Chapter

The Yuu-yuu Health Circle as a Place for Learning and Playing

Akio Kamiya, Masahiro Noguchi, Tsutomu Kibayashi, Toshiyasu Inumaru, Ayako Yokota and Tsuyoshi Kimura

Abstract

The Yuu-yuu Health Circle is a place for students to learn and deepen their understanding and interest by putting into practice the knowledge and skills they have gained in class at the university. This chapter introduces its maintenance and promotion activities for older adults in the community that were participated by students of the Departments of Physical Therapy and Occupational Therapy at Kinjo University before and during the coronavirus pandemic. The activity method and contents changed significantly during the pandemic. However, as a medical and welfare university, its job to develop human resources that deal with people has not changed. As an educational method toward such purpose, the activities helped students, who need to actively communicate with people of different ages and improve their interpersonal communication skills even during the pandemic.

Keywords: education, university, student, contribute to society, coronavirus disaster

1. Introduction

The National Institute of Population and Social Security Research revealed that the population of people aged 65 years and older comprised 20.2% of the population in 2005 and was expected to increase to 40.5% by 2055 [1]. This finding points out the aging of the population as a major problem for Japan in the coming decades. With an increase in the population of older adults, problems such as a rise in the social security budget and a decline in labor population are expected to grow in importance. Other problems include the increasing economic burden on people of working age and caregiver deficiency.

In response to this social situation, the Departments of Physical Therapy and Occupational Therapy of the Faculty of Health Sciences of Kinjo University has hosted the Yuu-yuu Health Circle since January 2009 with the support of Hakusan City. The meaning of "Yuu-yuu" is learning, which is a long process that involves seeing the world from a wide perspective. Its activities' purposes are as follows: (1) The university maintains its role as a hub of knowledge in the community; (2) there should be collaboration between industry, government, and academia; (3) universities should contribute to community development; and (4) the university provides opportunities for students to learn and study.

To achieve these goals, teachers and students develop volunteer activities to maintain and improve the health of older adults in the community. Examples of these activities are health lectures and low-load machine training (e.g., chest press, leg extension). Recruitment of older adults living in the area is conducted mainly through a public relations magazine published by Hakusan City with the cooperation. Participating students are mainly first- and third-year students of the Departments of Physical Therapy and Occupational Therapy because of curriculum reasons. By interacting with older adults living in the community, students can practice not only basic communication skills but also specialized ones, such as medical interviews, vital signs check (e.g., blood pressure), and mental and physical function measurements. In this way, Yuu-yuu Health Circle has become a good "learning square."

This chapter introduces the activities of the Yuu-yuu Health Circle before and during the coronavirus disaster, as well as its significance as a place for students to learn and prospects for activities after the coronavirus disaster.

2. Yuu-yuu Health Circle's on-campus activities

On-campus activities had been carried out for 2–3 periods a year or a total of 30 periods from January 2009 to December 2019. The content of one period consisted of physical fitness measurement, vital signs check, preparatory exercises, health lectures, low-load machine training, home exercise guidance, and cooling down exercises. A period lasted for two and a half months, and each 120-minute program was held once a week, for a total of 10 times (**Table 1**). Participants were aged over 65 years. The typical number of participants was 15, but this either increased or decreased depending on each period. The number of students was about 30. Approximately five faculty teachers were involved in the management. As of this writing, the total number of older adult participants was 497 and that of students was 1082. These numbers are expected to increase as it is a long-term activity.

Week	Contents
1	Vital signs checking, confirmation of physical condition, and enjoy talking (about 30 minutes) Warm-up exercises by students (about 10 minutes) Physical function evaluation before activity programs (about 80 minutes)
2 to 9	Vital signs checking, confirmation of physical condition, and enjoy talking (about 30 minutes) Warm-up exercises by students (about 10 minutes) Lectures regarding the maintenance of general health or instructions to practice the program at home (about 20 minutes) Low-load machine exercises for the elderly (about 50 minutes) Cool-down exercise by students (about 10 minutes)
10	Vital signs checking, confirmation of physical condition, and enjoy talking (about 30 minutes) Warm-up exercises by students (about 10 minutes) Physical function evaluation after activity programs (about 80 minutes) Certificate completion ceremony

This table outlines a total of 10 activity programs for one period of the Yuu-yuu Health Circle. Conduct 10 times at a pace of once a week. Physical function evaluations are conducted for the first and final rounds. One activity is for about 120 minutes.

Table 1.
Outline of the Yuu-yuu Health Circle activity program.

Physical fitness measures included body composition, walking speed, six-minute walking distance, timed up and go test, quadriceps femoris muscle strength, and center of gravity sway distance. Preparatory exercises incorporated rhythmic exercises that move the body while singing songs that are well known in Japan and enhanced the activity of muscles and respiratory circulation. In addition, while using a towel, the joints and muscles of the whole body were moved to prepare for exercise (**Figure 1**). In health lectures, teachers and students gave a lecture about health concerns (e.g., talking about the risk and prevention of heatstroke, effects of exercise on mind and body). Low-load machine training (**Figure 2**) mainly used six types: leg press, trunk flexion, leg extension, chest press, hip abduction, and rowing. Participants exercise while counting numbers so as not to hold their breath. The load amount was set to be in the range of "slightly tight" to "easy" in terms of subjective intensity. Six types of training machines were usually carried out one set at a time (one set comprised 10 repetitions and lasted for about 80 seconds). Home exercise guidance for participants included lectures on exercises that can be carried out at home with the aim of maintaining and increasing their exercise habits as much as possible. In a previous study of participants in the Yuu-yuu Health Circle, an improvement in the walking/balancing ability of late-stage older adults was more likely to occur than muscle weakness [2]. Therefore, a walking instruction (e.g., way to walk, time, and intensity) was incorporated into the home program. Cooling down exercise was carried out through a whole-body stretching.

2.1 Effects of the Yuu-yuu Health Circle on older adults

The results of our research [3] examining the effects of the Yuu-yuu Health Circle are introduced below. We targeted 64 community-dwelling older adults who participated in the Yuu-yuu Health Circle program. Their average age was 70 ± 6 years, average height was 157.7 ± 7.7 cm, and average weight was 57.7 ± 7.8 kg. Thirty-three males and 31 females joined this program. Before and after the program, we evaluated participants' flexibility, muscle strength, walking ability, standing balance, and

Figure 1.
Preparatory gymnastics. Students conduct and demonstrate the gymnastics in front of the participants.

Figure 2.
Exercising using a training machine. Low-load machine training mainly uses six types: leg press, trunk flexion, leg extension, chest press, hip abduction, and rowing. Participants exercise while counting numbers so as not to hold their breath.

quality of life using the 36-item Short Health Survey (SF-36) version 2 in Japanese. After the program, many physical function tests were significantly improved. In the SF-36 questionnaire, the "general health perception" significantly improved (**Table 2**). **Table 3** shows an example of comments and impressions after the end of the activities for the participants. The communication between older adults and young students positively stimulated the former and improved their motivation to participate in the activities. The older adults who participated in the activities mentioned, among others: "I smile when I have an activity with young students" and "I got the power of the young students."

2.2 Effects of the Yuu-yuu Health Circle on the students

As we aim to develop human resources that can play an active role in the medical field, we provide students with opportunities to interact with older adults in the community from their first year of university. Intergenerational exchanges require language usage, self-grooming, appropriate behavior, attitudes to interact with people, communication skills, and the ability to brighten up the atmosphere. Generally, in students, it is often meaningful to reinforce these interpersonal communication skills from an early stage because of their lack of experience. If students use basic medical skills, such as measuring blood pressure and conducting health interviews for older adults in the community, they will be able to acquire practical skills early. In addition, for third-year students who have undergone various on-campus studies, we implement advanced contents. For example, students integrate risk information of the target person and use it for exercise guidance; alternatively, they propose a home program for older adults based on the results of prior physical evaluation.

This activity assigned students to five groups: management, gymnastics, evaluation, training machines, and public relations. Student leaders were appointed for each

	Before	After	*p*	*n*
Flexibility				
The sit-and-reach test (cm)	18.7	20.5	*<0.05*	64
Spinal hyperextension test (cm)	21.3	22.8	*<0.05*	62
Muscle strength				
Grip strength (kg)	28.6	29.6	*<0.05*	42
Knee flexion (N)	48.9	53.4	*<0.05*	61
Walking ability				
Test for time needed to stand up and go (s)	6.6	6.3	*<0.05*	62
The time taken to walk 10 m (s)	5.1	4.8	*<0.05*	62
Distance during a 6-min walk (m)	498	512	*<0.05*	62
Balance of standing				
Functional reach test (cm)	26.8	27.9	*<0.05*	64
SF-36 questionnaire version 2 (Japanese)				
General health perception*	47.5	47.5	*<0.05*	28

**The value is the median.*

Table 2.
Comparison of results before and after the Yuu-yuu Health Circle activity program.

Participant's comments and impressions
Instead of leaving my physical condition to the doctor, I became conscious of managing my own health.
I got a power of young students.
It was a good training because I could move my head and body.
I'm glad that I do not usually have many opportunities to talk with students and move my body.
I got a smile when I have a activity with young students.
I got viger.

A translation of the comments and impressions obtained from participants.

Table 3.
Participants' comments and impressions of the Yuu-yuu health circle activity program.

group. By allocating leaders in separate groups, the burden on students was distributed, roles were clarified, and responsibilities were given to each group and individual. The management group oversaw the entire activity and acted as the moderator so that the activity would flow smoothly. For the gymnastics group, preparatory gymnastics and cooling down exercises were carried out. The evaluation group summarized the results of the pre- and post-physical fitness tests. The training machine group handled the training machine and instructed older adults in the home program. The public relations group was responsible for taking activity photos and updating blogs.

Students participating in this activity were in their first to third year and, thus, differed in specialized knowledge and interpersonal support ability. This made uniform management difficult. Therefore, we have prepared "goals and self-assessment

Goal of the Yuu-yuu Health Circle:					
Students strive to promote a safe and smooth the Yuu-yuu Health Circle and contribute to the health promotion of participants.					
Goals of the students:					
Students acquire 1. Risk and operation management, 2. Student's participation attitude, 3. Performing own group's roles, 4. Measurement skills, and 5. Teaching skills. These abilities necessary for the operation of the Yuu-yuu Health Circle strengthen with uniting under the leaders and teaching each other. Let us increase these abilities and whether it can be 80% or more by self-evaluation.					
	1. Risk and operation management	2. Student's participation attitude	3. Performing own group's roles	4. Measurement skills	5. Teaching skills
easy ↑	Get information about participants' risks (such as blood pressure) in charge.	Keep the meeting time.	Recognize the role of your group.	You can ask questions along the form.	You can give simple advice. (e.g., Close your eyes or take off your shoes.)
	Explain information about participants' risks.	You can communicate smoothly and bring out the smiles of the participants.	You can smoothly achieve the role of your own group.	Vital measurement can be performed smoothly.	Explain the points and precautions of exercise.
↓ difficult	Be able to understand and explain the risks of all participants.	Have a broad perspective to cooperate with and help leaders.	You can understand the overall role, help each other, and give advice to each other.	Participant's dysfunction can be mentioned	You can check the home program and give correction advice.
English translation of the questionnaire. This is excerpted and modified for illustration purposes. Each ability has about 10 items ranging from easy to difficult.					

Table 4.
Goals and self-assessment for students.

for students" that show the goals and required abilities of this activity step by step. By visualizing the different activity objectives and roles of each student, students could set their own goals according to their own abilities and work with self-discipline. **Table 4** presents a summary of these goals and self-assessment. A previous self-assessment survey of students investigated the goal attainment level of our diploma policy; the related question item was "Have a broad perspective to cooperate with and help leaders." The results showed that 28% of first-year, 64% of second-year, and 82% of third-year students had reached the goal and gradually recorded a high degree of achievement with progress [4]. **Table 5** shows examples of students' comments and impressions and indicates their positive opinions, such as having improved their communication skills.

3. Yuu-yuu Health Circle's off-campus activities

The Yuu-yuu Health Circle also conducts off-campus activities. About four times a year, students and teachers visit the community where older adults in the community

Student's comments and impressions
Communication skills have been improved.
The anxiety about dealing with the elderly has disappeared.
Vital measurement is now possible.
I enjoyed interacting with different generations.
When I went to the off-campus practice, there was doing the similar way of Yuu-yuu Health Circle, so I was able to do it easy.
By knowing healthy elderly people, I was able to compare them with hospitalized elderly people.

A translation of the comments and impressions are obtained from students.

Table 5.
Student's comments and impressions.

gather and hold one-off courses. Local older adults often gather at a public community center in each district and hold regular meetings. To find the activity destination, usually, we are directed to senior citizen groups in each district or receive referrals from the person in charge in Hakusan City. The key difference of the off-campus activities from on-campus ones is the lack of a training machine at the community center that is useful to participants. To ensure that the participating older adults enjoy the activities even in an environment without tools, we implement a dual task exercise, such as combining training of cognitive ability with a whole-body movement. When third-year university students can join the Yuu-yuu Health Circle at a community center, they measure older adults' physical functions, such as muscle strength, range of motion, and balance, and provide feedback to them on the spot. For students who want to become physical or occupational therapists, this activity serves as a practice for them to improve their measurement skills, which have started between students at the university (**Figure 3**). Students are motivated and work hard, even though they feel nervous and anxious. Students can deepen their understanding and interest by putting into practice the knowledge and skills they have gained in class at the university.

4. Yuu-yuu Health Circle activities during and its prospective activities after the coronavirus disaster

Since 2020, the coronavirus disease has seriously impacted global health and economies. In Japan, the prime minister issued the first state of emergency in mainly large cities from April 7 to May 31, 2020; the second, from January 8 to March 21, 2021; the third, from April 25 to June 20; and the fourth, from July 12 to as of this writing. Under these circumstances, face-to-face activities of older adults who are invited to the university have been canceled. Self-restraint at home has been found to have resulted in an increase in sitting activity time and an unhealthy eating behavior, such as snacking [5], a 58.2% reduction in walking time [6], and increased depression and stress [7]. In particular, there have been concerns about the deterioration of mental and physical functions of older adults due to physical inactivity.

Osawa et al. [8] developed the National Center for Geriatrics and Gerontology Home Exercise Program for Older People (NCGG-HEPOP2020) as an exercise program for older people. This is an introduction to programs that can be safely

Figure 3.
Individual measurement by a third-year university student. When third-year university students can join the Yuu-yuu Health Circle at a community center, they measure older adults' physical functions, such as muscle strength, range of motion, and balance, and provide them feedback on the spot.

implemented at home by dividing them into various aspects, such as physical activity, nutrition, oral function, and cognitive function for older adults. The unique flowchart makes it easy for older adults to select their optimal exercise content [8, 9]. In collaboration with the NCGG-HEPOP creation committee, we created videos of the NCGG-HEPOP2020 programs to make them easier to perform (**Figure 4**). Our

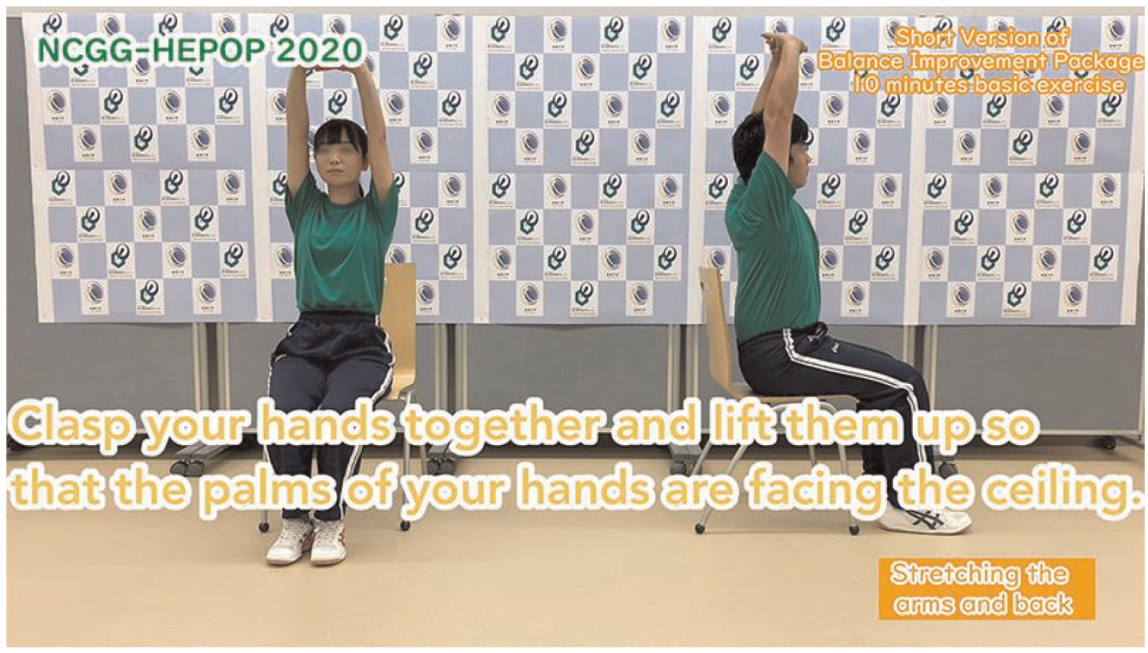

Figure 4.
The created gymnastics video. The videos can be seen on the National Center for Geriatrics and Gerontology's (NCGG's) website at: https://www.ncgg.go.jp/hospital/english/index.html or in the Kinjo university You Tube channel at https://www.youtube.com/channel/UCb-4GZTt9dKlgJB8rkXHjhg/videos.

faculty teachers supervised the management and video editing, and students oversaw gymnastics demonstrations, video telop creation, and narration. The created Japanese and English versions of the video were released on YouTube [10]. Through this activity, the students had a good opportunity to seriously think about the content of gymnastics, how to show it, and how to convey it as a teacher of gymnastics.

As another initiative, we conducted a trial activity *via* the web that connected a public community center where the older adults gather and the university online. The usual face-to-face on-site lectures were difficult to conduct in terms of infection control considering the coronavirus pandemic. Therefore, the students made a demonstration of gymnastics at the university and delivered the images and sounds in real time through the monitor of the public community center. Some problems included the difficulty in adjusting the load during gymnastics because it was difficult to see the faces of the participants. However, using online tools, students and participants were able to enjoy doing the gymnastics while counting together, even if they were far away from each other. In addition, we provided a learning environment that enhances gymnastics and interpersonal communication skills while reducing the risk of infection for students (**Figure 5**).

Regarding the outlook for activities after the coronavirus pandemic, we plan to increase the frequency of interaction between older adults and students by combining face-to-face activities and online communication. Specifically, problem-solving learning can be practiced through multidisciplinary collaboration by having students from multiple departments form a team and collaborate with the problem of maintaining and increasing the exercise time of older adults. The elimination of valuable time loss due to commuting time is worth noting. However, older adults being unaccustomed to and having difficulty using the Internet poses a problem. Therefore, providing ICT support, such as tapping family members, self-help groups in local communities, and university teachers, is necessary. Maintaining and increasing exercise habits and

Figure 5.
Health promotion activities of the university and community center. The Kinjo University and community center provided a learning environment for students to enhance their gymnastics and interpersonal communication skills while reducing the risk of infection.

physical activity are expected to positively affect the mind and the body and may help the immune response against the new coronavirus [11]. The activities mentioned above can have a meaningful contribution to the community and, at the same time, provide learning opportunities for students.

5. Conclusions

This chapter introduces the activities of the Yuu-yuu Health Circle. The Yuu-yuu Health Circle's activity method changed significantly during the coronavirus disaster. However, as a medical and welfare university, its job to develop human resources that deal with people has not changed. As an educational method conducted toward such purpose, the activities helped students, who need to actively communicate with people of different ages, improve their interpersonal communication skills even during the coronavirus pandemic. For that purpose, ensuring that learning opportunities are available amid infection control measures through ICT, such as online communication, is important.

Conflict of interest

The authors declare no conflict of interest.

Author details

Akio Kamiya*, Masahiro Noguchi, Tsutomu Kibayashi, Toshiyasu Inumaru, Ayako Yokota and Tsuyoshi Kimura
Kinjo University, Hakusan, Japan

*Address all correspondence to: kamiya@kinjo.ac.jp

References

[1] National Institute of Population and Social Security Research. Future estimated population in Japan [Nihonno syourai suikei jinkou]. 2006. pp. 2-13 (Japanese)

[2] Kamiya A, Kibayashi T, Noguchi M, Kimura T, Igari M, Koyama Y. Differences in changes in motor function and ability between the early- and late-stage elderly: Report from efforts to maintain and improve the health of the elderly in the community. Japanese Journal of Geriatric Psychiatry. 2016;**27** (Suppl 2):203 (Japanese)

[3] Kamiya A, Kibayashi T, Noguchi M, Yamamoto T, Kimura T, Okayama K, et al. Improvement of the health of senior citizens by a program organized by Kinjo University in cooperation with Hakusan City. In: Manninen O. Work among the elderly. Tampere: Kopijyvä Oy Ltd; 2011:125-131

[4] Kamiya A, Kibayashi T. Contribution to the community through student-centered volunteer activities. In: Nara I et al., editors. Rigakuryouhou Kanrigaku (Management in Physiotherapy Practices). Tokyo: Ishiyaku Publishers; 2018. pp. 91-92 (Japanese)

[5] Ammar A, Brach M, Trabelsi K, Chtourou H, Boukhris O, Masmoudi L, et al. Effects of COVID-19 home confinement on eating behavior and physical activity: Results of the ECLB-COVID19 international online survey. Nutrients. 2020;**12**(6):1583. DOI: 10.3390/nu12061583

[6] Castañeda-Babarro A, Arbillaga-Etxarri A, Gutiérrez-Santamaría B, Coca A. Physical activity change during COVID-19 confinement. International Journal of Environmental Research and Public Health. 2020;**17**(18):6878. DOI: 10.3390/ijerph17186878

[7] Meyer J, McDowell C, Lansing J, Brower C, Smith L, Tuly M, et al. Changes in physical activity and sedentary behavior in response to COVID-19 and their associations with mental health in 3052 US adults. International Journal of Environmental Research and Public Health. 2020; **17**(18):6469. DOI: 10.3390/ijerph17186469

[8] Osawa A, Maeshima S, Kondo I, Arai H. Balancing infection control and frailty prevention during and after the COVID-19 pandemic: Introduction of the National Center for Geriatrics and Gerontology home exercise program for older people home exercise program for older people 2020. Geriatrics and Gerontology International. 2020;**20**: 846-848

[9] National Center for Geriatrics and Gerontology Home Exercise Program for Older People (NCGG-HEPOP) [Internet]. 2021. Available from: https://www.ncgg.go.jp/hospital/english/index.html

[10] Kamiya A, Noguchi M, Kibayashi T, Maeshima S, Osawa A, Arai H. Video demonstrating NCGG-HEPOP 2020 exercises for older adults. Geriatrics and Gerontology International. 2021;**21**(9): 871-872. DOI: 10.1111/ggi.14241

[11] da Silveira MP, da Silva Fagundes KK, Bizuti MR, Starck É, Rossi RC, de Resende e Silva DT. Physical exercise as a tool to help the immune system against COVID-19: An integrative review of the current literature. Clinical and Experimental Medicine. 2021;**21**(1):15-28. DOI: 10.1007/s10238-020-00650-3