

Original article

Effect of group activities on health promotion for the community-dwelling elderly

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Abstract

Objective: In Japan, the Integrated Community Care System aims to support residents to live as independently as possible at home. *Koreisya-Kyoshitsu* and *Fureaiikiiki* salons are two types of group activities for community-dwelling elderly. We investigated effective ways of conducting such activities.

Methods: We analyzed 96 subjects from 8 salons and 354 subjects from 10 *Koreisya-Kyoshitsu*. Self-completed questionnaires included the following: attributes, the Motor Fitness Scale (MFS), revised Philadelphia Geriatric Center Morale Scale (PGCMS), Measurement of Psychological Independence (MPI), instrumental activities of daily living (IADL), and self-rated health status (SRH). Follow-up assessment was conducted 6 months later. Representatives from 8 salons and staff members from 10 *Koreisya-Kyoshitsu* answered an additional questionnaire on management.

Results: In *Koreisya-Kyoshitsu*, physical performance (MFS) ($p = 0.007$) and subjective well-being (PGCMS) ($p = 0.001$) improved significantly, whereas psychological independence (MPI) deteriorated significantly ($p = 0.015$). The MFS scores significantly improved in the sub-group with a high number of sessions (7 or more) ($p = 0.043$), as well as in the non-volunteer sub-group ($p = 0.004$). The PGCMS scores significantly improved in the sub-group with a high number of sessions ($p < 0.001$). The MPI scores significantly deteriorated in the sub-group with a low frequency of sessions (6 or less) and in the non-volunteer sub-group ($p = 0.013$ and $p = 0.010$, respectively). In salons, the frequency of going out decreased significantly ($p = 0.049$). Functional status (IADL) significantly improved in the “twice or more a month” sub-group ($p = 0.046$), whereas it significantly deteriorated in the “once a month” sub-group ($p = 0.004$). The proportion of volunteers/organizers in

Koreisya-Kyoshitsu (23.4%) was significantly lower than that in salons (39.6%).

Conclusion: The frequency (number) of sessions, but not the volunteer/non-volunteer attribute, was a key factor in obtaining the health promotion effects of group activities in both *Koreisya-Kyoshitsu* and salons.

Key words: community-dwelling elderly, volunteer, frequency, group activity, health promotion

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Introduction

In Japan, there are two types of group activities for community-dwelling elderly: *Koreisya-Kyoshitsu* and *Fureaiikiiki* salons. *Koreisya-Kyoshitsu* are culture, art, or science classes for seniors (social educational activities), constituting a form of lifelong learning, and have been held in municipal community centers since 1973 through subsidies (public assistance). Session sites (community centers) are accessible by foot, bicycle, and car. Staff members plan the content of activities and the period of *Koreisya-Kyoshitsu* every year.

Fureaiikiiki salons (salons) are self-active. They were proposed by the Japan National Council of Social Welfare in 1994 and are operated by volunteer citizens (organizers)¹. The Municipal Council of Social Welfare offers grants (mutual aid) for partial coverage of costs. The salons' session sites are autonomous community centers within participants' walking distance. Salon activities are continuous, effortless, pleasant, and free. Organizers and participants discuss how to conduct salons in an effective manner.

The Japanese Ministry of Health, Labour and Welfare is planning to establish the “Integrated Community Care System” by 2025, which will integrate housing, medical care, long-term care, preventive services, and livelihood support in the community². The Integrated Community Care System aims to support residents so that they can live as in-

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dependently as possible at home³). *Koreisya-Kyoshitsu* and salons provide preventive services and livelihood support for the Integrated Community Care System.

At present, staff of *Koreisya-Kyoshitsu* and organizers of salons decide on the content of activities and the duration/frequency of sessions, based on their experience and intuition. It is important to ascertain effective ways of conducting activities serving as health promotion for the community-dwelling elderly.

In the present study, we investigated the health promotion effects of *Koreisya-Kyoshitsu* and salons, to reveal effective ways of conducting activities.

Methods

Subjects

Participants of the salon group consisted of 187 people from 8 salons in Gunma Prefecture. We distributed baseline questionnaires and collected these from 185 people (98.9%); 2 people declined due to mental fatigue. In the follow-up assessment, we collected 115 (62.2%), as 70 people were absent. Of the 115 people, 96 answered all the questions, and their data were analyzed (96/185, 51.9%).

The participants of *Koreisya-Kyoshitsu* consisted of 574 people from 10 *Koreisya-Kyoshitsu* in Maebashi City, Gunma. We distributed and collected baseline assessment from 569 people (99.1%), as 5 people declined. We mailed follow-up assessment questionnaires to 569 people after 6 months, and asked them to fill and return the questionnaires by mail. In the follow-up assessment, we collected 492 out of 569 (86.5%) questionnaires because 77 people did not return the second questionnaire by mail. We analyzed 354 out of 569 (62.2%) people, who had answered all the questions.

Finally, we analyzed 96 subjects from 8 salons in Gunma Prefecture, and 354 subjects from 10 *Koreisya-Kyoshitsu* in Maebashi City, Gunma.

The 8 salons started receiving grants from the Municipal Council of Social Welfare between October 2011 and August 2012. The 96 subjects consisted of 38 organizers (39.6%) and 58 participants (60.4%). The subjects' median age range was 70–74 years. Twenty-three were male (24.0%) and 73 were female (76.0%) (Table 1).

The 10 *Koreisya-Kyoshitsu* were operated as community service centers of Maebashi City between January and November 2012. The 354 participants were all elderly and community-dwellers, and consisted of 83 volunteers (23.4%) and 271 participants (76.6%). The participants median age range was 75–79 years. One hundred and twenty-three were male (34.7%) and 231 were female (65.3%) (Table 1).

Survey

We explained the outline and aim of the study to staff at the Municipal Council of Social Welfare and community centers. Salon sessions were held at regular intervals. The frequency of salon sessions was between once a month and once a week. *Koreisya-Kyoshitsu* were held 3–15 times during the surveyed 6 months. The period, frequency, and class content of *Koreisya-Kyoshitsu* differed across community centers (Table 1). Class content included talking, exercise, singing, fancywork, tours, and so on. We explained the outline and aim of the study to participants at the first session. Baseline assessment was conducted at the second session. Follow-up assessment was conducted 6 months after baseline assessment. Salon participants answered questionnaires at the sessions. The term “session” in this study refers to each convention of a salon and *Koreisya-Kyoshitsu*. Six months after the first assessment, we mailed questionnaires to participants for follow-up assessment of *Koreisya-Kyoshitsu*. We asked them to answer the questionnaires and return them by mail.

Written informed consent was obtained from all subjects. The study was approved by the Epidemiologic Research Ethics Committee of the Gunma University Faculty of Medicine (22-9).

Evaluation

The following five questionnaires were self-completed: the Motor Fitness Scale (MFS)⁴, revised Philadelphia Geriatric Center Morale Scale (PGCMS)⁵, Measurement of Psychological Independence (MPI)⁶, instrumental activities of daily living (IADL)⁷, and self-rated health status (SRH)⁸.

The MFS consisted of 14 items and assessed physical performance. Possible responses to each item were 1 for “yes” and 0 for “no.” The MFS was divided into the following three subscales: mobility, 6 items; strength, 4 items; and balance, 4 items. Higher scores indicated better performance⁴. The MFS is a fitness test for elderly persons in daily life. The reliability and validity of the MFS have been reported⁴.

The PGCMS consisted of 17 items and assessed subjective well-being. The Japanese edition was developed by Koyano *et al.*⁹. The PGCMS evaluates subjective well-being among elderly persons⁹. The reliability of the PGCMS has been reported¹⁰. Subjects were assigned a score of 1 for a positive answer and 0 for a negative answer. The total score was 17 points. The PGCMS was divided into the following three subscales: agitation, 6 items; attitude towards aging, 5 items; and loneliness/dissatisfaction, 6 items. Higher scores indicated higher morale⁵.

The MPI consisted of 8 items and assessed the intention of psychological independence, that is, taking interest,

Table 1 Characteristics of participants

		<i>Koreisya-Kyoshitsu</i>	Salons	<i>p</i> -value
Number of sites	All	10	8	
	Low	5	4	
	High	5	4	
Duration [†]	All	2.6 ± 1.6M; 1~5M	continuing	
	Low	1.8 ± 1.8M; 1~5M	continuing	
	High	3.4 ± 1.1M; 2~5M	continuing	
Number of sessions [†]	All	5.8 ± 3.5/6M; 2~14	12.9 ± 8.7/6M; 6~27	
	Low	3.4 ± 1.5/6M; 2~5	6.8 ± 0.5/6M; 6~7	
	High	8.2 ± 3.3/6M; 6~14	19.0 ± 8.7/6M; 11~27	
Number of participants	All	354 (16~128/each)	96 (11~42/each)	
	Low	124 (16~128/each)	51 (16~42/each)	
	High	230 (20~97/each)	45 (11~24/each)	
Sex male/female	All	123 (34.7%) / 231 (65.3%)	23 (24.0%) / 73 (76.0%)	0.049*
	Low	51 (41.1%) / 73 (58.9%)	13 (25.5%) / 38 (74.5%)	
	High	72 (31.3%) / 158 (68.7%)	10 (22.2%) / 35 (77.8%)	
	Vol	43 (51.8%) / 40 (48.2%)	9 (23.7%) / 29 (76.3%)	
	Non	80 (29.5%) / 191 (70.5%)	14 (24.1%) / 44 (75.9%)	
Median age range	All	75~79	70~74	< 0.001**
	Low	75~79	70~74	
	High	75~79	70~74	
	Vol	75~79	65~69	
	Non	75~79	75~79	
Household single/living together	All	73 (20.6%) / 281 (79.4%)	16 (16.7%) / 80 (83.3%)	0.470
	Low	26 (21.0%) / 98 (79.0%)	9 (17.6%) / 42 (82.4%)	
	High	47 (20.4%) / 183 (79.6%)	7 (15.6%) / 38 (84.4%)	
	Vol	14 (16.9%) / 69 (83.1%)	8 (21.1%) / 30 (78.9%)	
	Non	59 (21.8%) / 212 (78.2%)	8 (13.8%) / 50 (86.2%)	
Volunteer/organizer Yes/No	All	83 (23.4%) / 271 (76.6%)	38 (39.6%) / 58 (60.4%)	0.003**
	Low	14 (11.3%) / 110 (88.7%)	27 (52.9%) / 24 (47.1%)	
	High	69 (30.0%) / 161 (70.0%)	11 (24.4%) / 34 (75.6%)	

* $p < 0.05$, ** $p < 0.01$. [†]Results are expressed as: mean ± standard deviation. [†]First session not included. All *p*-values were based on the χ^2 -test and the Mann-Whitney U test. “Low” of *Koreisya-Kyoshitsu*, 6 or less; “High” of *Koreisya-Kyoshitsu*, 7 or more (First session included). “Low” of salons, once a month; “High” of salons, twice or more a month. M, months; “Vol”, volunteers; “Non”, non-volunteers. §, $p < 0.001$; §§, $p = 0.004$.

having a purpose in life, becoming absorbed in something, doing something for someone, deciding for oneself, sticking to one’s opinion, acting accountably, and being confident about one’s opinion. Each item was rated from 1 (“think so”) to 4 (“don’t think so”). Lower scores indicated higher levels of psychological independence. Scores ranged from 8 to 32. The MPI was divided into two subscales, namely, purposefulness, 4 items; and personal accountability, 4 items. The reliability and validity of the MPI have been reported⁶.

IADL assessed functional status. IADL is a subscale of the Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC). Possible responses to each item were 1 for “yes” and 0 for “no.” The total score was 5 points. Higher scores indicated higher functional status⁷. The reli-

ability and validity of IADL have been reported¹¹.

SRH assessed subjective psychosocial well-being⁸. SRH was scored on a 4-point Likert scale (1 for “excellent” or “very good,” 2 for “good,” 3 for “fair,” and 4 for “poor”).

In addition, we requested participants to complete a questionnaire regarding the following: age group (5-year step), sex, family composition, familiar person in the neighborhood (Yes/No), volunteering for the session on the spot (Yes/No), the frequency of going out and the frequency of group activity (4 for “almost every day,” 3 for “3–4 times/week,” 2 for “almost once a week,” and 1 for “less than once a week”), and the frequency of participation in this session.

Analysis

Statistical analysis was performed using SPSS 22.0J for Windows. Spearman's correlation coefficient was employed for the PGCMS and the MPI. The Shapiro-Wilk test was used to assess whether the data were normally distributed or not. When data were not normally distributed, the Wilcoxon signed-rank test was used. We regarded $p < 0.05$ as indicative of significance.

We added sub-group analyses. We classified subjects of *Koreisya-Kyoshitsu* into 2 sub-groups by the number of sessions, as follows: 5 *Kyoshitsu* were classified under the sub-group with a low number of sessions (6 times or less; low), and 5 under the sub-group with a high number of sessions (7 times or more; high). We classified salon subjects into 2 sub-groups, as follows: 4 salons were classified under the "once a month" (Low) sub-group, and 4 under the "twice or more a month" (High) sub-group. We also classified subjects of *Koreisya-Kyoshitsu* and salons into 2 subgroups, as follows: volunteer/organizer subgroup (Vol) and non-volunteer/organizer subgroup (Non).

The sample size of this research was as follows: The number of participants in each salon was 10–30, and that of participants in each course of the *Koreisya-Kyoshitsu* was 20–40. We tried to satisfy the sample size requirements.

Results

Characteristics of Koreisya-Kyoshitsu and salons

In salons, there was a negative correlation between the PGCMS scores and the MPI scores ($r = -.261$, $p < 0.05$; Spearman's correlation coefficient). In *Koreisya-Kyoshitsu*, there was a negative correlation between the PGCMS scores and the MPI scores ($r = -.315$, $p < 0.01$; Spearman's correlation coefficient).

Table 1 shows the characteristics and demographic data of the participants of *Koreisya-Kyoshitsu* and salons. The mean duration of *Koreisya-Kyoshitsu* from the second session to the last session was 2.6 ± 1.6 months in the 6-month survey period. The *Koreisya-Kyoshitsu* sessions were held 5.8 ± 3.5 times, excluding the first session. During the 6-month survey, salons were held 12.9 ± 8.7 times, excluding the first session. Salons were held about twice as much as *Koreisya-Kyoshitsu* were. In *Koreisya-Kyoshitsu*, the number of participants at each session ranged between 10 and 100, depending on class content. In salons, the number of participants at each session ranged between 10 and 40. Females participated significantly more than males did in *Koreisya-Kyoshitsu* and salons. The median age range of participants in *Koreisya-Kyoshitsu* (75–79) was significantly higher than that in salons (70–74) ($p = 0.001$; Mann-Whitney U test). *Koreisya-Kyoshitsu* showed significantly lower

participation of Vol than salons did ($p = 0.003$; χ^2 -test).

In *Koreisya-Kyoshitsu*, the proportion of Vol in the low-frequency sub-group was significantly smaller than that in the high-frequency sub-group ($p < 0.001$; χ^2 -test). In salons, the proportion of Vol in the low-frequency sub-group was significantly larger than that in the high-frequency sub-group ($p = 0.004$; χ^2 -test).

In *Koreisya-Kyoshitsu*, the proportion of males in Vol was significantly higher than that in Non ($p < 0.001$; χ^2 -test). In salons, the median age of Vol was significantly lower than that of Non ($p < 0.001$; Mann-Whitney U test).

Effects and number of sessions of Koreisya-Kyoshitsu

Table 2 shows the results for *Koreisya-Kyoshitsu*. The MFS scores changed from 11.58 ± 2.70 to 11.79 ± 2.67 , demonstrating significant improvement ($p = 0.007$; Wilcoxon signed-rank test). The PGCMS scores changed from 12.59 ± 3.18 to 13.01 ± 3.28 , demonstrating significant improvement ($p = 0.001$). The MPI scores changed from 11.87 ± 3.28 to 12.27 ± 3.36 , showing significant deterioration ($p = 0.015$). There were no significant changes in IADL scores, SRH scores, the frequency of going out, and the frequency of group activity (Table 2).

In the sub-group with a high number of sessions (7 times or more), the MFS scores increased significantly from 11.67 ± 2.54 to 11.84 ± 2.54 ($p = 0.043$), and the PGCMS scores increased significantly from 12.53 ± 3.23 to 13.26 ± 3.15 ($p < 0.001$). In the sub-group with low session numbers 6 times or less), the MPI scores changed from 11.59 ± 2.95 to 12.28 ± 3.28 , showing significant deterioration ($p = 0.013$).

We further classified the subjects of *Koreisya-Kyoshitsu* into 2 sub-groups, according to participants' attribute of either Vol or Non. The baseline SRH scores were significantly lower (better health) in Vol than in Non ($p < 0.000$; Mann-Whitney U test). In Vol, the PGCMS scores increased significantly from 12.65 ± 2.56 to 13.61 ± 3.04 ($p < 0.001$), showing improved well-being. In Non, the MFS scores increased significantly from 11.45 ± 2.81 to 11.72 ± 2.74 ($p = 0.004$), showing improved physical performance. The MPI scores increased from 12.04 ± 3.30 to 12.53 ± 3.51 ($p = 0.010$), showing significant deterioration of psychological independence.

Effects and frequency of salons sessions

Table 3 shows the results for salons. Among the salon subjects, the frequency of going out changed from 3.75 ± 0.48 to 3.64 ± 0.65 , showing a significant decrease ($p = 0.049$). There were no significant changes in the MFS scores, PGCMS scores, MPI scores, IADL scores, SRH scores, and the frequency of group activity (Table 3).

In the "once a month" (Low) sub-group, IADL scores

Table 2 Health promotion effects of *Koreisya-Kyoshitsu*

Scale	Subjects	n	Baseline [†]	Follow-up [†]	p-value
Frequency of going out	All	354	3.66 ± 0.57	3.70 ± 0.53	0.215
	Low	124	3.59 ± 0.63	3.67 ± 0.55	0.149
	High	230	3.70 ± 0.54	3.72 ± 0.51	0.655
	Vol	83	3.76 ± 0.46	3.74 ± 0.50	0.705
	Non	271	3.64 ± 0.60	3.69 ± 0.54	0.112
Frequency of group activity	All	354	2.48 ± 0.90	2.52 ± 0.89	0.379
	Low	124	2.35 ± 0.88	2.40 ± 0.89	0.455
	High	230	2.56 ± 0.90	2.58 ± 0.88	0.589
	Vol	83	2.82 ± 0.77	2.70 ± 0.87	0.179
	Non	271	2.38 ± 0.92	2.46 ± 0.89	0.097
SRH‡	All	354	2.01 ± 0.59	2.01 ± 0.51	0.745
	Low	124	2.06 ± 0.62	2.09 ± 0.57	0.602
	High	230	1.97 ± 0.57	1.97 ± 0.48	0.980
	Vol	83	1.95 ± 0.54	1.95 ± 0.49	1.000
	Non	271	2.02 ± 0.60	2.03 ± 0.52	0.723
] trend (base) p < 0.001**		
MFS	All	354	11.58 ± 2.70	11.79 ± 2.67	0.007**
	Low	124	11.41 ± 2.97	11.68 ± 2.91	0.071
	High	230	11.67 ± 2.54	11.84 ± 2.54	0.043*
	Vol	83	12.02 ± 2.24	12.00 ± 2.44	0.692
	Non	271	11.45 ± 2.81	11.72 ± 2.74	0.004**
PGCMS	All	354	12.59 ± 3.18	13.01 ± 3.28	0.001**
	Low	124	12.69 ± 3.10	12.55 ± 3.47	0.859
	High	230	12.53 ± 3.23	13.26 ± 3.15	0.000**
	Vol	83	12.65 ± 2.56	13.61 ± 3.04	0.000**
	Non	271	12.57 ± 3.35	12.83 ± 3.33	0.138
MPI‡	All	354	11.87 ± 3.28	12.27 ± 3.36	0.015*
	Low	124	11.59 ± 2.95	12.28 ± 3.28	0.013*
	High	230	12.02 ± 3.45	12.26 ± 3.41	0.259
	Vol	83	11.31 ± 3.18	11.41 ± 2.66	0.753
	Non	271	12.04 ± 3.30	12.53 ± 3.51	0.010*
IADL	All	354	4.86 ± 0.44	4.84 ± 0.45	0.308
	Low	124	4.89 ± 0.39	4.86 ± 0.43	0.426
	High	230	4.85 ± 0.47	4.83 ± 0.46	0.471
	Vol	83	4.88 ± 0.45	4.87 ± 0.41	0.710
	Non	271	4.86 ± 0.44	4.84 ± 0.46	0.334

[†] Results are expressed as: mean ± standard deviation. Baseline was the second session. Follow-up was 6 months later. [‡] Lower number indicates a better condition. **p* < 0.05, ***p* < 0.01. All *p*-values were based on the Wilcoxon signed-rank test. SRH, self-rated health status; MFS, Motor Fitness Scale; PGCMS, revised Philadelphia Geriatric Center Morale Scale; MPI, Measurement of Psychological Independence; IADL, instrumental activities of daily living. “Low”, 6 or less; “High”, 7 or more. “Vol”, volunteers; “Non”, non-volunteers.

changed from 4.76 ± 0.55 to 4.57 ± 0.81, showing significant deterioration (*p* = 0.004). The frequency of going out changed from 3.75 ± 0.48 to 3.57 ± 0.76, showing a declining tendency (*p* = 0.059). In the “twice or more a month” (High) sub-group, IADL scores changed from 4.73 ± 0.78 to 4.82 ± 0.75, demonstrating significant improvement (*p* = 0.046). At baseline, the SRH scores of Vol was significantly lower (better health) than that of Non (*p* = 0.004; Mann-Whitney U test). Moreover, the MFS scores of Vol was significantly

higher (better physical performance) than that of Non (*p* < 0.001; Mann-Whitney U test) (Table 3).

Discussion

The sex, age group, and volunteer/organizer proportions differed significantly between *Koreisya-Kyoshitsu* and salons, even though the activities were similar. The percentages of females and young-old elderly persons were higher

Table 3 Health promotion effects of salons

Scale	Subjects	n	Baseline [†]	Follow-up [†]	p-value
Frequency of going out	All	96	3.75 ± 0.48	3.64 ± 0.65	0.049*
	Low	51	3.75 ± 0.48	3.57 ± 0.76	0.059
	High	45	3.76 ± 0.48	3.71 ± 0.51	0.480
	Vol	38	3.87 ± 0.34	3.79 ± 0.47	0.257
	Non	58	3.67 ± 0.54	3.53 ± 0.73	0.106
Frequency of group activity	All	96	2.35 ± 0.91	2.44 ± 0.81	0.264
	Low	51	2.45 ± 0.90	2.49 ± 0.83	0.637
	High	45	2.24 ± 0.91	2.38 ± 0.78	0.317
	Vol	38	2.68 ± 0.84	2.74 ± 0.72	0.635
	Non	58	2.14 ± 0.89	2.24 ± 0.80	0.320
SRH‡	All	96	2.01 ± 0.61	2.02 ± 0.58	0.858
	Low	51	1.92 ± 0.59	2.02 ± 0.58	0.096
	High	45	2.11 ± 0.61	2.02 ± 0.58	0.400
	Vol	38	1.89 ± 0.45	1.84 ± 0.49	0.414
	Non	58	2.09 ± 0.68	2.14 ± 0.61	0.552
] trend (base) p = 0.004**		
MFS	All	96	11.26 ± 3.27	11.40 ± 3.25	0.368
	Low	51	11.22 ± 3.25	11.22 ± 3.32	0.890
	High	45	11.31 ± 3.33	11.60 ± 3.20	0.277
	Vol	38	12.79 ± 1.40	12.84 ± 1.41	0.939
	Non	58	10.26 ± 3.74	10.45 ± 3.75	0.287
] trend (base) p < 0.001**		
PGCMS	All	96	12.73 ± 2.75	12.96 ± 2.92	0.298
	Low	51	12.90 ± 3.00	12.65 ± 3.08	0.791
	High	45	12.53 ± 2.46	13.31 ± 2.72	0.073
	Vol	38	13.26 ± 2.90	13.82 ± 2.76	0.140
	Non	58	12.38 ± 2.62	12.40 ± 2.91	0.812
MPI‡	All	96	12.21 ± 3.45	12.45 ± 3.29	0.312
	Low	51	11.43 ± 2.93	12.20 ± 3.25	0.106
	High	45	13.09 ± 3.81	12.73 ± 3.34	0.797
	Vol	38	11.66 ± 2.91	11.58 ± 2.69	0.836
	Non	58	12.57 ± 3.75	13.02 ± 3.53	0.266
IADL	All	96	4.75 ± 0.66	4.69 ± 0.79	0.134
	Low	51	4.76 ± 0.55	4.57 ± 0.81	0.004**
	High	45	4.73 ± 0.78	4.82 ± 0.75	0.046*
	Vol	38	4.92 ± 0.27	4.87 ± 0.41	0.157
	Non	58	4.64 ± 0.81	4.57 ± 0.94	0.285

[†] Results are expressed as: mean ± standard deviation. Baseline was the second session. Follow-up was 6 months later. [‡] Lower number indicates a better condition. *p < 0.05, **p < 0.01. All p-values were based on the Wilcoxon signed-rank test. SRH, self-rated health status; MFS, Motor Fitness Scale; PGCMS, revised Philadelphia Geriatric Center Morale Scale; MPI, Measurement of Psychological Independence; IADL, instrumental activities of daily living. “Low”, 6 or less; “High”, 7 or more. “Vol”, volunteers; “Non”, non-volunteers.

in salons than in *Koreisya-Kyoshitsu*. Previous studies have reported that young-old elderly persons tend to attend salons¹²⁾. Thus, *Koreisya-Kyoshitsu* and salons showed a different pattern in terms of age group: *Koreisya-Kyoshitsu* participants tended to be of an older age group.

Koreisya-Kyoshitsu participants showed improved physical performance and subjective well-being, although psychological independence deteriorated. In the sub-group with low session numbers, psychological independence deteriorated.

In the sub-group with high session numbers, physical performance and subjective well-being improved. Thus, we found that the number of sessions is important for the health promotion of participants in *Koreisya-Kyoshitsu*. *Koreisya-Kyoshitsu* were held 5.8 ± 3.5 times in the 6-month survey period. Although the total number of sessions of *Koreisya-Kyoshitsu* was half of that of salons during the 6-month survey period, *Koreisya-Kyoshitsu* showed health-promoting effects. The first reason is that previous studies have reported

ed that people with higher physical and psychological functioning more frequently use shops and community centers than do those with lower functioning¹³. Shops and recreation facilities with walking distance are important for facilitating physical activity among seniors¹⁴. Previous studies have reported that higher frequency of vehicle use, especially bicycles, improves the amount of leisure and work activity¹⁵. The second reason is that education programs have positive effects. Participants learn various things at each session, obtaining knowledge and skills. In a previous study, even one session of stress management education for the elderly reduced general stress responses¹⁶. Compared to the young-old elderly, depression among the old-old elderly significantly decreases, as the number of friends, morale, and social activities increase¹⁷. Participation in different kinds of activities is related to “Successful Aging”¹⁸. Certainly, participants of *Koreisya-Kyoshitsu* could obtain various educational benefits through multifarious activities. Thus, *Koreisya-Kyoshitsu* is suitable for the old-old elderly. Intensive education, such as 6 sessions in 3 months, might show health-promoting effects.

In the sub-group analysis, psychological independence (MPI) significantly deteriorated in the Low and Non sub-groups. Psychological independence evaluates taking an interest, having a purpose in life, doing something for someone, and so on. Volunteers need to acquire these attributes. Ishikawa *et al.* have verified the association of depression with less engagement in outside activities among elders living an independent life¹⁹. We assume that high-frequency participation maintains purposefulness and prevents deterioration of psychological independence.

In a longitudinal study of nearly two years, participants in a newly opened community salon showed significant improvement in self-rated health, compared to the control group²⁰. IADL deteriorated in the “once a month” sub-group of salons, but improved in the “twice or more a month” sub-group. Salons allow participants to communicate with others in their respective community. The maintenance of the independence of elderly persons who engage in social interaction is important; IADL research is consistent with the independence index of the elderly²¹.

We assumed that low frequency (once a month) in salons, as compared to high frequency, was associated with poor social interaction. Thus, IADL deteriorated. Among the community-dwelling elderly, a higher frequency of communication with neighbors is related to higher life satisfaction²² and lower depression^{12, 22}. Moreover, elderly salon participants can obtain information on health and welfare services^{23, 24}. Previous studies have shown that exercise guidance from classmates is better than that from professionals²⁵. Overweight/obese individuals have been found to

effectively lose weight through the support of teammates²⁶. However, in the present study, we suggested frequency as a key factor affecting health promotion in salons.

The present study has several limitations. Salons were assessed through a subjective survey. Our questionnaires did not elicit medical history information from participants. The number of participants and duration of the survey were limited. The season and location of *Koreisya-Kyoshitsu*/salons may influence the results. There were significant differences in some evaluation between baseline groups, owing to the field survey. *Koreisya-Kyoshitsu* and salons had different management styles. We could not obtain control groups in the community. In both *Koreisya-Kyoshitsu* and salons, participants were a mixture of volunteers/organizers and non-volunteers. The activity program was decided upon in each course of the *Koreisya-Kyoshitsu*/salon, and was not standardized.

Conclusion

The present study showed that the frequency/number of sessions affected the health promotion among participants in both *Koreisya-Kyoshitsu* and salons.

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