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Research Article

Training of Dementia Prevention Supporters Focusing on Early-Stage Elderly People, and Results of the Activities

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Abstract

Introduction: With the doubling of the number of elderly people needing assistance because of dementia, the daily problems of elderly people living alone, the problems of family difficulties, and issues surrounding the skills and relationships with care providers have also doubled. On the other hand, the number of retired elderly people wanting to volunteer is also increasing. In order to take advantage of this situation, we planned the establishment of a regional system in which early-stage elderly people support late-stage elderly people. In this study, monthly training sessions were held throughout the year, with the graduates attending intervention with researchers and visiting the homes of people who had difficulty going out as part of the dementia prevention program, whose effects we then verified.

Materials and Methods: The effects of the dementia prevention supporter training and the results obtained by the subsequent implementation of the dementia prevention program for the targeted elderly people were clarified through a before-and-after comparison.

Results: Among those registered as seminar supporters, there were 153 respondents who could be compared through the before-and-after comparison, with an average age of 70.5 ± 5.6 years. As a result of the training, knowledge of dementia prevention was significantly improved ($p < 0.01$). In terms of dementia prevention techniques, there were regional differences in self-evaluation and the rate of increase was low, for which concerns about providing technology as a supporter was a factor. The provision of the dementia prevention program to the elderly by supporters significantly improved the subjects' cognitive test scores and reduced stress levels. In terms of the dementia prevention program, music therapy and dance, which combined a dual task and a delayed-response tasks were effective, significantly improving cognitive test results.

Conclusion: The regional system in which early-stage elderly people support late-stage elderly people can be expected to be established in a stable manner. They have many experiences that they can share with the target elderly because they have lived in the same era as the elderly. In terms of visiting people who have difficulty getting out of the house, the production of personal histories significantly improved the results of cognitive tests. It is believed that this is due to the fact that the supporters, as early-stage elderly can understand and share the experiences of late-stage elderly people without explanation. Thus, in the future, we will continue our efforts to increase the number of early-stage elderly supporters for the stable provision of dementia prevention.

Keywords: *Early-Stage Elderly, Prevent Dementia, Supporters, Home-Visit, Dual Tasks, Delayed-Response Tasks*

Abbreviations

Dual Tasks: Refers to two tasks conducted at the same time, with a focus on performance changes in each of these two tasks. Patients with cognitive decline due to ageing often have difficulties processing and performing multiple tasks at the same time. In order to properly process given multiple tasks, it is necessary to properly allocate and divide attention in accordance with the processing capacity available for each task. These abilities are a type of executive function, in which the frontal lobe centered on the prefrontal cortex plays an important role [1].

Delayed-Response Tasks: This task involves reproducing or processing a memorized task after a waiting period (a delay of several minutes). The relationship between performance on delayed response tasks and the state of the prefrontal cortex has been reported [2].

Introduction

Recent years have seen a dramatic extension of the population's life span. Year by year, post-retirement life continues to be enriched and diversified, and it is natural for elderly people to plan for and enjoy their second life. However, the incidence of dementia is also increasing explosively year by year, and the second life of those who develop it is becoming difficult. It involves not just difficulty in thinking, but is also accompanied by great despair due to confusion. What's more, since elderly people suffering from dementia cannot do many things by themselves, they must receive support from others. However, it has become clear that the relationship with those who support them, as well as the skills of those supporters, has a great influence on the mind and body of these elderly people [3-5].

Introduce the problem

With the doubling of the number of elderly people needing assistance because of dementia, the daily problems of elderly people living alone, the problems of family difficulties, and issues surrounding the skills and relationships with care providers have also doubled. On the other hand, the number of retired elderly people wanting to volunteer is also increasing. In order to take advantage of this situation, we planned the establishment of a regional system in which early-stage elderly people support late-stage elderly people. Currently, although local governments conduct dementia supporter training, most of it is completed in a single day, so it does not reach a level at which support activities can be carried out.

However, the majority of early-stage elderly people do not consider themselves "elderly." They are still in good physical and mental health and are capable of active social activities [6]. Thus, in order to create a virtuous cycle in which the potential of early-stage elderly people can be fully demonstrated, this study involved holding monthly training sessions throughout a year, with one course being completed through 12 sessions held in 1 year. A dementia prevention program was held with graduates through support programs in congregations with researchers, visits to the homes of elderly people living alone or who have difficulty going outside. Preventive programs were implemented according to each person's condition, and their effectiveness was verified.

Explore importance of the problem

In the case of elderly people who live alone or have difficulty going out, it is easy to delay the response because it is not detected, even if it interferes with their daily lives. As a result, their problems are often discovered late and support is delayed. Solving this problem is consistent with the Sustainable Development Goal indicators, namely, "Ensure healthy lives and promote well-being for all at all ages," and "Make cities and human settlements inclusive, safe, resilient and sustainable". In addition, by creating a community between early-stage elderly people and late-stage elderly people, it becomes easier for them to foster a sense of fellowship through empathy and nostalgia at having lived through the same period, with both the supporters and the targets feeling a sense of psychological healing through the effect of recollection. The presence of psychological and physical differences based on the presence or absence of such fellowship has been

confirmed [7,8]. If these links and cooperation between members can be established, supporters will begin to believe that their contribution has positive effects on other participants, and a virtuous cycle will develop. In addition, it will help solve the lack of manpower in dementia care.

In order to verify the formation of these regional communities, four universities co-sponsored the recruitment of early-stage elderly people across four prefectures, namely Nara, Aichi, Hyogo and Wakayama, holding dementia prevention supporter seminars throughout the year, and having graduates participate in a dementia prevention support program for the elderly. Group programs were implemented at meetings for elderly people who could walk, and individual programs were implemented by visiting the homes of elderly people who had difficulty going outside. The effects of these were verified through a before-and-after comparison.

State hypotheses and their correspondence to research design

We validated a dementia prevention program in a pretest. In a group program, brain training and aerobic exercise combining the dual task and the delayed-response tasks are effective [9,10]. For elderly people who need individual program because of a deterioration of their motor function, awakening their memory through recollection is effective [11]. In addition, since there is a correlation between stress level and cognitive ability, it was considered necessary to relieve stress [12]. Based on these results, we developed a program combining the dual task and the delayed-response tasks, reminiscences and dance in collaboration with a music therapist, a dance instructor, a psychotherapy reminiscence therapist and a physiotherapist, and verified its effects [13]. The techniques to implement this program were acquired over one year of dementia prevention supporter training and implemented with elderly people as a target across the four co-sponsoring regions in order to verify their effectiveness and, in addition, to examine their results in terms of community formation.

Materials and Methods

The effects of the dementia prevention supporter training and the results achieved by the subsequent implementation of the dementia prevention program for the targeted elderly people were clarified through a before-and-after comparison.

Identify subsections

A. Dementia prevention support training (12 sessions for 1 course): Cognitive decline due to changes related to physiological aging, mild cognitive impairments (MCI), dementia symptoms and prevention measures, dual tasks and delayed-response tasks, reminiscence therapy, brain training tasks through dance and music therapy.

B. Before-and-after comparison through questionnaire: 1. Knowledge of dementia prevention, 2. Techniques, 3. Solidarity among supporters, 4. Satisfaction with the activities.

   The five-point Likert scale and free statements in these items were compared before and after the 12 sessions of training.

C. Continuation of group or home visits with the elderly: implementation of dementia prevention programs.

D. Before-and-after comparison through cognitive test and stress check:

   1. Matsui word memory test [Immediate replay]: 10 After reading a word, write down the memorized word 4 times in 1 minute. Evaluated on a scale of 40 points.

   2. Yamaguchi Kanji symbol conversion test: Mainly evaluates frontal lobe function (executive function and attention). Convert characters representing colors to their corresponding symbols. The score is based on the number of correct symbols. Evaluated out of 75 points.

3. Word recall test: Evaluates the ability to associate and recall words. Write down as many "animal names" as possible in 1 minute and score the number. Evaluated out of 50 points.

4. Matsui word memory test [Delayed recall]: 1. Recall and write down the first 10 words memorized. Perfect score out of 10 [14].

5. Stress check: Stress level measured on a 5-level face scale.

In the gathering program, comparisons were made before the start and after six interventions. In the home visit program, comparisons were made before and after three interventions. The difference in the number of interventions was due to the fact that the home visiting program was the first attempt and required a period of time for recruitment and preparation. This delayed the start of the program, and after the three visits there was an outbreak of the new coronavirus, which made interpersonal contact impossible. An alternative to this would be to use, the method was changed to remote intervention by installing a robot in the elderly person's home, but since this method was different from the research plan, it was not included in the results and the results of only three visits were compared.

Subject characteristics

A. Dementia prevention supporter: An early-stage elderly person with a physical condition that allows them to be active. Excludes those whom the interview judges as being incapable of continuing the activities.

B. Elderly people participating in dementia prevention programs: Persons participating in the gathering program need to be able to walk without assistance. Those who participate in the 1-hour program and do not have the physical strength to return home on their own are transferred to the visit program. People who can be targets of the visit program are those living at home without medical treatments such as oxygen therapy. Participation in the visit program is possible even with a decline in cognitive level. There is no age limit.

Sampling procedures

Since a paired t-test is performed before and after the intervention, the minimum number of people to achieve a detection of 80% and a standardized difference of 0.5 is 34.

power. t. test (power=0.8, delta=0.5, type="paired").

In addition to this, it was predicted that approximately 20% of the participants would not be able to complete the full course and, so we decided to recruit at least 41 participants in each area. The upper limit of people recruited was the capacity of the meeting venue (100 people per venue). Similarly, the visit program required a minimum of 34 people for statistical processing, with no upper limit set.

Experimental manipulations

Regular training for supporters, accompanied by before-and-after questionnaires, cognitive tests and stress checks before the start of the program for elderly people, implementation of the program at each monthly meeting and test comparison conducted 6 months later, implementation of the program through visits and comparison through tests conducted before each visit, as well as 3 months later. In terms of statistical analysis, the Wilcoxon signed rank sum test was used for the before-and-after comparison of the Likert scale, and a paired t-test was used for the comparison of the test scores. The free descriptions were qualitatively analyzed.

Clinical trials registry

This study is registered in the UMIN Clinical Trials Registry (ID: UMIN000037544) and is being conducted with the approval of the Research Ethics Review Board of Nara Medical University. The subjects received explanations of the contents of the activities, comparison tests, and disclosure of the results in both written and oral form and registered to the study by submitting a consent form.

Results

Recruitment process

In the four regions of Nara, Aichi, Hyogo and Wakayama Prefectures, we recruited early-stage elderly people for dementia prevention supporter training as well as elderly people who wished to be visited by supporters.

Supporter registrations began to be accepted with the start of the research period in June 2018. Supporter training was provided 12 times a year for the subjects (Figure 1).

Figure 1: *Dementia prevention supporter training program: Delayed-response tasks with music therapy.*

Dementia prevention activities were carried out by organizing gathering program between graduates and researchers with elderly people, as well as by visiting elderly people who have difficulties going out (Figure 2).

Figure 2: *Home visitation program: Creating a "personal history" by involves talking about and remembering past events.*

As a matter of special note, during this period, there was a time after April 2020 during which the activities needed to be suspended due to the new coronavirus pandemic. They resumed in June 2021, with the study ending in December 2021. As a result, the number of registered supporters was 96 in Nara Prefecture, 34 in Aichi Prefecture, 54 in Wakayama Prefecture, and 17 in Hyogo Prefecture. Since the new coronavirus epidemic peaked in Hyogo Prefecture during the preparatory stage, the number of registrations was lower because the start time was postponed until seminars could be held, and the number of attendees was restricted in order to maintain social distancing. After completing the annual training, the supporters worked with researchers on a dementia prevention program through meetings with elderly people, alongside a visit program for elderly people who have difficulty going outside. The gathering program was held once a month, but was suspended for one year and two months in 2020 in light of measures to prevent the spread of the new coronavirus. The visit program was suspended as a precautionary measure after visits for 34 people had been conducted. As a countermeasure for this period of interruption, a robot was installed in the home of an elderly person to avoid interpersonal contact, and the program was continued by remote control, but this is not included in the data.

Statistics and data analysis

Of the 201 people registered in supporter seminars, 153 underwent before-and-after comparisons; 82 in Nara Prefecture, with 11 males and 71 females; 29 in Aichi Prefecture, with 5 males and 24 females; 28 in Wakayama Prefecture, with 5 males and 23 females; and 14 in Hyogo Prefecture, with 2 males and 12 females; with the average age being 70.5 ± 5.6 years. In terms of the data aggregation results for knowledge of dementia prevention, the five-level Likert scale scores all showed significant improvement, ($p < 0.01$, Figure 3), averaging 2.6 to 4.1 points in in Nara Prefecture, 2.8 to 4.3 points in Aichi Prefecture, 2.9 to 3.9 points in Wakayama Prefecture, and 3.2 points to 4.1 points in Hyogo Prefecture. As for dementia prevention techniques, although improvement was noted, its increase was low and showed regional differences (Figure 4), with Nara Prefecture averaging 2.6 to 3.6 points ($p < 0.01$), Aichi Prefecture 3.2 to 4.0 points (n.s.), Wakayama prefecture 2.9 to 3.5 points (n.s.), and Hyogo prefecture 3.0 points to 3.8 points ($p < 0.05$).

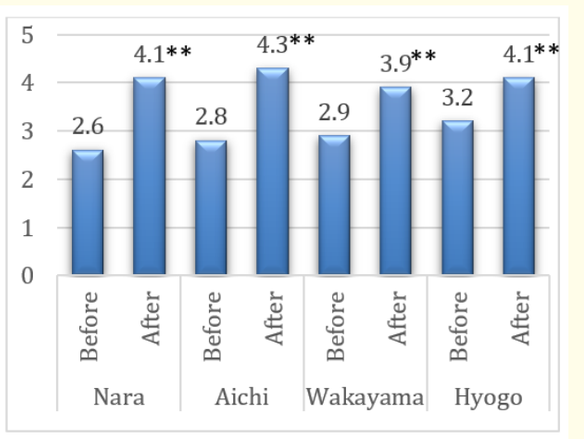

Figure 3: *Before-and-after comparison of knowledge of dementia prevention. ** p<0.01.*

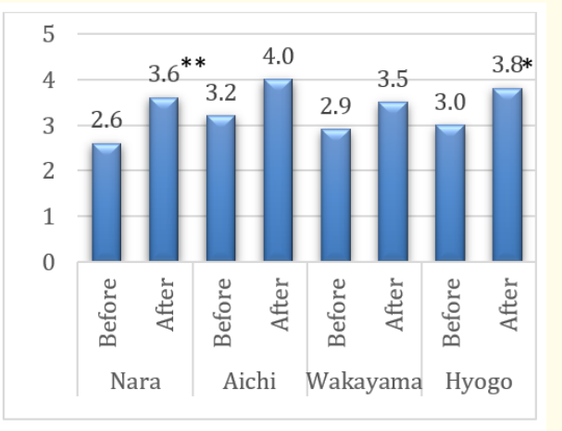

Figure 4: *Dementia prevention techniques. ** p < 0.01 *p < 0.05.*

In terms of links between supporters, although there was improvement, regional differences were noticeable (Figure 5), with Nara Prefecture averaging 3.8 to 4.6 points ($p < 0.05$), Aichi Prefecture 3.6 to 4.5 points ($p < 0.01$), Wakayama Prefecture 3.8 to 4.0 points (n.s.) and Hyogo Prefecture 3.2 points to 4.1 points ($p < 0.01$).

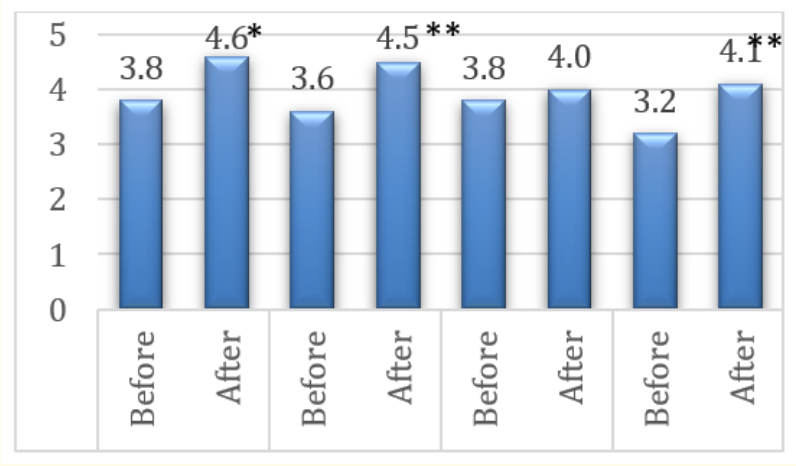

Figure 5: *Before-and-after comparison of supporters' solidarity.*

In terms of satisfaction with the activities, regional differences widened (Figure 6) with Nara Prefecture averaging 3.8 to 4.5 points ($p < 0.05$), Aichi Prefecture 3.8 to 4.6 points ($p < 0.01$), Wakayama Prefecture 3.9 to 4.2 points (n.s.), and Hyogo Prefecture 3.5 points to 3.9 points (n.s.).

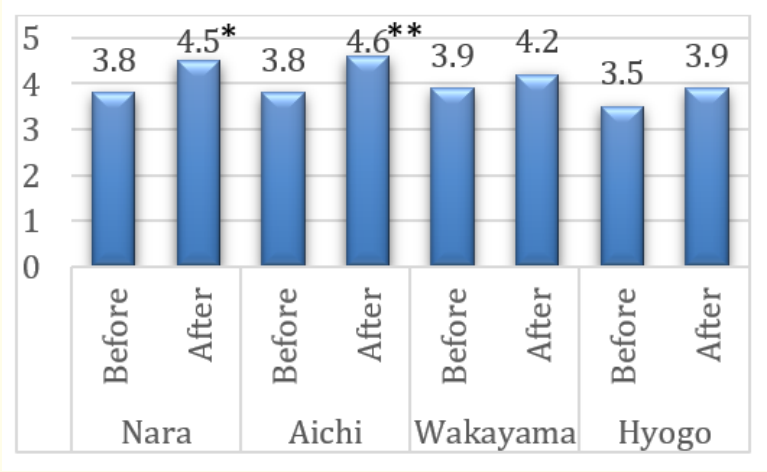

Figure 6: *Satisfaction with activities.*

In the free description, supporters wrote many comments to the effect that they had gained a good understanding of the basic aspects of age-related cognitive deterioration, the symptoms of MCI and dementia, as well as preventive measures, and that their understanding was gradually deepened by the lectures throughout the year. In terms of the dual task and delayed-response tasks, there was concern expressed that, although they had gained a good theoretical understanding, they may not be able to implement them in practice. About the reminiscence method using music, the comments were confident that the supporters could implement it by themselves right now, and that they intend to implement it in the senior citizens' clubs. There were also many comments that the supporters interacted with each other outside of the training and deepened their friendships.

With regard to the dementia prevention program for the elderly, 76 people participated in gathering program, with 64 valid responses being collected for before-and-after comparisons. These included 9 males and 55 females, with the average age being 77.6 ± 5.9 years. In the pre- and post-cognitive test comparison, the average scores in the immediate replay test increased from 24.8 points to 27.7 points ($p < 0.01$, Figure 7), and the code conversion test increased from 48.1 points to 57.8 points ($p < 0.05$, Figure 8).

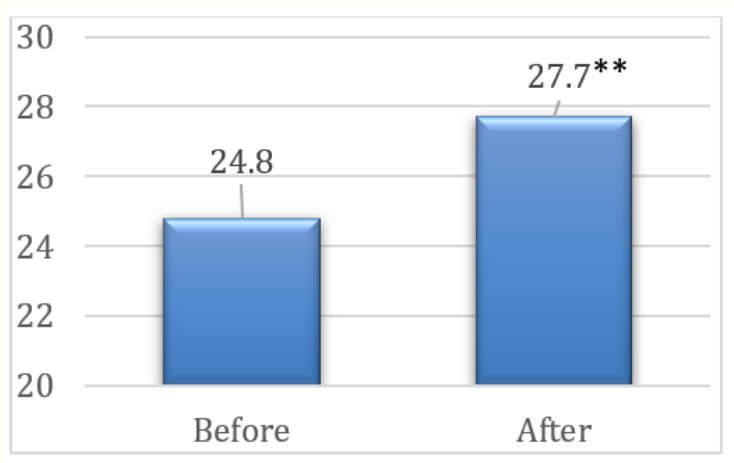

Figure 7: *Immediate replay test.*

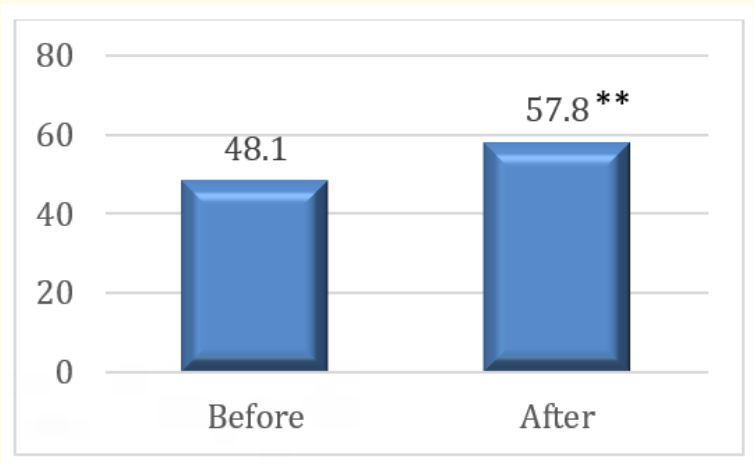

Figure 8: *Code conversion test.*

The word recall test was unchanged (n.s.) from 16 points to 18 points, and the delayed-response test increased from 6.5 points to 7.4 points ($p < 0.01$, Figure 9). With regard to the stress check, the stress level dropped from 3.2 to 2.6 ($p < 0.05$, Figure 10). In terms of visiting the homes of elderly people, visits to 34 individuals were made, with 8 males and 26 females, and an average age of 80.2 ± 6.13 years. In the pre- and post-test comparisons of cognitive tests showed that the mean score of the immediate replay test increased from 18.8 to 22.9 ($p < 0.01$), the code conversion test increased from 28.2 to 32.1 ($p < 0.01$), the word recall test was unchanged (n.s.) from 13.4 to 13.8, and the delayed-response test increased from 4.2 to 6.1 ($p < 0.01$).

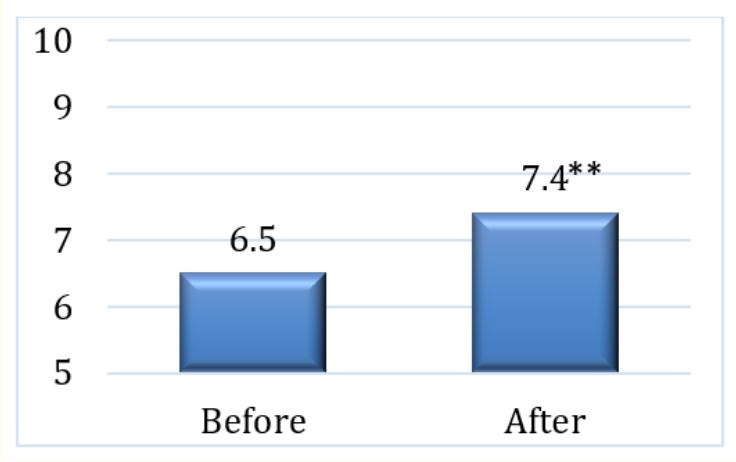

Figure 9: *Delayed-response test.*

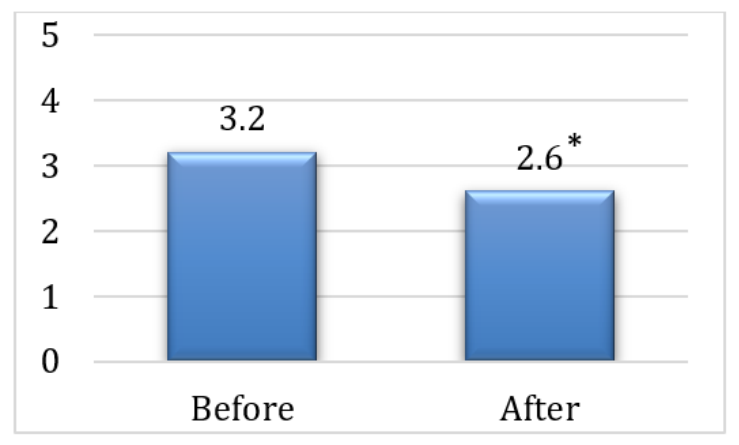

Figure 10: *Stress check.*

In the interviews with the elderly, they said that they do not talk to anyone for days unless their children come to their house or they get a phone call from someone, and that just receiving a visit like this and talking to them gives them a very happy, joyful and warm feeling.

Discussion

In this training for dementia prevention supporters, it was the knowledge level that showed the most significant improvement. This shows the effectiveness of long-term training throughout the year, as stated in the open-ended questionnaires. However, the overall rate of increase was low for dementia prevention techniques. The reason for this, as indicated in the free description, was that although the theory was well understood, the participants were not sure if they could put it into practice with the elderly. However, many of the participants commented that the reminiscence method in the program could be practiced immediately and that they would like to practice it in the senior citizen's club, and the major advantage of the reminiscence method is that anyone can easily do it. As for the other programs, it was thought that they needed to be improved so that they could be easily practiced by anyone. However, when the programs were actually practiced on the elderly, significant improvements in cognitive abilities were obtained. In theory, this is due to the synergistic effect of the dual task's improvement of frontal lobe function [15,16], the delayed reproduction training effect's improvement of memory [17,18], music therapy's effect on the cranial nerves [19-22] and dance's effectiveness of cognitive and physical function [23-25].

In particular, in music therapy and dance, group programs are recommended, and singing and dancing in a group has the great advantage of strengthening solidarity and social skills and promoting communication [26]. In addition, music therapy has the effect of promoting pleasant emotions and suppressing unpleasant emotions, which promotes psychological health [27], with this study also showing significant reductions in stress levels. It is also believed that the interpersonal relationships and interactions that accompany music act as a social support, which is a process that promotes psychological health [28]. In this way, for elderly people who can walk, a synergistic effect can be obtained by promoting interaction through a group program. However, interview results showed that elderly people who are living alone and have difficulty going out often do not talk to anyone for days. Such a situation alone is predicted to accelerate the deterioration of their mental and physical functions. As a solution to this problem, the in-home visitation program of this study seems to be meaningful, and it is necessary to continue to increase the number of supporters who can visit. As for the "personal histories" that were continuously created during the visits, the act of telling one's memories to a supporter and sharing memorable experiences together led to the creation of a special relationship. It has been reported that telling, writing, and repeatedly talking about the story of one's life enhances one's sense of potential [29].

Although the periods that the elderly have seen include the war during their childhood and the experiences of postwar food shortages and poverty, by recapturing their own history as "meaningful" and accepting the difficult experiences they went through as "irreplaceable proofs that they lived," they are able to improve their subjective well-being [30,31]. In addition to these psychological effects, this data showed significant improvements in cognitive function, demonstrating that conveying and describing the past had a positive influence on cognitive function. Previous studies have reported that by converting events stored as images into words, the hippocampus, visual cortex and language fields move in tandem, activating the brain [32]. In fact, the elderly people created a whole-body work by recalling memories that they would not normally remember, thinking about them, and organizing them through talking. Thus, a bond in which they eagerly await the supporters' visits has been formed, and it was considered to be a very effective activity for community building. In terms of the links between supporters, although a significant improvement was seen in the before-and-after comparisons, those regions with the lowest initial scores showed the greatest improvement. It is likely that there was no significant improvement in regions where people who were already friends invited each other to participate, as there was already strong initial cooperation. In those regions with high initial satisfaction with the activities, this area also saw no significant improvement. In addition, in Hyogo Prefecture, where the novel coronavirus spread during the supporter training and in which no supporter activities were possible, the level of satisfaction with the activities was particularly low.

Looking at these results comprehensively, success was based on a focus on early-stage elderly people. They have plenty of physical strength, time to spare, and are highly motivated to work. Since they are close in age to late-stage elderly people, it is easier for them to deepen their ties and form a community because of the many experiences that they can share. For this reason, deepening mutual relationships is the key to both supporter activities and elderly participation. We thus believe that methods for building relationships should be added when the program is revised in the future.

Conclusion

The regional system in which early-stage elderly people support late-stage elderly people can be expected to be established in a stable manner. As they lived through similar periods in their life, they have many experiences that they can share. The knowledge level of the dementia prevention supporter training has significantly improved, with the survey results indicating that a period of one year is appropriate. Moreover, it is likely that the reason why they were able to establish strong bonds with late-stage elderly people during the supporter activities lay in the fact that they consisted of early-stage elderly people, and not another generation. In terms of the dementia prevention program, music therapy and dance, which combined the dual task and the delayed-response tasks were effective, significantly improving cognitive test results. In the visitation activities for people who have difficulty going out, making a personal history significantly improved cognitive test performance, but this was thought to be due to the fact that the supporters were early-aged people who could understand and share the experiences of the late-aged people without explanation. In the future, it will be meaningful to continue efforts to increase the number of supporters of the elderly in the early stage.

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Conflict of Interest

This research is being carried out with a scientific research grant from the Ministry of Education, Culture, Sports, Science and Technology. There is no conflict of interest as we have not received any other financial support.

Bibliography

1. Yogev-Seligmann G., *et al*. "The role of executive function and attention in gait". *Movement Disorders* 23 (2008): 329-342.

2. Funahashi S. "Functions of delay-period activity in the prefrontal cortex and mnemonic scotomas revisited". *Frontiers in Systems Neuroscience* 9 (2015): 1-14.

3. National Institute on Aging. Stages of Alzheimer's and Dementia: Durations and Scales Used to Measure Progression (GDS, FAST and CDR). Dementia Care Central (2020).

4. Evripidou M., *et al*. "Nurses' knowledge and attitudes about dementia care: Systematic literature review". *Perspectives in Psychiatric Care* 55 (2019): 48-60.

5. Fazio S., *et al*. "Alzheimer's Association Dementia Care Practice Recommendations". *The Gerontologist* 58 (2018): S1-S9.

6. Cabinet Office. Survey on Daily Life of the Elderly, FY (2014).

7. Blieszner R., *et al*. "Friendship in Later Life: A Research Agenda". *Innovation in Aging* 3 (2019): 1-18.

8. Bahramnezhad F., *et al*. "The social network among the elderly and its relationship with quality of life". *Electronic Physician* 9 (2017): 4306-4311.

9. Sawami K., *et al*. "Effect of Cognitive Training by Music Therapy". *Journal of Psychiatry and Psychiatric Disorders* 2 (2018): 167-178.

10. Sawami K., *et al*. "Intellectual effects of delayed playback task and rhythmic activities". *Mental Health and Addiction Research* 2 (2017): 1-6.

11. Sawami K., *et al*. "Verification of the Effects of Brain Training in Elderly Subjects". *Japanese Journal of Health Recreation* 12 (2016): 29-35.

12. Sawami K., *et al*. "Relationship between cognitive function, vascular age and stress". *International Journal of Case Studies in Clinical Research* 1 (2017): 83-89.

13. Sawami K., *et al*. "Verification of The Effect of Cognitive Training by Dance". *Clinical and Medical Case Reports and Studies* 110 (2018): 1-6.

14. Ministry of Health, Labor and Welfare Long-term Care Prevention Evaluation Manual (2009).

15. Coelho FG., *et al*. "Multimodal exercise intervention improves frontal cognitive functions and gait in Alzheimer's disease: a controlled trial". *Geriatrics and Gerontology International* 13 (2013): 198-203.

16. De Andrade LP., *et al*. "Benefits of multimodal exercise intervention for postural control and frontal cognitive functions in individuals with Alzheimer's disease: a controlled trial". *Journal of the American Geriatrics Society* 61 (2013): 1919-1926.

17. Von Bastian CC., *et al*. "Effects of working memory training in young and old adults". *Memory and Cognition* 41 (2013): 611-624.

18. Jaeggi S., *et al*. "Improving fluid intelligence with training on working memory". *Proceedings of the National Academy of Sciences* 105 (2008): 6829-6833.

19. Fukui H., *et al*. "Efficacy of music therapy in treatment for the patients with Alzheimer's disease". *International Journal of Alzheimer's Disease* (2012): 1-6.

20. Satoh M., *et al*. "Music therapy using singing training improves psychomotor speed in patients with Alzheimer's disease: a neuropsychological and fMRI study". *Dementia and Geriatric Cognitive Disorders Extra* 5 (2015): 296-308.

21. Särkämö T., *et al*. "Music listening enhances cognitive recovery and mood after middle cerebral artery stroke". *Brain* 131 (2008): 866-876.

22. Boso M., *et al*. "Neurophysiology and neurobiology of the musical experience". Functional Neurology 21 (2006): 187-191.

23. Kattenstroth JC., *et al*. "Six months of dance intervention enhances postural, sensorimotor, and cognitive performance in elderly without affecting cardio-respiratory functions". *Frontiers in Aging Neuroscience* 5 (2013): 1-16.

24. Hewston P., *et al*. "Effects of dance on cognitive function in older adults: a systematic review and meta-analysis". *Age Ageing* 50 (2021): 1084-1092.

25. Fong ZH., *et al*. "Arts-based interventions to improve cognition in older persons with mild cognitive impairment: A systematic review of randomized controlled trials". *Aging and Mental Health* 25 (2021): 1605-1617.

26. Takahashi T., *et al*. "The effect of the maintenance of cognitive function by group music therapy for person of advanced years: comparing music therapy with karaoke". *Cross-Cultural Business and Cultural Studies* 20 (2015): 179-184.

27. Mori K., *et al*. "Recent progress in music and emotion studies: Psychological response, peripheral nervous system activity, and musico-acoustic features". *Japanese Psychological Review* 57 (2014): 215-234.

28. Pearce E., *et al*. "The ice-breaker effect: singing mediates fast social bonding". *Royal Society Open Science* 2 (2015): 1-9.

29. Gary K. "Telling and Listening to Stories: Creating a Wisdom Environment for Older People". *Generations* 3 (2003): 30-33.

30. Furusumi M., *et al.* "Cognitive and psychological effects of creating a life history book using reminiscence therapy for the elderly individuals living in communities". *The Nara Medical University Journal of Nursing Science* 17 (2021): 81-89.

31. Iyama Y., *et al*. "Effectiveness of Reminiscence and Autobigraphy in the Community-Dwelling Elderly Who Suffered from Forgetfulness". *Bulletin of the University of Shimane Junior College Izumo Campus* 1 (2007): 31-37.

32. Koyama K. "Why does "reminiscence therapy" work for dementia?" *Shodensha* (2011) 92-95.

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