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Analysis of Gender Differences in Disaster Preparedness for Nankai Trough Earthquake

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Abstract

Aim: This preliminary study assesses the awareness and preparedness for disaster risk reduction (DRR) among female residents in Kochi prefecture and enumerates the differences in DRR awareness and preparedness between genders.

Methods: A survey was completed with 1,002 people at three public events in Kochi prefecture in 2015. The questionnaire was posted on an application service provider called Survey Monkey. The participants filled out their responses on a tablet-type device. The data analysis used IBM SPSS Statistics version 23, and the significance level was set at 5%.

Results: Women made up 70 percent of the total participants, and the age group between 30s-40s accounted for more than 50 percent. The gender difference in disaster preparedness was found in that more men participated in disaster drills than women. In future disaster preparedness, more female participants expressed to desire to participate in disaster drills. In addition, gender differences in possible voluntary actions' was found, in that, more male answered rescue and fire extinguishing; whereas, more women answered care for people with disabilities and elderly. All gender differences showed statistical significance according to Chi-square test ($p < 0.05$).

Conclusion: This preliminary study found that women's awareness and preparedness for DRR was not necessarily low in comparison to men. Yet, these study findings allowed identification of differences in disaster preparedness between male and female. These results revealed that women have lack of opportunities for DRR education and drills. As the future step of this study, DRR projects for female will be conduct.

Keywords: Gender difference; Awareness; Preparedness; Disaster risk reduction

Introduction

Community-level disaster risk reduction activities in Japan are dominantly initiated by male members of the society. Active participants of disaster drills, trainings, and meetings about disaster risk reduction (DRR) in majority also have been men. In addition, men are responsible for making DRR manuals and decisions about shelter management.

For these reasons, gender-related problems in shelters for disaster victims in the past have been occurred. Ikeda [1] has explored and reported about disaster and gender. She argues that 1) There is a gender gap in human suffering after a disaster; 2) Women's burden of physical labor increases when disaster happens; 3) The violence against women increases when disaster occurs; and 4) Women can play an important role in reducing disaster risks. It has been established that commitment to DRR, relief support, and reconstruction by women would be better facilitated by sharing information about needs of not only women but also of children, the elderly, and other vulnerable population who were not considered in DRR dialogues enough so far [2].

In disaster, more women lose their lives than men due to poverty in Great Hanshin-Awaji Earthquake [3]. In addition, some women have been raped in shelters and temporary houses [4,5]. Furthermore, women carried out physically laborious duties, for example, cleaning the house, serving meals in shelters, providing care for the their children and elderly in shelters and temporary houses after a disaster [4,6]. Such exposures to extra burden in care lead to increased stresses among women, who are also victims of a disaster and need to receive emotional and physical care.

Therefore, women's commitment to DRR is quiet important in reducing hardship of women and provide help to other vulnerable population. In addition, female participation in DRR would lead to greater protection of human lives, health, and livelihood against large-scale disasters in Japan, such as Nankai Trough Earthquake predicted to occur in near future on the South Eastern Coast.

In the context of low female participation in DRR, the level of awareness and preparedness for DRR among women has also not been identified. The purpose of this preliminary study is, thus, to identify the awareness and preparedness for DRR among female residents of Kochi prefecture. In addition, this study enumerates the differences in awareness and preparedness for DRR between male and female genders. The results of this study would serve as the base evidence to encourage women to participate in DRR activities and solve gender problems in disaster sites and in communities in non-disaster times as well.

Method

This study used a survey of 1,006 people agreed to participate in this study at three public events in Kochi prefecture on July 4th, 5th, 25th, and 26th, and September 12th, 2015.

Data Collection

A questionnaire was developed by the author in reference to a public opinion survey (Cabinet office, 2014) and a survey of resident's awareness on earthquake and tsunami (Kochi prefecture, 2015). Question items included: 1) demographic information of the participants, 2) preparedness for disasters, 3) emergency foods in stocks and fastened furniture, and 4) possible voluntary actions in disaster times.

The items were put in an application service provider called Survey Monkey, and the survey was conducted on tablet-type devices that were set up in front the Kochi prefecture's exhibition booth at local events.

Data Analysis

The data was computed in descriptive statistics and analyzed by using IBM SPSS Statistics version 23 for gender differences in DRR awareness and action. Significance differences were analyzed by chi-square test, and statistically significant items were analyzed by binomial logistic regression analysis. This study set the significance level at 5%.

Ethical Consideration

This study was conducted upon the approval of the Research Ethical Committee of the University of Kochi. Ethical consideration for participants was described on the first page of the questionnaire. Participants, who read the research purpose and ethical consideration and agreed to it, proceeded to answer the questionnaire.

Results

Demographic information

A total of 1002 participants completed the questionnaire. Women made up 70 percent. Participants in the 30s-40s in age accounted for more than 50 percent (**Table 1**).

Table 1 Demographic information of the participants (n=1.002).

Demographic	n	%	
Gender	Male	305	30.3
	Female	687	68.3
	Unanswered	14	1.4
Age	Under 20	79	7.9
	20s	124	12.4
	30s	377	37.5
	40s	209	20.8
	50s	79	7.9
	60s	95	9.4
	Over70	35	3.5
	Unanswered	8	0.8

Preparedness for disasters

The second section of the survey asked the participants how well they are prepared for disaster. Twenty-three items were asked to be answered in three-point scale: a) I have already prepared, b) I have not prepared, but I am going to, and c) I do not plan to prepare in the future (**Table 2**).

The participants, who answered that they have completed preparedness, said that they checked the nearby shelter, stocked portable radio and flashlight, and removed heavy objects from the shelf. Gender differences in preparedness was found in that forty percent of men participated in disaster drills in community, whereas, thirty three percent of female did. Another differences found in that fifty-one percent of female prepared emergency food and water, on the other hand, forty-three percent of male did. These differences were statistically significant according to Chi-square test ($p<0.05$), and this result indicates there was differences between male and female.

Those who answered that they would prepare for disaster from here on said that they wanted to stock an emergency toilet kit, fasten furniture and electrics to walls, and put protective films on the windows in near future. Gender differences was found in that fifty-four percent of female wanted to participate in disaster drill, on the other hand, forty-two percent of male did. Another differenced found in that forty-seven percent of male wanted to stock water and food, on the other hand, forty percent of female did. This differences were statistically significant according to Chi-square test ($p<0.05$), and this result indicates there was differences between male and female. This

result was opposite result of completed preparedness described above.

Those who answered that they would not prepare said that they would not inspect the concrete-block walls around house, repair their house for earthquake resistance, or fill bathtub with

water in future. Especially, thirty percent of men answered they would not stock emergency toilet kits. This differences were statistically significant according to Chi-square test ($p < 0.05$). In addition, there were more men than women would not prepare in the future, in descriptive statistics.

Table 2 Preparedness for disasters.

1. Placement of fire extinguisher and a bucket which is filled with water	13. Prepare eyeglasses, artificial tooth, hearing aid, and medicine
2. Filling bathtub with water	14. Stock of water and food
3. Fastening furniture and electronics to walls	15. Stock of portable radio and flashlight
4. Fixation of the drawer	16. Preparing shoes for escaping
5. Lock of the door for earthquake shock	17. Preparing valuables
6. Safe arrangement of furniture	18. Preparing cloths and blanket
7. Placement of furniture in low position	19. Stock of emergency toilet kits
8. Removing heavy objects from shelves	20. Emergency contact methods among family member
9. Putting protective films on the windows	21. Check of the hazard map
10. Inspection of concrete-block walls around house	22. Checking the shelter
11. Repairing house for earthquake resistance	23. Participation in disaster drills
12. Evaluation of earthquake resistance	

Possible voluntary actions in disaster times

The third section of the survey asked the participants about voluntary actions they think they would take in disaster times. The actions were 1) rescue, 2) fire extinguishing, 3) confirmation

of neighbor’s safely 4) treatment of injured person, 5) care for people with disabilities and elderly, 6) provision of food, 7) provision of well water, 8) provision of home stay, and 9) nothing (Table 3).

Table 3 Possible voluntary actions.

Items	Participants						
	Males		Females		Total		p-value
	n	%	n	%	n	%	
Rescue	185	60.7	214	31.1	399	40.2	0.000
Fire extinguishing	130	42.6	143	20.8	272	27.5	0.000
Confirmation of neighbor’s safety	114	37.6	220	32,0	334	33.7	0.109
Treatment of injured person	68	22.3	174	25.3	242	24.4	0.337
Care for people with disabilities & elderly	74	24.3	216	31.4	290	29.2	0.023
Provision of food	58	19	139	20.2	197	19.9	0.730
Provision of well water	15	4.9	30	4.4	45	4.5	0.741
Provision of home stay	50	16.4	130	18.9	180	18.1	0.372
Nothing	31	10.2	90	13.1	121	12.2	0.208

Note: $P < 0.05$

Gender differences in possible voluntary actions was found in this section as well. Sixty percent of men answered rescue and forty-two percent of men answered fire extinguishing. On the other hand, thirty-one and twenty percent of women answered it. In addition, thirty-one percent of women answered care for

people with disabilities and elderly, on the other hand, twenty-four percent of men answered it. This differences were statistically significant according to Chi-square test ($p < 0.05$), and this result indicates there was differences between male and female.

Discussion

This preliminary study revealed that there exist gender differences in DRR awareness and preparedness. In addition, this study also found that DRR awareness among female was not low necessarily in comparison with male. The number of females who participated in disaster drill were low, however, more female participants answered that they wanted to participate in disaster drills. This result points out that female member of society had fewer opportunities due to Japanese social structure so far. This also indicates the data of possible voluntary actions. More male answered rescue and fire extinguishing, on the other hand, more female answered care for people with disabilities and elderly. Generally, because of the physical difference between men and women, men have had masculine work, for example a physical demanding and dangerous work. On the other hand, women have had feminine work, for example a physical light work. The division of role and labor between genders is also still deeply rooted in Japan, for example, males become key persons in companies and communities. On the other hand, female's role is to manage their houses. However, recently, females are to have more working opportunities in society. As a result, this study hypothesized resulted that females also might have interest on DRR in community. Therefore DRR events and seminars that females can participate easily is necessary in the future.

This study also confirmed the potential abilities of male and female. DRR sectors need to assess and understand their each characteristic. In addition, DRR sectors need to provide educational opportunities that enable to protect their securities and fulfill their abilities to women in particular. Because as stated in introduction part, female are exposed heavy load of physical or voluntary work to expected long period of disaster in shelter. However, the care that female serve vulnerable population in shelter have important key in reducing disaster risks. Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) stated that female participation in DRR from non-disaster times is crucial, and build their capacities and expand their rights are needed for DRR. Future direction of this study plans to conduct a project on DRR for female based on this result as the next step [7].

Limitation

This study had several limitations. The participants of this study were not extracted by random sampling for the

population. Thus these results may have selection bias. In addition, this study did not get much demographic information. Thus, this study did not analyze the influencing factors about detail.

Conclusion

This preliminary study found that women's awareness and preparedness for DRR was not necessarily low in comparison to men. Yet, these study findings allowed identification of differences in disaster preparedness between male and female. These results revealed that women have lack of opportunities for DRR education and drills. As the future step of this study, DRR projects for female will be conduct.

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Conflict of Interest

The authors attest that they have no competing interests.

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