
A Study on Educational Effect of Cognitive Training Program

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Abstract

The prevalence of dementia in Korea has been consistently high and the number of patients is estimated to be over three millions by 2050. The dementia is a disease that destroys the mental, physical, and social functions and place a burden on the patients and their families, requiring social responsibility for the care of the elderly. Therefore, with the aim of preventing dementia and delaying the progression, human resources who provide cognitive improvement and cognitive rehabilitation services to patients should be fostered. This is an one-group pre- and post-test pre-experimental design study intended to verify the effectiveness of cognitive training program on knowledge of dementia, dementia attitude and knowledge of cognitive activity, performance ability. This education was provided for 52 subjects of the cognitive game activity instructor course at L citizen's university from August 5, to October 9, 2021. This program was given one session in a week (ten sessions in total). As a result, dementia attitude (DAS: Dementia Attitudes Scale) was significant statistically with total score ($t=-4.33$, $p<.001$), stabilization score ($t=-3.62$, $p=.001$), and knowledge score ($t=-3.66$, $p=.001$). And knowledge of cognitive activity score was significant statistically ($t=-4.93$, $p<.001$). Performance ability was not significant statistically, ($t=-1.37$, $p=.175$), but the mean score increased slightly (pretest $M\pm SD=3.73\pm 0.37$) (posttest $M\pm SD=3.79\pm 0.29$). Therefore, cognitive training program appeared as a useful program for the effective activity of cognitive training program leader taking care of the elderly with dementia. But the educational contents are needed to improve the knowledge of dementia and ability to performance the program when developing a program and to generalize this, it is suggested that the study should be repeated by securing the number of subjects.

Keywords: Dementia; Cognition; Dementia Attitude; Cognitive Training; Dementia Prevention

1. INTRODUCTION

The prevalence of dementia in Korea has been high consistently. The number of dementia patients among the population aged 65 and over is estimated to be about 0.79M (10.29%) in 2019, and it is predicted to be over 1.36M in 2030, 2.2M in 2040, and 3M in 2050. The most common among estimated dementia patients as of 2019 is Alzheimer's type dementia (app. 74%), and is followed by other types of dementia and vascular dementia. The combined ratio of the mild and most mild ones accounts for more than half (58.8%) of patients [1].

Accordingly, the Korean government, in accordance with the Dementia Management Act., is managing dementia at the national level by establishing one central dementia center, 17 regional dementia centers, 256

dementia relief centers, and a dementia counseling call center. Dementia is also managed through elderly care facilities, communal homes, day and night care facilities, visiting nursing care, and welfare centers. However, facility expansion is required as a response to the increase in dementia patients [1].

The Ministry of Health and Welfare conducted dementia research projects for the prevention of dementia and the development of treatment technology, and is implementing rehabilitation services and welfare programs while improving the level of care in dementia-specialized hospitals and nursing facilities for dementia medical services. The Long-Term Care Insurance System, implemented in 2008, improved the rating procedure of dementia in 2011 and distributed dementia cognitive improvement programs to day and night care services [2].

Dementia is a disease that destroys mental, physical, and social functions of patients and is a chronic wasting disease in which the patients can survive up to ten years after onset. In dementia patients, the ability to survive alone gradually diminishes over time as there are fewer things they can do alone.

In addition, the possibility of long-term support by guardians is high, and since there are many cases where they need constant care, this disease places a great burden on families [3]. Dementia needs management at the national level because it affects individual and family relationships thus is recognized as a social problem.

Recently, social awareness of the care for the elderly by families is gradually weakening due to the nuclear family and the increase in women's participation in economic activities, increasing calls for the government and society to take responsibility for the care of the elderly [4]. Single intervention programs, with the aim of preservation or recovery of impaired cognitive function in dementia patients, to improve cognitive function by maintaining or enhancing remaining memory functions such as memory, orientation, and recall include cognitive therapy, reality therapy, recall therapy, music therapy, art therapy, horticultural therapy, and occupational and game therapy. However, the results of the studies on the effectiveness of the program were inconsistent, and problems such as the lack of professional staffs and the one-off nature of the program have been pointed out [5].

In Korea, standard guidelines for programs aimed at improving cognitive function, such as cognitive improvement and cognitive rehabilitation, or specific operating systems for providing personnel and training targets have not been established yet. Although doctors, nurses, social workers, and caregivers are considered as professionals in charge of providing dementia-related services, professionals are being produced in the informal private qualification training process, since the organic link between them, the guidance and supervision system, division of roles, and scope of responsibility have not also been established yet [6].

In addition, the increase in dementia patients raised the demand for programs to improve cognitive function of them and studies on the effectiveness of such programs have been reported. However, the effectiveness of education for nurturing leaders who provide programs has not been reported in Korea and has been very limited abroad.

The education program for cognitive training program leader conducted in this study is an education for experts who directly face the general elderly and those with dementia to improve their cognitive function in order to prevent and delay the progression of dementia. The subjects were, therefore, leaders who directly face the elderly with dementia and provide services to them in cognitive training programs.

A previous study suggested that, since attitude is the basis for behavior and affected by knowledge, the amount of dementia knowledge possessed by caregivers caring for the elderly with dementia affects their dementia attitude and performance ability [7], meaning that program experts who provide actual services need to develop knowledge about dementia. In addition, the negative attitude toward dementia was found to be associated with inadequate nursing care for the elderly with dementia [8]. Since dementia attitude affects program quality [9] and negative dementia attitude affects the dementia treatment, support, and decision-making [10], it is important to improve the trainee's dementia attitude.

In summary, professional workers with knowledge of dementia and a positive attitude toward dementia or training such experts are required to efficiently operate a program for prevention of dementia and delay of

progression in the elderly with dementia. The purpose of this study was to investigate the effect of cognitive training program education completion on dementia knowledge, dementia attitude, and performance ability to implement cognitive training program, in program leaders who provide cognitive training programs for cognitive improvement and dementia prevention of the dementia in general elderly and those with dementia.

2. METHOD

2.1 Design

This is a one-group pre- and post-test design experimental study to investigate the effect of cognitive training program to nurture expert for dementia prevention on trainee's dementia knowledge, dementia attitude, knowledge on cognitive activity, and performance to conduct cognitive training program.

2.2 Subjects

The subjects of this study are applicants for the dementia prevention cognitive game activity instructor certification course hosted by L Citizens University located in S city. The sample size calculated using the G*power 3.1 program with a significance level (α) of .05, a power ($1-\beta$) of 0.95, and an effect size (d) of 0.5 by applying a paired t-test was 45 and was determined as 53 in consideration of the dropout rate. Except for data from one subject due to incorrect information, data from a total of 52 subjects are included in the analysis.

2.3 Data Collection & Ethical Consideration

Data were collected from Aug. 5, to Oct. 9, 2021, and the subjects' general characteristics, dementia knowledge, dementia attitude, educational performance, and performance to conduct cognitive training program were evaluated using a self-report method.

Following the research ethics, the researchers explained the intention, purpose, and method of the study to the subjects before enrollment, and administered questionnaire to them who agreed to participate in the research.

2.4 Instruments

2.4.1 Characteristics of Subjects

The characteristics of the subjects were divided into general characteristics and education-related characteristics. The general characteristics consist of nine items on gender, age, education, raw income, religion, marital status, nursing experience, current occupation, and education and education-related characteristics include motivation to participate in education and self-confidence in learning.

2.4.2 Dementia Knowledge

The dementia knowledge was measured using the dementia awareness evaluation instrument used in the 2012 dementia prevalence survey [11]. It consists of 15 items including five items on the cause of, three items on epidemiology and system of, four items on symptoms and diagnosis of, and three items on treatment and prevention of dementia.

For the alleviation of the influence of heedless answers, it consists of 8 and 7 questions with correct answers 'yes' and 'no', respectively. Items no. 2, 3, 4, 5, 9, 10, 13, and 14 items are calculated inversely, and the higher score indicates the more dementia knowledge.

2.4.3 Dementia Attitude

The subjects' dementia attitude was measured using the Dementia Attitude Scale (DAS), developed in 2010 by O'Connor and McFadden19) [12] and used, after translation, in the 2012 dementia prevalence survey [11]. The DAS consists of a total of 20 items including ten items on the dementia knowledge that evaluates cognitive aspects and another ten items on the social comfort that evaluates emotion and behavior.

Each item is responded using a seven-point scale ranging from 1 (disagree at all) to 7 (strongly agree) thus highest score is 140. Six items are counted inversely and a higher score indicates a more positive dementia

attitude. The reliability of the total score measured by the developer was .83-.85 (Cronbach α statistic).

The social comfort sub-scale that measures emotion and behavior is measured using the extent to which subjects agree with items no. 1, 2, 4, 5, 6, 8, 9, 13, 16, and 17, and the dementia knowledge sub-scale that measures cognition aspect is measured using the extent to which subjects agree with items no. 3, 7, 10, 11, 12, 14, 15, 18, 19, and 20. Three kinds of scores including two-subscale scores and a total score are evaluated. Items no. 2, 6, 8, 9, 16, and 17 are calculated inversely, and the Cronbach's α in this study is .87.

2.4.4 Cognitive Activity Knowledge

The degree of understanding of each item is responded on a five-point scale: 5: very excellent knowledge, 4: excellent knowledge, 3: common knowledge, 2: poor knowledge, and 1: no knowledge. The higher score indicates the higher level of cognitive activity and the reliability of Cronbach's α in this study is .84.

2.4.5 Ability to Perform Cognitive Training Program

The cognitive training program self-efficacy was measured using modified and supplemented tool developed by Chi heeja to measure the nursing practice for the elderly [13]. 16 items in the original version were reduced to 12 items for the purpose of this study. Each item is responded using a four-point scale where 4 "always", 3 "often", 2 "sometimes", 1 "not at all". The higher score indicates the more positive performance and the Cronbach's α reliability in both the original version and this study are .87.

2.4.6 Self-confidence in Learning Cognitive Training Program

Self-confidence refers to that of trainees after completing the program, and was measured using eight item Self-Confidence in Learning Using Simulations Scale developed by NLN (2006) and responded using a five-point scale [14]. The scores are ranged from 5 meaning 'strong agree' to 1 meaning 'strong disagree' and higher score indicates higher self-confidence for the contents of the cognitive training program and the Cronbach's α reliability in both a previous study by American Nurses Association and this study are .87.

2.4.7 Motivation for Participation

The motivation to participation is measured using an educational participation motivation measurement tool modified and supplemented by Noh hyoryun and Lee eunju[15] based on the learning motivation scale by Vallerand and Bissonnette [16] and Kim Jinho's research [17].

This 15 item questionnaire composed of three factors including learning-oriented, destination-oriented, and activity-oriented ones. Each item is responded using a five-point scale where 5 represents "always", 4 "often", 3 "normal", 2 "rarely", and 1 "not at all" and higher score indicates higher positive self-motivation. The Cronbach's α reliability in this study were .90 and .89, respectively.

2.5 Data Analysis

The collected data was analyzed using SPSS WIN 18.0 Program, and the detailed analysis method is as follows:

- 1) For general characteristics of subjects, descriptive statistics such as frequency, percentage, mean and standard deviation were used.
- 2) To analyze the difference in the effectiveness of the cognitive training program for dementia prevention, dementia knowledge, dementia attitude, educational performance, and cognitive training program self-efficacy were analyzed using means, standard deviation, and paired t-test.

2.6 Education for Leaders of Cognitive Training Program to Dementia Prevention

This educational program consists of three parts: dementia knowledge, theory of cognitive training program, and practice of cognitive training program. Dementia knowledge includes knowledge of dementia such as basic concepts of dementia, characteristics of brain functions, cognitive and behavioral symptoms of dementia, types and treatment of dementia. The theory of cognitive training program includes classification criteria, characteristics and understanding of cognitive training, cognitive stimulation, cognitive rehabilitation,

psychology and characteristics of the elderly with dementia, and methods of providing cognitive activity programs. The cognitive training program consisted of face-to-face and untact practice due to the COVID-19 pandemic, and the 'Saengsaeng brain CAP Simchung-e' app for cognitive training program was used to increase the practical application of trainees [18]. One sessions of 2hours, a total of 20 hours of the program was conducted focusing on the textbook of dementia prevention cognitive game activity instructor certification course hosted by L Citizens University located in S city. Due to COVID-19 pandemic, two sessions of face-to-face class and eight sessions of untact class were provided. Table 1 shows the contents of program.

[Table 1] Contents of Education Program for Leader of Cognitive Training Program

Session	Theme	Content	Details
1	Game for Dementia Prevention & ICT	Direction of Dementia Problem Management & Role and Vision of ICT and AL in Untact Era	<ol style="list-style-type: none"> 1. To determine a word in the crossword puzzle 2. To connect in order (consonants or numbers) 3. To write the date and present time and draw it on the clock figure. 4. The problem of the increase in patients with dementia due to increase in elderly population. 5. Our happy old age with knowing, caring for, and community. 6. ICT and AI technologies already in the lives of the elderly, an expectations for future.
2	Understanding of Dementia	Definition and Types of Dementia & Cognitive Decline and Psycho-Behavioral Symptoms	<ol style="list-style-type: none"> 1. Past, present and future of dementia. 2. Subjects of dementia care 3. Definition of dementia (a syndrome that causes difficulties in daily life due to cognitive decline even in normal person) 4. Stage of dementia (forgetfulness - mild cognitive impairment - dementia) 5. Structure of the brain and the roles of each part 6. Structure and characteristics of neurons 7. Two major symptoms of dementia (cognitive decline, psychological/behavioral symptoms)
3	Types of Dementia	Dementia Management focusing on Early Diagnosis & Importance of Early Diagnosis and Treatment Direction	<ol style="list-style-type: none"> 1. Types of dementia (degenerative dementia, vascular dementia, pseudo dementia) 2. Importance of early diagnosis of dementia (a key factor for symptom improvement through treatment - timing of dementia diagnosis) 3. Factors that make early diagnosis of dementia to be difficult 4. 2020 National Dementia Policy 5. Dementia treatment (drug treatment, non-drug treatment)
4	Etiology of Dementia	Causative Factors of Dementia including Carbohydrate Addiction and Metabolic Syndrome	<ol style="list-style-type: none"> 1. Various mechanisms of dementia etiology by carbohydrate addiction 2. Various mechanisms of dementia etiology by metabolic dysfunction 3. Various mechanisms of dementia etiology by other causes
5	Newcare for Dementia Prevention	Five Measures to Prevent Dementia: NEW CARE	<ol style="list-style-type: none"> 1) N - Nutrition 2) E - Exercise 3) W - Well sleep 4) CA - Creative Activity

			5) RE - Relationship
6	Cognitive Training Program CAP	Introduction of Cap, Cognitive Training Program	1. To download the cognitive training program app 2. To browse content of each area 3. To learn actively 4. To learn how to guide the elderly with dementia
7	Brain Training & Activation	Introduction of Brain Training & Activation into Class	1. To induce brain activation using hand clapping and hand gymnastics 2. To open thinking through consensus building, motivation, and warm-up
8	Demonstration	Demonstration for each Areas	1. To participate in the cognitive training program CAP as a patient with dementia 2. To take notes on precautions and learn to use the device
9	Practice of Learning & Reality	Practice and Demonstration of Trainees	1. To enhance understanding of learning and induce concentration in using audiovisual materials for each area 2. To solve various problems of each class topic through interaction rather than lecture-based education
10	Game & Practice of CAP & Reality	Practice and Demonstration of Trainees	1. To download paper-written materials for each area at homepage 2. To prepare for practice for the difficulty level according to trainee 3. To obtain a sense of accomplishment through sharing of paper-based learning results 4. Finish

3. RESULTS

Measurements using the Dementia Attitudes Scale (DAS) showed statistical significance in total score, social comfort sub-scale score, and knowledge sub-scale score, and the mean score of cognitive activity knowledge score increased statistically significantly after education ($p < .001$). The ability to perform cognitive training program score increased, which did not reach statistical significance. The details of the general characteristics and results of the subjects are as follows:

3.1 General Characteristics

For the general characteristics of subjects, there were seven males (13.5%) and 45 females (86.5%); one (1.9%) is at their 30-40s, 29 (55.8%) 40-60s, and 22 (42.3%) over 60 years old. As for education, three (5.8%) graduated middle school, six (11.55%) high school, and 43 (82.7%) college or university. For the monthly income, those under 1M KRW and over 4M KRW accounted for most ($n=18$, 34.6%) and least ($n=5$, 9.6%). For the marital status, most of them ($n=47$, 90.4%) were married while four (7.7%) were not married and one response was incomplete.

There were nine subjects (17.3%) with nursing experience, 42 (80.8%) without nursing experience. For the current occupation, there were two caregivers (3.8%), four nursing assistants (7.7%), four social workers (7.7%), and 24 others (46.2%). 18 subjects (34.6%) were unemployed. The motivation for participating in the program were certificate ($n=37$, 71.2%), job ($n=5$, 9.6%), leisure time ($n=4$, 7.7%), recommendation ($n=2$, 3.8%), and others ($n=4$, 7.7%).

For the education-related characteristics, the average score of motivation for participation was 4.20 ± 0.52 and those for learning-, destination-, and activity-oriented motivations were 4.57 ± 0.52 , 4.16 ± 0.65 , and 3.87 ± 0.69 , respectively. The average score of self-confidence after completing cognitive training program was 4.38 ± 0.49 [Table 2].

[Table 2] General and Education-Related Characteristics of Subjects (N=52)

Variables	Categories	N(%) M±SD	Min~Max
Gender	Male	7(13.5)	
	Female	45(86.5)	
Age (years old)	30-40	1(1.9)	
	40-60	29(55.8)	
	Over 60	22(42.3)	
Education	Middle School	3(5.8)	
	High School	6(11.5)	
	College	18(34.6)	
	University	25(48.1)	
Monthly Income (KRW)	Under 1M	18(34.6)	
	1-2M	16(30.8)	
	2-3M	13(25.0)	
	Over 4M	5(9.6)	
Marital Status	Married	47(90.4)	
	Single	4(7.7)	
	Error	1(1.9)	
Experience of Caring	Yes	9(17.3)	
	No	42(80.8)	
	Error	1(1.9)	
Occupation	Caregiver	2(3.8)	
	Nursing Assistant	4(7.7)	
	Social Worker	4(7.7)	
	Nurse	0	
	None	18(34.6)	
	Others	24(46.2)	
Motivation for Participation	Certificate	37(71.2)	
	Job	5(9.6)	
	Economic Help	0	
	Leisure Time	4(7.7)	
	Recommendation	2(3.8)	

	Others	4(7.7)	
Motivation Level	Learning-oriented	4.57±0.52	3.2-5.0
	Destination-oriented	4.16±0.65	2.8-5.0
	Activity-oriented	3.87±0.69	2.6-5.0
	Total	4.20±0.52	3.1-5.0
Self-Confidence		4.38±0.49	3.2-5.0

3.2 Effectiveness of Program

To examine the effectiveness of the cognitive training program, the averages before and after the program were compared. The results showed that the difference in dementia knowledge scores including cause of dementia ($t=1.21$, $p=.220$), epidemiology and system ($t=-0.57$, $p=.569$), symptoms and diagnosis ($t=0.70$, $p=.485$), and treatment and prevention ($t=1.15$, $p=.255$) was not statistically significant ($t=1.17$, $p=.247$). While differences in dementia attitude score, social comfort sub-scale score ($t=-3.62$, $p=.001$), knowledge sub-scale score ($t=-3.66$, $p=.001$) and total score ($t=-4.33$, $p<.001$) were statistically significant. Average score of cognitive activity knowledge increased statistically significantly ($t=-4.93$, $p<.001$) and average score of ability to perform cognitive training program also increased but not statistically significant ($t=-1.37$, $p=.175$) [Table 3].

[Table 3] Effectiveness of Cognitive Training Program (N=52)

Variables	Categories	Pretest(M±SD)	Posttest(M±SD)	t	p
Dementia Knowledge	Cause	9.44±0.75	9.29±0.82	1.21	.220
	Epidemiology and system	5.00±0.89	5.06±0.80	-0.57	.569
	Symptoms and diagnosis	7.54±0.67	7.46±0.58	0.70	.485
	Treatment and prevention	5.56±0.50	5.46±0.54	1.15	.255
	Total	27.54±1.60	27.27±1.37	1.17	.247
Dementia Attitude	Knowledge	5.13±0.74	5.40±0.76	-3.66	.001
	Social Comfort	4.64±0.96	5.01±0.96	-3.62	.001
	Total	4.88±0.74	5.21±0.76	-4.33	<.001
Cognitive Activity Knowledge		3.54±0.48	3.83±0.39	-4.93	<.001
Ability to Perform		3.73±0.37	3.79±0.29	-1.37	.175

4. DISCUSSION

This study tested the effectiveness of education in applicants who want to become a cognitive training program provider for the elderly with dementia, and the results showed that this program improved subjects' dementia attitude and cognitive activity knowledge. The difference in dementia knowledge score and score of ability to perform program between pre- and post-program were not statistically significant.

For the general characteristics of subjects, there were far more females ($n=45$) than males ($n=7$), which is consistent with the result of Choi & Lee [18] on care burden factors according to the relationship between dementia patients and their primary caregivers, that, regardless of the presence of a spouse of patients with dementia, female ($n=69$) are more than male ($n=42$) in the main caregiver. This may be explained by the influence of the traditional Korean social trend that caring is a work unique to women.

The difference between before and after the program of Dementia knowledge score was not statistically significant ($t=1.17$, $p=.247$). This result is inconsistent with those showing significantly high score of dementia attitude in nursing students who completed dementia education program [19], though the comparison is difficult due to

difference in subjects and measurement tool between them. This is because, through mass media in everyday life, knowledge about dementia was widely publicized and educated not only to medical personnel but also to the general public, and the subjects' educational level was relatively high evidenced by higher rate of college and university graduation ($n=43$, 82.7%). Since caregiver's positive attitude toward dementia delays facility admission of elderly [20], and negative attitude toward dementia prohibit them from accessing to dementia management and hinders caregiver's appropriate nursing care [21], dementia attitude is an important element also for program leader.

The dementia attitude score showed a statistically significant increase in the knowledge sub-scale score measuring cognitive aspects of dementia ($t=-3.66$, $p=.001$), social comfort sub-scale score measuring dementia emotion and behavior ($t=-3.62$, $p=.001$), and total score ($t=-4.93$, $p<.001$). These results are consistent with the results of previous studies showing that the social comfort and knowledge sub-scale scores and total score of volunteers and families of dementia patients who completed the dementia education program improved [22, 23]. In addition, results of the report on effects on knowledge and attitudes toward dementia of nursing students after geriatric nursing education and the result of a study that developed a dementia education program in practical education for nursing students and theoretically learned knowledge about dementia and various cognitive rehabilitation programs and then practiced program operation showed improvement in dementia knowledge and attitude [24], supporting the results of this study, though the comparison is difficult due to difference in subjects and measurement tool between them. In addition, the average score of the knowledge sub-scale after education was 5.46 and the average score of the social comfort sub-scale representing the emotional and behavioral aspects was 5.01 showed higher than the average median value (3.5), consistent with the results of previous study that the level of emotion and behavior toward dementia is lower than that of dementia knowledge [25][28][29][30]. It is considered, therefore, in the development of dementia knowledge and programs, the addition of measures to improve activity as well as education on dementia knowledge is required.

Cognitive activity education increased cognitive activity knowledge statistically significantly ($t=-4.93$, $p<.001$), however the improvement of the mean score of ability to perform cognitive training program (37.3 vs 38.3) was not statistically significant ($t=-1.37$, $p=.175$). This results is consistent with those of previous studies that reported that the dementia attitude and self-efficacy scores for nursing the elderly with dementia improved among volunteers who received theoretical education corresponding to dementia knowledge and practical education corresponding to cognitive rehabilitation education [4], and that elderly nursing self-efficacy score and geriatric nursing performance score was slightly improved though it was not statistically significant after nursing caregiver education [26], though the comparison is difficult due to difference in subjects and measurement tool between them. The cognitive training program leader is a program provider to improve the cognitive function of the elderly with dementia, and their self-efficacy and performance are important parts of the program. Considering the report that the appropriate completion time is more than 240 hours in providing cognitive rehabilitation programs for the elderly with dementia [27], the extension of the training hours and increase of proportion of practical training are required. In addition, since non-face-to-face education due to the COVID-19 pandemic is expected to have a negative impact on educational effectiveness, a re-evaluation of its effectiveness is required through re-implementation of the program after the end of COVID-19.

5. CONCLUSIONS

The education program for cognitive training program leader provided in this study is an education to provide a program to the elderly with dementia through dementia theory education, cognitive training theory and practice. It was attempted to understand the effect of the program on the degree of knowledge and performance of the program. The study results showed significant improvement in attitude toward dementia and cognitive training program knowledge, and slight improvement in dementia knowledge and cognitive training program performance.

This study was composed to apply the program to the elderly with dementia by combining theory and practice, but it is regrettable that effective education was not achieved due to the COVID-19 pandemic. Nevertheless, this education is considered to have improved the leaders' ability to provide programs to the elderly with dementia by improving their knowledge of attitudes and cognitive activities about dementia. The generalization of the result is limited since this study has the limitation of adopting only the experimental group without the control group. A comparative study with the control group is required. In addition, additional research on supplementation of educational content and methods to improve actual program performance is required and additional research on the completion time, number of training sessions, and overall training content of cognitive training program education is recommended.

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Authors' contributions

All authors contributed toward data analysis, drafting and revising the paper and agreed to be responsible for all the aspects of this work.

Declaration of Conflicts of Interests

Authors declare that they have no conflict of interest.

Declarations

Author(s) declare that all works are original and this manuscript has not been published in any other journal.

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