

Disaster Preparedness of Child Care Teachers: A Cross-Sectional Study in South Korea

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ABSTRACT

Objective: We aimed to identify the differences in personal disaster preparedness and disaster risk perception among child care and preschool teachers in South Korea by using demographic characteristics and disaster-related questions.

Methods: A cross-sectional self-reporting questionnaire was administered from February to October 2014.

Results: Of all the participants, 68.1% had received disaster preparedness education and training on 2 or more occasions per year; 13.2% had received no education or training. Personal disaster preparedness differed significantly by marital status ($P < 0.05$), the number of disaster education and training sessions attended ($P < 0.05$), and having purchased home insurance ($P < 0.001$). Disaster risk perception differed significantly by children's age group under a teacher's care ($P < 0.05$). The topic on which child care teachers wanted more training was "fractures and bleeding emergency care" (53.9%). The most probable disaster was considered to be a typhoon (66.0%).

Conclusions: Disaster preparedness is important for both young children and their teachers. Field-based teacher disaster preparedness education and training should be provided so that they can respond effectively to disaster occurrence regardless of type, time, or location. (*Disaster Med Public Health Preparedness*. 2018;12:321-328)

Key Words: disaster, preparedness, child care, preschool, teacher

Children under 6 years of age usually spend over 80% of the day in child care or preschool facilities (ie, day-care facilities or out-of-home care facilities such as sports facilities and camps). As these children are too young to protect themselves,¹⁻⁴ teachers play an important role in their safety. Of the safety-related accidents occurring among children at home or in child care or preschool facilities, 71.1% involved children aged 1-6 years⁵ and most were preventable.⁴

According to the Child Welfare Law in South Korea, managers of child care centers and preschools must provide annual reports to a mayor or county governor on the results of their disaster-related safety education curriculum. Child care and preschool teachers are also expected to educate children about disaster-related safety education, so that the children are better prepared to protect themselves.⁶

Therefore, child care and preschool teachers should also be well educated about disaster preparedness so that they are equipped to teach these topics to the children in their care. However, in South Korea, disaster-related safety education is not mandatory either through on-the-job training or as part of the

early childhood education curriculum. From 2011 to 2015, only 18.6% of child care and preschool teachers were reported receiving disaster preparedness education and training.⁷ The disaster preparedness of teachers has been reported as the major factor protecting young children's growth and development from the impacts of disaster.⁷⁻¹⁰

Disaster preparedness and disaster education and training include comprehensive skills, abilities, knowledge, and activities to prevent damage from an unpredictable disaster occurrence,¹⁰⁻¹² covering natural, manmade, and social disasters in this study.

The disaster preparedness of teachers are positioned to provide primary protection of young children, and yet little research has explored disaster preparedness and disaster risk perception among child care and preschool teachers in South Korea. We need a better understanding of the level of disaster-related preparedness among child care and preschool teachers in order to improve the safety of the young children under their care. Therefore, the purposes of this study were to measure the current status of disaster-related questions, personal disaster preparedness, and disaster risk perception among teachers in South Korean child

care and preschool facilities, and to identify differences in their personal disaster preparedness and disaster risk perception by using demographic characteristics and disaster-related questions.

METHODS

Study Design

A cross-sectional design was used to administer a self-reported questionnaire, which took approximately 20 minutes for teachers to complete.

Participants

To achieve a reasonable sample size for this study, we performed a power analysis using G*power 3.1.5 (SOFTMEDIA) for *t*-test and ANOVA. The sample size for computation of test with a power of 0.80, an effect size of 0.15, and α of 0.05 was 270. A convenience sample of child care and preschool teachers was recruited from 36 facilities in 2 large South Korean cities. The principal investigator (PI) contacted the directors of 36 child care and preschool facilities to obtain permission for recruitment. Participation was both voluntary and anonymous. Questionnaires were mailed to child care and preschool teachers who agreed to take part in this study; questionnaire packages with cover letters were distributed with a return envelope addressed to the PI. Data were collected from February to October 2014. A total of 450 questionnaires were distributed and 395 were returned (a response rate of 87.8%). Finally, 373 questionnaires were used in the analysis.

Measures

The questionnaire was developed and adapted from those used in previous studies,^{10,11} and consisted of 3 sections: demographic characteristics and disaster-related questions, personal disaster preparedness, and disaster risk perception. In this study, disasters include natural, manmade, and social disasters.

Demographic Characteristics and Disaster-Related Questions

There were 6 demographic characteristics: gender, age, marital status, educational level, children's age group under a teacher's care, and career. The disaster-related questions were as follows. (a) Have you ever been exposed to a disaster? (Yes, No), (b) How many times per year have you attended disaster education and training sessions? (Never, once, twice or more), (c) If you had the opportunity, would you attend disaster education and training sessions? (Yes, No), (d) What topics have you learned about disaster preparedness within the last year?, (e) If you had the opportunity to attend disaster education and training, what are the 6 topics you want to learn? (f) What types of disasters do you think can occur easily in South Korea? (g) Do you have fire or natural disaster

insurance for your home? (Yes, No) (See supplementary material).

Personal Disaster Preparedness

The personal disaster preparedness questionnaire was originally developed by Uhm et al¹⁰ and was modified for this study. There were 2 subcategories: household-related preparedness (including 13 survival items, such as bottled water, food in retort pouches, a first-aid kit, an evacuation plan, and an emergency network among family members, household emergency goods such as a battery-powered radio, flashlight, blanket, matches, and generator) and workplace-related preparedness (including 6 survival items, such as an emergency network between facility and parents, workplace guidelines for disaster occurrences, and nonelectrical goods such as a battery-powered radio, flashlight, generator, and blanket).

Responses were dichotomous (Yes/No) and coded as Yes = 1 and No = 0 with a total score range of 0-19 points. A higher score indicated a greater level of personal disaster preparedness.

Disaster Risk Perception

Disaster risk perception was measured with the question: What do you think about the sentence, "I think that daycare/preschool facilities can be vulnerable to disasters.?" and a 5-point response scale that included "not at all" (1) to "very much so" (5). A higher score indicated a greater perception of disaster risk.

Data Analysis

Data were analyzed using IBM SPSS Statistics for Windows, Version 20.0 (Armonk, NY). Statistical analyses included descriptive statistics, *t*-tests, ANOVA, and Scheffé tests for post hoc multiple comparisons for ANOVA. Psychometric reliability was calculated using Cronbach's α .

Ethics

This study was approved by Daejeon University's institutional review board (1040647-201312-HR-041-03). Prior to beginning the study, we received written consent from all participants, who were also informed that their consent could be withdrawn at any time during the study. The consent was included with the survey and collected at the same time.

RESULTS

Demographic Characteristics and Disaster-Related Questions, Personal Disaster Preparedness, and Disaster Risk Perception

Demographic and disaster-related questions are presented in Table 1. Most teachers were women (98.1%), and their average age was 30.5 (SD \pm 7.18) years. Three hundred sixty-six respondents (98.1%) had studied early childhood education at a college or university. A total of 233 participants

TABLE 1

Demographic Characteristics and Disaster-Related Questions (N = 373)		
Category	N	%
Gender		
Male	7	1.9
Female	366	98.1
Age (years)		
20-29	219	58.7
30-39	103	27.6
≥ 40	51	13.7
Marital status		
Married	263	70.5
Unmarried	109	29.2
Educational level		
Training course	7	1.9
≥ Collage	366	98.1
Children's age group (years)		
0-3	81	22.6
3-5	278	77.4
Career (years)		
< 1	55	14.7
1-3	85	22.8
≥ 3	233	62.5
Number of disaster education/training sessions attended (per year)		
None	49	13.2
1	70	18.8
≥ 2	254	68.1
Would attend disaster education/training sessions if given the chance		
Yes	366	98.1
No	7	1.9
Purchase of home insurance		
Yes	145	38.9
No	228	61.1
Previous disaster exposure		
Yes	35	9.4
No	338	90.6

(62.5%) reported a career duration of more than 3 years. Two hundred seventy-eight respondents (77.4%) taught children aged 3-5 years. Thirty-five respondents (9.4%) had been the victim of a disaster. Two hundred fifty-four respondents (68.1%) had completed disaster education and training 2 or more times per year; 49 (13.2%) had not attended any. Most respondents (98.1%) would attend disaster education and training if given the opportunity. About 4 in 10 respondents (38.9%) had purchased home insurance.

The 6 most frequently mentioned topics on which the teachers had received disaster education and training were “cardiopulmonary resuscitation” (59.5%), “earthquake evacuation drill” (55.8%), “heavy rain or typhoon evacuation drill” (54.7%), “water safety” (54.2%), “fire/explosion evacuation drill” (54.2%), and “drug abuse/misuse prevention” (53.6%) (Figure 1). The most frequently mentioned topics on which they expressed interest in disaster education and training were “fractures and bleeding emergency care”

(53.9%), “use of safety equipment” (43.2%), “sexual violence prevention” (37.5%), “elevator safety” (35.9%), “missing and kidnapping prevention” (24.9%), and “child abuse prevention” (24.1%) (Figure 2). The 5 most probable disasters that respondents mentioned as occurring in South Korea were “typhoon” (66.0%), “flood” (50.9%), “heavy snow” (47.5%), “earthquake” (41.0%), and “environmental pollution” (34.9%) (Figure 3).

The mean scores for personal disaster preparedness and disaster risk perception were 13.2 (SD ± 3.5) and 3.9 (SD ± 1.0), respectively (Table 2). For the 2 subcategories of personal disaster preparedness, the mean scores for household-related preparedness and workplace-related preparedness were 6.7 (SD ± 2.8) and 5.2 (SD ± 1.0), respectively (Table 2). The Cronbach's α for personal disaster preparedness in this study was 0.734; subcategory Cronbach's α were 0.718 for household-related preparedness and 0.432 for workplace-related preparedness.

Personal Disaster Preparedness and Disaster Risk Perception Differences Based on Demographic Characteristics and Disaster-Related Questions

t-Test and ANOVA results for the major variables are presented in Table 3. Personal disaster preparedness differed significantly by marital status, the number of disaster education and training sessions attended, and whether the respondents owned home insurance. In Scheffé's test of the number of disaster education and training sessions attended, the mean score of respondents who attended more than 2 times (12.30 ± 3.0) was significantly higher than those who attended only once (11.13 ± 3.03) or never (10.94 ± 3.70).

Scores for disaster risk perception differed significantly by children's age group under a teacher's care.

DISCUSSION

The results of this study indicate that 68.1% of participants received disaster preparedness education and training 2 or more times per year; most participants reported that they would attend disaster education and training if they had the chance. The younger the children under the respondents' care, the higher the respondents' disaster risk perception scores were. The most frequently mentioned topic on which the teachers wanted to learn more was first aid such as emergency care for fractures and bleeding for young children. The number of child care and preschool teachers who had completed disaster education and training in this study was consistent with the results reported by Lee.⁷ Moreover, the proportion of child care and preschool teachers who had never received disaster preparedness education and training was 13.2%. Most teachers in our sample reported that they would attend disaster preparedness education and training if given the opportunity, which is consistent with several previous studies.^{10,11,13,14} Although child care and preschool

FIGURE 1

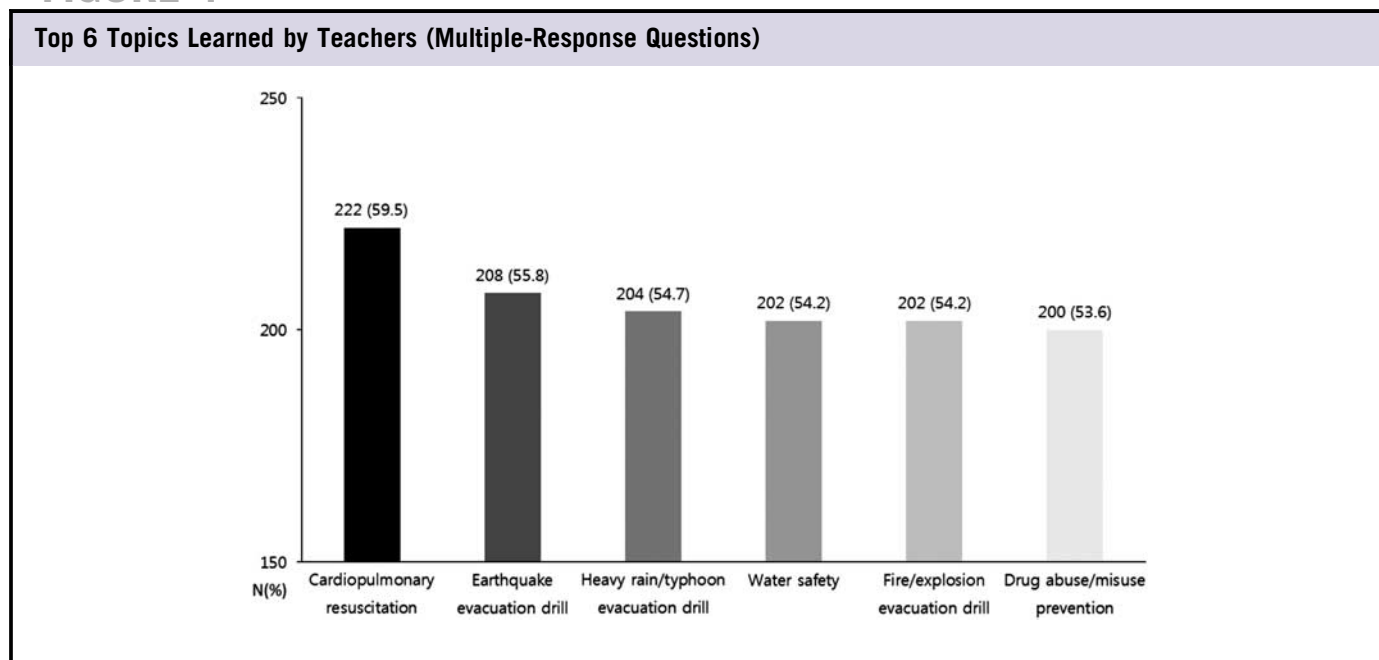
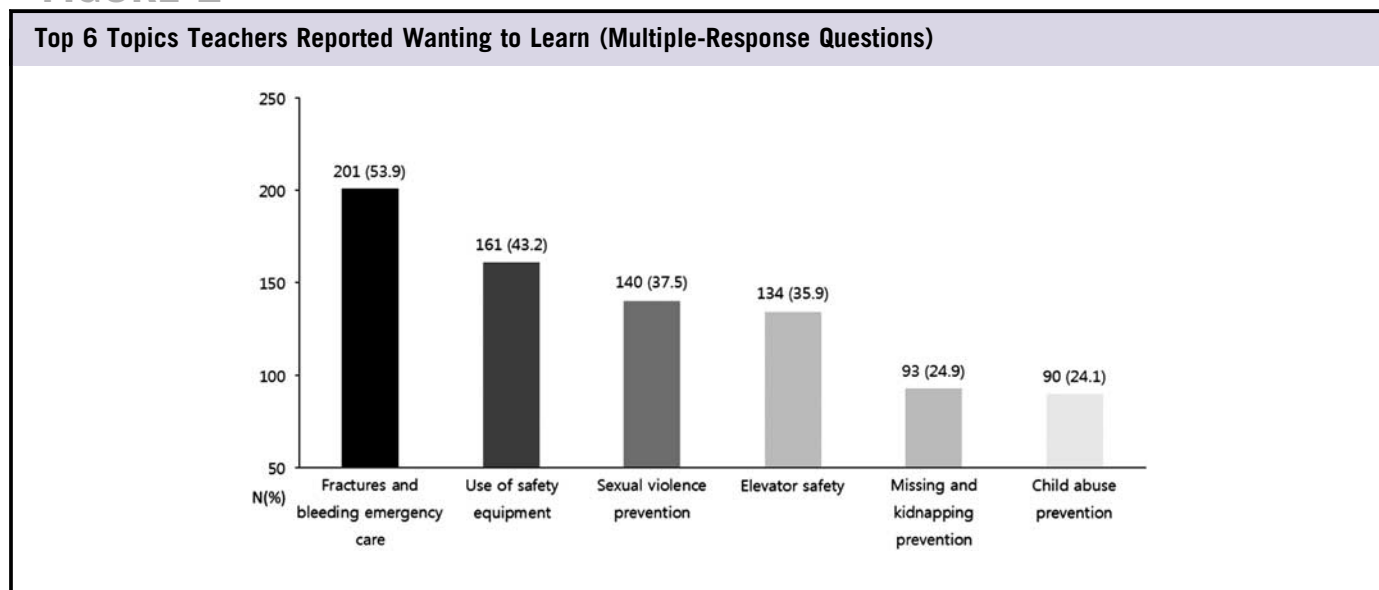


FIGURE 2



teachers recognized the importance of disaster preparedness education and training, they had not been actively involved in such training because it is not mandatory either through on-the-job training or as part of the curriculum in early childhood education in South Korea. Therefore, in the interest of child safety, disaster education and training should be included in education curricula.

The most significant advantage of disaster insurance is that it helps victims recover more easily. The rate of home insurance ownership in this study was 38.9%. A previous study by

Wang et al¹⁵ reported that 4% of Chinese people purchased home insurance.¹⁵ This result may suggest that teachers of the young children had greater disaster preparedness and greater insight than the general population. Many seriously consider preparing for disaster after receiving education and training or watching an advertisement about disaster preparedness.^{15,16} Personal disaster preparedness can reduce disaster-related loss of life, significant injuries, and damage.¹⁷ Therefore, the importance of disaster insurance and personal disaster preparedness (including a survival kit and an evacuation plan) should be promoted and advertised continuously worldwide

FIGURE 3

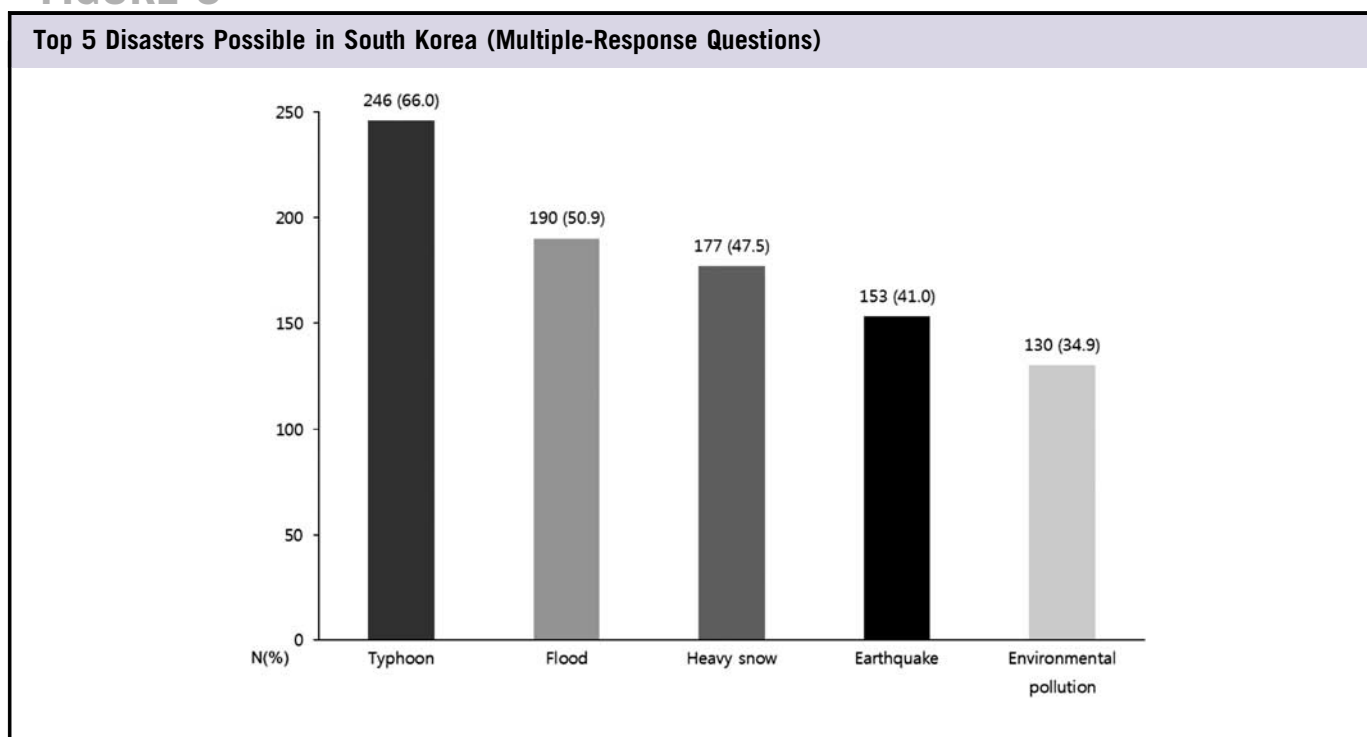


TABLE 2

Mean (SD), Range and Cronbach's α for Personal Disaster Preparedness Scores (N = 373)

Category	Mean (SD)	Range	Cronbach's α
Personal disaster preparedness (overall)	13.2 (3.5)	0-21	0.734
Household-related preparedness	6.7 (2.8)	0-13	0.718
Workplace-related preparedness	5.2 (1.0)	0-6	0.432

because disaster occurrence can occur anywhere and at any time.

The most frequently mentioned disaster preparedness subjects in which teachers had received education and training were consistent with previous studies.^{11,18}

However, the 6 most frequently mentioned topics on which these teachers most wanted information were on practical education and training related to safety in everyday life, and for rescuing young children. This may be related to the impact of the Child Welfare Law in 2015.⁶ This finding was also consistent with previous studies.¹⁹⁻²¹

Fractures and bleeding emergency care was the highest ranked among the topics that teachers reported they wanted to learn. Fractures and bleeding are also the most frequent injuries among young children in everyday life.⁵ This finding reflects a concern

of teachers with daily safety for young children. Learning to cope with safety accidents in daily life is equivalent to preparing for future disasters. Therefore, disaster education and training should reflect common accidents in daily life and general safety.

The result regarding knowledge about possible disasters in South Korea was also consistent with several previous studies.^{10,11,15,16} Because of South Korea's geography, losses from natural disasters may be greater than from manmade or social disasters.¹¹ In this study, the mean score for personal disaster preparedness was higher than that in previous reports.^{10,11,22} In particular, the mean score for workplace-related preparedness was higher than that for household-related preparedness. This may be related to the impact of the Child Welfare Law in 2015,⁶ which led to facilities with young children bearing greater responsibility for disaster prevention than other facilities.⁴ The mean disaster risk perception score was consistent with that of Noh.²³ The Cronbach's α of 0.734 for personal disaster preparedness in this study was somewhat lower than that in the study by Uhm et al.¹⁰ In this study, personal disaster preparedness scores were significantly higher among those who were married. This may be because married respondents have greater responsibility for their homes and families than do those who are unmarried. Personal disaster preparedness scores were significantly higher among those who had attended 2 or more disaster education and training sessions than among those who had attended once or never. A previous study reported that acquired disaster information influenced preparedness against disaster occurrence.²⁴ This may be attributed to disaster education and training.^{25,26} Lee²⁷ reported that child care and preschool teachers' personal

TABLE 3

Differences in Personal Disaster Preparedness and Disaster Risk Perception Scores by Demographic Characteristics and Disaster-Related Questions (N = 373)

Category	Personal Disaster Preparedness		Disaster Risk Perception	
	Mean (SD)	P-value*	Mean (SD)	P-value*
Gender				
Male	13.43 (3.15)	0.207	3.29 (0.76)	0.088
Female	11.87 (3.23)		3.92 (0.97)	
Age (years)				
20-29	11.63 (3.27)	0.676	3.98 (0.87)	0.239
30-39	12.25 (3.29)		3.82 (1.05)	
≥ 40	12.33 (2.92)		3.78 (1.17)	
Marital status				
Married	12.56 (2.98)	0.013	3.86 (1.06)	0.668
Unmarried	11.64 (3.29)		3.92 (0.94)	
Educational level				
Training course	11.14 (1.86)	0.534	3.71 (1.49)	0.599
≥ Collage	11.91 (3.25)		3.91 (0.96)	
Children's age group (years)				
0-3	12.02 (3.23)	0.358	3.99 (0.92)	0.004
3-5	11.64 (3.23)		3.65 (0.92)	
Career (years)				
<1	11.53 (3.38)	0.495	4.07 (0.87)	0.230
1-3	12.17 (3.48)		3.78 (0.85)	
≥ 3	11.88 (3.11)		3.91 (1.03)	
Number of disaster education/training sessions attended (per year)				
None ^a	10.94 (3.70)	0.002	3.90 (0.96)	0.745
1 ^b	11.13 (3.03)		3.83 (1.04)	
≥ 2 ^c	12.30 (3.13)		3.93 (0.96)	
Would attend disaster education/training if given the chance				
Yes	11.90 (3.25)	0.933	3.92 (0.97)	0.080
No	12.00 (3.25)		3.29 (0.75)	
Purchase of home insurance				
Yes	12.92 (3.11)	<0.001	3.95 (1.03)	0.471
No	11.25 (3.15)		3.88 (0.94)	
Previous disaster exposure				
Yes	13.24 (3.38)	0.313	4.09 (0.95)	0.252
No	12.71 (4.04)		3.89 (0.97)	

* t-Test/ANOVA; Scheffe's test, a < b < c.

disaster preparedness was related to their age, marital status, facility type, age range of the children whom they were caring, and appraisal accreditation.²⁷ Consistent with Lee,²⁷ in this study, there was a significant difference in disaster risk perception by children's age group for whom the respondents were caring.²⁷ However, in other studies, the type of disaster, previous disaster experience, gender (female), fear, education level, and home ownership were found to influence disaster risk perception.^{26,28,29} These differences could be attributed to the fact that participants in this study were limited to child care and preschool teachers in South Korea. Disaster risk perception influences disaster preparedness behaviors²⁴; therefore, future studies should include other variables.

Young children separated from their caregiver during a disaster occurrence are unable to understand what is happening and may respond fearfully by crying, fussing, or becoming irritable,³⁰ indicating that young children are vulnerable to

becoming disaster victims. Studies have reported that 56% of deaths among children under 10 years³¹ and 95.5% of childhood accidents⁴ were preventable. Teachers should play a very important role in preventing harm to young children in a disaster occurrence. It is also important that teachers act according to the knowledge gained through disaster preparedness education and training. This is, in part, because young children learn by watching how their teachers conduct disaster prevention activities in their daily lives. In particular, in a real-world disaster occurrence, teachers should act as rescuers; thus, their disaster training should prepare them to care not only for young children but also for themselves.

One of the limitations of this study was that the study sample was not fully representative of child care and preschool teachers in South Korea, because we only selected respondents from 2 big cities in South Korea. The results of this study may not be generalizable to all Korean child care and preschool teachers.

Thus, future studies should include a more diverse range of child care and preschool facilities. Second, this study was cross-sectional in nature; therefore, caution should be exercised in interpreting the causality of the antecedents of personal disaster preparedness and disaster risk perception. Longitudinal study designs are needed to test these influential factors and their effects. Our findings provide a baseline of personal disaster preparedness for child care and preschool teachers in South Korea, which is important because child care and preschool personnel have been neglected in disaster education and training, as well as in academic disaster research.

CONCLUSIONS

The results of the study showed that child care and preschool teachers recognize the importance of disaster preparedness. However, the teachers had not undertaken disaster education and training because it is not compulsory for gaining or maintaining teaching certification in South Korea. The topics on which the teachers wanted to learn more disaster education and training were related to children's everyday safety such as fractures and bleeding emergency care.

Moreover, the respondents considered that in South Korea natural disasters were the most likely type to occur. Child care and preschool personnel have increasing responsibility for children's safe because young children now spend most of their day in the care of a teacher. Thus, educational opportunities including children's everyday safety as well as for natural, manmade, and social disasters should be offered to meet the demand from child care and preschool teachers and to improve their capacity to respond effectively to disaster occurrence.

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Author Contributions

Dr Uhm and Dr Oh together did the entire process of this research (from choosing a topic to making a thesis) through discussion.

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Supplementary material

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