

***Effective Cognitive Stimulation Therapy in the Elderly with Mild Neurocognitive Disorder: Perspectives from Participants and Interprofessional teams***

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**Abstract**

**Introduction:** Cognitive stimulation therapy (CST) was effective to reduce risk of cognitive decline in patients with mild neurocognitive disorder (MND). The objective was to explore factors contributing to the effectiveness of CST for MND from perspective of interprofessional team members and participants with MDD.

**Methods:** After finish 6 sessions of CST, data were collected through individual face-to-face interviews with 25 elderly with MND, and interprofessional team members; 1 physician, 1 practical nurse, 1 nurse aid, 1 psychologist, 1 physical therapist and 1 occupational therapist. All of the interviews were video recorded for nonverbal language interpretation. Conversations were fully transcribed along with field notes and an audit trail after each session, and analyzed using interpretive description methodology.

**Results:** The importance of CST was emphasized by all participants. Three core themes emerged from the analysis of data: (i) program with two subthemes of “training for specific brain function” and “training for improve global brain function;” (ii) activities with three subthemes of “small group activities”, “interactive activities” and “effective teaching material;” (iii) home works with two subthemes of “suitable for each participant” and “adaptation in daily living;” Moreover, participants with MND mentioned accessibility to program, notification system and encourage from family members helped them to participate training and practice at home.

**Conclusions:** Increasing awareness of holistic factors including program, activities and home works should be emphasized in planning for CST. Not only appropriate program and activities, but also accessibility, notification systems and family members were the keys of effective training.

**Keywords:** cognition, dementia, training.

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## **Introduction**

The Statistical Manual of Mental Disorders - fifth edition (DSM-5) provides the new cluster of neurocognitive disorders that includes three syndromes: delirium, mild, and major neurocognitive disorders (1). Mild neurocognitive disorders (MND) is synonym for mild cognitive impairment (MCI) and is characterized by a mild acquired cognitive decline not interfering with independence in everyday activities, even though greater effort or compensatory strategies may be required (2). The estimated prevalence of mild cognitive impairment in population-based studies ranges from 10 to 20% in persons older than 65 years of age (3,4). The annual rate in which MND progresses to dementia varies between 8% and 15% per year (5), implying that it is an important condition to identify and treat (6) because dementia drastically affects daily life and personal activities and has numerous clinical complications (7). Higher participation in mentally stimulating activities is generally known to be associated with better cognitive function and reduce risk of cognitive decline and dementia (8-12). In cognitive intervention, cognitive stimulation therapy (CST) includes a range of group activities with the aim to enhance general cognition and social functioning. This approach assumes that cognitive functions work together and should be stimulated at the same time in a social setting. CST is based on reality orientation that involves the presentation of orientation and memory information, relating, for example, to time, place, and person, in order to provide the person with a greater understanding of his/her surroundings, possibly resulting in an improved sense of control and self-esteem (13). In patients with MND, multimodal neuro-imaging studies showed consistent training-related increase in brain activity in medial temporal, prefrontal, and posterior default mode networks, as well as increase in gray matter structure in frontoparietal and entorhinal regions (14). Moreover, brain metabolic changes included Brodmann areas reported to be involved in working memory and attentive processes as well as executive functions (15). CST in MND patients can lead to significant improvements in memory function (16). In addition, Training in an Executive function, Attention, Memory and Visuospatial function (TEAM-V) Program was also effective to improve global cognitive function (17). After being diagnosed with MND, most patients reported initiating one or more health related activities. For example, they were interested in cognitive stimulation such as taking classes and increasing general activity level (18). However, little is known of the extent to which such practical interventions for effective CST are actually implemented within the MND population. Therefore, this study aimed to explore factors that contribute to the effectiveness of CST in TEAM-V Programs for MND populations, through gaining the perspectives of participants with MND and interprofessional group facilitators.

## **Methods**

### **Study Design and Subjects**

With approval from the Ethics Committee Board of the Institutional Review Board of the Royal Thai Army Medical Department (IRBTA), the authors conducted semi-structured interviews with 25 elderly patients with MND at the Geriatric Clinic of Phramongkutklao Hospital between October 2013 and December 2013. A total of 25 participants were recruited through an existing cognitive stimulation group run in the Geriatric Clinic of Phramongkutklao Hospital. The group members were deemed eligible for inclusion if they met the inclusion criteria as set out in the previous

TEAM-V Program. These stipulated that elderly subjects met neurolo-psychological test criteria for MND and had some ability to communicate. The exclusion criteria comprised elderly subjects that had disability. They participated in 6 sessions of 3 hours in group-based multicomponent cognitive stimulation every 2 weeks between July 2013 and September 2013. During the first hour, participants were invited to join movement activities such as stretching and muscle exercises. During the remaining 2 hours of each session, the participants were given cognitive training for each domain that linked to problems commonly found in MCI. The summary of learnings was discussed at the end of each session. Moreover, during the weeks between sessions, participants were assigned homework to summarize what they had learned in sessions. Group facilitators were composed of interprofessional team members; 1 physician, 1 practical nurse, 1 nurse aid, 1 psychologist, 1 physical therapist and 1 occupational therapist. After approaching the participants with MND and group facilitators, the interviewers introduced themselves. After explaining the objectives of the study, written informed consent was obtained and the participants with MND and group facilitators had an individual interview in the end of the program. All of the interviews were video recorded for nonverbal language interpretation. Conversations were fully transcribed along with field notes and an audit trail immediately after each session. After demographic data collection, participants and staffs were asked about the CST that they participated in. Two aspects were explored: characteristic of effective CST and factors to improve CST. The interview took 30 to 50 minutes each session, depending on the participant and staff.

### **Data Analysis**

Open codes were created and analyzed using investigator triangulation method. 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. Themes were based on the model (Figure 1) and were described along with verbatim quotes from the participants.

# Effective Cognitive Stimulation Therapy

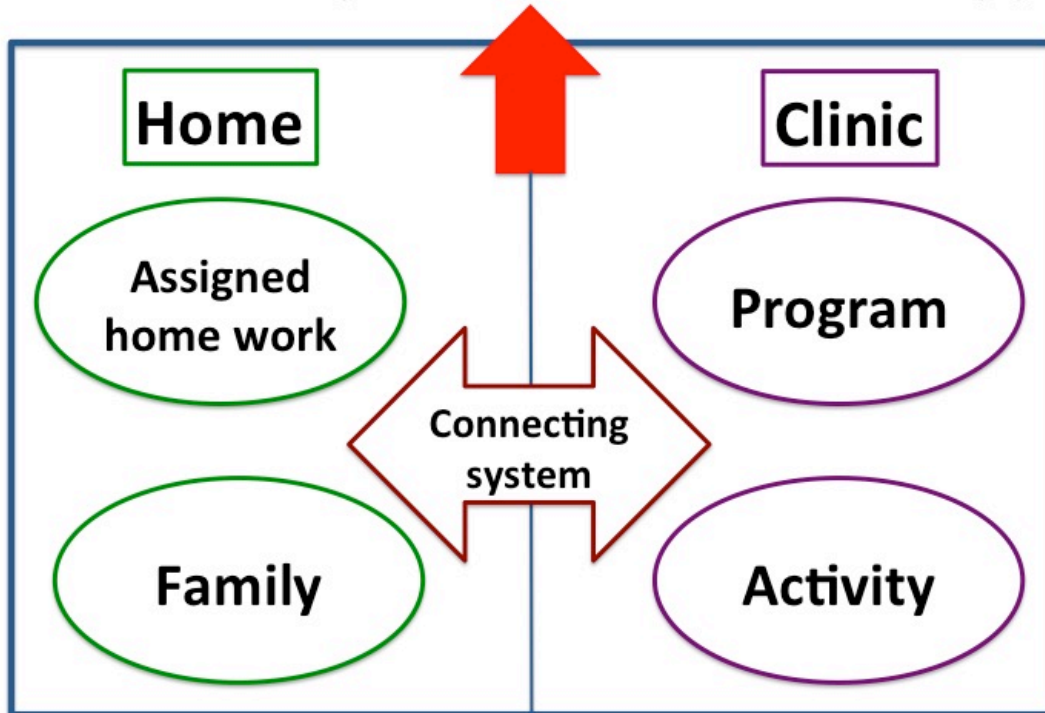


Figure 1: Factors contributing to the effectiveness of CST for MND elderly from perspective of group facilitators and participants with MND.

## Results

### Participant Characteristics

A total of 25 participants with MND and 6 group facilitators were eligible without exclusions ( $n = 0$ ). The authors interviewed all 25 patients with MND (aged  $70.5 \pm 7.5$  years old). In all, 18 of them had amnesic and all 6 Group facilitators (aged  $43.5 \pm 3.7$  years old). (Table 1).

Table 1: Demographics of participants with MND and group facilitators

Characteristics	Participants with MND, N = 25	Group facilitators, N = 6
Age (years), mean +/- SD	$70.5 \pm 7.5$	$43.5 \pm 3.7$
Gender		
Female, n (%)	22 (88)	4 (67)
Male, n (%)	3 (12)	2 (33)
Type of MCI		
Amnesic MCI, n (%)	18 (72)	
Non-amnesic MCI, n (%)	7 (28)	
Mini Mental State Examination (MMSE) , mean $\pm$ SD	$26.5 \pm 2.0$	

### Thematic Analysis

The importance of cognitive stimulation therapy was emphasized by all participants. After analyzing final codes, three main themes of perspectives from participants with MND and group facilitators, and three main themes from participants with MND. Ten subthemes emerged (Table 2).

Table 2: Themes, subthemes and codes of the participants with MND and group facilitators after the interview

Perspectives from	Themes	Sub-theme	Codes
Both participants with MND and group facilitators	Programs	Specific brain function training	-Training for each domain of brain functions -Training for common problems of specific brain functions
		Global brain function training	- Training for overall of brain function such as thinking speed
	Activities	Small group	- Friendly environment make more confident to participate
		Interactive sessions	- Draw participants attention - Group facilitators should encourage participants to do interactive activities
		Effective teaching materials	- Help participants follow the steps of training and understand - Provide to practice at participants' home
	Home works	Suitable for each participants	- Fit to each participant - Should draw participant attention to do
		Can adapt in daily living	- Can adapt to routine of daily living

Perspectives from participants with MND	Accessibility		- To provide transportation
	Notification system		- Before class notification: remind participants to attend the classes - After class notification: remind participants to do homework or practice at home
	Support from family members		- Encourage participants to do home works or practice at home - Help to access the training: transportation or financial support

### **Perspectives from participants with MND and group facilitators**

#### Theme 1: Program

##### Subtheme: Specific brain function training

‘The good program should have specific brain function training such as memory because I think forgetfulness is most common problem. Most elderly want to improve their memory.’ (Participant with MND)

‘The participants will be given cognitive training for each domain that linked to problems commonly found in the elderly such as memory, language, executive function and visuospatial skills.’ (Group facilitator)

##### Subtheme: global brain function training

‘The 9-square-table aerobic exercise in brain training helped me a lot to improve my balance. I found my movement is better.’ (Participant with MND)

‘I hope my thinking speed can be improved if I participate brain training.’ (Participant with MND)

‘I think global brain function training has many benefits such as improvement of quality of life, activities of daily living and reducing stress or anxiety.’ (Group facilitator)

#### Theme 2: Activities

##### Subtheme: Small group

‘Activities in a large class may not appropriate because participants may a bit hesitate to do or say much. A small group with friendly environment is better. It make participants a bit more confident to answer questions.’ (Participant with MND)

‘It would be better if participants can do small group activities outside of the clinic or hospital such as gardening.’ (Group facilitator)

##### Subtheme: Interaction

‘I don’t like lecture. Brain training should have a lot of interactive activities such as

questions and answers or interactive games. It will draw participants attention.’  
(Participant with MND)

‘The group facilitators are very important to encourage participants to do interactive activities with them.’ (Group facilitator)

Subtheme: Effective teaching materials

‘I think the good quality of teaching materials are very essential because brain training is very complex. Therefore, participant couldn’t follow all the steps of training, but effective teaching materials will help participants to follow the steps and understand.’ (Participant with MND)

‘It will be better if facilitators provide CDs of activities or books, so participants can practice by themselves at home’. (Group facilitator)

Theme 3: Home works

Subtheme: Suitable for each participants

‘Home works should suitable for each participants because if it’s too easy, it will not improve brain function. On the other hands, if it’s too difficult, it may not draw participant attention to do.’ (Participant with MND)

‘Because deflections of each participant’ brain function are different, some activities of training program should tailor made.’ (Group facilitator)

Subtheme: Can adapt in daily living

‘Homework is not going to be boring if it can adapt to daily life such as exercise in the morning or writing diary at night time.’ (Participant with MND)

‘It will be better if home works will improve brain function about activities of daily living’ (Group facilitator)

## **Perspectives from participants with MND**

Theme 4: Accesibility

‘Some participants such as elderly with chronic diseases may have problems to take public transportation by themselves. Therefore, they can not participate to the brain training program.’ (Participant with MND)

Theme 5: Notification system

‘Notification system is very essential including before and after classes. Before class notification will remind participant to attend the classes, and after class notification will help participant to remind to do homework or practice at home.’ (Participant with MND)

Theme 6: Support from family members

‘Family members will support or encourage participants to do home works or practice at home’ (Participant with MND)

‘If participants have transportation problems or financial strain, family members will help them to reduce barriers to participate the brain training program’ (Participant with MND)

## **Discussion**

Our study contributes new evidence to inform implementation strategies for planning CST in the elderly with MND. The findings of our research, qualitatively derived from participants with MND and interdisciplinary group facilitators; provide insight on the challenges of implementing complex new CST. Despite the challenges



encountered, participants with MND and interdisciplinary group facilitators were enthusiastic about their participation in the CST.

There were six key factors for the effective CST in the elderly with MND. This phenomenon leads to several suggestions. First, group facilitators concerned about program or activity in the clinic and homework at home same as the study of methods and management of the healthy brain study that concerned about protocols and participatory training sessions (19). However, participants with MND still concerned about accessibility to the program and notification system of before and after classes. Therefore, designing of CST were not only program or activities, but also other barriers such as transportation and reminding systems. Second, supports from family members were essential in perspectives of participants with MND. The results were the same as a pilot study of couples-focused intervention for MND revealed positive trends in meaningful activity performance and maintenance of health-related outcomes, as well as high program satisfaction (20). Therefore, objectives, methods, activities and benefits of CST should be provided to family members or main caregivers before the training, so they will support about transportation or money and encourage participants to practice CST. For example, family meetings should be held before training, or some part of CST may be performed by caregivers (21). Third, the tailor made design may fit each participant. Designing of the activities in classes should have some activities to improve specific brain function for each participant. Assignment of homework should be flexible for each participant, and can adapt for each participants' daily living. Therefore, Individual CST in MND patients may gain benefit same as the study of people with dementia (22,23). Fourth, group facilitators are important factors by encouraging participants to participate and interactive with the activities. The collaboration between interdisciplinary teams may be make more effective teaching materials. Therefore, the strong collaborate between interdisciplinary teams is one of the key of successful same as the AVERT stroke rehabilitation trial (24). Finally, further research should explore the factors to promote or barriers, impacts and benefits of longer term CST from different viewpoints such as from participants, family members, group facilitators, community and policy makers.

To the authors' knowledge, this study is the first qualitative research in Thailand to explore factors contributing to the effectiveness of CST for MND in the elderly. This study was conducted under a holistic perspective. Not only perspectives from the elderly with MND, but also perspectives from interprofessional group facilitators were explored. Therefore, the results will lead to develop effective CST strategies in patients with MND in the future. However, our study had several limitations. First, the interviews were conducted in a large tertiary care hospital in the capital city. Participants' answers may differ from another setting such as secondary care hospitals, primary care units or in community due to different education and socioeconomic factors. Second, despite using semi-structured interview guidelines, they were all one-session interviews. Important issues may have been missed or not explored thoroughly. Further, mutual relationship between participants and the interviewer with multiple-session interviews may be explored thoroughly. Furthermore, many interesting emerging issues from the interviews were not explored much further because they were not the main objectives of the study. Moreover, translation bias occurred in quotations of this work. We first conducted the interviews and made audit trails in Thai. Afterwards, interviewers and a native English speaker helped to translate in English. However, this process also mistranslated English

expressions to some extent. Finally, just like other qualitative research, participants were selected and voluntary. The thoughts of nonparticipating subjects were impossible to ascertain. Such is an inevitable weakness of all qualitative (and also quantitative) research.

This study provides further evidence to support the use of CST in routine practice for people with MND and encourages program designs focusing on the six main factors that will increase the effectiveness of CST.

**Disclosure statement**

No potential conflicts of interest were disclosed.

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