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RESEARCH ARTICLE

Factors Influencing the Preference for Homes as the Location for Long-term Care in the Japanese Population

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Abstract:

Introduction:

In this cross-sectional study, we aimed to investigate the factors for preferring homes as the location to receive long-term care in community-dwelling populations.

Methods:

A total of 4,113 individuals with a response rate of 36.7% from four areas in Japan were analyzed. All information was obtained from a questionnaire survey conducted in 2019. We used negative binomial regression modeling with adjustments for areas to calculate the prevalence ratios (PRs) and 95% confidence intervals (CIs) for the preference of long-term home care about factors. All missing values were input using multiple imputations.

Results:

The results show that the prevalence of preferring homes as the location for receiving long-term care was 73.4%. Being employed (PR: 1.04; 95% CI: 1.00–1.09), living with others (PR: 1.12; 95% CI: 1.05–1.19), feeling satisfied with the environment of nursing care in residential areas (PR: 1.05; 95% CI: 1.00–1.10), feeling satisfied with the natural surroundings in the community (PR: 1.18; 95% CI: 1.07–1.31), the presence of people in the community who can be consulted about problems (PR: 1.05; 95% CI: 1.00–1.10), and the presence of close friends in the community (PR: 1.09; 95% CI: 1.03–1.15) were significantly associated with the preference for long-term home care.

Conclusion:

We suggest that municipalities should consider these social and interpersonal associations to support older residents' preference of receiving home care services.

Keywords: Aging, Housing, Relocation, Long-term care, Social environment, Physical environment.

Article History

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1. INTRODUCTION

The proportion of older people has been increasing in many countries across the world [1]. Japan has had the highest proportion of older people globally since 2004, reaching 28.7% in 2020 [2]. With aging continuing to progress in Japan, the proportion of people who require long-term care has been continuously increasing, reaching 18.3% in 2021 [3]. Long-

term care insurance is a mandatory national insurance system in Japan, reflecting the issue's societal and fiscal implications. All individuals aged 65 years or older are eligible for the insurance program regardless of their income status. The certification of eligibility for the benefits of this program is judged based on a nationally standardized procedure, including a physician's examination and evaluation of physical and cognitive functions [4].

The ultimate goal of the Japanese long-term care insurance program is to increase the proportion of individuals who receive long-term care services at home among the increasing

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numbers of those who need this care. This approach has financial benefits, as home care services incur lower long-term care insurance costs than institutional care services. Hence, an increase in home care service users would enhance the sustainability of the insurance program [5], while an increase in institutional care use would threaten it. To promote home care service usage, we aimed to investigate the factors for preferring homes as the location for receiving long-term care in community-dwelling populations.

2. MATERIALS AND METHODS

2.1. Study Population

In this cross-sectional study, 11,204 householders were selected from four areas in Japan (Areas A and B in Osaka, C in Aichi, and D in Kanagawa Prefecture) as of the 1st quarter of 2019, each of which had higher population aging rates (A: 30.2%, B: 41.6%, C: 38.6%, D: 45.5%) than the national average (26.7%) [6]. All four districts are known as new towns [7], and all face the challenges of extreme ageing and population decline. To ensure the feasibility of the study, all four areas are districts where consent and support for the study was obtained from the chairpersons of the neighborhood councils. As the information on residents was not available before conducting the survey, questionnaires were distributed to all households living in the four neighborhoods. Questionnaires were distributed to each household by the community association directors. The questionnaire included a reminder for the head of the household to answer the questions. One week after distribution, the neighborhood association directors collected the questionnaires from all households. There are no monetary or other incentives to encourage participation. The responses to the questionnaire were consent to the study. This study was approved by the Ethics Review Committee of the Osaka City University Graduate School of Human Life Science (no. 19-27).

2.2. Definition of the Preference for Home as the Location for Long-term Care

Participants were queried on their preference for homes as the location for long-term care: 'If you needed nursing care, where and how would you like to receive it?' Possible responses included receiving family-centered care at home, receiving a combination of family care and external care services at home, receiving care at home if there is a care service that allows me to live without depending on my family, receiving nursing care at a nursing home or senior housing, receiving care at a special nursing home or other facilities for the aged, receiving care at a medical institution and other non-specified responses. We defined a preference for homes as the location for long-term care as any one of the first three responses detailed above, *i.e.*, those relating to receiving care at home.

2.3. Questionnaire for Characteristics and Living Environment

The questionnaire on characteristics and living environment considered the following: age (≤ 39 , 40 to 64, ≥ 65 years); sex (male, female); employment status (not working,

working); living situation (living alone, living with others); families living close to each other (absent, present); years of residence (≤ 9 , 10 to 19, ≥ 20 years); housing type (solitary, other); the environment of nursing care in the residential area (not sufficient, sufficient); ease of walking in the surrounding streets (not satisfied, satisfied); natural surroundings in the community (not satisfied, satisfied); convenience of daily shopping, medical care, welfare, cultural facilities (not satisfied, satisfied); engagement with your neighbors and community (not satisfied, satisfied); presence of people in the community who can be consulted about problems (absent, present); degree of relationship with neighbors (almost no relationship, would converse upon meeting); close friends in the community (absent, present); social participation (absent, present); attachment to neighbors (absent, present).

2.4. Sample Size

In two previous studies of Japanese individuals, the proportion of those wishing to receive care at home was 35.8% and 64%, respectively. The dummy variables planned to be used in the analysis were 19, which would require 190 cases, considering that at least 10 cases are needed per variable [8]. Assuming the proportion of individuals who wanted to receive long-term care at home to be 35.8%, the minimum number of cases needed was estimated to be 531.

2.5. Statistical Analysis

The characteristics and living environment of the study participants were expressed as percentages. Prevalence ratios (PRs) and 95% confidence intervals (95% CIs) for the preference for homes as care locations were calculated using a negative log-binomial model. To obtain multivariate-adjusted PRs for preferring homes as care locations in relation to Characteristics and living environment, we controlled for the residential area. Subgroup analyses were repeated by sex and age categories. All missing values were input using multiple imputations with the fully conditional specification (FCS) method [9] to create five complete data sets. The FCS statement of the PROC MI procedure in SAS was used to obtain estimates combining five estimates consisting of five analyses by the PROC MIANALYZE procedure. An α level of 0.05 was considered to be statistically significant. All statistical analyses were performed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA).

3. RESULTS

Of the individuals we approached, 4,113 individuals (response rate: 36.7%) responded to the questionnaire. The prevalence of the preference for homes as the location for long-term care was recorded as 73.4%.

Table 1 shows factors associated with preferred places of long-term care. Being employed (PR: 1.04; 95% CI: 1.00 – 1.09), living with others (PR: 1.12; 95% CI: 1.05 – 1.19), feeling satisfied with the environment of nursing care in the residential area (PR: 1.05; 95% CI: 1.00 – 1.10), satisfaction with the natural surroundings of the community (PR: 1.18; 95% CI: 1.07 – 1.31), the presence of people in the community who could be consulted about problems (PR: 1.05; 95% CI:

1.00 – 1.10), and presence of close friends in the community (PR: 1.09; 95% CI: 1.03 – 1.15) were significantly associated with the preference for long-term home care.

Table 2 shows factors associated with the preferred place of long-term care by sex. Being employed (PR: 1.07; 95% CI: 1.00 – 1.15), living with others (PR: 1.35; 95% CI: 1.16 – 1.57) for men, and satisfaction with the natural surroundings of the community (PR: 1.17; 95% CI: 1.02 – 1.37) and presence of attachment to the neighbors (PR: 1.17; 95% CI: 1.07 – 1.27) were significantly associated with the preference for long-term

home care.

Table 3 shows factors associated with preferred place of long-term care by age categories. Presence of close friends in the community (PR: 1.09; 95% CI: 1.03–1.15) for the age 40 to 64 years category and satisfaction with engaging with your neighbors and community (PR: 0.87; 95% CI: 0.80–0.95) for aged 65 years or older were significantly associated with the preference for long-term home care. No significant association was found for participants aged ≤ 39 years.

Table 1. Factors associated with preferred place of long-term care (n = 4,301).

Variable	Category	Location Preference for Long-term care		p-value ¹	Multivariate PR (95% CI) ^{2,3}
		Other than Home (%)	Home (%)		
Age (years)	≤ 39	4.1	4.8	<0.001	1.00
	40 to 64	31.3	28.7		0.94 (0.86, 1.04)
	≥65	34.6	66.5		0.99 (0.90, 1.09)
Sex	Men	41.0	42.6	0.04	1.00
	Women	59.0	57.4		0.96 (0.92, 1.00)
Employment status	No working	41.0	39.5	0.04	1.00
	Working	59.0	60.5		1.04 (1.00, 1.09)*
Living situation	Alone	17.5	12.5	<0.001	1.00
	Live with others	82.5	87.5		1.12 (1.05, 1.19)*
Families living close to each other	Absent	56.8	56.3	0.52	1.00
	Present	43.2	43.7		1.00 (0.96, 1.03)
Residence year (years)	≤10	11.2	11.6	0.74	1.00
	10 to 19	17.8	17.7		1.00 (0.93, 1.08)
	≥20	71.0	70.7		0.98 (0.91, 1.05)
Housing type	Solitary	92.4	93.4	0.01	1.00
	Other	7.6	6.6		0.99 (0.91, 1.08)
The environment of nursing care in the residential area	Not sufficient	84.6	81.4	<0.001	1.00
	Sufficient	15.4	18.6		1.05 (1.00, 1.10)*
Ease of walking on the surrounding streets	Not satisfied	35.9	35.2	0.32	1.00
	Satisfied	64.1	64.8		0.98 (0.94, 1.02)
Natural surroundings in the community	Not satisfied	8.8	5.0	<0.001	1.00
	Satisfied	91.2	95.0		1.18 (1.07, 1.31)*
Convenience of daily shopping, medical care, welfare, cultural facilities	Not satisfied	68.8	66.1	<0.001	1.00
	Satisfied	31.2	33.9		1.03 (0.98, 1.07)
Engage with your neighbors and community	Not satisfied	27.8	26.1	0.01	1.00
	Satisfied	72.2	73.9		0.98 (0.94, 1.03)
Presence of people in the community who can be consulted about problems	Absent	34.7	28.8	<0.001	1.00
	Present	65.3	71.2		1.05 (1.00, 1.10)*
Degree of relationship with neighbors	Almost no relationship	30.9	28.0	<0.001	1.00
	Talking if met	69.1	72.0		0.98 (0.94, 1.03)
Close friends in the community	Absent	29.1	22.4	<0.001	1.00
	Present	70.9	77.6		1.09 (1.03, 1.15)*
Social participation	Absent	95.1	93.8	<0.001	1.00
	Present	4.9	6.2		1.01 (0.94, 1.08)
Attachment to the neighbors	Absent	56.7	50.6	<0.001	1.00
	Present	43.3	49.4		1.03 (0.99, 1.07)

(Table 1) contd....

Variable	Category	Location Preference for Long-term care		p-value ¹	Multivariate PR (95% CI) ^{2,3}
		Other than Home (%)	Home (%)		
<p>Note: ¹ p-values were calculated by chi-square test ² Negative binomial regression model adjusting for residential area ³ All variables were introduced into the multivariate model * P<0.05</p>					

Table 2. Factors associated with preferred place of long-term care by sex.

Variable	Category	Multivariate PR (95% CI) ^{1,2}	
		Men (n = 1,733)	Women (n = 2,380)
Age(years)	≤ 39	1.00	1.00
	40 to 64	0.92(0.77,1.09)	0.92(0.82,1.04)
	≥65	0.94(0.79,1.12)	0.98(0.87,1.11)
Employment status	No working	1.00	1.00
	Working	1.07(1.00,1.15)*	1.01(0.94,1.02)
Living situation	Alone	1.00	1.00
	Live with others	1.35(1.16, 1.57)*	0.95(0.88,1.07)
Families living close to each other	Absent	1.00	1.00
	Present	1.00(0.95,1.06)	0.98(0.94,1.03)
Residence year(years)	≤10	1.00	1.00
	10 to 19	1.01(0.91,1.13)	1.00(0.91,1.10)
	≥20	0.97(0.88,1.07)	0.99(0.90,1.08)
1.07Housing type	Solitary	1.00	1.00
	Other	0.96(0.83,1.11)	1.02(0.92,1.12)
The environment of nursing care in the residential area	Not sufficient	1.00	1.00
	Sufficient	1.03(0.95,1.10)	1.05(0.99,1.12)
Ease of walking on the surrounding streets	Not satisfied	1.00	1.00
	Satisfied	0.94(0.88,1.00)	1.01(0.96,1.06)
Natural surroundings in the community	Not satisfied	1.00	1.00
	Satisfied	1.13(0.98,1.31)	1.17(1.02,1.37)*
Convenience of daily shopping, medical care, welfare, cultural facilities	Not satisfied	1.00	1.00
	Satisfied	1.06(0.99,1.13)	0.99(0.93,1.05)
Engage with your neighbors and community	Not satisfied	1.00	1.00
	Satisfied	0.98(0.92,1.05)	0.95(0.89,1.01)
Presence of people in the community who can be consulted about problems	Absent	1.00	1.00
	Present	1.03(0.97,1.10)	1.06(0.99,1.14)
Degree of relationship with neighbors	Almost no relationship	1.00	1.00
	Talking if met	0.96(0.90,1.03)	0.98(0.91,1.05)
Close friends in the community	Absent	1.00	1.00
	Present	1.11(1.03,1.19)	1.06(0.98,1.11)
Social participation	Absent	1.00	1.00
	Present	1.01(0.91,1.13)	1.00(0.91,1.10)
Attachment to the neighbors	Absent	1.00	1.00
	Present	1.07(0.98,1.17)	1.17(1.07,1.27)*
<p>Note: 1 Negative binomial regression model adjusting for residential area 2 All variables were introduced into the multivariate model * P<0.05</p>			

Table 3. Factors associated with preferred place of long-term care by age categories.

Variable	Category	Multivariate PR (95% CI) ^{1,2}		
		Age ≤ 39 Years (n = 189)	Age 40 to 64 Years (n = 1,210)	Age ≥ 65 Years (n = 2,714)
Sex	Men	1.00	1.00	1.00
	Women	0.86(0.71, 1.03)	0.96(0.92, 1.01)	0.90(0.84, 0.98)
Employment status	No working	1.00	1.00	1.00
	Working	1.96(0.94, 4.06)	1.01(0.97, 1.06)	1.03(0.89, 1.19)
Living situation	Alone	1.00	1.00	1.00
	Live with others	0.69(0.43, 1.03)	1.11(1.04, 1.18)	0.99(0.83, 1.17)
Families living close to each other	Absent	1.00	1.00	1.00
	Present	1.06(0.90, 1.26)	0.99(0.95, 1.03)	0.96(0.89, 1.03)
Residence year(years)	≤10	1.00	1.00	1.00
	10 to 19	0.99(0.79, 1.23)	1.00(0.92, 1.08)	1.05(0.94, 1.16)
	≥20	0.95(0.73, 1.23)	0.99(0.92, 1.06)	0.99(0.89, 1.09)
Housing type	Solitary	1.00	1.00	1.00
	Other	0.79(0.50, 1.24)	1.00(0.92, 1.09)	0.92(0.77, 1.09)
The environment of nursing care in the residential area	Not sufficient	1.00	1.00	1.00
	Sufficient	1.04(0.83, 1.31)	1.04(0.99, 1.09)	1.06(0.97, 1.17)
Ease of walking on the surrounding streets	Not satisfied	1.00	1.00	1.00
	Satisfied	1.00(0.84, 1.20)	0.97(0.93, 1.02)	1.04(0.96, 1.12)
Natural surroundings in the community	Not satisfied	1.00	1.00	1.00
	Satisfied	0.85(0.71, 1.02)	1.18(1.06, 1.32)	1.24(0.98, 1.57)
Convenience of daily shopping, medical care, welfare, cultural facilities	Not satisfied	1.00	1.00	1.00
	Satisfied	1.03(0.86, 1.24)	1.02(0.98, 1.06)	1.04(0.96, 1.13)
Engage with your neighbors and community	Not satisfied	1.00	1.00	1.00
	Satisfied	0.85(0.70, 1.04)	0.97(0.92, 1.01)	0.87(0.80, 0.95)*
Presence of people in the community who can be consulted about problems	Absent	1.00	1.00	1.00
	Present	1.30(0.98, 1.73)	1.04(0.99, 1.09)	1.05(0.96, 1.15)
Degree of relationship with neighbors	Almost no relationship	1.00	1.00	1.00
	Talking if met	1.00(0.82, 1.21)	0.97(0.93, 1.02)	1.00(0.91, 1.08)
Close friends in the community	Absent	1.00	1.00	1.00
	Present	1.02(0.84, 1.24)	1.09(1.03, 1.15)*	1.08(0.98, 1.19)
Social participation	Absent	1.00	1.00	1.00
	Present	1.35(1.06, 1.73)	1.01(0.94, 1.08)	1.12(0.94, 1.33)
Attachment to the neighbors	Absent	1.00	1.00	1.00
	Present	1.08(0.88, 1.34)	1.13(1.06, 1.20)	1.09(0.98, 1.20)

1 Negative binomial regression model adjusting for residential area
 2 All variables were introduced into the multivariate model
 * P<0.05

4. DISCUSSION

This cross-sectional study reveals that a number of factors can be significantly associated with the preference for long-term home care. Many of these factors relate to the environment of the residential area and the presence of interpersonal relationships.

Participants who live with others showed a greater preference for long-term home care. This finding is consistent with a previous study. Matsumoto *et al.* [10] found that living alone or with only one family member significantly increased the desire to move (multivariate odds ratio: 2.61; 95% CI: 1.56 – 4.37) among 2,500 Japanese people aged 40 to 64 years when they were unable to walk outside alone. The Japanese long-term care insurance program was launched in 2000 with the

aim of reducing the burden of family caregiving [11]. However, 36.1% of Japanese older adults still want to receive long-term care from their families [12]. People who receive the benefit of family support may feel more strongly about the value of long-term home care than those who live alone. In addition to this, Sergeant and Ekerdt [13], in their qualitative study, suggested that family members' intentions play an important role in older adults' decisions to relocate.

Being employed is positively associated with the preference for long-term home care, which is consistent with a report that found that being employed was positively associated with the preference to be at home when receiving end-of-life care (multivariate odds ratio: 1.347; 95% CI: 1.250 – 1.452) among 20,204 Japanese individuals aged over 65 years [14]. Individuals may perceive moving as being more difficult when

they are currently working. Furthermore, the authors suggest that employees might not realize when they will need care at home and may not foresee the burden and economic consequences of home care on their families. Thus, they may choose homes as their preferred place of long-term care.

Respondents who felt satisfied with the nursing care environment in the residential area showed a greater preference for long-term home care. This association may be explained by the accessibility of information on social services. Sugimoto *et al.* [15] found that a preference for receiving long-term care at a facility was significantly associated with fewer information sources about social services or municipality policies (multivariate odds ratio: 1.20; 95% CI: 1.02–1.42) among 539 Japanese individuals aged 40 – 64 years. Considering the association between concerns about home care (*e.g.*, being unable to respond to sudden changes adequately) and non-home preference [16], increasing the number of information sources and subsequent knowledge of social services may alleviate concerns and support the selection of receiving home care service for those who want it. To realize this, the provision of care service information from multiple sources will also be necessary.

Those who responded affirmatively to the presence of people in the community who can be consulted about problems and close friends in the community showed a greater preference for long-term home care. Sergeant *et al.* [17] reported that among 5,020 US residents 50 years of age and older, individuals without friends in their neighborhood were more likely to move (multivariate odds ratio: 1.671; 95% CI: 1.504 – 1.855). Sergeant and Ekerdt [13], in their qualitative study, argue that proximity to amenities plays an important role in older adults' decisions to relocate. A narrative literature review [18] shows that social ties to friends in a community can promote aging in place by developing beyond the agreed rules and remits of the 'formal' service and incorporating various forms of supplementary assistance and social activities. Satisfaction with the natural surroundings of the community also showed a greater preference for long-term home care. These results are consistent with a framework of relocation among older people put forth by Litwak and Longino [19], which presented the case of moving for the sake of good amenities.

Satisfaction with Engaging with your neighbors and community for 65 years or older was negatively associated with the preference for long-term home care. These connections with others and communities, referred to as social capital, create trust and reciprocal exchange and are assumed to be more beneficial in the preservation of social norms and the capacity to engage in collective action [20]. On the other hand, norms facilitate social coordination and collective problem-solving while imposing restrictions on other parties' actions. Receiving long-term home care is also a burden on neighbors. For older individuals, this dark side of social capital [21] may make them hesitant to receive long-term home care.

LIMITATIONS OF THE STUDY

The findings from this research have some limitations. First, we cannot rule out a temporal relationship due to the

nature of cross-sectional research. Second, this study was conducted in four areas in Japan. Accordingly, there may be questions about the generalizability of these findings. Thirds, a selection bias of participants with high health consciousness might influence the outcomes of this study. The response rate for the survey was low. Possible reasons for the low response rate included householders who were unable to contact the neighborhood association officer responsible for collecting the survey because they were working during the day and very old or handicapped householders who were unable to respond to the self-administered survey may not have been included in the survey respondents. Fourth, the questions and the options used in this study have not been validated.

CONCLUSION

This study revealed that feeling satisfaction of the environment of nursing care in the residential area, satisfaction with the natural surroundings in the community, the presence of people in the community who can be consulted about problems, and the presence of close friends in the community were significantly associated with the preference for long-term home care. Municipalities should consider older adults' social and inter-personal associations to support their preference of receiving home care services.

LIST OF ABBREVIATIONS

PRs	=	Prevalence Ratios
FCS	=	Fully Conditional Specification

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Ethics Review Committee of the Osaka City University Graduate School of Human Life Science.

HUMAN AND ANIMAL RIGHTS

No animals were used for studies that are the basis of this research. All human procedures followed were under the guidelines of the Helsinki Declaration of 1975.

CONSENT FOR PUBLICATION

Submission of self-completed questionnaires was considered an agreement to participate in the research. Authors only accessed fully anonymized data.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of this study are available within the article.

STANDARDS OF REPORTING

STROBE guidelines were followed.

FUNDING

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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Declared none.

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