

Relationship Between Social Activity and Frailty in Japanese Older Women During Restriction on Outings due to COVID-19



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<https://doi.org/10.5770/cgj.24.507>

ABSTRACT

Background

This study investigated the relationship between social activities and frailty during the restriction on outings due to COVID-19.

Design

A cross-sectional study.

Setting and Subjects

This study was conducted in City Nishinomiya of Prefecture Hyogo, in Japan. A mail survey was carried out among women aged 65 years or older in May 2020. A population of 293 women aged 65 years or older living in the community was recruited for the study and 213 of them were analyzed.

Measurements

The survey included questions on sex, age, height, weight, and social activity. Social activity consisted of participation in social organizations and their frequency, as well as frequency of interaction with family and friends. The survey also asked if regular social activity had been impeded by COVID-19.

Results

A significant association was found between frailty and hindered interaction with friends (β : 0.176, $p = .014$). Multivariate linear regression analysis confirmed that this association was also significant in Model 1 (β : 0.158, $p = .025$), and Model 2 (β : 0.148, $p = .034$).

Conclusions

No association between being hindered in social activity and frailty was found in older women living in the community during the restriction on outings due to COVID-19.

Key words: COVID-19, social activity, frailty, older adults

INTRODUCTION

The novel coronavirus (SARS-CoV2) continues to spread across the globe⁽¹⁾ with a drastic impact on our daily lives. A majority of countries worldwide, including the US and France, have enacted lockdowns. In Japan, a state of emergency was declared on April 16, 2020, and outings were restricted for a period of approximately one month.

Interaction with others is thought to have been hindered as a result of avoiding outings amid the lockdown and the state of emergency declaration in Japan. Further, the frequency of everyday interaction with others is thought to have been reduced in view of social distancing.⁽²⁾ Frailty is a serious health issue associated with old age, and studies have noted the importance of screening for frailty in older adults during lockdowns.⁽³⁾

Therefore, this study sought to understand how social activities had been impeded due to COVID-19 and the restriction on outings. The study also aims to investigate the association between reduced social activity and frailty during the period of restriction on outings due to COVID-19.

METHODS

Study Participants & Study Period

This study was conducted in City Nishinomiya of Prefecture Hyogo. Study participants were 505 older adults, who were the residents of the city and agreed to participate in a welfare project through district/child welfare officers of the city's Ward Naruo. Survey forms were distributed to these participants by mail at the beginning of May 2020. Survey responses were received from 322 participants. Data from men ($n=23$) were limited and, therefore, male respondents were excluded from analysis. This study was approved by the ethics committee of Mukogawa Women's University (approval number: 19-15).

Survey Content

The survey included questions about sex, age, height, body weight, living arrangements, self-rated health, life satisfaction, eating habits, economic status, and illness.

Food Group Intake

A dietary variety score was used to assess food group intake. This score is calculated per an individual’s frequency of food intake. The food items were classified into meats, fish and shellfish, eggs and egg products, soybeans and soybean products, milk and milk products, seaweeds, vegetables, fruits, potatoes, and oils. The total dietary variety score ranged from 0 to 10 points, with intake of each food group given 1 point for a response of “eat almost every day” and 0 points for responses of “eat once every two days/eat once or twice a week/eat hardly ever”.⁽⁴⁾

Frailty Assessment

The following five items were assessed and scored to yield a frailty score: “Have you lost 2 to 3 kg or more in the last six months?”, “Do you feel like you walk more slowly?”, “Do you exercise at least once per week?”, “Can you remember what happened 5 minutes ago?”, “Do you feel tired for no reason?” These five items were answered with “yes” or “no.” The total score for these five items ranged from 0 to 5 points and was used as the frailty score, with 0 for no frailty and 5 for the most frailty.⁽⁵⁾

Assessment of Social Activity

Social activity was assessed using the frequency of interaction with family and friends, as well as the frequency of participation in community activities. Choices for frequency of interaction with family and friends and of participation were: “almost every day,” “two to three times per week,” “once per week,” “once or twice per month,” “several times per year,” “hardly ever,” and “do not have family or friends.” Responses of “almost every day,” “two to three times per week,” and “once per week” were combined into a “high frequency” category, while “once or twice per month” and “several times per year” were combined into a “low frequency” category, and “hardly ever,” “no social participation,” and “do not have family or friends” were combined into a “none” category.

How COVID-19 Has Hindered Social Activity

How COVID-19 has hindered social activity was assessed using a modified version of the following question from the SF-36: “During the past four weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?”⁽⁶⁾ There were five potential responses for how COVID-19 has hindered social activity, namely, “has not hindered at all,” “has hindered very little,” “has hindered somewhat,” “has hindered quite a lot,” and “could not do social activities.” Responses of “has not hindered at all” were used as a “not at all” category, while “has hindered very little” and “has hindered somewhat”

were combined into a “very little or somewhat” category, and “has hindered quite a lot” and “could not do social activities” were combined into a “quite a lot or could not do social activities” category.

Data Collection and Analysis

Survey responses were received from 299 participants. Data of 213 participants, excluding those with missing data for age, height, weight, frail score, and social activity (n = 86), were analyzed. Categorical analysis data are shown in Table 1 with the number and percentage of respondents. Continuous

TABLE 1. Attributes of older women living in the community

		Mean or (n)	SD or (%)	Median
Age		79.7	6.6	80.0
Height		151.3	5.5	151.0
Body weight		52.0	7.7	51.0
BMI		22.7	3.2	22.5
BMI <18.5		11.0	5.2	5.2
Illness	≥2	105	(49.3)	
	<2	108	(50.7)	
Frailty score		1.3	1.1	1.0
Dietary variety score		4.6	2.0	5.0
Economic security	Secure	203	(95.3)	
	Insecure	10	(4.7)	
Social activities				
<i>Frequency of Interaction</i>				
Friends	High frequency ^a	124	(58.2)	
	Low frequency ^b	70	(32.9)	
	None ^c	19	(8.9)	
Family	High frequency ^a	136	(63.8)	
	Low frequency ^b	68	(31.9)	
	None ^c	9	(4.2)	
<i>Frequency of Contact</i>				
Friends	High frequency ^a	125	(58.7)	
	Low frequency ^b	62	(29.1)	
	None ^c	26	(12.2)	
Family	High frequency ^a	66	(31.0)	
	Low frequency ^b	123	(57.7)	
	None ^c	24	(11.3)	
<i>Frequency of Participation in Social Organizations</i>				
	High frequency ^a	120	(56.3)	
	Low frequency ^b	53	(24.9)	
	None ^c	40	(18.8)	

^aAt least once a week.

^bOnce or twice a month or once or twice a year.

^cNot really or None.

variables are depicted as mean and standard deviation. Linear regression analysis was used to examine the relationship between social activity and frailty score. In multivariate linear regression analysis, Model 1 was adjusted only for age (75 years or older), while Model 2 was adjusted for age (75 years or older), body mass index (BMI) (below 18.5), number of illnesses (two or more), dietary variety score, and economic status. Statistical analyses were carried out using IBM SPSS 24.0 (IBM SPSS Statistics, Armonk, NY), with a significance probability set at below 5%.

RESULTS

Table 1 shows the attributes of analyzed participants. The frequency of participation in social organizations was “high” for 56.3% of participants. Frequency of contact was “high” for 31.0% of participants for family and for 58.7% of participants for friends, while frequency of interaction was “high” for 63.8% of participants for family and for 58.2% of participants for friends.

Table 2 shows the impact of COVID-19 on social activities. Approximately 80% of the participants responded that COVID-19 had hindered their participation in social organizations and the extent was “very little or somewhat” or “quite a lot or could not do social activities.” Furthermore, about 75% participants stated that COVID-19 had impeded the frequency of interaction with family and the extent was “very little or somewhat” or “quite a lot or could not do social activities.” Similarly, over 50% of participants responded that COVID-19 had hindered the frequency of interaction with friends and the extent was “very little or somewhat” or “quite a lot or could not do social activities.”

Table 3 shows the association between social activities and frailty score. A significant association was found between hindered interaction with friends and frailty score (β : 0.176, $p = .014$). This association was also found to be significant in both Model 1, which was adjusted for age (β : 0.158, $p = .025$), and Model 2, which was adjusted for age, BMI, number of illnesses, dietary variety score, and economic status (β : 0.148, $p = .034$). No significant association was found between hindrance of other social activities and frailty.

DISCUSSION

This study investigated the impact of the novel coronavirus on the frequency of social participation, and interaction and contact with family and friends among older women living in the community. The results revealed that community social activities stopped almost entirely and interaction with friends and family was also hindered due to COVID-19. This study also explored the relationship between reduced social activity and frailty, but found no association in most cases. A significant association was found between frailty and reduced interaction with friends even after adjusting to BMI, age, number of illnesses, dietary variation score, and economic status. Henceforth, should be considered essential to explore the impact of mid- to long-term impeded social activity due to COVID-19 on frailty.

Our results are consistent with past studies reporting that characteristics of the individual level social environment play a protective role against frailty.^(7,8) Personal social connections may be an important health behavior setting for older adults. Consequently, these results suggest that the impact of COVID-19 on interactions with friends had an effect on vulnerability.

Large social gatherings and community activities are expected to remain restricted even after the COVID-19 situation is controlled. Thus, in the future, the effects of reduced interaction with friends and family on health are likely to persist. Due to the major impact that reduction of participation in social organizations and interaction with others will have on health,⁽⁹⁾ it is essential to consider new methods for social and community activities and the means of communicating with others. At the same time, only 53.6% of Japanese older adults in their 70s use the Internet, and this rate is even lower for adults in their 80s (23.4%).⁽¹⁰⁾ Consequently, opportunities for increasing communication with others through the Internet are considered difficult for adults over 70. However, studies have found that promoting Information and Communication Technology (ICT) use in older adults has a preventive effect on isolation and depression.^(11,12) It may become necessary to prepare and promote ICT use in order to maintain the health of older adults in the mid- to long-term amid the spread of

TABLE 2.
Impact of COVID-19 on social activities

		<i>Not At All</i>		<i>Very Little or Somewhat</i>		<i>Quite a Lot Or Could Not Do Social Activity</i>	
		<i>n</i>	<i>(%)</i>	<i>n</i>	<i>(%)</i>	<i>n</i>	<i>(%)</i>
Hindered frequency of interaction	Family	27	(12.7)	63	(29.6)	99	(46.5)
	Friends	76	(35.7)	75	(35.2)	43	(20.2)
Hindered frequency of contact	Family	102	(47.9)	70	(32.9)	32	(15.0)
	Friends	13	(6.1)	59	(27.7)	115	(54.0)
Hindered frequency of participation in social organizations		4	(1.9)	11	(5.2)	158	(74.2)

TABLE 3.
Relationship between hindered social activity and frailty score

		Unstandardized Coefficients	Unstandardized Coefficients 95%CI		Standardized Coefficients	Significance Level
			Lower	Upper		
Crude						
Hindered frequency of interaction	Family	0.123	-0.079	0.325	0.084	0.232
	Friends	0.248	0.051	0.446	0.176	0.014
Hindered frequency of contact	Family	-0.097	-0.313	0.119	-0.065	0.377
	Friends	-0.211	-0.462	0.040	-0.121	0.099
Hindered frequency of participation in social organizations		-0.127	-0.550	0.296	-0.045	0.555
Model 1 ^a						
Hindered frequency of interaction	Family	0.098	-0.102	0.298	0.067	0.335
	Friends	0.223	0.028	0.419	0.158	0.025
Hindered frequency of contact	Family	-0.093	-0.305	0.118	-0.062	0.386
	Friends	-0.158	-0.404	0.087	-0.091	0.205
Hindered frequency of participation in social organizations		-0.109	-0.524	0.307	-0.039	0.607
Model 2 ^b						
Hindered frequency of interaction	Family	0.082	-0.115	0.279	0.056	0.415
	Friends	0.209	0.016	0.403	0.148	0.034
Hindered frequency of contact	Family	-0.064	-0.275	0.146	-0.043	0.548
	Friends	-0.167	-0.417	0.083	-0.096	0.189
Hindered frequency of participation in social organizations		-0.194	-0.607	0.219	-0.069	0.356

^aAdjusted for age.

^bAdjusted for age, BMI, number of illnesses, dietary variety scores, and economic status.

infectious diseases in the future.⁽¹³⁾ Exploring methods of social and community activities for older adults after COVID-19 has demonstrated⁽¹⁴⁾ that improving their communication with others is an urgent need.

This study has a few limitations. First, the sample size was small. Second, the relationship between social activity and frailty in men was not explored. This study found that the social activity of older adults living in the community had been impeded by COVID-19. It is necessary to investigate the impact of mid- to long-term reduction in social activity on their health in the future.

ACKNOWLEDGEMENTS

The authors disclosed receipt of the following financial support for the research of this article. This work was supported by the Hyogo Prefecture Hyogo Planning Prefectural Citizen's Department Vision Bureau, Vision Division.

CONFLICT OF INTEREST DISCLOSURES

The authors declare that no conflicts of interest exist.

REFERENCES

1. World Health Organization. Coronavirus disease (COVID-19): situation dashboard [Internet]. Geneva, Switzerland: World Health Organization; 2020. [cited 2020 June 17]. Available from: <https://who.sprinklr.com/>
2. World Health Organization. COVID-19: physical distancing [Internet]. Geneva, Switzerland: World Health Organization; 2020. [cited 2020 June 17]. Available from: <https://www.who.int/westernpacific/emergencies/covid-19/information/physical-distancing>
3. Hubbard RE, Maier AB, Hilmer SN, *et al.* Frailty in the face of COVID-19. *Age Ageing*. 2020;49(4):499–500.
4. Yokoyama Y, Nishi M, Murayama H, *et al.* Association of dietary variety with body composition and physical function in community-dwelling elderly Japanese. *J Nutr Health Aging*. 2016;20(7):691–96.
5. Yamada M, Arai H. Predictive value of frailty scores for healthy life expectancy in community-dwelling older Japanese adults. *J Am Med Dir Assoc*. 2015;16(11):1002.e7–11.
6. Fukuhara S, Bito S, Green J, *et al.* Translation, adaptation, and validation of the SF-36 Health Survey for use in Japan. *J Clin Epidemiol*. 1998;51(11):1037–44.
7. Abe T, Okuyama K, Kamada M, *et al.* Social participation

- and physical prefrailty in older Japanese adults: the Shimane CoHRE study. *PLoS One*. 2020;15(12):e0243548.
8. Chen LJ, Chen CY, Lue BH, *et al*. Prevalence and associated factors of frailty among elderly people in Taiwan. *Int J Gerontol*. 2014;8(3):114–19.
 9. Kawachi I, Kennedy BP, Lochner K, *et al*. Social capital, income inequality, and mortality. *Am J Public Health*. 1997;87(9):1491–98.
 10. Government of Japan. Cabinet Office. [2018 edition of the white paper on Aging Society] [in Japanese] [Internet]. Tokyo, Japan: Cabinet Office; 2018. [cited 2020 June 30]. Available from: https://www8.cao.go.jp/kourei/whitepaper/w-2018/zenbun/30pdf_index.html
 11. Cotten SR, Ford G, Ford S, *et al*. Internet use and depression among retired older adults in the United States: a longitudinal analysis. *J Gerontol B Psychol Sci Soc Sci*. 2014;69(5):763–71.
 12. Schulz R, Wahl HW, Matthews JT, *et al*. Advancing the aging and technology agenda in gerontology. *Gerontologist*. 2015; 55(5):724–34.
 13. Vahia IV, Blazer DG, Smith GS, *et al*. COVID-19, mental health and aging: a need for new knowledge to bridge science and service. *Am J Geriatr Psychiatry*. 2020;28(7):695–97.
 14. Berg-Weger M, Morley JE. Loneliness and social isolation in older adults during the COVID-19 pandemic: implications for gerontological social work [editorial]. *J Nutr Health Aging*. 2020; 24(5):456–58.
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