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To cite this article: Yusuke Yabutani & Nobuhiro Yamada (2022): Conditions facilitating the participation of residents of older apartment complexes in community activities in Japan: basic study on community support measures, Journal of Asian Architecture and Building Engineering, DOI: [10.1080/13467581.2021.2008399](https://doi.org/10.1080/13467581.2021.2008399)

To link to this article: <https://doi.org/10.1080/13467581.2021.2008399>



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Published online: 06 Jan 2022.



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Conditions facilitating the participation of residents of older apartment complexes in community activities in Japan: basic study on community support measures

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ABSTRACT

The problem of social isolation is more acute in older apartment complexes, requiring the enhancement of community functions by encouraging residents to participate in community activities. This study aimed to identify the conditions that encourage residents to participate in community activities, based on each participation characteristic, in an older apartment complex. A questionnaire survey was conducted of all residents aged 20 years or older in the Akebono apartment complex in Sapporo City, Japan, and 201 responses were collected. Chi-square tests and residual analysis were used to clarify the attributes and participation conditions for each participation characteristic of the residents. Significantly more residents in their 70s living with their spouses were willing to participate on an ongoing basis. Participation conditions included a high level of community contribution, enjoyment, acquisition of skills, and interaction. Results indicated that residents who wanted to participate in the future were significantly more likely to be in their 50s and to have lived in the complex for less than five years; their requirements included hobby activities, enjoyment, and interaction. Residents who did not want to participate were significantly more likely to be in their 40s.

ARTICLE HISTORY

Received 25 June 2021
Accepted 11 November 2021

KEYWORDS

Apartment complex;
community activity;
community development;
housing complex;
participation condition

1. Introduction

1.1. Study background

After the Second World War, many housing complexes were constructed to solve the global housing shortage, particularly in Western countries (Matsumura 2001). These housing complexes were plagued with problems such as increasing vacancies, devastated communities, and deteriorating public safety due to the aging of the buildings and residents and the low standard of specifications as compared to the modern age, and some complexes were considered abandoned when residents disappeared and the complexes were no longer managed (Matsumura 2001). Physical improvements of housing complexes as well as housing complex and community revitalization are being conducted to solve these problems (Matsumura 2001).

The Japan Housing Corporation, now referred to as the Urban Renaissance Agency (UR), was established in 1955 to alleviate the housing shortage caused by Japan's rapid economic growth, and a large number of public apartment complexes were built in the suburbs of major cities. These apartment complexes were designed to accommodate households with homogeneous lifestyles, and households of the same generation and family structure moved in together. However, these older apartment complexes have experienced

a rapid decline in birthrate, aging population, and population decline in recent years. According to a 2017 survey conducted by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) on municipalities nationwide, many municipalities cited the large number of elderly people (69.7%) and weakening communities (21.1%) as issues faced by their residential complexes (Ministry of Land, Infrastructure, Transport and Tourism 2018). In addition, in the fiscal year 2015, *Kodokushi* (dying alone or lonely deaths) among the elderly (65 years old or older) occurred in approximately 750,000 rental housing units operated and managed by the Urban Renaissance Agency, an increase of 1.5 times compared to the fiscal year 2008 (Cabinet Office 2017). Thus, the problem of social isolation and *Kodokushi* due to poor community functioning has become more acute. Additionally, a decline in community functions is thought to lead to a decline in the well-being of these residents.

A variety of community activities,¹ including neighborhood association activities, can improve residents' quality of life by enhancing community functioning (Ouchi 1993). However, as the functioning of the community declines, community activity systems tend to weaken. Additionally, the quality of public services is declining because of the financial difficulties of local

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¹In this study, we defined community activities as activities that residents work on jointly and proactively to improve the living environment of the community and community interaction, including neighborhood association activities and hobby club activities.

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governments. Subsequently, to ensure a stable life for apartment complex residents in the future, they will be required to manage their communities independently.

Community design has been attracting attention in Japan in recent years for its potential to solve regional problems through expert community intervention and activation of community activities. For experts to support the community effectively, it is necessary to consider how to support each resident according to their characteristics. In other words, it is important to understand the current situation and intentions of residents in apartment complexes and the conditions of activities to encourage their participation in community activities.

1.2. Literature review

Several recent studies on community activities have investigated the impact of participation and related factors. For example, it has been reported that participation in community activities among the elderly can lead to mental health benefits, prevention of quality of life (QOL) decline (Lindsay-Smith et al. 2019), and reduction of depressive symptoms (Klinedinst and Resnick 2014). It has also been reported that participation in community activities with neighbors builds social capital and has a positive impact on health status (Ho et al. 2018) and healthy eating behaviors (Nishio et al. 2021). Furthermore, it has been reported that establishing a sense of belonging to a community and neighborhood through community activities leads to an increase in subjective well-being (Chiang et al., 2013) and life satisfaction (Sener, Terzioglu, and Karabulut 2007). The above effects are also important in public apartment complexes where the birthrate is declining, and the aging population is growing. It has also been reported that sons of fathers who participate in community activities exhibit lower rates of persistent crime (Mahoney and Magnusson 2001), suggesting that community activities can be useful for people other than the elderly.

As related factors for participation in community activities, Willie-Tyndale et al. (2016) conducted a survey of elderly people in Jamaica and found that being a relatively young elderly person (60–69 years old) and having a family were factors for participation. Hattori et al. (2011) conducted a survey of residents who actively participate in community activities and found that the following factors make participation easier: good health, understanding and cooperation of family members, being able to participate with familiar people, proximity to home, and having enough time to participate. Yoshimura and Ishizaka (2012) and Yabutani and Nakahara (2017) classified the motivations for participating in community activities into using spare time, desire for recognition from others, and self-actualization needs, and clarified the

relationship between the type of activity and the role within the activity group. Alternatively, Yabutani, Nakahara, and Shino (2019) reported that elderly people who were reluctant to participate in social activities tended to be late-stage elderly men and early-stage elderly women and tended to live in households with three to four family members living together. The results of Willie-Tyndale et al. and Yoshimura et al.'s studies (Willie-Tyndale et al. 2016; Yabutani, Nakahara, and Shino 2019) are contradictory regarding the age and presence of family members; however, this may be attributable to variations in human characteristics and the nature of community activities among different countries. Thus, further verification is needed.

Kim, Hino, and Fujiwara (2021) reported that the higher the neighborhood residence rate, the higher the number of elderly people's participation in community activities, suggesting that improving the surrounding environment is significant for promoting participation in community activities. Naud et al. (2021) also determined that environmental factors, such as transportation, are disincentives for participation. Because it is challenging to remedy the tangible aspects of the environment in an aging public housing complex, it is necessary to consider ways to support the intangible aspects. For example, it has been shown that rents are higher for apartment complexes with community support programs because of the added value and that this effect is beneficial for larger apartment complexes (Hanson, Hawley, and Turnbull 2018). The implementation of such community support programs is considered an effective measure not only in promoting local activities but also in increasing the value of apartment complexes.

Tomioka, Kurumatani, and Hosoi (2017) cited poor Instrumental Activities of Daily Living as a disincentive to participation and emphasized the importance of encouraging participation in gender-appropriate community activities, as women tend to do. Sone et al. (2018) reported that participants whose partners had functional disabilities were less likely to participate in community activities and underscored the importance of enhancing support systems that include not only patients with disabilities but also their partners, to promote participation in community activities. These studies suggest that the characteristics and circumstances of individuals should be strongly considered when developing a plan to support their community.

Additional studies have been conducted on community activities in apartment complexes. For example, Lai and Sasaki (2020) reported that the practice of utilizing idle space in aging apartment complexes by private organizations contributes to the promotion of community activities and to supporting the livelihood of elderly and vulnerable households. They emphasized that activities related to supporting daily life and meals had the effect of promoting

multigenerational exchange. Additionally, Ishikawa et al. (2017) found that the larger the size of the housing complex, the higher the awareness of the need for salon activities but the lower the willingness to participate, indicating a guideline that easy activities should be offered so that everyone in large apartment complexes can participate. However, the content of activities that everyone can easily participate in has not been clarified. In addition, in recent years, there have been proposals for ways to build sustainable relationships among residents of apartment complexes by combining in-person interaction with interaction through social networks (Kim, Cho, and Chae 2014). As mentioned, studies on community activities in multi-unit apartment complexes have been undertaken; however, thus far, no studies have investigated conditions that might facilitate residents' participation in community activities in multi-unit apartment complexes. This is because the community of residents in multi-family apartment complexes share a common spatial location, which creates a sense of community through the constructive participation and close contact of residents (Kim, Cho, and Chae 2014). Therefore, conducting a survey of residents in multi-family apartment complexes has the potential to provide useful knowledge for considering community support measures. Moreover, it is important to note that previous studies have indicated that there are significant differences in the number of people living in various communities.

Further, existing studies have clarified the effects of participation in community activities and the factors that promote or hinder participation. Many studies have been conducted, especially for the elderly; however, few studies have been undertaken across various generations. In addition, while it is clear that support methods need to be adapted to the characteristics of residents, the conditions for encouraging participation according to characteristics have not been clarified.

1.3. Study purpose

This study aimed to examine community support measures in older public apartment complexes in Japan and identify the conditions necessary to encourage residents to participate in community activities based on their characteristics. Residents were classified into types based on their past participation status in community activities and future intention to participate, and the characteristics of the types and conditions that facilitate their participation were analyzed.

The present study is novel in that it clarifies the human characteristics of various generations of residents of apartment complexes and conditions that facilitate their participation in community activities. The results have social implications, as they can inform the development of effective methods to support residents in apartment complexes based on their characteristics.

2. Methods

2.1. Research location

This study was conducted in the Akebono apartment complex (42°59'N, 141°21'E), located in Makomanai, Minami-ku, Sapporo. The Akebono apartment complex is a five-story reinforced concrete apartment complex built by the Japan Housing Corporation from 1963 to 1967, with 32 buildings, 1,240 dwelling units, and 397 vacant houses² (a vacancy rate of 32.0%; Figure 1). It is located about 7 km south of Sapporo's center and is an approximately 25-minute walk from the nearest station, Makomanai subway station. According to the 2015 census, the complex has a population of 1,471, which comprises an aging population of 49.4% (2015). Considering that the average aging rate of UR apartment complex nationwide is 34.8%, the complex is experiencing a particularly severe decline in the number of children and younger residents and an increasingly aging population. Only about 60% of all households in the complex are members of the community association, which considerably increases the vulnerability of the community.

Minami Ward was the first ward in Sapporo to experience a population decline, and its aging rate of 31.9% (2015) is the highest in the city. Makomanai is the center of the ward and was the main venue for the Sapporo Olympics held in 1972. The Akebono-cho area, where the Akebono Complex is located, was the first area in Makomanai to be developed, and it flourished as the gateway to Makomanai. However, the opening of the Makomanai subway station in 1971, coinciding with the Olympics, moved the center of Makomanai to the station area, and Akebono-cho began to decline (Figure 2)..

In the decade after the establishment of the Japan Housing Corporation, 16 apartment complexes with more than 1,000 units under management, including the Akebono apartment complex, were developed.³ However, the Akebono apartment complex is one of the few large apartment complexes built soon after the establishment of the still existing Japan Housing Corporation. As this study aims to clarify the conditions

²In the Akebono apartment complex, the number of vacant houses was visually verified when distributing the questionnaires by blocking the entrance mailboxes of vacant houses with tape.

³"List of Individual Housing Stock Types for UR rental housing stock (Draft)" published by the Urban Renaissance Agency. https://www.ur-net.go.jp/chintai_portal/stock/index.html, Accessed on 4 December 2020.

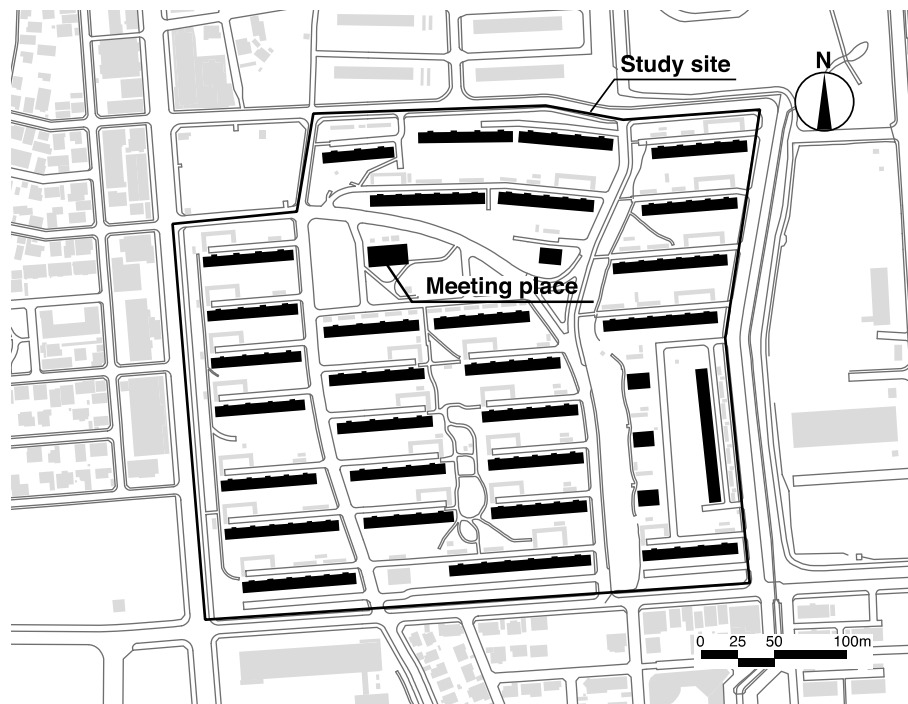


Figure 1. Block plan of the Akebono apartment complex.

for residents' participation in community activities in older apartment complexes with a significant decline in community functioning, it was appropriate to focus on the Akebono apartment complex, as it is a large complex with a variety of participation characteristics among residents, and various social problems, such as a low birth-rate, an aging population, an increase in vacancies, and a decline in the community association membership rate, all of which are worsening.

2.2. Survey items

A survey was conducted to understand the characteristics of and conditions for participation in community activities⁴ among the Akebono apartment complex residents. Four main items were included in the questionnaire: (1) basic attributes, (2) frequency of going out, (3) participation in community activities, and (4) conditions for facilitating participation (Table 1).

The frequency of using the Honcho shopping street, located near the housing complex, was included in (2) frequency of going out, as we assumed a relationship between this aspect and participation in community activities. The survey was conducted using the same method as in the previous study (Yabutani and Nakahara 2017), and respondents were asked to identify their participation status according to four levels of participation: "Participate as a planner and manager," "Often participate," "Sometimes participate," and "I have never participated." The respondents were also asked to

indicate their intention to participate in the future, using the same four response levels: "Want to participate as a planner and manager," "Want to participate," "Want to participate sometimes," and "Do not want to participate." The respondents who answered "Never participated" or "Do not want to participate" for either question were asked to provide a reason for their choice, using a descriptive question. They then answered 18 questions about the community activities they were interested in, which were included in the questionnaire based on previous research (Mizuno et al. 2012; Ushiyama and Shioji 2005; Nishimura et al. 2000).

With regard to the conditions for facilitating participation, the respondents were asked to respond to 20 items on five levels that were based on previous studies (Hattori et al. 2011; Mizuno et al. 2012; Tsunemoto, Majima, and Noguchi 1999): "Not at all true (1 point)," "Not really true (2 points)," "Neither true nor untrue (3 points)," "Somewhat true (4 points)," and "Very true (5 points)."

The above survey items were reviewed by two experts in architecture and urban planning to ensure their neutrality.

2.3. Survey implementation

With the cooperation of the Urban Renaissance Agency and the Akebono Apartment Complex Community Association, a request for participation open to all households was posted on the bulletin board on the first floor of the stairwell in each apartment block. The

⁴The specific community activities shown to the respondents in this survey are presented in Figure 5.

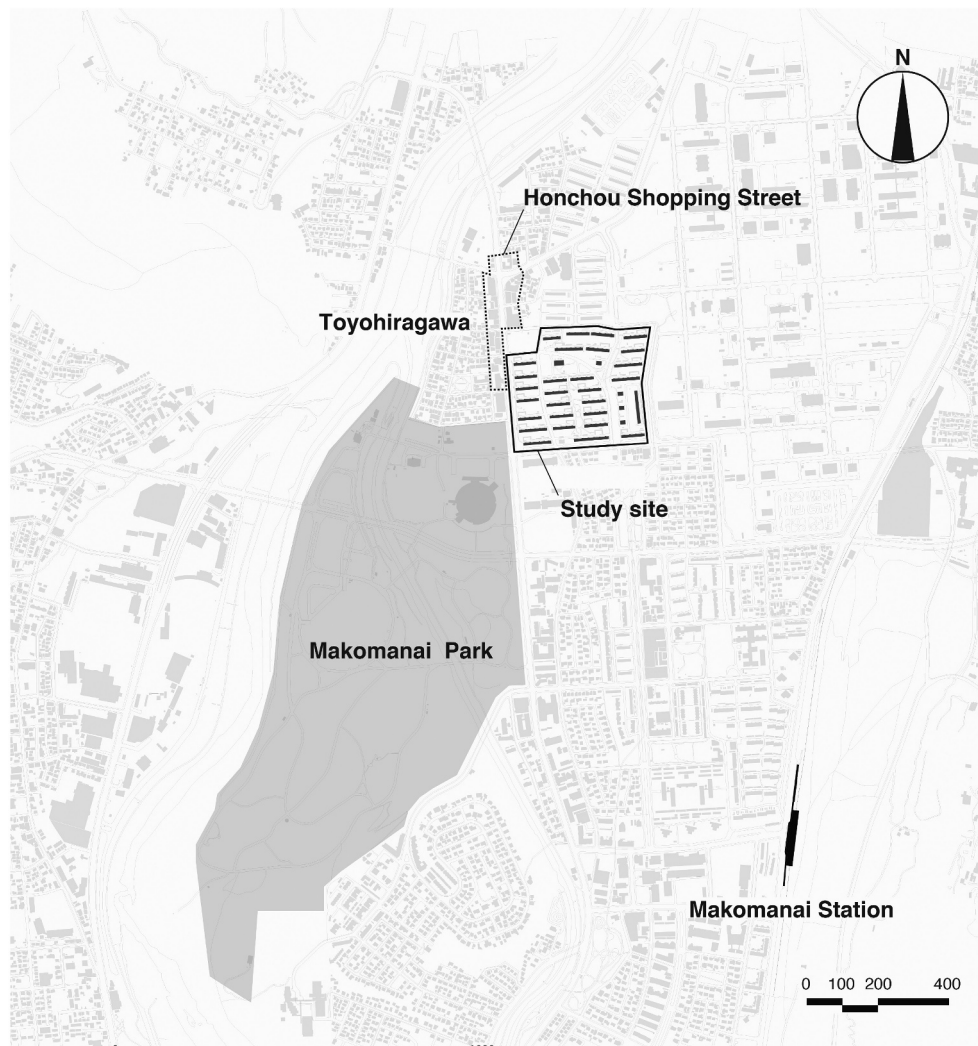


Figure 2. Positional relationships of the Akebono apartment complex in Makomanai.

questionnaires were distributed by posting envelopes containing two anonymous questionnaires and a request for survey cooperation at the entrance to all the residences in the Akebono apartment complex (except for vacant units and units with a “no flyers” notice). Residents aged 20 years or older were asked to respond. Collection bags were placed on bulletin boards located on the first floor of each stairwell, and they were collected at a later date. We adopted the questionnaire method for two reasons: it eliminates researcher bias and it allows us to survey all residents to assess the trend of the entire complex. Questionnaires were distributed through post because many of the target respondents were elderly, and the collection rate was expected to be higher than that of an Internet survey. The survey was conducted in August 2017, with 835 envelopes distributed and 338 envelopes collected (40.5% collection rate). In total, 1,670 questionnaire sheets were distributed, and 422 sheets were collected (25.3% recovery rate; [Table 1](#)).

2.4. Analysis method

First, we conducted a simple tabulation of the questionnaire to assess the overall trend of the apartment complex. Next, a factor analysis was conducted based on the responses to 20 items regarding the conditions for participation in community activities. The validity of the factor analysis will be discussed in [Section 4.4](#). In addition, the residents of the apartment complex were categorized based on their participation in community activities and their intention to participate. To clarify the characteristics of each type, we created a cross tabulation table between each type and basic attributes and conducted a χ^2 test and residual analysis. All numerical values of each group obtained by cross tabulation are independent, and the χ^2 test and residual analysis are appropriate as methods to derive significant differences among the types. Upon completion of the questionnaire survey, the number of valid responses was 201 (valid response rate: 12.0%),⁵ and it was judged that a sufficient number of samples was

⁵The valid response rate is calculated as the proportion of valid responses to the number of distributed questionnaires. As two questionnaires were distributed per household, with one response per person, questionnaires distributed to households with only one person were not relevant, but those questionnaires were also included in the number of questionnaires distributed.

Table 1. Survey outline.

Purpose	To understand the characteristics of and conditions for participation in community activities among residents of the Akebono apartment complex
Target population	Resident in Akebono apartment complex for 20 years or more
Method	Two questionnaires in an envelope, delivered to each house by mail
Period	August, 2017
Questionnaire items	<ol style="list-style-type: none"> 1. Basic attributes Gender/Age/Occupation/Period of residence Composition of the family living together Household income 2. Frequency of going out Frequency of going out Frequency of using Honcho shopping street 3. Participation in community activities Participation condition/Participation intention Community activities that interest you 4. Condition for facilitating participation
Number of questionnaires distributed	Number of returned questionnaires
Response rates	Envelopes: 835 Questionnaires: 1670 Envelope: 40.5% Questionnaire: 25.3%
Valid responses	Rate: 12.0% Envelopes: 338 Questionnaires: 422

Table 2. Cross-tabulation of participation statuses and intentions in community activities.

Participation status	Participation intention				Total
	Want to participate as a planner and manager	Want to participate	Want to participate sometimes	Does not want to participate	
Participate as a planner and manager	1	11	4	7	7 (3.5%)
Participate often	2	11	5	9	9 (4.5%)
Sometimes participate		2	76	84	84 (41.8%)
Never participated		43	43	101	101 (50.2%)
Total	2 (1.0%)	8 (4.0%)	128 (63.7%)	63 (31.3%)	201 (100%)

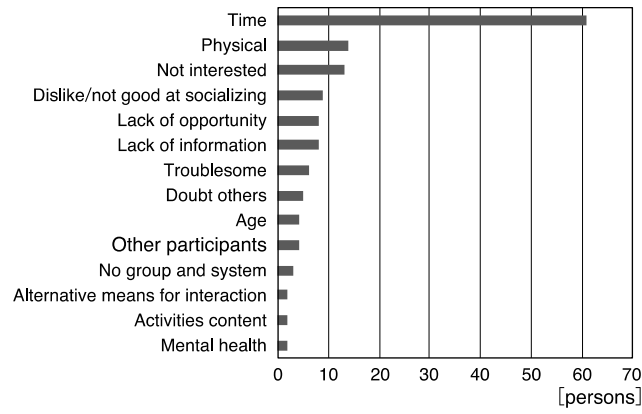


Figure 3. Reasons for non-participation in community activities.

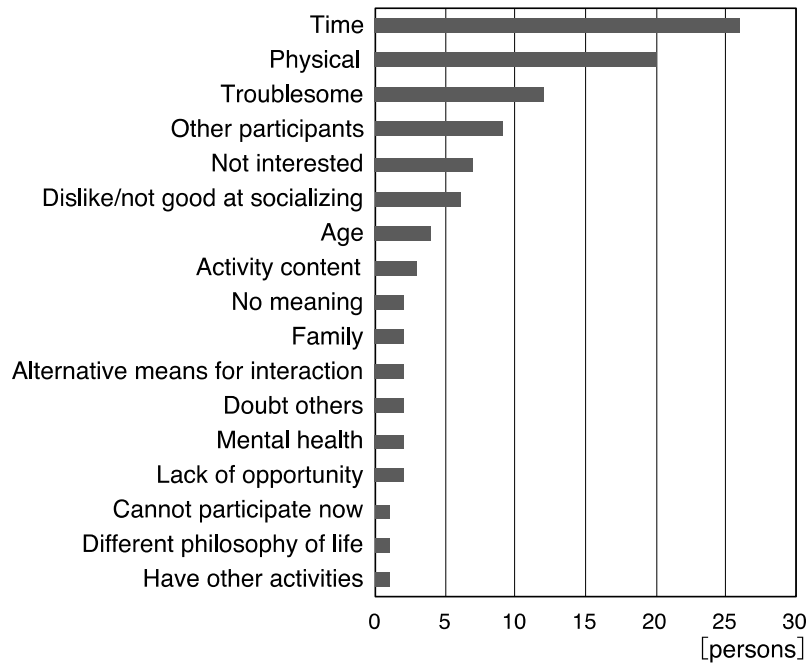


Figure 4. Reasons for not wanting to participate in community activities.

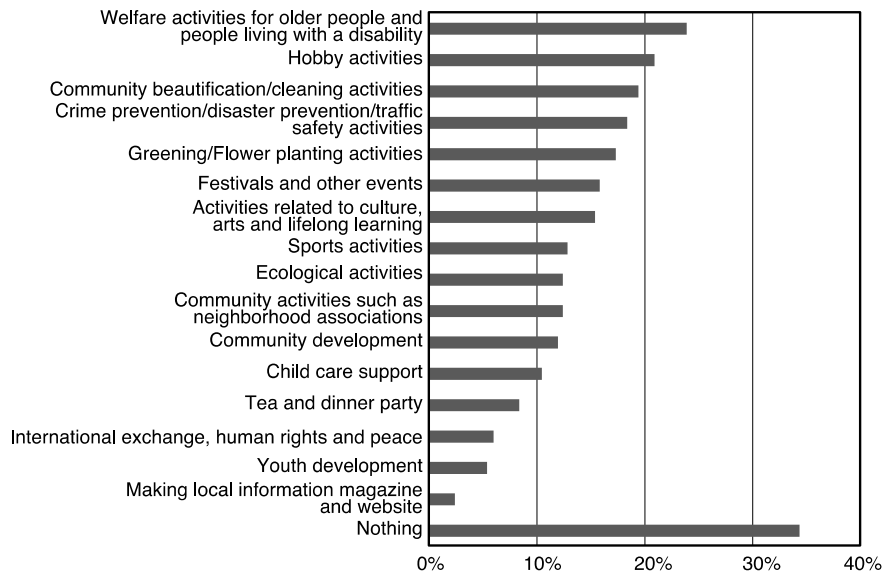


Figure 5. Community activities of interest.

Table 3. Factor analysis results.

Conditions/items for facilitating participation	Factor1 Activity content and Interaction	Factor2 Burden reduction	Factor3 Participation with acquaintances	Factor4 Fairness
You can acquire knowledge and skills	0.777	-0.079	-0.041	0.083
You enjoy the activity	0.734	0.064	-0.067	0.045
You can utilize your hobbies and skills	0.733	-0.103	0.032	0.068
You can talk with people	0.71	-0.043	0.177	-0.144
You are interested in the content	0.705	0.057	-0.191	0.215
You can interact with different generations	0.676	-0.094	0.185	0.034
The facility serves as a base for activities	0.662	0.137	-0.057	-0.117
You can participate at your convenience	0.62	0.274	-0.068	0.066
You can interact with people of your own generation	0.541	0.007	0.364	-0.116
There is cooperation and understanding from your family	0.364	-0.105	0.343	0.089
Your work burden is low	-0.193	0.842	0.169	0.073
Your economic burden is low	0.201	0.827	-0.199	-0.218
Your time burden is low	-0.164	0.669	0.139	0.214
The location of the activity is convenient	0.205	0.562	0.060	0.030
You have an acquaintance in the group	-0.146	0.131	0.742	0.100
You can interact with your friends or people close to you	0.335	-0.027	0.666	-0.122
The system and activities are conducted transparently and fairly	0.046	-0.062	-0.035	0.947
It is easy to build relationships	-0.013	0.135	0.087	0.567
The activities serve the community	0.343	0.086	0.012	0.414

obtained to conduct the above statistical analysis. The computer program used for the statistical analysis was MacOS Sierra 10.12.5, and the software used was R for Mac (version 3.4.1).

3. Characteristics of residents in the Akebono apartment complex

3.1. Basic attributes of the apartment complex residents

With regard to gender, 48.3% of the respondents were men, and 51.7% were women. According to the census, 44.8% of the residents were men, and 55.2% were women; thus, there was no significant bias. The most common age group was "70–79 years" (25.9%), and 50.2% of the respondents were aged 65 or older, half of whom were older adults. This is almost the same as the proportion of older adults in Japan, according to the national census; thus, it can be assumed that an unbiased sample of older adults was obtained.

The most common response for occupation was "No occupation" (34.3%), which may be because many of the respondents were elderly. Regarding the composition of family members living with the respondents, the most common response was "Single" (40.1%), suggesting that there are many single elderly people among the respondents. When asked about household income (including pension), the highest percentage was in the range of "2 to 3.99 million yen (approximately 18,000 to 36,000 USD)" (47.8%), followed by "1 to 1.99 million yen (approximately 9,000 to 18,000 USD)" (32.2%). According to the National Tax Agency (2018), the average annual salary of salaried

workers in Japan at the time of the survey was 4.32 million yen (approximately 38,880 USD), and evidently, many residents earned less than that amount.

3.2. Frequency of going out and Honcho shopping street

The most common answer for the frequency of going out was "Almost every day" (49.3%), followed by "3–5 times a week" (25.9%), demonstrating that three-quarters of all respondents go out three or more times a week. Also, 17.4% of respondents answered "1–2 times a week," demonstrating that 90% of all respondents go out at least once a week. However, 3.5% went out "Once a fortnight," 2.5% went out "Once a month," and 1.5% went out "Rarely."

With respect to the frequency of using Honcho shopping street, the most common answer was "Rarely" (34.8%), followed by "Once or twice a week" (29.9%). There are two groups among the participants: those who use Honcho shopping street and those who do not. However, the number of residents who used the service "Almost every day" (2.0%) and "3–5 times a week" (6.5%) was generally low (Table 5).

4. Participation in community activities by apartment complex residents

4.1. Past participation status in community activities

The most common answer for past participation status in community activities was "Never participated" (50.2%), followed by "Sometimes participate"

Table 4. Typification by participation status and intention in community activities.

Types		n	%	n	%
I. Continuous participation	i. Management – Management	2	1.0	94	46.8
	ii. Management – Participation	5	2.5		
	iii. Participation – Participation	87	43.3		
II. Participation intention	iv. Non-participation – Participation	44	21.9	44	21.9
III. Non-participation	v. Participation – Non-participation	6	3.0	63	31.3
	vi. Non-participation – Non-participation	57	28.4		
Total		201	100.0	201	100.0

(41.8%). However, the proportions of “Participate as a planner and manager” (3.5%) were very low (4.5%; Table 2). Overall, the number of residents who actively participate in community activities is small,

suggesting that the burden of running community activities is unevenly distributed among some residents.

The reasons for “Never participated” were divided into categories based on the interpretation of respondents’ answers to the open questions (summarized in Figure 3). As the number of written respondents was only 91, we included the results for 50 non-valid respondents and summarized the results for 141 respondents. The most common reason was “Time reasons” (n = 61), and this was due to “Lack of time,” “Time does not fit,” and “Busy with work.” In the study by Hattori et al. (2011), having enough time was also cited as a condition for participation, and it became clear that securing time for community activities is an issue. The next most common reason was “Physical reasons” (14 respondents), which is believed to be related to the predominance of elderly people.

Table 5. Cross-tabulation of type of participation in community activities and basic attributes.

Basic attributes		I. Continuous participation			II. Participation intention			III. Non-participation			Total	
		n	%	p-value	n	%	p-value	n	%	p-value	n	%
Gender	Man	48	23.9%		22	10.9%		27	13.4%		97	48.3%
	Woman	46	22.9%		22	10.9%		36	17.9%		104	51.7%
Age (years)	20–29	2	1.0%		1	0.5%		1	0.5%		4	2.0%
	30–39	4	2.0%		1	0.5%		5	2.5%		10	5.0%
	40–49	2	1.0%	**	7	3.5%		13	6.5%	**	22	10.9%
	50–59	12	6.0%	*	15	7.5%	**	13	6.5%		40	19.9%
	60–64	12	6.0%		1	0.5%	*	11	5.5%		24	11.9%
	65–69	18	9.0%		8	4.0%		4	2.0%	*	30	14.9%
	70–79	34	16.9%	**	10	5.0%		8	4.0%	**	52	25.9%
	≥80	10	5.0%		1	0.5%	+	8	4.0%		19	9.5%
Occupation	Office worker	19	9.5%		11	5.5%		18	9.0%		48	23.9%
	Public servant	0	0.0%		0	0.0%		1	0.5%		1	0.5%
	Self-employed	4	2.0%		2	1.0%		5	2.5%		11	5.5%
	No occupation	41	20.4%	**	10	5.0%	+	18	9.0%		69	34.3%
	Housewife	16	8.0%		4	2.0%		7	3.5%		27	13.4%
	Part-timer	12	6.0%		9	4.5%		8	4.0%		29	14.4%
	Other	2	1.0%	**	8	4.0%	**	6	3.0%		16	8.0%
Period of residence (years)	<5	6	3.0%	*	9	4.5%	*	8	4.0%		23	11.4%
	5–9	10	5.0%		5	2.5%		14	7.0%	*	29	14.4%
	10–19	40	19.9%	+	15	7.5%		17	8.5%	+	72	35.8%
	20–29	18	9.0%	+	4	2.0%		7	3.5%		29	14.4%
	30–39	7	3.5%	+	7	3.5%		10	5.0%		24	11.9%
	≥40	13	6.5%		4	2.0%		7	3.5%		24	11.9%
Composition of family living together	Single	33	16.4%		24	11.9%	*	24	11.9%		81	40.3%
	Couple with child(ren)	10	5.0%		8	4.0%		10	5.0%		28	13.9%
	Couple	37	18.4%	**	9	4.5%		12	6.0%	*	58	28.9%
	Three generations	2	1.0%		0	0.0%		0	0.0%		2	1.0%
	Other	12	6.0%		3	1.5%	+	17	8.5%	**	32	15.9%
Household income (million yen)	≤0.99	3	1.5%		4	2.0%		4	2.0%		11	5.5%
	1–1.99	27	13.4%		17	8.5%		21	10.4%		65	32.3%
	2–3.99	51	25.4%		17	8.5%		28	13.9%		96	47.8%
	4–5.99	11	5.5%		4	2.0%		8	4.0%		23	11.4%
	≥6	2	1.0%		2	1.0%		2	1.0%		6	3.0%
Frequency of going out	Almost every day	38	18.9%	*	24	11.9%		37	18.4%	+	99	49.3%
	3–5 times a week	29	14.4%		14	7.0%		9	4.5%	*	52	25.9%
	1–2 times a week	22	10.9%	*	5	2.5%		8	4.0%		35	17.4%
	Once a fortnight	5	2.5%		0	0.0%		2	1.0%		7	3.5%
	Once a month	0	0.0%	*	0	0.0%		5	2.5%	**	5	2.5%
	Rarely	0	0.0%		1	0.5%		2	1.0%		3	1.5%
Frequency of using Honcho shopping street	Almost every day	3	1.5%		0	0.0%		1	0.5%		4	2.0%
	3–5 times a week	6	3.0%		4	2.0%		3	1.5%		13	6.5%
	1–2 times a week	38	18.9%	**	9	4.5%		13	6.5%	+	60	29.9%
	Once a fortnight	12	6.0%		6	3.0%		6	3.0%		24	11.9%
	Once a month	12	6.0%		9	4.5%		9	4.5%		30	14.9%
	Rarely	23	11.4%	**	16	8.0%		31	15.4%	**	70	34.8%
Total		94	46.8%		44	**		63	31.3%		201	100.0%

*P < 0.10, *P < 0.05, **P < 0.01.

4.2. Future intention to participate in community activities

The most common response to the question about their intention to participate in community activities was "Want to participate sometimes" (63.7%). Considering that many residents have never participated in community activities, it can be inferred that there are a certain number of residents who have not been able to participate in them but would like to do so in the future. Conversely, the number of respondents who "Want to be involved in planning and management as a main member" (1.0%) is very low, indicating that the lack of future leaders is an issue.

The reasons for not wanting to participate (31.3%) were divided into categories based on the free-text answers (Figure 4). As the number of written responses was 58, we included 44 non-valid respondents and collected information from 102 respondents. The most common answer was "Time reasons" ($n = 26$), and as stated above, this was due to reasons such as "Lack of time," "Time does not fit," and "Busy with work." This was followed by "Physical reasons" ($n = 20$), a trend similar to past participation status.

4.3. Community activities that interest residents

The most common answer for the activities of interest of the apartment complex residents was "None" (34.3%), which is believed to suggest that many of the respondents do not want to participate. They tended to have less interest in "Making local information magazines and websites" (2.5%; Figure 5). This may be because few people have such skills, as many of the respondents are elderly.

4.4. Conditions for participation in community activities

A factor analysis was conducted based on the responses to the 20 items related to the conditions for facilitating participation in community activities. First, the mean, standard deviation, maximum, and minimum values of the 20 items obtained from the 201 participants were determined, and the bias of the distribution of scores was confirmed. As a result, a ceiling effect was found for "You can participate at your convenience," but it was judged that this item was necessary for examining the conditions of participation; therefore, the analysis was carried out without removing it.

Next, a factor analysis was performed using the maximum likelihood method, and, judging from the decay of the eigenvalues by the scree plot, a four-factor solution was adopted, and a factor analysis using the maximum likelihood method and Promax rotation was performed again. To confirm the validity of the correlation matrix of the 19 items, the Kaiser-Meyer-Olkin

measure of sampling (KMO) and Bartlett's test of sphericity were conducted. The result was 0.88 for the KMO; the significance probability of the sphericity test was $p < 0.0001$. This demonstrated that the factor analysis was appropriate, and factor analysis by the maximum likelihood method and Promax rotation was performed again. The final results of the factor analysis are illustrated in Table 3; the shading in Table 3 indicates the coherence of each factor. The results of the analysis for each factor are as follows.

The first factor consisted of 10 items. The factor loadings were particularly high for items related to the content of the activity, such as "You can acquire knowledge and skills," "You enjoy the activity," "You can utilize your hobbies and skills," and "You are interested in the content." Factor loadings for items that require interaction with people, such as "You can talk with people" and "You can interact with different generations," were also particularly high, so we named this factor the "Activity content/interaction" factor.

The second factor consisted of four items. As three items, "Your laborious burden is small," "Your economic burden is small," and "Your time burden is small," had particularly high factor loadings, the burden reduction was used as a condition for participation. Subsequently, we named it the "Burden reduction" factor.

The third factor consisted of two items, "You have your acquaintance in the group" and "You can participate with your friends and close people." This indicates that they were motivated by the desire to enjoy interacting with others. This factor was named the "Participation with acquaintance" factor. The fourth factor consisted of three items; the factor loadings were particularly high for the item "The system and activities are transparent and fair," which was named the "Fairness" factor.

5. Characteristics of and conditions for participation in community activities by apartment complex residents

5.1. Types of participation in community activities by apartment complex residents

A cross-tabulation table (Table 3) of apartment complex residents' status of and intention to participate in community activities was developed and categorized into the following six categories: i. Management–Management (1.0%), ii. Management–Participation (2.5%), iii. Participation–Participation (43.3%), iv. Non-participation–Participation (21.9%), v. Participation–Non-participation (3.0%), and vi. Non-participation–Non-participation (28.4%).

Subsequently, individuals in the i. Management–Management, ii. Management–Participation, and iii. Participation–Participation categories, who have planned and managed community activities in the past or have participated in them in the past and would like to

continue to plan, manage, or participate in them in the future, were combined into the I. Continuous participation group (46.8%). The iv. Non-participation–Participation group comprised residents who have not participated in community activities so far but would like to participate in them in the future, and they were labeled as the II. Participation intention group (21.9%). The v. Non-participation–Participation and vi. Non-participation–Non-participation groups, who do not want to or cannot participate in the future regardless of their past participation or non-participation, were combined into the III. Non-participation group (31.3%). The three types are illustrated in Table 4.

5.2. Characteristics of basic attributes of each participation type

To clarify the characteristics of each type of apartment complex residents' participation in community activities, a cross-tabulation table between each type and the basic attributes was created, and the probability of the significance between each type and attribute was determined using a χ^2 test and a residual analysis (Table 5). Significant differences were found in the χ^2 test for age ($\chi^2 = 43.013$, Df = 14, $p < 0.01$), occupation ($\chi^2 = 22.217$, Df = 12, $p < 0.05$), periods of residence ($\chi^2 = 18.191$, Df = 10, $p < 0.10$), and composition of family living together ($\chi^2 = 21.164$, Df = 8, $p < 0.01$). The results of the residuals analysis for those items are illustrated below.

With regard to age, I. Continuous participation was significantly more common in the "70–79 years" group and significantly less common in the "40–49 years" and "50–59 years" groups. II. Participation intention was significantly more common in the "50–59 years" group and significantly less common in the "60–64 years" group. III. Non-participation was significantly more common in the "40–49 years" group and significantly less common

Table 6. Cross-tabulation of type of participation in community activities and reasons for non-participation.

Reasons for non-participation	II. Participation intention			III. Non-participation		
	n	%	p-value	n	%	p-value
Time	26	18.4%	*	35	24.8%	*
Lack of information	7	5.0%	**	1	0.7%	**
Lack of opportunity	5	3.5%	+	3	2.1%	+
Not interested	1	0.7%	*	12	8.5%	*
No group and system	1	0.7%		2	1.4%	
Physical	1	0.7%	*	13	9.2%	*
Mental	1	0.7%		1	0.7%	
Troublesome	1	0.7%		5	3.5%	
Due to other participants	1	0.7%		3	2.1%	
Doubts about others	1	0.7%		4	2.8%	
Reasons related to contents of activities	0	0.0%		2	1.4%	
Dislike/not good at socializing	0	0.0%	*	9	6.4%	*
Reasons related to age	0	0.0%		4	2.8%	
Have social interaction by alternative means	0	0.0%		2	1.4%	
Total	45	31.9%		96	68.1%	

*P < 0.10, *P < 0.05, **P < 0.01.

in the "65–69 years" and "70–79 years" groups. The older residents were more likely to participate in community activities than the younger residents, and they also tended to want to participate in community activities in the future as they approached retirement. The results differed from those of Willie-Tyndale et al. (2016), who reported that elderly people in their 60s were more likely to participate in community activities than those in their 70s or older. However, this may be because the nature of community activities varies across countries and because other residential environments may differ from apartment complexes in that the latter may offer more opportunities to engage with nearby friends and places for activities.

For occupation, "No occupation" was significantly more common in I. Continuous participation, suggesting that unemployed residents have more time to spare and are actively participating in community activities.

Table 7. Cross-tabulation of type of participation in community activities and activity themes.

Activity themes	I. Continuous participation			II. Participation intention			III. Non-participation		
	n	%	p-value	n	%	p-value	n	%	p-value
Welfare activities for elderly and disabled people	30	14.9%	*	10	5.0%		8	4.0%	*
Hobby activities	22	10.9%		15	7.5%	*	5	2.5%	**
Community beautification/cleaning activities	24	11.9%	*	11	5.5%		4	2.0%	**
Crime prevention/disaster prevention/traffic safety activities	26	12.9%	**	8	4.0%		3	1.5%	**
Greening/flower planting activities	20	10.0%		9	4.5%		6	3.0%	
Festivals and other events	24	11.9%	**	4	2.0%		4	2.0%	*
Activities related to culture, arts, and lifelong learning	20	10.0%	*	5	2.5%		6	3.0%	
Sports activities	16	8.0%		7	3.5%		3	1.5%	*
Ecological activities	15	7.5%		8	4.0%		2	1.0%	**
Community activities such as neighborhood associations	18	9.0%	**	3	1.5%		4	2.0%	+
Community development	18	9.0%	**	5	2.5%		1	0.5%	**
Childcare support	12	6.0%		6	3.0%		3	1.5%	
Tea and dinner parties	10	5.0%		6	3.0%		1	0.5%	*
International exchange, human rights, and peace	5	2.5%		4	2.0%		3	1.5%	
Youth development	7	3.5%		4	2.0%		0	0.0%	*
Creating a local information magazine and website	2	1.0%		2	1.0%		1	0.5%	
Nothing	22	10.9%	**	9	4.5%	*	38	18.9%	**

*P < 0.10, *P < 0.05, ** P < 0.01.

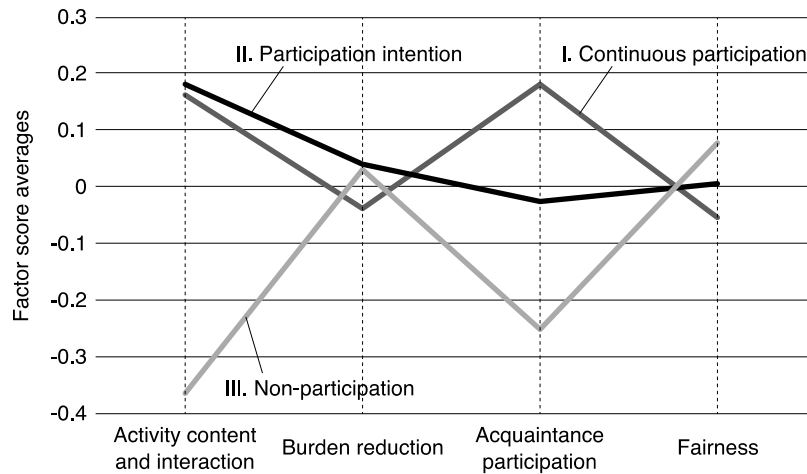


Figure 6. Factor score averages by participation type.

With regard to the period of residence, I. Continuous participation was significantly less common in the “Less than five years” group and tended to be more common in the “10–19 years” and “20–29 years” groups. II. Participation intention was significantly higher in the “Less than five years” group. II. Non-participation was significantly more common in the “5–9 years” group and less common in the “10–19 years” group. In other words, the residents did not participate in community activities when they first moved in, but they would like to participate in them in the future. However, after five to nine years of residence, there was no longer an intention to participate in community activities, while those who lived in the house for 10–29 years were continuously involved in community activities.

For the composition of family living together, I. Continuous participation was significantly higher among “Couples.” For II. Participation intention, “Singles” were significantly more likely to be involved. III. Non-participation was significantly more common in “Others” and less common in “Couples.” Those who lived by themselves did not participate in community activities in the past but would like to participate in them in the future. This result supports the findings of Willie-Tyndale et al. (2016).

5.3. Characteristics of the frequency of going out and using Honcho shopping street

To characterize the outgoing behavior of the residents of this apartment complex by type of participation in community activities, a cross-tabulation table between each type and the frequency of going out and the frequency of using Honcho shopping street was created. The probability of significance with each type was determined using a χ^2 test and residual analysis (Table 5).

The cross-tabulation results between the participation types and the frequency of going out were significantly different: $\chi^2 = 27.513$, Df = 10, $p < 0.01$. The

residual analysis illustrated that the I. Continuous participation group was significantly more likely to select “1–2 times a week” and significantly less “Almost every day” and “Once a month” for visits to Honcho shopping street. II. Participation intention was not significantly different from “1–2 times a week.” For the III. Non-participation group, both “Once a month” and “Almost every day” were significantly more common. However, “3–5 times a week” was significantly less common for this group. Residents who went out more frequently and less frequently were reluctant to participate in community activities, while residents who went out “1–2 times a week” were the most active in community activities.

The χ^2 test results for participation type and frequency of using Honcho shopping street were significantly different: $\chi^2 = 17.323$, Df = 10, $p < 0.05$. The residual analysis revealed that the I. Continuous participation group was significantly more likely to visit “1–2 times a week” and significantly less common to select “Rarely.” The II. Participation intention group was not significantly different. For the III. Non-participation group, “Rarely” was significantly more common, but “1–2 times a week” was less common. Residents who shop at the neighborhood shopping street actively participate in community activities, while residents who rarely use the neighborhood shopping mall are reluctant to participate in community activities.

5.4. Reasons for non-participation by participation type

A cross-tabulation table was created between the participation types (II. Participation intention and III. Non-participation) and the reasons for non-participation, and the significance probability was determined using a χ^2 test and a residual analysis (Table 6). The χ^2 test results demonstrated a significant difference: $\chi^2 = 43.628$, Df = 15, $p < 0.01$. The residual analysis demonstrated that “Time reasons” and “Lack of

information” were significantly more common in II. Participation intention, while “Lack of opportunity” tended to be more common. In other words, there are two main types of residents: those who intend to participate but could not because of time constraints and those who could not participate because of lack of information or opportunities. Those who were not interested, could not participate physically, and disliked/were not good at socializing were significantly more likely to be in the III. Non-participation group. This indicates that there are two major types of residents: those who cannot participate in community activities because of physical reasons such as illness and those who are unwilling to participate in community activities because of lack of interest or poor interaction.

5.5. Interest in community activities by participation type

A cross-tabulation table between the community activities of interest and each participation type was created, and significance probabilities were determined using a χ^2 test and residual analysis. Consequently, significant differences were found for all 13 items, except for “Child care support,” “Greening/Flower planting activities,” and “International exchange, human rights, and peace” (Table 7). The I. Continuous participation group is particularly interested in activities that contribute to the local community, such as “Crime prevention/disaster prevention/traffic safety activities,” “Community activities such as neighborhood associations,” “Festivals and other events,” and “Community development,” which have been carried out by the local community. The II. Participation intention group is particularly interested in hobby activities. However, many residents of the III. Non-participation group responded that they were not interested in the activity. Lai and Sasaki (2020) reported that activities related to supporting the daily life and food requirements of residents can promote multigenerational exchange; however, in the present study, minimal interest in these activities was expressed. To promote multigenerational exchange in apartment complexes, it would be effective to combine activities related to supporting daily life and meals with those of interest to the respondents in this study.

5.6. Conditions for participation in community activities by participation type

To identify the conditions that would make people more likely to participate in community activities for each participation type, the factor scores of all respondents from the factor analysis were standardized, and

the mean factor scores of the four factors for each type were calculated. These are illustrated in Figure 6. The I. Continuous participation group had high values for the “Activity content and interaction” and “Participation with acquaintance” factors, and the ability to participate and interact with acquaintances was a condition for encouraging participation. However, the “Burden reduction” and “Fairness” factors had the lowest values among all the categories, indicating that they were not so important as conditions for participation.

The II. Participation intention group had a high “Activity content and interaction” factor, and the ability to enjoy the activity and interact with others can be a condition for encouraging participation. Additionally, the “Burden reduction” factor was also positive, being the highest compared to the other types, and could be a condition for encouraging participation.

The III. Non-participation group had positive values for the “Burden reduction” and “Fairness” factors and substantially low values for the “Activities and interaction” and “Participation with acquaintance” factors. This indicates that ensuring fairness in the activity and reducing the burden may encourage participation, but the content of the activity and the ability to participate with acquaintances are not conditions that encourage participation.

In their survey of residents who were already participating in community activities, Hattori et al. (2011) found that one of the conditions for encouraging participation was the ability to participate with those close to them. The results of the present study support the same; in addition, we report new findings regarding engagement in activities, such that it is difficult for people who do not participate in community activities to be encouraged to participate.

6. Discussion

Based on the above analysis results, below, the characteristics of each participation type are clarified, and the conditions for encouraging participation based on the characteristics of participation are discussed.

6.1. I. Continuous participation

This category includes residents who have participated in or have been organizers of community activities in the past and are willing to continue participating in the future. Overall, 46.8% of the total number of residents belong to this group, which is the most common among the three types. As for the respondents’ characteristics, many were unemployed in their 70s, while those in their 40s and 50s were less likely to be employed, indicating that they have been actively involved in community activities since ending their employment.⁶ As for the

⁶According to the Ministry of Health, Labor and Welfare’s 2017 Comprehensive Survey of Working Conditions, 79.3% of companies with a retirement system set the retirement age at 60.

length of residence, few respondents lived in the apartment complex for less than five years, and most of them tended to live in the range of 10–29 years, indicating that it is difficult to participate in community activities immediately after living in the complex, and they would participate only after living there for some time. Additionally, many residents live together as a couple, which indicates that living as a couple is linked to participation in community activities. With regard to the frequency of going out, the residents who went out once or twice a week were the most likely to participate, while those who went out almost every day and once a month were the least likely.

Additionally, residents who use Honcho shopping street once or twice a week were the most likely to participate, while those who rarely use it were the least likely. This suggests that, although residents can go out, they only go out for shopping and other daily needs, and their daily activities are limited to the area around the complex. As conditions for easier participation in community activities, they must adapt the activities to their needs and interact with acquaintances. As for the content of the activities, the respondents are interested in contributing to the community.

The results indicate that most of the residents who actively participated in the community activities and would like to participate in the future are retired senior citizens living with their spouses and have lived in the community for 10–29 years. In other words, they started living in the apartment complex before retirement and are likely to take part in community activities in their spare time after retirement. Additionally, as they do not go out often, they are likely to spend more time with their spouse. As a condition for the continued participation of these residents, it is necessary to provide them with activities and opportunities to interact with others that are enjoyable and allow them to acquire knowledge and skills. These residents seek new opportunities for personal growth in lieu of work after retirement and want to interact with others because they have few opportunities to interact with people other than their partners. For example, community association activities and summer festivals that contribute to the local community are considered effective.

Additionally, only 1.0% of this group were i. Management-Management, suggesting that the burden of planning and managing community activities is concentrated on a few people. If many residents plan and manage various community activities, the burden on a limited number of individuals will be reduced, and participants' options will increase. This will make the activities more sustainable and make it easier for many residents to participate in community activities. Therefore, one of the challenges is developing and supporting human resources for planning and management in the future.

6.2. II. Participation intention

This type includes 21.9% of all residents who have not participated in community activities in the past but would like to do so in the future. With regard to age, the majority of the residents were in their 50s and not retired, and the minority were in their early 60s and had just retired, suggesting that, although they would like to participate in community activities after retirement, they may or may not start when they retire. This can be inferred from the fact that one of the most common reasons for not participating in community activities is "Time reasons," such as work. For the length of residence, many respondents had lived in the apartment complex for less than five years, suggesting that many would like to participate in community activities in the future as they had moved to the complex and had no connection with other residents. With respect to the composition of families living together, many of the respondents were single, and as they had no relationships with other people at home, it is assumed that they would like to participate in community activities and become involved with other residents. They were also more interested in club-based activities, such as "Hobby activities." Compared to the I. Continuous participation group, they were more interested in interacting and enjoying their hobbies than helping the community. The conditions for easy participation were that the activity itself must be enjoyable, and the residents must be able to interact with other residents.

From above, it can be inferred that many of the residents who have not participated in community activities in the past but would like to participate in the future are either retiring in a few years or have lived alone for a short period. This suggests that supporting residents' participation in community activities at the time of retirement or when they move in would be effective. Lack of information about the activities was the main reason for residents' non-participation in community activities; providing residents with appropriate information about activities could be an effective support measure. Additionally, it is necessary to understand residents' needs and plan the content of the activities accordingly, as the content of the activities and opportunities for interaction could encourage participation, reduce the sense of burden, and emphasize the fairness of activities. For example, hobby activities such as cooking classes and karaoke are considered effective.

6.3. III. Non-participation

This group includes 31.3% of all residents who were unwilling or could not participate in community activities in the future, regardless of their past participation or non-participation. In terms of age, the residents were more likely to be in their 40s and less likely to be in their

late 60–70s. The most common reason for not wanting to participate in community activities in the future was “Time reasons,” such as work, which suggests that residents in their 40s are unwilling to participate actively in community activities because they are in their middle management years and busy with work. However, fewer residents in their late 60s–70s are reluctant to participate in community activities in the future because they are retired and have more time to spare.

Most respondents have lived in the complex for 5–9 years. The II. Participation intention group was more likely to be residents for “Less than five years,” suggesting that, although there was an intention to participate in community activities soon after moving in, this intention reduced after living in the complex for a while. Many respondents cited “Physical reasons” and “Due to other participants” as reasons for not participating in the future. Therefore, the intention to participate in community activities may change to non-participation from not being able to fit in or not being able to participate because of physical reasons related to age.

With respect to the frequency of going out, “Almost every day” and “Once a month” were the most common, while “3–5 times a week” was less common. The residents who do not intend to participate can be divided into two types: those who cannot participate in community activities because of physical reasons and those who do not want to participate in community activities as it makes them feel conscious. It is assumed that residents who go out less frequently are of the former type, while those who go out more frequently are of the latter type. Additionally, many of these residents rarely used the neighborhood shopping street, while those in the I. Continuous participation group tended to use it, suggesting that their awareness of participation in community activities was related to their awareness of the use of local shops.

Regarding the activities they were interested in, the respondents tended to believe that they would never want to participate in community activities, regardless of the content, as many of them answered “Nothing.” This is further strengthened by the fact that the “Activity content and interaction” and “Participation with acquaintance” factors, as conditions for participation, were low. Additionally, the factors “Burden reduction” and “Fairness” were positive for the conditions of participation in community activities.

From above, it can be surmised that most respondents who were unwilling or could not participate in activities were middle managers in their 40s with time constraints, while others could not participate because of physical reasons or did not want to participate because of concerns relating to personal preferences, such as a dislike of social interaction. Some residents also changed their minds about not participating after

living in the complex for about five years. For those who do not want to participate because of time constraints, the first step would be to plan activities that allow them to participate with a small burden under an equitable system. However, residents who could not participate for physical reasons, or do not want to participate because they felt conscious in such social situations, regardless of the nature of the activity, do not need encouragement to participate in community activities; rather, they should be provided with welfare services, such as monitoring and health counseling, that can be used freely, and they should be allowed to choose the distance required between them and other people by the availability of venues such as community cafes and libraries.

7. Conclusion

In this study, we conducted basic research to examine the community support measures in older public apartment complexes and classified three resident types by their past participation status in community activities and their future intention to participate. The aim was to clarify the characteristics of each type and the conditions that facilitate participation. The I. Continuous participation group had been actively involved in community activities in the past and would like to continue participating in the future. This group was most likely to be retired older adults living as couples. They are encouraged to participate because of the enjoyment from the activity, the knowledge and skills that can be acquired, and the opportunity to interact with others. The II. Participation intention group had not participated in community activities in the past but would like to do so in the future. They were most likely to be single residents who would be retiring in a few years or who had been living in the community for a short period. As the content of the activities and opportunities for interaction will encourage their participation, it is important to understand their needs and plan activities accordingly. The III. Non-participation group did not want to or could not participate in activities; many residents could not participate because of time constraints or physical reasons. For residents who are unwilling to participate because of time constraints, activities should be organized that allow them to participate with a small burden under an equitable system.

In older apartment complexes, where the aging of the population and decline of local communities are expected to become more prevalent in the future, this clarification of the conditions for participation based on the characteristics of the residents is useful for clarifying effective targets of community activities. It is especially useful when residents who are planning and managing

such activities want to attract new participants and revitalize their activities. In addition, it is useful for experts who support community activities to consider ways to support the community and the kind of community activities that should be promoted, and to formulate detailed strategies based on the characteristics of the target residents. By increasing the number of participants in community activities through such efforts, it is expected to reduce the excessive burden of planning and management, improve the QOL and subjective well-being of residents, and even increase the value of the housing complexes.

The clarification of participation conditions according to the characteristics of apartment complex residents is useful knowledge for developing more suitable community activities while involving the residents. As this study was conducted in one apartment complex, further research in other complexes is needed to verify the generalizability of the results.

Acknowledgments

We would like to express our gratitude to the residents of the Akebono apartment complex and the Urban Renaissance Agency Hokkaido Area Management Center for their cooperation in this study.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by JSPS KAKENHI Grant Number JP17K17973 and JP19K20614, and The Hokuriku Bank Grant-in-Aid for Young Scientists.

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