Original Research

The Journal of Prevention of Alzheimer's Disease - JPAD
Volume 7, Number 2, 2020

Exploring Factors that Contribute to Joining and Regularly Practicing in Cognitive Training among Healthy Older Adults: A One-Year Follow-Up Qualitative Study

P. Srisuwan[1], D. Nakawiro[2], S. Chansirikarnjana[3], O. Kuha[4], S. Kengpanich[1], K. Gesakomol[1]

1. Department of Outpatient and Family Medicine, Phramongkutklao Hospital, Bangkok, Thailand; 2. Department of Psychiatry, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; 3. Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand; 4. Institute of Geriatric Medicine, Ministry of Public Health, Nonthaburi, Thailand

Corresponding Author: Srisuwan P, Department of Outpatient and Family Medicine, Phramongkutklao Hospital, Bangkok, 10400, Thailand. Phone (662) 354-7660 ext. 93100, Fax (662) 354-9006, Email: patsri2004@yahoo.com

J Prev Alz Dis 2020;2(7):75-81
Published online March 23, 2020, http://dx.doi.org/10.14283/jpad.2020.14

Abstract

BACKGROUND: Cognitive interventions have the potential to enhance cognition among healthy older adults. However, little is known of the factors associated with the joining and participating of older people in group-based multicomponent cognitive training (CT).

OBJECTIVES: To explore factors that contribute to joining and regularly practicing CT over 1 year among healthy older adults.

DESIGN: A qualitative study.

SETTING: Geriatric clinic in Bangkok, Thailand.

PARTICIPANTS: 40 nondemented community-dwelling older adults

INTERVENTION: The CT of executive functions, attention, memory and visuospatial functions (TEAM-V) program was conducted over 5 sessions, with a 2-week interval between each session.

MEASUREMENTS: An inductive qualitative approach, based on semi-structure interviews with 40 healthy older adults, was employed. The interviews explored factors of joining CT at baseline, factors of regularly participating in class at 6 months and at home at 1 year. Data were coded and analyzed using and the thematic analysis approach.

RESULTS: After analyzing factors concerning joining CT, 3 core themes emerged: (1) individual characteristics with 3 subthemes of "health status", "time arrangement", and "financial status"; (2) individual perceptions with 2 subthemes of "perceived susceptibility to dementia" and "perceived severity of dementia" and (3) encouragement from families and friends. After analyzing factors of practicing CT in class, 3 core themes emerged: (1) program with 3 subthemes of "session", "group facilitators" and "notification before class"; (2) accessibility with 2 subthemes of "distance" and "transportation" and (3) encouragement from families and friends. After analyzing factors of practicing CT at home, 2 core themes emerged: (1) contents of the training program and (2) encouragement from families and friends.

CONCLUSIONS: Increased awareness of holistic factors including older adults' characteristic and perceptions, support from families and friends and accessibility should be emphasized in planning CT. Designing the content of CT that could be applied or adapted in daily living and effective program components such as a notification system could increase practicing.

Key words: Cognitive training, joining, older adults, participation, qualitative study.

Introduction

Dementia is the leading cause of dependence and disability in the elderly population worldwide. As the average life expectancy increases, the prevalence of dementia is expected to increase exponentially (1). Consistently high or increasing social engagement is associated with a lower risk of dementia (2,3). Furthermore, Participation in social activities such as group activities outside the family may have a bigger impact on cognitive function than social contacts with family members or non-relatives (4). Moreover, higher participation in cognitive training (CT) is associated with better cognitive function and reduced risk of cognitive decline and dementia among healthy older people (5,6) and people with dementia (7). For example, the Advanced CT for Independent and Vital Elderly (ACTIVE) study, the first large scale randomized controlled trail, demonstrated significant improvements in cognition such as memory and reasoning, which were sustained for up to ten years, and also showed benefit to instrumental activities of daily living (IADL) (8). CT is an approach using guided practice on structured tasks with the direct aim of improving or maintaining cognitive ability (9,10). This training can assume many formats. For example, it can be conducted individually or in groups, with either a single, e.g., memory, or multiple topics, e.g., memory and executive function. Moreover, the approach might consider a bottom-up training, e.g., enhancing sensory and perceptual skills to improve higher order processing, or top-down, e.g., target mechanisms of cognitive control to improve the systematic problem-solving approach (11). In our previous study, a training of executive functions, attention, memory and visuospatial functions, the TEAM-V Program was developed for group-based multicomponent CT. A top-down approach

Received August 16, 2019
Accepted for publication October 3, 2019

was used for CT among healthy older adults. The results showed that the TEAM-V Program helped to improve global cognitive function and memory, reduce anxious and depressive symptoms and enhance IADL among healthy older people in six months (12)..

Older people should be encouraged to participate in group activities especially CT to reduce their risk of dementia. Understanding factors that contribute to joining and participating in group-based CT are essential for planning the training. Socio-demographic and health factors were associated with the participation of elderly people in general group educational activities (13). Having an effective program and facilitators and collaboration from family members were the main factors contributing to regularly participating in CT for mild cognitive impairment (14). However, little is known of the factors associated with the joining and participating of older people in group-based multicomponent CT.

Therefore, this study aimed to explore factors contributing to joining CT in TEAM-V Programs, regularly practicing CT in classes and at home among healthy older adults over one year.

Methods

Study Design and Subjects

For the TEAM-V CT, using a single-blinded, controlled trial, 40 healthy older adults were randomized to the intervention group. The authors recruited participants who visited the geriatric clinic, outpatient department, Phramongkutklao Hospital, Bangkok, Thailand from April to May 2017. The enrolled participants of the TEAM-V Program were aged > 60 years and willing to participate in all five activities. The exclusion criteria were: Thai version of the Hospital Anxiety and Depression Scale (HADS) score higher than 11 on anxiety or depression (15), Thai version of the Montreal Cognitive Assessment (MoCA) score less than 26 (16), having any conditions affecting participation in program activities, e.g., balancing problems, hearing impairment as well as any psychiatric diseases and neurological problems such as stroke. The CT was conducted over five sessions, with a two-week interval between each session. Each session involved the training of different cognitive domains. The details of each session are shown in Table 1. Figure 1 illustrates the timeline of the TEAM-V Program enrollment.

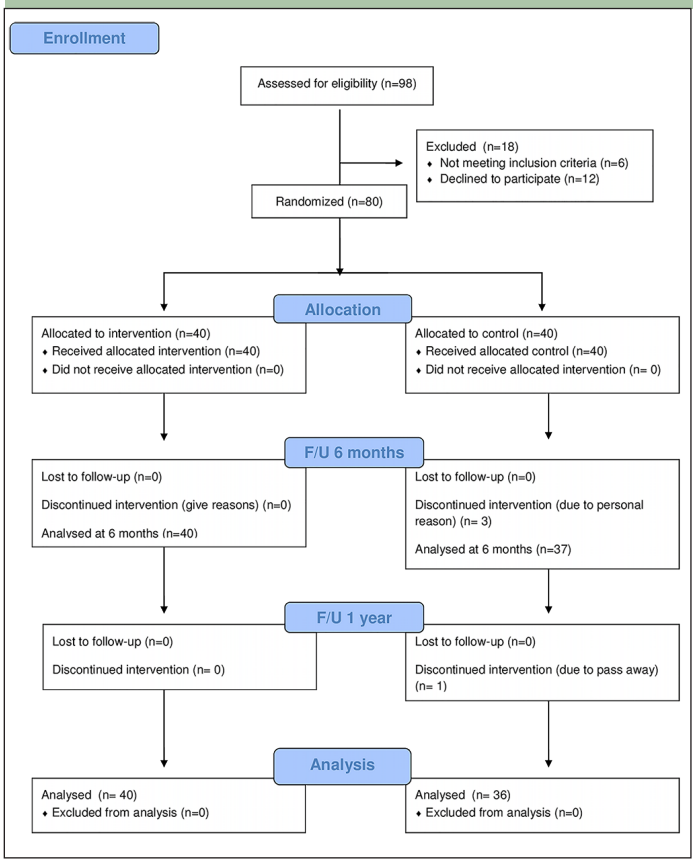
The authors conducted semi-structured interviews with 40 participants in the intervention group of the TEAM-V CT. After approaching the participants, the interviewers introduced themselves. After explaining the objectives of the study, the participants were individually interviewed. All of the interviews were recorded by audiotape. Conversations were fully transcribed along with field notes and an audit trail was created immediately after each session. Three main aspects were explored: (1) factors to join CT, (2) factors to regularly practice CT in class and (3) factors to regularly practice CT at home. After collecting demographic data, the interviews explored factors of joining CT. The first question was asked at baseline, “What factors influenced your decision to join CT”. The second question was asked at 6-month follow-up, “What factors influenced your decision to regularly practice CT in classes”. Finally, the last question was asked at 1 year follow-up, “What factors influenced your decision to regularly practice CT at home”. The interview took 10 to 15 minutes each session, depending on the participant. This study was approved by the Institutional Review Board of the Royal Thai Army Medical Department Ethics Committee as instituted (IRBRTA 599/60) by the Declaration of

Table 1. TEAM-V program CT activities

Sessions	Type/main domain training	Contents of training	Example of activities in class	Example of homework
1	Attention	Switching, selective and sustained attentions	Listening carefully a story and a song as a distractor, answers the detail of the story	Identifying internal and external distracters in daily living
2	Attention and memory	Attention and short-term memory	Practicing mental visualization techniques to memorize information such as names and objects	Memory techniques using in real life such techniques to remember of shopping lists
3	Memory	Short and long-term memory	Listening a story and practicing strategies such as mnemonics, mind map and picture to improve memory	Short-term memory: summarized news with mnemonics, mind map and picture Long-term memory: autobiography
4	Visuospatial	Spatial-temporal reasoning	Identify number of overlap descriptions, analyze a figure and reproduce it	Drawing a map from home to hospital
5	Executive function	Management skills	Planning and doing sandwich with limited resources	-

Helsinski, and all participants were required to provide written informed consent before enrollment. The TEAM-V Program was registered under the Thai Clinical Trials Registry (TCTR20190709003).

Figure 1. CONSORT diagram of the TEAM-V program enrollment flow



Data Analysis

Open codes were created and analyzed using the investigator triangulation method. The codes were purely data driven. After that, the codes were discussed, modified and merged by the authors and final revised codes were developed afterward. Emerging concepts were extracted and analyzed using a thematic analysis approach.

Results

Participant Characteristics

All 40 healthy older adults in the intervention group of the TEAM-V Program participated in this study. Patients' characteristics are shown in Table 2. On average, participants were young-old age (mean age 66.23±4.64 years). Most participants were female (80%), most had a bachelor's degree (63%) and had a chronic medical condition (83%). The TEAM-V Program adherence rates were 100% including five sessions of training and at follow-up at six months and one year. The details of the TEAM-V program enrollment flow are shown in Figure 1.

Table 2. Participant characteristics

Characteristics	Mean or percent
Age (years), mean +/- SD	66.23±4.64
Gender	
Female, n (%)	32 (80)
Male, n (%)	8 (20)
Marital status	
Single, n (%)	8 (20%)
Married, n (%)	24 (60%)
Other (Widowed,separated, divorced), n (%)	8 (20%)
Highest level of education	
7-12 years, n (%)	1 (2.5%)
Associate's degree, n (%)	2 (5%)
Bachelor's degree, n (%)	25 (62.5%)
Graduate degree, n (%)	12 (30%)
Chronic medical conditions, n (%)	33 (82.5%)
Self-reported health status[a]	
Low, n (%)	15 (37.5%)
High, n (%)	25 (62.5%)
Activities of Daily Living (ADL)[b]	
Independent, n (%)	38 (95%)
Requiring some help, n (%)	2 (5%)

a. Derived from responses to the question, "How satisfied are you with your health?" (WHO QoL)[13]; b. Based on the Chula ADL Index[14]

Thematic analysis

After analyzing final codes, three main themes in joining the program, three main themes in regular practice CT in class, and two main themes in regular practice CT at home were identified. The category, themes, subthemes and codes of the participants after the interview are shown in Table 3 and Figure 2. The quoted statements were examples of the responses by the participants.

Joining CT

Individual characteristics and individual perceptions were very important to join CT.

Individual characteristics

Good health status was an importance factor. Although most of participants (82.5%) reported some chronic medical conditions such as hypertension and diabetes, self-reported health statuses was high (62.5%). Moreover, most were still independent regarding ADL (95%). In addition, available time to join the program and good financial status also supported participants to join the

program.

"I am so lucky, my health is good. Although I have hypertension and dyslipidemia, but the diseases do not limit my activities. I can do whatever I want. If I have stroke or disabilities, it will limit me in performing a lot of activities including joining CT class."

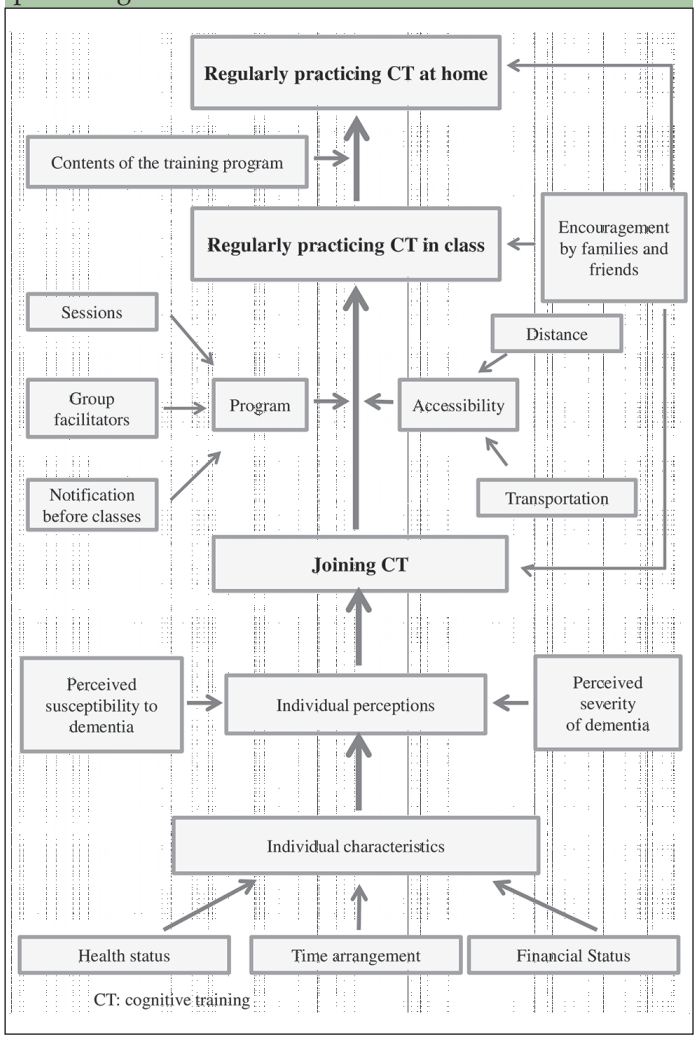
"I am single and retired; I have free time to join the class"

"The class is set up in the morning. I can join the class and then come back to my home to do some housework"

"I am a retired solider, I have enough pension and have some savings, so I don't have to worry about working after retiring. Therefore, I have free time to join the class."

"My daughter gives some money to me every month, so I have enough money to pay the fee of transportation to the class"

Figure 2. Factors that contribute to joining and regularly practicing in CT



Individual perceptions

Perceived susceptibility and severity of dementia were two main factors to urge participants to join the program. Perceived susceptibility to dementia from health care professionals or having dementia in their families increased their awareness of dementia. Moreover, participants who were taking care of people with dementia had experience the severity of the disease. In addition, some participants recognized the severity of dementia from media such as television or websites.

"My doctor told me that I have a risk to develop dementia because my mother and my aunt had dementia. I have taken care of my mother since the beginning of the disease until she passed away. Her memory gradually left; she repeatedly asked me the same questions; did not know how to get dressed. At the end of the disease, she did not know herself and did not know how to walk, so she had to stay in bed all the time. It is a very dangerous disease. I don't want to get it"

"I am 70 years old, and forget something sometimes that's normal, but my nurse who visits me at home told me aging increases the risk of dementia, I am elderly, so I think I have some risk of dementia although I don't have family with dementia".

"Dementia is very scary, I saw the news of an elderly woman with dementia who didn't know herself, wandered far away from home and didn't know how to come back"

Regularly practicing CT in class

Actually, the CT program was complicated because the program had to be designed to train many specific cognitive domains incorporating various activities. However, designing of the program in sessions with small groups, interactive activities and practicing step by step would help participants to understand the training. Moreover, friendly, warm, enthusiastic group facilitators could support participants during class. In addition, before class, the program used notification by phone call from one of the group facilitators to remind participants to join the session. Participants who lived near the class or accessed convenient transportation to the class tended to regularly practice CT in class.

"At the beginning in the large class, I hesitated to speak or answer questions, but after participating in a lot of interactive activities in a small group, I was not hesitant at all due to the friendlier environment. The small group drew my attention and was also more interesting than large group."

"Before training, I thought brain training was very complex; maybe I couldn't follow all the steps of training, but step by step training from easy to difficult techniques helped me to understand"

"Group facilitators were always enthusiastic to answer my questions throughout the session. They were very friendly, so I dared to ask or answer questions."

"Most of facilitators helped me to understand the sessions, explained the objectives and summarized the session. If they did not explain, I would not have

Table 3. Category, themes, subthemes and codes of the participants after the interview

Category	Themes	Sub-theme	Codes
Joining CT	Individual characteristics	Health status	Good health status, no sever disability
		Time arrangement	Having free time
		Financial status	No financial problems
	Individual perceptions	Perceived susceptibility to dementia	Giving advice from healthcare professionals, having family history of dementia
		Perceived severity of dementia	
	Experience from taking care of people with dementia, know from media		
	Encouragement	Families and friends	Support and encourage participants to join class
Regular practice CT in class	Program	Session	Having small group and interactive activities, practicing step by step,
		Group facilitators	Good explanation, help to interact, friendly
		Notification before class	Phone call to remind to join classes, encourage doing homework
	Accessibility	Distance	Living near elderly club
		Transportation	Good transportation system, can come with families
	Encouragement	Families and friends	Support and encourage participants to practice in class
Regular practice CT at home	Contents of the training program	Application	Can do or adapt in daily living
	Encouragement	Families and friends	Support and encourage participants to practice at home

understood."

"I am a housewife, so I have a lot of activities at home; sometime I nearly forgot to join class, but fortunately phone calls from the program always reminded me"

"My home is near class, the distance between my home and the class is only 3 bus stops. It is easy for me to participate in the class."

"My son's workplace is near class, he drops me to join the class in the morning and picks me up in the afternoon after class. I often have right knee pain. If I have to go by bus by myself, I cannot participate in the class for sure".

"Although my home is far from class, one of the bus lines begins near my home and goes to the hospital. Therefore, I can sit on the bus. It is not difficult to me to go to the hospital."

Regularly practiceing CT at home

Most participants said the benefits in everyday life were necessary. Therefore, participants were interested to practicing techniques that they could adapt in daily life to improve their cognition.

"I felt at first brain training techniques were going to very difficult. However, after learning in class, I realized it was quite fun and I could adapt to my daily life. My favorite technique of improving short-term memory is memorizing by various techniques such as mnemonics and mind map. I practice every morning when I try to summarize news and write it in my notebook."

Encouragement from family members and friends

Encouragement from family members and friends not only stimulated participants to join class but also urged participants to regularly attend and practice CT including in class and at home

"My wife wanted to join the program, and she encouraged me to join the program too. After classes, the program has some homework; she always encouraged me to do homeworks. Morover, after finishing all five sessions, she still encouraged me to practice as much as possible such as when we go to shopping, I have to remember the shopping list by the various techniues"

"My close friend decided to join the program, so I wanted to join too."

"My daugther always asked me what techniques I have learned in the class; she encourage me to practice everyday. Forexample, when she comes back home, I have to summerize the news using various techniques that I have learned in the program."

"My friend, I just know her from the program because we are in the same small group. She always supports me to practice in the class and also at home. I enjoy practicing with her in the class. She calls me at home to discuss about homework and also notify me to practice after class."

Discussion

This study comprised a qualitative research that explored the factors promoting practicing in CT among healthy older adults using a holistic perspective. The duration of the study involved a one-year follow-up with five sessions in group-based, multicomponent, cognitive stimulation involved in training different cognitive domains every two weeks and all participants attended all of the five sessions in the training. No lost follow-up occurred at six months and one year. Therefore, the participation rate of the program was very high (100%).

In response to our research question, the authors found that there were multifactorial compositions promoting joining or practicing in CT Not only clinical factors such as health status but also psychological such as participants' perceptions and social factors such as financial status were influenced to participants decisions. Individual characteristics such as having good health and individual perceptions such as concerning about susceptibility of dementia were influenced participants to join CT. The results can be explained by the health belief model relates a sociopsychologic theory of decision making to individual health-related behavior (19). To illustrate, individual perceptions of susceptibility and severity of dementia which are people believes about health problems impact the engagement. The perceptions of high benefits from the program and low barriers to attend the program such as easy accessibility, friend and family support promote the adherence of the training. Self-efficacy including good health status and free time also gets into high engagement too. This was similar to the results of a cross-sectional mixed methods analysis involving 1,028 participants in rual Sri Lanka by Marsh and colleagues revealed that there were several barriers of social participation in older adults such as having poor health, living alone and time constrain (20). This study revealed that most participants had a chronic medical condition such as hypertension. This was similar to the results of a cross-sectional analysis involving 3,034 participants in Brazil by Dias and colleagues revealed that the morbidities in the elderly who participated in education activities were hypertension and diabetes mellitus. Among non-participants, spinal cord problems and vision problems prevailed (13). People with physical limitations are more likely to have activities of daily living problems (21). In Fibra study in Brazil by Pinto and colleague revealed that not only physical health problems such as vision impairment and low cognitive status but also mental problems such as depressive were symptoms were related to low social participation in older adults (22). Therefore, design of CT program should pay attention to older adults with physical limitations and mental problems.

The present findings suggest that appropriate program and good accessibility to CT class were importance factors to regular attend and practice CT in class. CT is very complex and can take many formats7. If the trainings are not appropriate such as too complicate, difficult to understand or not interesting, participants do not want to attend all of the classes. Therefore, in this study found that appropriate sessions such as having small group and interactive activities, friendly group facilitators and notification before class helped participants attended and practiced CT. This was similar to the results of factors that contribute to regular participation and practice in CT among older adults with minor neurocognitive disorder (14). Accessibility such as transportation was also an importance factor in this study. This was similar to the results of National Health and Aging Trends Study involving 7,197 participants in the USA revealed that poor transportation was a barrier to social participation 12.2-18.2% in homebound older adults (23). Moreover, older adults with multicomorbidity who used of public transport or of their own car had higher levels of participation in social activities (24).

In the present study, contents of the training program could apply or adapt in daily living was an important factor to regular practice CT at home. Recent study about CT in Parkinson's disease found that CT using real-life activities could foster relevance and meaning to the participants' life which, in turn, enhance motivation, engagement in the intervention and follow-through (25). Encouragements from families and friends were main factors to support participants to join CT and regular practice CT in class and at home. This was similar to the results of Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) Study involving 631 participants in Finland revealed that being married or cohabiting was independently associated with the greater probability of starting computer-based CT (26). Compare with study of adherence to diabetes therapy in the US. found that practical and emotional support received by both family and friends had a positive influence on global measures of disease management in patients with diabetes. Adherance was 27% higher when patients had practical available to them (27). Moreover, study of barriers to social participation among lonely older adults in United Kingdom revealed not only illness/disability and lack of a supportive community but also loss of friends and families were importance barriers too (28). Neighborhood factors were not mentioned in this study. However, in ACTIVE study in the USA revealed that neighborhood factors do impact cognitive outcomes albeit in a subtle way (i.e., mostly through practice-related effect) (29).

This study was limited by several factors. First, the data was collected in Pramongkutklao hospital, tertiary care hospital, in the Bangkok city of Thailand. For implementation in larger scale, such as primary care or rural area, the results may different from these research outcomes due to educational, economical, and social factors. Second, we found factors that maybe effect on the training program. Nevertheless, we did not explored further outcomes because those were not the main objective of this study. Third, this study was designed base on single blind method, as same as other interviewed quantitative study, the bias might be occurred due to mutual relationship. Moreover, interviewing passages were set in Thai language and were translated into English by native speaker before analyzing process. Therefore, translation bias may occur due to mistranslation. Finally, the participants were selected and enrolled with voluntary procedure. The factors from non-participating patients might be miss and lost to be analyzed.

Conclusion

To summarize, Increase awareness of holistic factors including older adults' characteristic such as health, time and financial status and perceptions such as concerning about susceptibility and severity of dementia, support from families and friends and accessibility should be emphasized in planning CT. The current study adds new knowledge to designing the content of CT that could apply or adapt in daily living and effective program such as interesting sessions, appropriate group facilitators and notification system can increase practicing CT in class and at home.

Acknowledgement: The authors would like to express our gratitude to the participants and PMK aging team in Geriatric Clinic, Phramongkutklao Hospital. We also would like to thank the Institute of Geriatric Medicine for allowing the research team to be a part of the larger study and conducted project activities in the Central region of Thailand. We also thank Ms. Worarachanee Imjaijitt for statistical analysis.

Funding: The research project was partially supported by The Thai Health Promotion Foundation. The sponsors had no role in the design and conduct of the study; in the collection, analysis, and interpretation of data; in the preparation of the manuscript; or in the review or approval of the manuscript.

Conflict of interest disclosure: There is no conflict of interest.

Ethical standards: The TEAM-V study was approved by the Institutional Review Board of the Royal Thai Army Medical Department Ethics Committee as instituted by the Declaration of Helsinski.

References

1. Martin M, Clare L, Altgassen AM , Cameron MH, Zehnder F. Cognitive-1. Satizabal C, Beiser AS, Seshadri S. Incidence of Dementia over Three Decades in the Framingham Heart Study. N Engl J Med 2016;375(1):93-4.
2. Zhou Z, Wang P, Fang Y. Social engagement and Its change are associated with dementia risk among Chinese older adults: A longitudinal study. Sci Rep 2018;8(1):1551. doi: 10.1038/s41598-017-17879-w.
3. Chertkow H. An action plan to face the challenge of dementia: INTERNATIONAL STATEMENT ON DEMENTIA from IAP for health. J Prev Alzheimers Dis 2018;5(3):207-212.
4. Glei DA, Landau DA, Goldman N, Chuang YL, Rodríguez G, Weinstein M. Participating in social activities helps preserve cognitive function: an analysis of a longitudinal, population-based study of the elderly. Int J Epidemiol 2005;34(4):864-71.
5. Giuli C, Fattoretti P, Gagliardi C, Mocchegiani E, Venarucci D, Balietti M, et al. My Mind Project: the effects of cognitive training for elderly-the study protocol of a prospective randomized intervention study. Aging Clin Exp Res 2017;29(3):353-60. doi: 10.1007/s40520-016-0570-1.
6. Y Lee. Primary prevention of dementia: The future of population-based multidomain lifestyte interventions. J Prev Alz Dis 2018;5(1):5-7.
7. King JB, Jones KG, Goldberg E, Rollins M, MacNamee K, Moffit C, et al. Increased Functional Connectivity After Listening to Favored Music in Adults With Alzheimer Dementia. J Prev Alzheimers Dis 2019;6(1):56-62.
8. Rebok GW, Ball K, Guey LT, Jones RN, Kim HY, King JW, et al. Ten-year effects of the advanced cognitive training for independent and vital elderly cognitive training trial on cognition and everyday functioning in older adults. J Am Geriatr Soc. 2014; 62(1):16-24. https://doi.org/ 10.1111/jgs.12607
9. Bahar-Fuchs A, Martyr A, Goh AM, Sabates J, Clare L. Cognitive training for people with mild to moderate dementia. Cochrane Database Syst Rev 2019;3:CD013069. doi: 10.1002/14651858.CD013069.pub2.
10. Anstey KJ, Peters R. Oversimplification of dementia risk reduction messaging is a threat to knowledge translation in dementia prevention research. J Prev Alz Dis 2018;5(1):2-4.
11. Lenze EJ, Bowie CR. Cognitive training for older adults: what works?. J Am Geriatr Soc. 2018; 66(4):645-7. https://doi.org/10.1111/jgs.15230
12. Srisuwan P, Nakawiro D, Chansirikarnjana S, Kuha O,Janbumrung S, Thammachot T. Effects of group-based multicomponent cognitive training on cognition, mood and instrumental activities of daily living among older people living in the community. IJMBS 2019;3(2):102-13. https://doi.org/10.32553/ijmbs.v3i2.107
13. Dias FA, Tavares DM. Factors associated with the participation of elderly people in group educational activities. Rev Gaúcha Enferm 2013;34(2):70-7.
14. Srisuwan P, Nakawiro D, Chansirikarnjana S. Exploring factors that contribute to regular participation and practice in cognitive stimulation training for mild cognitive impairment: A qualitative study. JARH 2017;1(4):1-10. DOI: 10.14302/issn.2474-7785.jarh-16-1348.
15. Nilchaikovit T, Lortrakul M, Phisansuthideth U. Development of Thai version of Hospital Anxiety and Depression Scale in cancer patients. J Psychiatr Assoc Thailand. 1996; 41(1):18-30. http://www.psychiatry.or.th/JOURNAL/vol411.html#hads
16. Julayanont P, Tangwongchai S, Hemrungrojn S, Tunvirachaisakul C, Panthumchinda K, Hongsawat J, et al. The montreal cognitive assessment-basic; as creening tool for mild cognitive impairment in illiterate and low-educated elderly adults. J Am Geriatr Soc. 2015; 63(12):2550-4. https://doi.org/10.1111/jgs.13820
17. Hongthong D, Somrongthong R, Ward P. Factors influencing the Quality of Life (Qol) among Thai older people in a rural area of Thailand. Iran J Public Health 2015;44(4):479-85.
18. Jitapunkul S, Kamolratanakul P, Ebrahim S. The meaning of activities of daily living in a Thai elderly population; development of a new index. Age Ageing 1994; 23(2):332-36.
19. Harrison JA, Mullen PD, Green LW. A meta-analysis of studies of the Health Belief Model with adults. Health Educ Res 1992;7(1):107-16.
20. Marsh C, Agius P.A, Jayakody G, Shajehan R, Abeywickrema C, Durrant K, et al. Factors associated with social participation amongst elders in rural Sri Lanka: A cross-sectional mixed methods analysis. BMC Public Health 2018;18:636.
21. Houtum LV, Rijken M, Groenewegen P. Do everyday problems of people with chronic illness interfere with their disease management?. BMC Public Health 2015;15:1000.
22. Pinto JM, Neri AL. Factors related to low social participation in older adults: fining from the Fibra study, Brazil. Cad. saúde colet 2017;25(3):286-293.
23. Szanton SL, Roberts L, Leff R, Walker JL, Seplaki CL, Soones T, et al. Home but still engaged: participation in social activities among the homebound. Qual Life Res 2016;25:1913-20.
24. Galenkamp H, Gagliardi C, Principi A, Golinowska S, Moreira A, Schmidt AE, et al. Predictors of social leisure activities in older Europeans with and without multicomorbidiy. Eur J Ageing 2016;13:129-43.
25. Foster ER, Spence D, Toglia J. Feasibility of a cognitive strategy training intervention for people with Parkinson disease. Disabil Rehavil 2018;40(10):1127-34.
26. Turunen M, Hokkanen L, Bäckman L, Stingkdotter-Neely A, Hänninen T, Paajanen T, et al. Computer-based cognitive training for older adults: Determinants of adherence. PLoS One 2019;14(7):e0219541. doi: 10.1371/journal.pone.0219541. eCollection 2019.
27. Miller TA, DiMatteo MR. Importance of family/social support and impact on adherence to diabetes therapy. Diabetes Metab Syndr Obes 2013;6:421-6.
28. Goll JC, Charlesworth G, Scior K, Stott J. Barriers to social participation among lonely older adults: the influence of social fears and identity. PLoS One 2015;10(2):e0116664.
29. Meyer OL, Sisco SM, Harvey D, Zahodne LB, Glymour MM, Manly JJ, et al. Neighborhood predictors of cognitive training outcomes and trajectories in ACTIVE. Res Aging 2017;39(3):422-467.