

原著

Association Between Social Capital and Mental Health among Caregivers of People with Dementia

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ABSTRACT

Objectives

This study aimed to examine the association between social capital and depressive symptoms among caregivers of people with dementia.

Methods

Participant recruitment was conducted by sending information about the present study by mail to 470 comprehensive community support centers, 470 home-visit nurse stations that allowed the provision of visiting nursing services, and 470 social welfare councils randomly selected from throughout Japan from April 2022 to March 2023. Consent letters to participate in this study were subsequently received from 43 facilities, to which 364 questionnaires were sent by mail. Demographic data were obtained using a questionnaire survey that included a social capital scale for people with dementia and the Japanese version of the Center for Epidemiologic Studies Depression Scale (CES-D). Logistic regression analysis was used to assess the association between social capital and depressive symptoms.

Results

In total, 96 responses (74.0% female; mean age \pm standard deviation [SD], 66.2 \pm 11.5 years) were analyzed. The mean \pm SD CES-D score was 17.1 \pm 10.9, with 43 caregivers (44.8%) scoring 16 points or higher. The results of the logistic regression analysis indicated that social capital was independently associated with depressive symptoms (odds ratio: .88, $p < .001$) after adjusting for caregiver and care recipient variables.

Conclusions

These findings suggest that fostering a community with rich social capital is important for promoting good mental health among caregivers of people with dementia.

Keywords : Dementia; Depressive symptoms; Family caregiver; Mental health; Social capital

I. Introduction

The incidence of dementia is increasing in Japan, with the Japanese government estimating that the prevalence of dementia among the elderly will be 19% by 2025 and 21.4% by 2040 (Fukawa, 2022). In 2019, to respond to this situation, the Ministerial Council of Japan approved the “Framework for Promoting Dementia Care”. The goal of this framework is to delay the onset of dementia and create a society where even people with dementia can live optimistically (Ministry of Health, Labour and Welfare, 2019).

Continuing to live in their own community provides many benefits for people with dementia. Previous studies have reported that enabling people with dementia to continue to live in their own community is important for not only maintaining quality of life (QOL), physical and mental states, and social connectedness, but also preventing increases in the direct costs of dementia care (Allegri, 2006; Hessmann et al., 2018; Nikmat, Hawthorne, & Al-Mashoor, 2015; Olsen et al., 2016).

Family members such as spouses, children, and children’s spouses are an important resource for people with dementia who want to continue to live in their community, as they represent over 60% of all home caregivers (Boccardi & Mecocci, 2017; Kimura, Nishio, Kukihara, Koga, & Inoue, 2019). While many family caregivers support people with dementia, it is well known that such caregivers experience a care burden that can lead to mental distress (e.g., depressive symptoms). Thus, caring for people with dementia is considered to be associated with physical and emotional issues among caregivers (Manzini & Vale, 2020). The subjective health status of caregivers of people with dementia has also been reported to be associated with depressive states (Kai, Ishii, Ishii, Fuchino, & Okamura, 2022), and the perceived burden of caring for people with dementia has been found to be significantly

related to depressive symptoms among both spouses and child caregivers (McAuliffe, Ong, & Kinsella, 2020). Moreover, in previous studies, 36.9% of caregivers of people with Alzheimer’s disease have shown mild depressive symptoms (Manzini & Vale, 2020), and 47% of caregivers of people with dementia have reported clinically significant depressive symptoms (Pillemer, Davis, & Tremont, 2018). Thus, the degree to which caregivers of people with dementia are able to avoid depressive symptoms can make or break their decision to continue providing care.

Social connectedness is considered to be effective for caregivers of people with dementia, who can often experience loneliness (Saadi et al., 2021). In general, loneliness has been linked to worse health outcomes (Lwi, Ford, & Levenson, 2022). Loneliness therefore plays an important role in the relationship between caregiving for people with dementia and depressive symptoms among caregivers (Saadi et al., 2021). In a systematic review of interventions for caregivers of people with dementia, peer support was the most frequent intervention, and common intervention strategies included expanding one’s social network (Velloze, Jester, Jeste, & Mausbach, 2022).

Caregivers of people with dementia have diverse interactions in their communities because most of them receive both formal and informal support. Support resources in the community play an important role for caregivers of people with dementia by helping to expand social networks, improve reciprocity and trust between neighbors, and facilitate access to care services (Chen, Huang, Yeh, Huang, & Chen, 2015; Furukawa & Greiner, 2020; Hong & Harrington, 2016; Lu, Jiang, Sun, & Lou, 2020). Social capital theory can help explain these interactions among caregivers. As social capital is a multidimensional concept, several definitions have been proposed (Alvarez, Kawachi, & Romani, 2017). The most famous definition of social capital is that given by Putnam (Putnam,

2000): “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (p.19). He placed trust and norms at the core of social networks (Sato, 2013).

Social capital can be classified into different forms and types. One of the classifications of social capital involves the differentiation between cognitive and structural social capital. Cognitive social capital, which includes norms, values, attitudes, and beliefs (Islam, Merlo, Kawachi, Lindström, & Gerdtham, 2006), involves people’s perceptions about interpersonal trust as well as norms of reciprocity within the group (Villalonga-Olives & Kawachi, 2015), and affects behavioral norms, including the control of risky behavior, mutual support, and informal ways of informational exchange in relation to health (Cullen & Whiteford, 2001). On the other hand, the structural components of social capital are observable aspects of social organization, such as social network density or patterns of civic participation (Islam, Merlo, Kawachi, Lindström, & Gerdtham, 2006).

The framework of structural social capital consists of two distinct dimensions: horizontal and vertical. Horizontal social capital is referred to as ‘bonding social capital’, whereas vertical social capital is referred to as ‘bridging social capital’. However, several researchers have proposed that another type of social capital, termed ‘linking social capital’, is needed to capture the power dynamics of vertical associations (Claridge, 2018).

Bonding social capital involves connections within a group or community characterized by having similar demographic characteristics, attitudes, and available information and resources. Bonding social capital refers to mutual trust and cooperative relationships between members of a network who perceive themselves as being similar to one another in terms of their social identity (Szreter & Woolcock, 2004). Bonding social capital can

be an extremely beneficial social function by providing support resources to people with socioeconomic problems or poor health. It also tends to help people ‘get by’ through providing norms and trust that, in turn, facilitate collaborative action (Claridge, 2018).

Bridging social capital is a connection that links people from various parts of society, such as different races, classes, or religions. It involves relationships based on respect and mutuality between people aware of their differences in terms of sociodemographic perspectives, age, ethnic group, class, and so on (Szreter & Woolcock, 2004).

Linking social capital is defined as involving norms of respect and networks of trusting relationships between people interacting across formal or institutionalized power or authority hierarchies in society (Szreter & Woolcock, 2004).

As mentioned earlier, social capital has three components: trust, norms of reciprocity, and networks. Trust is considered as an important condition for the smooth and optimal functioning of complex systems such as health care (Groenewagen, Hansen, & de Jong, 2019). In general, social trust can be described as the expectation that people will act on good will, attempt to honor their commitments, and avoid inflicting damage or harm to others (Freitag & Bauer, 2013). Trust consists of two types: particularized and generalized (Freitag & Bauer, 2013; Glanville & Story, 2018). Particularized trust involves trust at a close social range and is primarily shown toward people that the individual knows personally from daily interactions (e.g., friends, neighbors, coworkers) (Freitag & Bauer, 2013; Glanville & Story, 2018). Because particularized trust is considered as trust in familiar others, it is of the same nature as the cognitive dimension of bonding social capital (Glanville & Story, 2018). On the other hand, generalized trust is an abstract attitude toward all people

(Freitag & Bauer, 2013) characterized by the absence of a specified receiver of trust or a specific regard in which the receiver is trusted (Frederiksen, 2019); therefore, it corresponds to the cognitive component of bridging social capital (Glanville & Story, 2018). Measuring particularized and generalized trust can provide a more robust social capital proxy (Giordano, Björk, & Lindström, 2012). Efforts taken in terms of building and maintaining trust can help significantly improve local health-care management, enhance trust in physicians, and facilitate access to and improve the quality of health care (Ahern & Hendryx, 2003).

Reciprocity is interpreted as a give-and-take and defined as repayment for acts of giving (Perls, 1953) and acts of both giving and receiving (Zabielski, 1984). Reciprocity has two types: generalized and specific. Generalized reciprocity is a norm in which the mutual exchange of benefits may be imbalanced, but involves the intrinsic expectation that future transactions may level any potential imbalances (Rönnerstrand & Sundell, 2015). Therefore, the norms of generalized reciprocity facilitate collective action (Putnam, 2000). On the other hand, specific reciprocity is defined as doing something for others under the condition that they will also do something 'equivalent' for you in the future (Emmering, Astroth, Woith, Dyck, & Kim, 2018). In regard to caregivers of people with dementia, not only receiving support from, but also giving support to, other caregivers allows them to recognize their personal strengths and resources and promote their confidence and self-efficacy (Lu, Jiang, Sun, & Lou, 2020; Furukawa & Greiner, 2020).

Social networks involve a set of ties among people with similar interests or interactions (Shushtari et al., 2018) who cooperate for mutual benefit (Putnam, 2000). Therefore, social networks, and the patterns of relationships between individuals and groups, are intimately tied to the idea of social capital (Barnes-

Mauthe, Gray, Arita, Lynham, & Leung, 2015). Contradictory opinions are held with respect to network ties. Social cohesion is an important factor that can help explain the frequency of communication between actors about specific issues (Friedkin, 1983). On the other hand, weak ties are an important resource for realizing mobility opportunities (Granovetter, 1973). Weak ties are connections that link two otherwise unconnected network groups (Liu, Sidhu, Beacom, & Valente, 2017). Regardless of the size or strength of social ties, if the caregivers of people with dementia fail to recognize the usefulness of social networks, then social ties will not function beneficially for caregivers.

Social support is a similar concept to social capital in regard to interpersonal relationships, serving as a qualitative and functional aspect of social networks (Faquinello & Marcon, 2011). Social support plays important roles in enabling caregivers to live well and reducing the burden of caregivers of people with dementia (Clare et al., 2019; Gibson, Holmes, Fields, & Richardson, 2019; Ruisoto et al., 2020). However, whereas social capital involves both aspects of giving and receiving, social support involves only the aspect of receiving; i.e., social support does not involve the aspects of providing support and thus differs from social capital on this point (Furukawa & Greiner, 2020).

Social capital has been reported to be associated with health-related areas, such as self-reported health, cardiovascular disease, infectious disease, cancer, mortality, obesity, and diabetes (Rodgers, Valuev, Hswen, & Subramanian, 2019). Some studies found that higher social capital predicts and associates with better mental health (Ehsan, Klaas, Bastianen, & Spini, 2019; Hamano et al., 2015). Few studies have been conducted on caregivers of people with dementia in regard to social capital, whereas social capital seems to be associated with mental health among people living in the

community. To the best of my knowledge, only one comparison study on the relationship between caregiver burden and perceptions of social capital between caregivers and non-caregivers of people with dementia has been conducted (Papastavrou, Andreou, Middleton, Tsangari, & Papacostas, 2015). The association between social capital among caregivers of people with dementia and caregiver health, especially mental health, is still unknown.

The present study aimed to clarify the association between social capital and mental health, especially depressive symptoms, among caregivers of people with dementia.

II. Material and methods

1. Study design

A cross-sectional study design was used.

2. Recruitment and procedures

Participant recruitment was conducted by sending information about the present study by mail to 470 comprehensive community support centers (10 comprehensive community support centers from each of the 47 prefectures in Japan), 470 home-visit nurse stations that allowed the provision of visiting nursing services (10 home-visit nurse stations from each of the 47 prefectures in Japan), and 470 social welfare councils (10 social welfare councils from each of the 47 prefectures in Japan) randomly selected from throughout Japan from April 2022 to March 2023. Consent letters to participate in this study were subsequently received from 43 facilities, to which 364 questionnaires were sent by mail. The staff who belonged to these 43 facilities were then asked to distribute the questionnaires directly to caregivers of people with dementia living in the community who met the following inclusion criteria: family caregivers who primarily provided care to people with

dementia, who were age 20 years or over, who had not received a diagnosis of cognitive decline by a physician, and who had the ability to read and understand Japanese.

3. Ethical considerations

This study was approved by an institutional review board of Kansai University of Nursing and Health Sciences (No. 100). All participants received a written letter of explanation regarding the purpose of the study along with all ethical considerations. Returning the questionnaire by mail was considered to indicate consent to participate.

4. Measures

The social capital scale for caregivers of people with dementia, which was developed in Japan, was used to measure social capital. This scale is composed of 17 items and the following three factors: support for people with dementia and their caregivers, trust in providing dementia care, and support from neighbors. The reliability and validity of the scale have been confirmed (Furukawa & Greiner, 2020). This scale is scored on a five-point Likert scale ranging from “1 = strongly disagree” to “5 = strongly agree”. The possible scores range from 15 to 85, with higher scores indicating greater social capital.

Depressive symptoms were assessed using the Japanese version of the Center for Epidemiologic Studies Depression Scale (CES-D) (Shima, Shikano, Kitamura, & Asai, 1985). The original version of the CES-D is a 20-item scale that assesses how often individuals have experienced depressive symptoms in the past week (Radloff, 1977). The score for each item ranges from “0 = rarely or none of the time” to “3 = most or all of the time”, and the total score ranges from 0 to 60. A score of 16 or higher indicates more depressive symptoms (Radloff,

1977). The reliability and validity of the Japanese version of the CES-D were confirmed in a previous study (Shima, Shikano, Kitamura, & Asai, 1985).

5. Demographic data

The following demographic data were collected: gender, age, and highest level of education of the caregivers, duration of caregiving, and long-term care level of the care recipient (Table 1).

6. Data analyses

All analyses were conducted using IBM SPSS statistics ver. 28.0 for Windows (IBM, Tokyo, Japan). Means and frequencies were computed, and t-tests and analysis of variance were used to compare the demographic data (e.g., gender and age of caregiver, highest level of education, duration of caregiving, long-term care level of the care recipient).

CES-D scores were divided into two groups (< 16 and ≥ 16 points). Logistic regression analysis was then conducted to assess the associations between depressive symptoms and social capital and caregiver and care recipient variables such as caregivers' age, education, and period of caregiving and long-term care level of the care recipient.

III. Results

1. Participants' characteristics

In total, 147 responses were received (response rate, 40.4%). Finally, 96 caregivers (25 males [26.0%]; mean age \pm standard deviation [SD], 66.2 ± 11.5 years) who provided complete responses to the questionnaire were included in the analytical sample. Table 1 shows the participants' characteristics. Most caregivers were daughters (30.2%) or spouses (22.9%).

The mean length \pm SD of caregiving was 6.5 ± 6.1 years (range, 0.33–29.5 years). In addition, 92 caregivers (95.8%) had at least a high school education, and 91 people with dementia (94.8%) required support or care.

Table 1. Participants' characteristics (N = 96).

Variable	N (%)
Gender of caregiver	
Male	25 (26.0)
Female	71 (74.0)
Age of caregiver	
Mean \pm SD (years)	66.2 ± 11.5
Relation with care recipient	
Spouse	22 (22.9)
Daughter	29 (30.2)
Son	6 (6.3)
Daughter-in-law	14 (14.6)
Grandson/granddaughter	4 (4.2)
Parent	16 (16.7)
Other	5 (5.2)
Educational attainment of caregiver	
Junior high school	4 (4.2)
High school	40 (41.7)
Junior college/technical school	33 (34.4)
University	18 (18.8)
Other	1 (1.0)
Duration of caregiving	
Mean \pm SD (years)	6.5 ± 6.1
Long-term care level of care recipient ^a	
Independent	3 (3.1)
Requiring support 1	4 (4.2)
Requiring support 2	3 (3.1)
Requiring long-term care level 1	14 (14.6)
Requiring long-term care level 2	20 (20.8)
Requiring long-term care level 3	27 (28.1)
Requiring long-term care level 4	10 (10.4)
Requiring long-term care level 5	13 (13.5)
Unknown	2 (2.1)

^aA higher long-term care or support level indicates a worse condition. SD = standard deviation.

2. Depressive symptoms and social capital among caregivers of people with dementia

The mean CES-D score was 17.1 ± 10.9 , with 43 caregivers (44.8%) scoring 16 or higher. Table 2 shows the results of t-tests and analysis of variance. No significant difference in CES-D scores was found between males (16.7 ± 12.8) and females (17.2 ± 10.2). A higher education

level tended to be associated with more depressive symptoms (junior high school: 12.5 ± 7.2, high school: 15.8 ± 10.2, junior college/technical school: 18.0 ± 9.2, university: 19.7 ± 15.1), but this difference was not significant. Child and grandchild caregivers tended to have more depressive symptoms than spouse, daughter-in-law, and parent caregivers (daughters: 18.8 ± 11.3, sons: 17.0 ± 9.6, grandsons/granddaughters: 21.8 ± 18.9, spouses: 16.1 ± 11.4, daughters-in-law: 15.3 ± 7.5, parents: 16.2 ± 11.9), but none of these differences was significant.

Table 2. Depressive symptoms and social capital among caregivers of people with dementia.

Variables	CES-D			Social capital	
	n	Mean ± SD	p	Mean ± SD	p
Gender ^a					
Male	25	16.7 ± 12.8	.84	52.2 ± 12.1	.67
Female	71	17.2 ± 10.2		53.3 ± 10.0	
Education ^b					
Junior high school	4	12.5 ± 7.2	.59	44.0 ± 9.8	.33
High school	40	15.8 ± 10.2		52.1 ± 9.9	
Junior college/technical school	33	18.0 ± 9.2		55.0 ± 11.0	
University	18	19.7 ± 15.1		53.2 ± 11.1	
Other	1	11.0		58.0	
Relation ^b					
Spouse	22	16.1 ± 11.4	.91	55.0 ± 11.1	.59
Daughter	29	18.8 ± 11.3		51.1 ± 9.6	
Son	6	17.0 ± 9.6		46.5 ± 8.7	
Daughter-in-law	14	15.3 ± 7.5		53.8 ± 9.7	
Grandson/granddaughter	4	21.8 ± 18.9		54.0 ± 18.1	
Parent	16	16.2 ± 11.9		54.6 ± 9.7	
Other	5	16.0 ± 8.4		55.6 ± 14.5	

^at-test.

^bAnalysis of variance.

CES-D = Center for Epidemiologic Studies Depression Scale; SD = standard deviation.

The mean social capital scale score was 53.0 ± 10.5. The mean social capital score among males was almost the same as that among females (males: 52.2 ± 12.1, females: 53.3 ± 10.0). Caregivers who had an education level of high school or higher tended to have more social capital than did those who had an education level of junior high school (junior high school: 44.0 ± 9.8, high school: 52.1 ± 9.9, junior college/technical school: 55.0 ± 11.0, university: 53.2 ± 11.1), but none of these differences was significant. Child caregivers tended to have lower social capital scores than did the other caregivers (daughters: 51.1 ± 9.6, sons: 46.5 ± 8.7, grandsons/granddaughters: 54.0 ± 18.1, spouses: 55.0 ± 11.1, daughters-in-law: 53.8

± 9.7, parents: 54.6 ± 9.7), but no significant differences between relations with the care recipient were found.

Table 3. Results of the logistic regression analysis (N = 96).

Variables	OR	CES-D	
		95% CI	p
Social capital	.87	.81 – .93	< .001
Caregiver's age	1.03	.97 – 1.09	.40
Caregiver's gender			
Male	Reference		
Female	5.46	.57 – 52.07	.14
Relation			
Parent	Reference		
Spouse	5.93	.633 – 55.54	.12
Daughter	3.01	.57 – 15.46	.19
Son	3.24	.13 – 77.74	.47
Daughter-in-law	2.69	.38 – 19.25	.33
Grandson/granddaughter	1.27	.05 – 35.35	.89
Other	.97	.03 – 35.92	.29
Education			
Junior high school	Reference		
High school	.92	.03 – 28.70	.96
Junior college/technical school	5.19	.13 – 206.66	.38
University	4.67	.11 – 194.31	.41
Duration of caregiving	1.01	.99 – 1.02	.29
Level of long term care insurance ^a			
Independent	Reference		
Requiring support 1	1.08	.02 – 59.22	.97
Requiring support 2	.14	.00 – 14.38	.40
Requiring long-term care level 1	2.08	.08 – 56.39	.66
Requiring long-term care level 2	.66	.02 – 18.15	.80
Requiring long-term care level 3	1.75	.07 – 42.24	.73
Requiring long-term care level 4	.43	.01 – 15.28	.65
Requiring long-term care level 5	.52	.01 – 21.20	.73
Unknown	1.86	.01 – 464.30	.83

^aA higher long-term care or support level indicates a worse condition.

OR = odds ratio; CI = confidence interval.

3. Association between depressive symptoms and social capital

As shown in Table 3, the results of the logistic regression analysis revealed that only social capital was significantly associated with depressive symptoms (odds ratio [OR]: .88, 95% confidence interval [CI]: .81 – .93, p < .001). No significant association was found between depressive symptoms and the caregivers' or care recipients' variables, such as gender, education, relation with the care recipient, and long-term care level of the person with dementia.

IV. Discussion

The present study aimed to clarify the association between social capital and mental health, especially depressive symptoms, among caregivers of people with dementia. No significant differences in depressive symptoms or social capital were found according to the

caregivers' or care recipients' variables, such as gender, education, and relation with the care recipient, and long-term care level of the care recipient. This study assessed the association between mental health, especially depressive symptoms and social capital using logistic regression analysis with caregivers' and care recipients' data such as caregivers' age, education, and period of caregiving and long-term care level of the care recipient.

The mean CES-D score in the present study (17.1 ± 10.9) was higher than that reported in previous studies in Japan; one study reported a mean CES-D score of 5.5 ± 4.1 among older adult caregivers (Ninomiya, Tabuchi, Rahman, & Kobayashi, 2019), and another reported a score of 12.7 among young caregivers (Koyama et al., 2017). A CES-D score of 16 or higher indicates possible depressive disorder (Radloff, 1977). The results of the present study showed that the participants were more depressed than those of previous studies. The study by Ninomiya and colleagues (2019) included care recipients who did not have dementia. When caregiving intensity is higher and when they experience perceived benefits or uplifts, dementia caregivers experience greater burden (Sörensen, & Conwell, 2011). Dementia caregivers experience a greater degree of physical and mental health problems compared to caregivers of older adults without dementia (Lee, Xu, Kim, & Chen, 2020). The age of the young caregivers in the study by Koyama and colleagues was under 65 years, while the mean age of caregivers in the present study was 65 years and over. A systematic review of the care burden of family caregivers of people with dementia showed that older caregivers experienced greater burden (Wan, Zhou, Fan, & Qu, 2022). The age of caregivers might be associated with caregiver burden; therefore, older caregivers might have worse mental health.

The results of the logistic regression analysis

revealed that social capital was significantly associated with depressive symptoms. This result suggests that social capital moderated the level of depressive symptoms. Social capital has been found to affect various psychological aspects of people living in their communities, especially depressive symptoms (Clark, Williams, Schulz, Williams, & Holt, 2018; Wu et al., 2018; Yamaguchi et al., 2019; Yang et al., 2018; Zhou et al., 2018). The present results are consistent with some findings in previous studies. Developing a community with rich social capital would be helpful for mental health among caregivers of people with dementia and effective for people with dementia to live in their community as long as possible.

To the best of my knowledge, this is the first study to investigate the association between social capital and depressive symptoms among caregivers of people with dementia. Social capital was found to be independently associated with depressive symptoms among caregivers of people with dementia after adjusting for caregiver and care recipient variables. The association between social capital and depressive symptoms found in this study suggests that caregivers with high social capital might be more able to access information on caring for family members with dementia. Social capital is known to have positive effects on the sources and efficacy of health information, as well as health information-seeking intentions (Kim, Lim, & Park, 2015). Social capital is classified into three types: bonding, bridging, and linking. Bonding social capital involves mutual trust and cooperative relationships between members of a network who perceive themselves as being similar to one another (Szreter & Woolcock, 2004). Bridging social capital is a connection that brings people together from different parts of society, such as different races, classes, or religions. Linking social capital is defined as the norm of respect and networks of trusting relationships between people who are

interacting across formal or institutionalized power or authority in society (Szreter & Woolcock, 2004). Caregivers with high social capital can access a variety of information from not only similar people, but also people across different social, power, and authority conditions. The benefits stemming from the formation of weak relationships for accessing new resources are superior to those from the formation of strong ones (Granovetter, 1973).

The social capital scale used in this study assesses three dimensions: support for people with dementia and their caregivers, trust in providing dementia care, and support from neighbors (Furukawa & Greiner, 2020). Support for people with dementia and their caregivers assesses reciprocity as an aspect of giving (Furukawa & Greiner, 2020). Using the knowledge and skills obtained from caregiving experiences to help other caregivers could enhance caregivers' altruistic behaviors, help them recognize their personal resources and strengths, and improve their confidence and self-efficacy (Lu, Jiang, Sun, & Lou, 2020). Improved confidence and self-efficacy could help caregivers recognize caregiving as a positive experience, and reciprocity could help moderate depressive symptoms. Moreover, it is likely that social reciprocity has a positive effect on individual compliance in terms of mental health, such as encouraging people to take part in volunteer or charity work (Wang, Chen, Liu, Lu, & Yao, 2019). Experiences with volunteering could help improve the mental health of caregivers by facilitating support and promoting a feeling of belonging in the community accompanied by a sense of connection to others.

Trust in providing dementia care is likely to reduce the prevalence of depressive symptoms. A higher level of trust is related to better mental health, such as increased happiness, elevated mental QOL, and reductions in anxiety and depression (Lin, Namdar, Griffiths, & Pakpour, 2021). Trust of others is useful

for caregivers of people with dementia. For example, caregivers can ask their trusted neighbors to seek out family members with dementia when wandering occurs, allowing them to return to their home quickly and safely. Speedier solutions for the problematic behaviors associated with dementia could help reduce the caregiving burden, and thereby help prevent depressive symptoms.

Support from neighbors involves the aspect of receiving support through a social network (Furukawa & Greiner, 2020). Social networks allow caregivers to receive more social support. As mentioned earlier, bonding social capital can be a beneficial social function by providing support resources to people who experience socioeconomic problems or poor health. Bridging social capital helps people gather more information, gain access to power or better placement within a network, and recognize new opportunities (Adler & Kwon, 2002). Linking social capital helps connect people across explicit hierarchies of vertical power. It is likely that caregivers with richer social capital can receive support from not only neighbors, but also various institutions, including hospitals, other types of health-care facilities, and national and local governments.

Although previous studies have reported that spouse caregivers have more depressive symptoms than do adult children caregivers (Liu, 2021; Watson, Tatangelo, & McCabe, 2019), the CES-D scores of child caregivers in the present study tended to be higher than those of spouses (spouses: 16.1 ± 11.4 , sons: 18.8 ± 11.3 , daughters: 17.0 ± 9.6). This result is contradictory to those in previous studies. One explanation for this could be that adult caregivers play multiple roles (e.g., employment, child-rearing, caregiving for dementia), which can lead to role overload and burden, and thereby, more depressive symptoms (McAuliffe, Ong, & Kinsella, 2020). Another reason could be the family-centered nature of Japanese

culture, characterized by filial piety, which is a prominent Confucian principle in Chinese and other Asian cultures that emphasizes honor and devotion to one's parents (McAuliffe, Ong, & Kinsella, 2020). This culture might compel child caregivers to believe that children should care for their parents. Consequently, this cultural aspect may place a greater burden on adult children caregivers to take care of their parent with dementia, leading to a higher risk of developing depressive symptoms.

In this study, social capital was found to be significantly associated with depressive symptoms among caregivers of people with dementia. Therefore, creating a community with rich social capital is important. However, Japan's population is estimated to decrease to about 121 million by 2025 and to about 97 million by 2050 (Ministry of Land, Infrastructure, Transport and Tourism, 2015). Therefore, social connectedness throughout Japan is expected to become increasingly weaker as the numbers of community members continue to decline in the future. Thus, new interventions to foster communities with richer social capital, for example, through the use of information communication technology, are needed in Japan.

This study has some limitations. First, even though institutions all over Japan were invited to participate in this study, only 43 facilities returned the consent letter, and thus, the sample size was relatively small. There may have been some difficulties in distributing questionnaires directly to caregivers of individuals with dementia, and these difficulties will need to be addressed in future studies. Second, this study used a cross-sectional study design due to the lack of sufficient funds and time for research, therefore, causality could not be established. A longitudinal study is needed to gain a better understanding of how changes in social capital affect depressive symptoms among caregivers of people with dementia. Third, no associations were found between depressive

symptoms and caregiver or care recipient variables. A systematic review of care burden on family caregivers of patients with dementia and affecting factors showed that economic stress and social support were some of the factors associated with caregiver burden (Wan, Zhou, Fan, & Qu, 2022). Therefore, additional variables, such as the caregiver's economic and marital status and the age and gender of the care recipient, might need to be examined to clarify the association between depressive symptoms and caregiver and care recipient variables. Finally, the social capital scale for caregivers of people with dementia was used to assess social capital. This scale focuses on the cognitive aspects of social capital. While a meta-analysis of social capital studies found that cognitive social capital is more significantly related to health than structural social capital (Xue, Reed, & Menclova, 2020), the structural aspects of social capital among caregivers of people with dementia might also need to be assessed in a future study.

V. Conclusions

This study aimed to investigate the association between social capital and depressive symptoms among caregivers of people with dementia. A total of 96 responses (74.0% female; mean age \pm SD, 66.2 \pm 11.5 years) were received. The mean CES-D score was 17.1 \pm 10.9, and 46 caregivers (44.8%) scored \geq 16, suggesting that the incidence of depressive symptoms in this study was not unique and supported the results of previous studies. Moreover, the results of the logistic regression analysis showed that only social capital was associated with depressive symptoms, which suggests that fostering a community with rich social capital is important for the mental health of caregivers of people with dementia. However, due to population decline, Japanese communities are weakening. Therefore, new interventions, such as the use of information communication

technology, are needed to foster communities with rich social capital in Japan.

VI. Declaration of Competing Interest

The author declares no competing interests.

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