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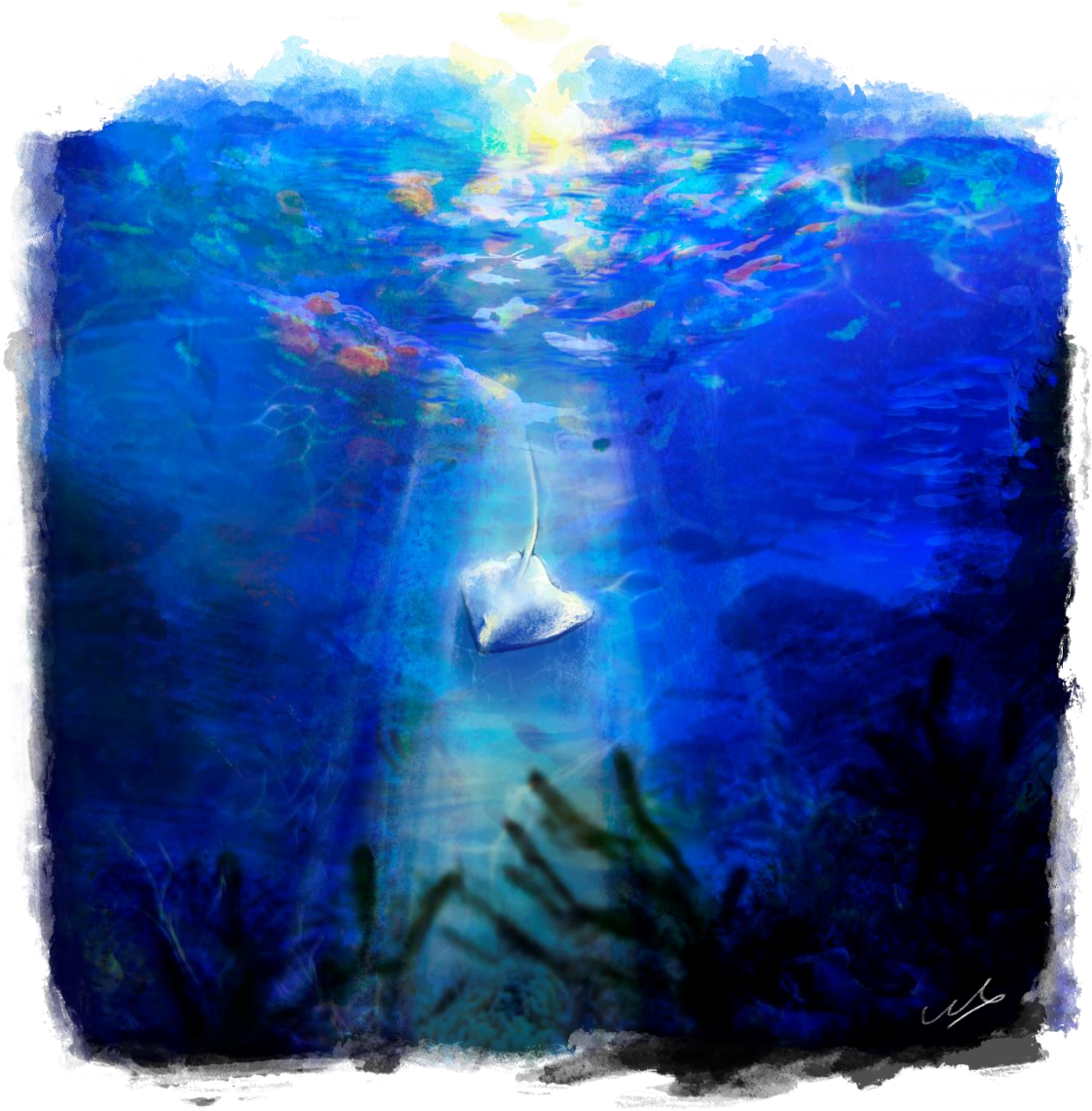

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Original Article

Shift in Lifestyle and Individual Functioning of Older Adult Community Members in Japan under COVID-19: An Exploratory Study

Yuji MARUYAMA [1)]

1) School of Sport and Health Science, University of Tokai Gakuen, Japan

ABSTRACT

This study aimed to examine the lifestyle habits, and physical and mental health of older adults living in the Japanese communities in 2018-2020. A total of 257 older women who lived independently in a community participated in this study. The average age of the participants was 77.7±6.0 years. Participants were salon attendees. Cued recall and, one-leg standing with eyes open were measured and a questionnaire about daily life was administered to the participants. During the two-year study period measurements were taken once a year. The 2020 record for cued recall showed a statistically significant difference compared to 2019, and the 2020 record for one-leg standing with eyes open showed a statistically significant difference compared to the other two years. The Coronavirus (COVID-19) pandemic from the daily life questionnaire survey revealed that older adults recieved fewer opportunities for conversation. The COVID-19 pandemic has caused a decline in the physical and mental functions of older adults living in the community. Exercising while adopting measures against infection is considered highly necessary.

＜Key-words＞
older adults, mental function, physical function, lifestyle habits, COVID-19

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maruyama-y@tokaigakuen-u.ac.jp（Yuji Maruyama）

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Ⅰ. Introduction

A case of pneumonia of unknown aetiology reported in Wuhan, China in December 2019 marked the outbreak of coronavirus disease 2019 (COVID-19)[1]. The infection spread quickly and rapidly around the world. The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020[2]. Since then, mutant strains with high rates of infection and transmission have emerged due to viral mutations[3]. People all over the world have been forced to refrain from activities intermittently. The infection is also prevalent in Japan, and as of 2022, there is no prospect of the spread and convergence of the infection. People have had less physical activity due to long-term restrictions on going out and participating in activities. During the COVID-19 pandemic, older adults were considered an "at risk" group. Accordingly, concerns rose about the mental health of older adults. WHO warned that the impact on the mental and psychosocial wellbeing of vulnerable groups, such as older adults, would be large and enduring[4]. The United Nations (UN) stressed that, although COVID-19 is a physical health crisis, it could develop into a major mental health crisis, especially for specific populations such as older adults, if action is not taken[5]. It has been suggested that governmental measures taken regarding social distancing and isolation, especially targeting at risk groups at risk, can result in social isolation and loneliness[67]. The social isolation and loss of activity caused by the COVID-19 pandemic might also affect cognitive functioning[8]. Noguchi et al.[9] conducted a questionnaire survey on social isolation and cognitive function via mail for older adults living in the quasi-cities of Japan. Among those who completed both baseline and follow-up surveys in March and October 2020, respectively, 955 people aged 70 and over with no cognitive impairment at baseline were included in the analysis. This was a longitudinal study, which indicated that the social isolation during the COVID-19 pandemic was associated with a decline in the cognitive functioning of older adults. It was reported that attention should be paid to the social isolation process during the pandemic for protecting the cognitive health of older adults.

Makizako et al. conducted a mail survey among older adults living in a 77–99-year-old community in Bibai, Hokkaido, in July 2020. Their findings indicated that of the 774 responders, 339 (43.8%) participants reported a decline in physical fitness, whereas 259 (33.5%) perceived declining cognitive fitness during the COVID-19 state of emergency[10].

Recent reviews reported that the pandemic caused a radical change in the lifestyles of older people by, reducing their levels of physical activity and social interaction[11][12]. Such changes have the potential to negatively affect physical and mental health, especially in those with chronic diseases, disabilities, and geriatric syndromes[11]. Several studies have reported that frailty is significantly associated with risk of death in COVID-19 patients, with non-survivors having higher clinical frailty scores than survivors[13-17]. Older adults in particular need to avoid sarcopenia, a loss of muscle mass, to prevent frailty. This requires regular physical activity. However, the restrictions on nonessential outings limit the amount of physical activity. The restriction older adults live a confined life leading to

a decline in their physical fitness.

The COVID-19 pandemic has reduced the opportunities for a large number of older adults to gather one place, making it difficult for them to engage in ongoing cultural and sports activities as a group. As a result, there are fewer opportunities for physical fitness measurements, etc. Data on the actual numbers regarding COVID-19 among older adults in large groups are scarce. In previous studies, the evaluation of the health status of older adults affected by COVID-19 has mostly been based on questionnaires. COVID-19 made it difficult to measure the health status of a large group of people. However, the health status of some older adults could be measured when the infection situation was manageable. Therefore, this study aimed to examine the changes in mental and physical functions before COVID-19, with those who participated in the measurement continuously in the COVID-19 as the subjects of analysis.

Ⅱ. Methods

1. Participants

Inclusion criteria for participation in the study were older adults who belonged to Matsuyama Fureai-ikiiki salons and lived independently in the community. Matsuyama city opened salons for older adults to maintain and improve their mental and physical functioning and prevent long-term care. Two hundred and fifty-seven older adults participated in the study and performed all the annual measurements (three times in total).

This was a retrospective cohort study that used a non-probability consecutive sampling technique for selection. The study was conducted from October 2018 to November 2020. The measurements were conducted once a year for each participant from all 186 salons in Matsuyama city.

2. Survey Items

Participants completed a cognitive function test, cued recall, and a functional measure, that is, one-leg standing with eyes open . A daily life questionnaire was also administered. The method of measuring cued recall involves a 16-item playback task in which 16 pictures (e.g., those of lions) are given along with their respective category names (e.g., animals). Then, after the interference task, the 16 items are first played back freely, followed by a cued recall of only those items that could not be played back during the free playback, given the name of the latter category. The maximum score is 32 points: 2 points for a correct response in the free playback and 1 point for a correct response in the cued recall. During the one-legged standing with their eyes open, the participants were barefoot and both upper limbs were kept placed at the sides of their torso. The maximum time that participants were to hold the one-legged standing with their eyes open was 120 s. A staff member of the Council of Social Welfare who was trained in measuring one-legged standing recorded the measurements. A stopwatch was used to measure the time. The criteria for discontinuing the measurement were when: (1) the upper limbs were separated

from the trunk, (2) the participant moved the position of their supporting leg, or (3) the contralateral foot was in contact with the floor. The measurement was performed twice on each side, and the longest (best) time was adopted as the representative value. The questionnaire survey asked questions about the participants' daily lives (views of own physical fitness, frequency of going out per week, exercise frequency per week, body pain, and opportunities for conversation). Participants were asked to answer each question on a four-point scale. They were carried out as part of the activities by Fureai-ikiiki Salons in Matsuyama City. The staff of the Matsuyama Social Welfare Council explained this research to participants at each salon.

3. Data Analysis

For statistical treatment, a one-way ANOVA was used to measure cued recall and one-leg standing with eyes open for each year. A Tamhane's T2 test was used for subsequent analysis. A χ-square test was used to measure the difference between each year of the questionnaire survey. In addition, multivariate analyses were conducted for the 2020 figures with "cued recall" and "one-leg standing with eyes open" as objective variables and lifestyle items as explanatory variables, respectively. IBM SPSS Statistics ver. 26 was used to analyze the data. The significance level for statistical treatment was set at a risk rate of less than 5%.

4. Ethical Considerations

All qualifying participants provided written informed consent before participating in the study. The study protocol was designed according to the Declaration of Helsinki and was approved by the Tokaigakuen University Ethics Committee (2021-8).

III. Results

The participants were living independently in the community. They comprised 26 males (aged 76.4 ± 5.0 years) and 231 females (aged 77.8 ± 6.1 years). The results of cued recall are shown in Table 1. The cued recall scores were 25.6 ± 7.8 in 2018, 26.8 ± 4.3 in 2019, and 25.5 ± 5.3 in 2020. The 2020 record showed a statistically significant difference compared to 2019 ($p < 0.01$). The results of one-leg standing with eyes open are shown in Table 2. The record of one-leg standing with eyes open was 61.4 ± 42.9 seconds in 2018, 60.2 ± 43.0 seconds in 2019, and 44.7 ± 41.8 seconds in 2020. The 2020 record showed a statistically significant difference compared to the last two years ($p < 0.01$). The results of the lifestyle-related questionnaire are shown in Table 3. There was a statistically significant difference in the conversation opportunities between 2019 and 2020 ($p < 0.05$). A multivariate analysis was performed to examine which lifestyle-related items affected the results of cued recall and one-leg standing with eyes open. Table 4 shows the standardization coefficient (β) and contribution rate (R2) of the results. The R2 was not significantly high.

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<Table 1> Result of cued recall (score)

	2018	2019	2020
		**	
TOTAL n=257	25.6±7.8	26.8±4.3	25.5±5.3

Values are expressed as mean ± SD. **p<0.01

<Table 2> Result of one-legged standing with eyes open (sec)

	2018	2019	2020
		**	
		**	
TOTAL n=257	61.4±42.9	60.2±43.0	44.7±41.8

Values are expressed as mean ± SD. **p<0.01

<Table 3> Result of the lifestyle-related questionnaire

n (%)

Views on own physical fitness	Very confident	Fairly confident	Not very confident	No confidence	Total	χ^2 value
2018	10 (3.9)	140 (54.5)	99 (38.5)	8 (3.1)	257 (100.0)	
2019	4 (1.6)	138 (53.7)	114 (44.4)	1 (0.4)	257 (100.0)	13.06*
2020	4 (1.6)	139 (54.1)	112 (43.6)	2 (0.8)	257 (100.0)	
Frequency of going out per week	More than 5 days	3-4 days	1-2 days	Not going out	Total	
2018	157 (61.1)	77 (30.0)	22 (8.6)	1 (0.4)	257 (100.0)	
2019	166 (64.6)	71 (27.6)	19 (7.4)	1 (0.4)	257 (100.0)	4.17
2020	152 (59.1)	76 (29.6)	29 (11.3)	0 (0.0)	257 (100.0)	
Exercise frequency per week	More than 5 days	3-4 days	1-2 days	No exercise	Total	
2018	87 (33.9)	83 (32.3)	74 (28.8)	13 (5.1)	257 (100.0)	
2019	79 (30.7)	90 (35.0)	66 (25.7)	22 (8.6)	257 (100.0)	4.04
2020	89 (34.6)	80 (31.1)	70 (27.2)	18 (7.0)	257 (100.0)	
Body pain	Much pain	More or less pain	Rather painless	Less pain	Total	
2018	8 (3.1)	70 (27.2)	123 (47.9)	56 (21.8)	257 (100.0)	
2019	9 (3.5)	73 (28.4)	121 (47.1)	54 (21.0)	257 (100.0)	4.44
2020	16 (6.2)	71 (27.6)	111 (43.2)	59 (23.0)	257 (100.0)	
Opportunities for conversation	Very much	Rather frequent	Rather scarce	Very few	Total	
2018	41 (16.0)	155 (60.3)	55 (21.4)	6 (2.3)	257 (100.0)	
2019	48 (18.7)	140 (54.5)	67 (26.1)	2 (0.8)	257 (100.0)	15.28*
2020	30 (11.7)	136 (52.5)	82 (31.9)	9 (3.7)	257 (100.0)	

*p<0.05

<Table 4> A multivariate analysis of the variables affecting cued recall and one-leg standing with eyes open

	cued recall		one-leg standing with eyes open	
	ß	p value	ß	p value
Views on own physical fitness	0.144	0.05	0.123	0.05
Frequency of going out	0.093	0.14	0.111	0.05
Exercise frequency	-0.101	0.11	-0.198	0.01
Body pain	0.142	0.05	0.087	0.17
Opportunities for conversation	-0.129	0.05	-0.07	0.27
Contribution rate	0.079		0.086	

Ⅳ. Discussion

Cued recall is one of the indicators to assess cognitive function. Even if physical functions are maintained, cognitive decline can impair ADL and make it difficult to carry out daily life smoothly . Based on the results of cued recall in 2020, we hypothesized that participants' cognitive function was impaired in the coronary disaster . The participants became more secluded during the coronary disaster , and Table 3 shows that they had fewer opportunities to talk to others pre-pandemic. It has been reported that there is a close relationship between opportunities for conversation and maintenance of cognitive function[18], and this was thought to have influenced the results.

The one-legged standing test with eyes open is an indicator of physical fitness in older adults, which involves evaluating balance ability[19]. In older adults, diminished balance is associated with reduced physical functioning and an increased risk of falling[20)21)]. Maintaining or improving motor (balance) ability is essential for extending the healthy lifespan of older adults [22)23)]. Maintaining balance leads to stable gait, especially among older adults, for whom walking is a means of mobility. The results for one-leg standing with eyes open in 2020 in this study were significantly lower than those before the COVID-19 pandemic, indicating a need for interventions such as lower limb strength training that can be performed at home to improve balance ability.

Multivariate analysis of the 2020 values showed that the contribution of "opportunities for conversation" to cued recall was significant. Views on “own physical fitness,” “frequency of going out per week,” “exercise frequency per week,” and “body pain” were significant contributors to one-leg standing with eyes open. To maintain mental and physical functions, it was considered necessary to have conversations with others without being confined to one's home. Older adults who live alone have few opportunities for conversation at home, so it is necessary to activate their brains through conversations with others using information and communications technology mediums, such as video calls. Previous studies indicate that exercising decreases physical pain in older adults[24,25)].

Further, exercise activates the hippocampus and improves cognitive function[26]. Pain and cognitive function have been reported to be bidirectionally related[24]. Thus, the physical and mental benefits of exercising have proven to be significant. However, the COVID-19 pandemic made it difficult to exercise in large groups at community centers. Therefore, individuals should engage in strength training, walking, and other activities that they can perform regularly.

A study conducted in Belgium and the Netherlands, showed a significant decline in activity levels, sleep quality, and well-being during the COVID-19 pandemic[8]. It has been reported that the COVID-19 pandemic has had a serious impact on the mental health of older adults, requiring more governmental and medical involvement.

A strength of this study is capturing the measured functional decline in older adults during the COVID-19 pandemic. Several other research reports are Internet-based surveys. This study is considered to have more convincing data because it measured a large sample of older adults using a face-to-face methodology. The results of this study showed a significant decline in the mental and physical functions of the participants post pandemic. This should also serve as a wake-up call regarding the health status of older adults in Japan.

The COVID-19 pandemic has led to an increase in remote work worldwide, and physical activity is declining even among the younger generation. It is believed that more efforts are needed at the municipal and private levels to prevent residents from becoming confined to their homes and to promote the health of the national' population.

The subjects of this study were older adults who had been participating in community salon activities before the COVID-19 pandemic and had high social participation. Therefore, the results for the subjects of this study are limited in that they cannot be interpreted as changes in older adults in general. In the future, it is necessary to examine changes in the physical and mental functions of older adults who do not participate in social activities.

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