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Neighborhood Association, Peer Communication, and Self-Assistance Behaviors Against Disaster Among Individuals With Spinal Cord Injury

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Abstract

Objective: Individuals with spinal cord injuries (SCIs) are vulnerable in case of disaster, and it is unknown how they can prepare themselves for such events. This study explored factors associated with self-assistance behaviors against disasters.

Methods: An internet-based cross-sectional survey was conducted in Japan. The participants were 70 individuals with SCI in a self-help group in Japan. Self-assistance behaviors against disaster were defined in terms of personal network, escape, information, essential items, disaster drill participation, and list registration. After identifying significant variables through binary analyses, logistic regression analysis was conducted to adjust for age and sex.

Results: Neighborhood association and peer communication significantly predicted list registration (AOR:2.97; 95% CI:1.05 – 8.40; $P = 0.04$; AOR:2.79, 95% CI:1.00–7.74, $P = 0.05$). However, no significant factor was found in relation to other self-assistance behaviors against disasters.

Conclusion: Belonging to a neighborhood association and having communication with peers could help individuals with SCI register on a list for assistance during disaster. To promote self-assistance behaviors against disasters, access to neighborhood associations, and opportunities for peer communication should be increased.

Introduction

It is important for everyone to prepare for disasters such as earthquakes, floods, and landslides, which are unpredictable. For individuals with disabilities who require a great deal of effort to maintain a lifeline that supports daily life, disaster preparedness requires more work.[1] The US National Organization on Disability recommends that individuals with disabilities be prepared for the particular characteristics of their disability with an emergency plan including the following 4 components of self-assistance: personal network, escape, information, and essential items.[2] However, factors promoting self-assistance against disasters remain unclear especially among those with severe disabilities such as spinal cord injuries (SCIs).[3]

Previous studies regarding self-assistance against disasters among individuals with severe disabilities are limited. A US randomized controlled trial targeting adults living independently in the community revealed the positive effect of a peer-mentored program on disaster preparedness.[4] Another US study exploring the factors associated with disaster preparedness among individuals with disability found a significant association between community advantage and individual self-efficacy.[5] A Japanese qualitative study targeting individuals with SCI after the Great East Japan Earthquake illustrated that seemingly ordinary activities such as peer communication could promote disaster preparedness in addition to basic measures like personal networks.[6] To add evidence to the foundation that these studies provide, it is necessary to quantitatively examine what contributes to self-preparedness against disasters for people with severe disabilities.

This study aimed to explore the factors associated with self-assistance behaviors against disasters among individuals with SCI.

Methods

Participants

The participants were individuals with SCI who belonged to self-help groups in Japan. The author asked an umbrella organization of SCI self-help groups in Japan (ZenkokuKeisonren) for cooperation on data collection for this study. This organization consisted of 13 prefectural organizations (Fukushima, Tochigi, Tokyo, Kanagawa, Shizuoka, Aichi, Gifu, Kyoto, Osaka,

Table 1. Binary analyses between the participants' characteristics and 6 self-assistance behaviors against disaster

Variables		Total 70	Personal network Yes 24	No 46	P	Escape Yes 7	No 63	P	Information Yes 44	No 26	P	Essential items Yes 21	No 49	P	List registration Yes 35	No 35	P	Disaster drill Yes 10	No 60	P
Socio-demographic characteristics																				
Age*	Mean	51.7	54.2	50.4	0.18	54.7	51.4	0.46	53.1	49.3	0.18	52.1	51.5	0.86	52.8	50.6	0.42	50.7	51.9	0.77
Sex	Male	59	20	39	1.00	5	54	0.30	36	23	0.52	17	42	0.72	31	28	0.51	9	50	1.00
	Female	11	4	7		2	9		8	3		4	7		4	7		1	10	
Living status	Alone	21	9	12	0.32	2	19	1.00	12	9	0.59	9	12	0.12	11	10	0.79	2	19	0.71
	Not alone	49	15	34		5	44		32	17		12	37		24	25		8	41	
Disability conditions																				
Injury level	C4 or higher	31	8	23	0.16	2	29	0.45	19	12	0.87	9	22	0.82	15	16	0.89	4	27	1.00
	C5 or lower	38	16	22		5	33		29	14		12	26		19	19		5	33	
Main transportation	Electric WC†	43	15	28	0.73	4	39	1.00	28	15	0.54	14	29	0.40	23	20	0.37	5	38	0.39
	Manual WC†	26	8	18		3	23		15	11		6	20		11	15		5	21	
Urination	Dependent	58	20	38	1.00	6	52	1.00	36	22	0.73	18	40	1.00	30	28	0.70	10	48	0.35
	Independent	11	4	7		1	10		8	3		3	8		5	6		0	11	
Defecation	Dependent	65	21	44	0.33	7	58	1.00	39	26	0.15	21	44	0.31	32	33	1.00	10	55	1.00
	Independent	5	3	2		0	5		5	0		0	5		3	2		0	5	
Social activities																				
Frequency of going outdoors	≤ once / week	17	4	13	0.38	1	16	1.00	10	7	0.69	2	15	0.07	8	9	0.78	2	15	1.00
	≥ twice / week	53	20	33		6	47		34	19		19	34		27	26		8	45	
Neighborhood association	Belonged	35	13	22	0.62	5	30	0.43	22	13	1.00	11	24	0.79	22	13	**0.03**	7	28	0.31
	Not belonged	35	11	24		2	33		22	13		10	25		13	22		3	32	
Community activities	Performed	43	18	25	0.24	5	38	1.00	28	15	0.77	14	29	1.00	24	19	0.84	8	35	0.42
	Not performed	17	4	13		2	15		12	5		5	12		9	8		1	16	
Peer communication	Yes	33	10	23	0.51	3	30	1.00	22	11	0.53	12	21	0.27	21	12	**0.03**	6	27	0.50
	No	37	14	23		4	33		22	15		9	28		14	23		4	33	

*Cohen's d for personal network, escape, information, essential items, list registration, and disaster drill were −0.34, −0.29, −0.34, −0.05, −0.19, and 0.10.
†wheelchair.

Hyogo, Tottori, Ehime, and Kagawa), and each organization had a mailing list. The inclusion criteria for this study were: being 20 years old and older, belonging to an SCI self-help group under ZenkokuKeisonren, and being registered on the mailing lists.

Data collection

An e-mail with a link to our questionnaire was sent to 300 members who were registered on the mailing lists in December 2015. Subsequently, the responses were collected until the end of February 2016. A reminder e-mail was sent 1 month later.

Measurements

The outcome variables were 6 self-assistance behaviors related to disasters. According to the US National Organization on Disability,[2] the following 4 self-assistance behaviors should be included in an emergency plan for individuals with disabilities: (1) personal network (they have 2 or 3 people who will take care of them during an emergency, and each knows the contact information); (2) escape (they identify multiple routes to a safe place inside and outside their building, and they practice the escape plans with their personal network); (3) information (they identify the devices to keep obtaining information about the emergency and know where the information is); and (4) essential items (items for their specific needs besides the basic items). Besides these 4, we added 2 other kinds of behaviors: (5) list registration (they voluntarily register on a list of people requiring assistance during a disaster), and (6) disaster drill participation (they have participated in a disaster drill). Participants were asked about these 6 behaviors using 'yes/no' questions.

Sociodemographic characteristics (age, sex, and living status), disability conditions (injury level, main transportation, urination, and defecation), and social activities (frequency of going outdoors, neighborhood association, community activities, and peer communication) were also measured. Specifically, participants were asked whether they belonged to a neighborhood association; they answered 'yes' or 'no.' They were also asked to choose from 5 responses regarding their impression of community activities: (1) I think there are many community activities, (2) I think community activities are performed to some extent, (3) I think there is almost no activity, (4) I do not think there are community activities, and (5) I do not know. Answers 1 and 2 indicate that community activities are performed, whereas answers 3 and 4 indicate that they are not performed. Therefore, answers 1, 2, 3, and 4 are treated as binary variables. Finally, regarding peer communication, the participants were asked to answer 'yes' or 'no' to the question, 'Have you talked about disaster experiences with people with similar disabilities?'

Data analysis

First, binary analyses (chi-square tests, Fisher's exact tests, and Student's t-tests) were conducted between 6 self-assistance behaviors and all variables. Second, a logistic regression analysis was conducted to find out which variables significantly predict list registration, after adjusting for age and sex. SPSS version 27.0 (IBM Corp., Armonk, New York, USA) was used for all analyses.

Results

Among the 300 targeted members, 70 (23.3%) agreed to participate in this study and met the criteria. The participants' characteristics

Table 2. Logistic regression analysis predicting the list registration

Variables		B	AOR	95% CI	P
Age		0.20	1.02	0.97 - 1.07	0.39
Sex	Female		1.00	Ref.	
	Male	−0.90	0.41	0.10 - 1.75	0.23
Neighborhood association	Not belonged		1.00	ref.	
	Belonged	1.09	2.97	1.05 - 8.40	0.04
Peer communication	No		1.00	ref.	
	Yes	1.03	2.79	1.00 - 7.74	0.05

and the results of the binary analyses are shown in Table 1. The most frequent self-assistance behavior against disaster was information (62.9%), and the least frequent was escape (10.0%). Neighborhood associations and peer communication were significantly associated with list registration. However, other outcome variables were not significantly associated with any of the factors.

Table 2 shows the results of the logistic regression analysis predicting list registration. After adjusting for age and sex, neighborhood association (AOR:2.97, 95% CI:1.05 – 8.40, $P = 0.04$), and peer communication (AOR:2.79, 95% CI:1.00 – 7.74, $P = 0.05$) remained significant.

Limitations

This study has some limitations. First, the participants were limited to those with SCI who belonged to a self-help group, and it is difficult to generalize the results obtained for all individuals with SCI or other disabilities. Second, this was a cross-sectional study, and no causal relationship could be concluded.

Discussion

This study explored factors associated with self-assistance behaviors against disasters among individuals with SCI. Belonging to neighborhood associations and having an experience of peer communication were significantly associated with registration on a list of people requiring assistance during a disaster.

The importance of communities in disaster preparedness has attracted attention in recent years.[7,8] For example, Adams *et al.* explored the community and individual characteristics in relation to disaster preparedness among individuals with disabilities.[5] They found that living in a community with advantageous housing and social environment played an important role in promoting disaster preparedness. Research shows that the quality of a community affects the daily lives of individuals with disabilities. However, the impact maybe more pronounced during a disaster. Belonging to a neighborhood association would help people with severe disabilities build a visible network with their neighbors, increasing their chances of being informed and cared for during a disaster. Thus, registration on a list of people requiring assistance during a disaster would be promoted by encouraging individuals with SCI to belong to their neighborhood association.

Peer support has the power to improve the lives of individuals with SCI.[9,10] The results of this study suggest that peer support is also effective at promoting self-assistance behaviors against disaster for individuals with SCI. Experiences and advice from people

with the same disabilities not only arouse appropriate fear of a disaster but also encourage more practical and concrete disaster-preparedness actions. Thus, in addition to the usual efforts to promote self-assistance behaviors against disasters for individuals with SCI, it may also be effective to increase opportunities for communication with peers among individuals with SCI.

Conclusion

Belonging to a neighborhood association and having communication with peers could help individuals with SCI register on lists for individuals requiring assistance in case of a disaster. To promote self-assistance behaviors against disasters, access to neighborhood associations and opportunities for peer communication should be increased.

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