy or sunny weather or day or night. Therefore, the disaster drills should be regularly conducted in preparation for all weather conditions including clear or cloudy and warm or hot weather and 24 hour a day including at midnight or dawn.

It was found that rehabilitation facilities for the disabled have an emergency evacuation system including task distribution system that is operated by employees for emergency evacuation, network system of emergency contacts within facility, the system that employees search evacuation routes and guides users of facility safely, the response system for the users of facility for emergency and network system of emergency contacts among employees of facilities, users and users' families. Even though it was not mentioned above, more than 50% facilities answered that they have implemented staff workshop for disaster risk reduction. Moreover, most of rehabilitation facilities for the disabled knew where they can safely find evacuation shelters and route in addition to the facilities and have collaborated with local residents in disasters. This high level of the consciousness of disaster prevention will prevent people from being plunged in confusion and help them keep cool even in the chaos state.

To support the disabled or the elderly safely in disasters, the cooperation of local residents and organization such as other welfare facilities, local organizations for disaster prevention and fire station are required. Many guidelines for disaster response including evacuation support guideline for people requiring help in disasters (Cabinet Office, Government of Japan, 2006) have emphasized the network with community resources and the establishment of plan to specifically explain how to cope with disasters and how to decide who does what. It was found that this survey supports the guidelines for disaster response and it is the first study to survey the current situation of disaster prevention management of rehabilitation facilities for the disabled and their consciousness of emergency evacuation in disasters.

In this context, a few problems of disaster prevention measures will be considered for the vulnerable people to disasters based on the past disasters and damages.

First, the complacent way of thinking that great disasters may not occur has delayed well-timed evacuation and caused a lot of casualties. It will make the disabled or the elderly difficult to escape and take more time for them to be evacuated in fierce rainstorm

that is accompanied with heavy rain. Therefore, the system to enable vulnerable people to disasters to be evacuated in early stage need to be established and the competent staff who can lead and support the emergency evacuation and protection need to be fostered.

Second, all the victims including healthy people, the infirm and the disabled have been evacuated to the same shelters, which has caused people to be sicker and be even dead. In this reason, welfare shelters that only accommodate the elderly or the disabled need to be installed in each sub-municipal, municipal and prefecture and can be also installed in welfare facilities in disasters; It is necessary to install welfare shelters to enable to respond to disaster risk in each community (Yamanashi Prefectural Government 2012). In addition, because the types of disabilities are diverse and each type of disabilities has its unique needs, the supports in disasters are needed to be provided according to the seriousness of disabilities (Fukuoka Prefectural Government 2012).

This study has some limitations;

First, this study cannot tell the consciousness of disaster prevention of the disabled who are utilizing facilities, because the data for this study was not from the disabled, but from the employees of facilities. Moreover, the number of users of facilities was not asked, which makes difficult to determine whether the disaster drill was effective or not.

Second, the three months for the research may be insufficient period to expand the results to the long-term period. In spite of the limitation, this study has been useful to quantify the current situation of disasters and disaster prevention system of rehabilitation facilities for the disabled. The future studies need to consider the characteristics of each disability and the opinions of users of facilities as well as those of employees and the period of study also needs to be prolonged.

Even though disasters cannot be prevented in advance, the countermeasures for disaster prevention and disaster risk reduction for rehabilitation facilities for the disabled that are made by analyzing and responding the types of disasters and the damages of each disaster can minimize casualties and damages. For the disaster prevention plan, the types, scale and location of facilities need to be considered. At last, the training for the disaster drill including emergency evacuation need to be provided for both employees and users of facilities to enable them to be evacuated smoothly and quickly.

In conclusion, the results of this research showed that the disaster drills of rehabilitation facilities for the disabled have been properly conducted according to the guideline for disaster response, for example, the frequency of disaster drill, the collaboration with community, etc., and the consciousness of disaster prevention of employees is high. It is certain that the results of this study will contribute to establish the countermeasures for disaster prevention and become the foundation for the further study on the disaster prevention of rehabilitation facilities for the disabled.

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