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Effects of cognitive stimulation therapy on cognitive ability of demented older adults

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Dementia has affected to each older adult in a different way depending on the impact of the disease and the personality of older adult before becoming ill.This quasi-experimental study aimed to examine the effect of cognitive stimulation therapy program [CST] on cognitive ability of demented older adults. Simple random sampling technique was used to recruit 54 demented older adults in two nursing homes, Indonesia. They were equally divided into experimental and control group. The experimental group received a 3-time weekly CST program for 5 weeks while the control group received usual care from the nursing home. Demographic questionnaire and Indonesian version of the mini mental state examination were used to collect data. Independent *t*-tests were used to compare changes in cognitive ability among the two groups.

The results showed that after receiving CST program, the difference of mean score of cognitive ability in the experimental group was significantly higher than the difference of mean score of the control group ($p < .001$). Findings revealed that health care providers should implement this CST program to enhance cognitive ability of demented older adults. Future research should focus on various severities of demented older adults in order to improve their cognitive ability.

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CHAPTER 1
INTRODUCTION

Statements and significance of the problems

Cognition is the process of retrieve, saving, sharing and using information. Components of cognitive are language, thought, memory, executive function, judgment, attention, and perception. It is the ability to process thought (world health organization [WHO], 2017). The development preservation of the multidimensional cognitive structure allow older adult to maintain social connectedness, an ongoing sense of purpose, and the abilities to function independently to permit functional recovery from illness or injury , and to cope with residual functional deficits (Touhy 2016). Based on Greenwood and Parasuraman (2012) brain may be able to achieve new or regain lost functions by changing it in to internal connectivity network according to environmental, it is because interaction between neuronal plasticity and cognitive plasticity, aging brain can be reorganized by cognitive demand or cognitive plasticity. Cognitive ability decline included memory disorder, neuropsychiatric symptoms, orientation disorder, aphasia or forget the meaning of words, apraxia, agnosia or cannot understand the meaning of what they see and hear, executive function disorder and change in personality (Solso 2001, Lemaire 2016).

Dementia is a group of symptoms characterized by significant cognitive decline from a previous level of performance in one or more cognitive domains such as learning and memory, language, executive function, complex attention, perceptual-motor, and social cognition (Toh, Ghazali, & Subramaniam, 2016; Arlington, 2013). Based on WHO (2017), dementia results from a variety of diseases and injuries that primarily or secondarily affect the brain, the causes of dementia usually of a chronic disease or progressive nature. Some chronic diseases such as Alzheimer disease, vascular dementia, Parkinson disease, dementia with lewy body and frontotemporal dementia (Touhy, 2016) also Alzheimer's disease is the most common form of dementia and may contribute to 60 - 70 % of cases (WHO, 2017).

Based on WHO (2017) there is 47.5 million people have dementia and 7.7 million new cases every year in the world (Miller 2012, Grinspun 2016). 213.694

persons aged 65 years, 4.584 (2.2 %) lived in nursing homes in Germany. The prevalence of dementia was 51.8 % in nursing home residents and 2.7 % in community-dwelling elderly in (Hoffmann, Kaduszkiewicz, Glaeske, Van den, & Koller, 2014). In Indonesia there is not record of statistic of total population older adults which live in nursing home. In Indonesia it is report that in 2016 there were 1.2 million people living with dementia (Martin Prince 2015, Maher 2016). The growing number of dementia cases has extensive economic and societal impacts. Economically, dementia cost the world approximately $604 billion in 2010. Societally, in the United States alone, more than 15 million Americans provided unpaid care to those with dementia in 2013 (Alzheimer Disease International [ADI], 2015). In Indonesia, dementia cost was $1.777 million in 2015 (Prince et al., 2015). Dementia will made many issues or consequences in older adult's life not only physical, psychological, but also have impact to economy, society and family caregivers (The Japanese Society for dementia care [JSDC], 2010; WHO, 2017).

Dementia has effects to each older adult in a different way depend on the impact of the disease and the personality of older adult before becoming ill. There are stage of dementia which could be measure with some of instruments such as global deterioration scale 7, functional assessment staging test 7, clinical dementia rating and mini mental state examination [MMSE]. There are three stages of dementia including early stage, middle stage, and late stage. Early stage will have forgetfulness, losing track of the time and becoming lost in familiar places. Middle stage becoming forgetful of recent events and people's names, becoming lost at home, having increasing difficulty with communication, needing help with personal care, experiencing behavior changes, including wandering and repeated questioning. Last stage becoming unaware of the time and place, having difficulty recognizing relatives and friends, having an increasing need for assisted self-care, having difficulty walking and experiencing behavior changes that may escalater and include aggression (WHO, 2017). All of these effects, made older adults with dementia are often dehumanized because they are perceived as having lost autonomy, dignity, and control (JSDC, 2010). The effect of perspective taking on dehumanization of older adults especially with dementia who are perceived as lacking humanness and are stigmatized because of their medical conditions (Miron, McFadden, Nazario, & Buelow, 2017 ; Mauk,

2010). Dementia is one of the major causes of disability and dependency among older people worldwide. It is overwhelming not only for the people who have it, but also for their carers and families (WHO, 2017).

Based on Losada, Pilemer, Gonzales, Moreno, & Alberto (2016) show that 401 dementia family caregivers found 64.26 % have ambivalent feelings. It is impact to the mental health of family caregivers such as depression and anxiety .Especially the family caregivers have to deal with the manifestations of behavioral and psychological symptoms of dementia [BPSD] such as agitation (e.g. aggression, screaming), psychiatric symptoms (e.g. delusions, hallucinations), personality changes (e.g. inappropriate sexual behavior, disinhibiting), mood disturbances (e.g. apathy, depression, euphoria, emotional lability), aberrant motor movements (e.g. pacing, rummaging, wandering), neurogetative changes (e.g. appetite changes, sleep disturbances) (Mauk 2010). Another effect of dementia older adults is affect to ageist attitudes and mortality salience. 102 men of participants and 138 women of participants with target age 29 or 71 and health status (normal, unknown, arthritis, and dementia) has found that target with dementia generated lower competence ratings, higher warmth ratings, greater death-thought accessibility, and more fear, empathy, and pity than targets with normal or unknown health. Older adults with dementia received higher pity ratings than all other targets, and participants reported more death-related thoughts (O'Connor & McFadden, 2012). Based on all of the consequences, we need to maintain cognition.

Cognitive ability decline included memory disorder, neuropsychiatric symptoms, orientation disorder, aphasia or forget the meaning of words, apraxia, agnosia or cannot understand the meaning of what they see and hear, executive function disorder and change in personality (Solso 2001, Lemaire 2016). It was found proof that the cognitive problems on demented older adults such as memory disorder or impaired immediate memory increased to 4 million in the United States in 2015; neuropsychiatric symptoms included nighttime motor behavior (54.8 %), depression (51.9 %), anxiety (48.1 %), irritability (44.2 %), and delusion (27.9 %) in Thailand; apraxia or lost concept increasing 32.3 % from 96 demented older people in Turkey; executive function disorder or the ability to predict behavioral outcomes testing by color-word stroop and trail-making test [TMT-B] and found that rate of incompletion

were high for both tests (60.6 % for the color-word stroop and 67.6 % for TMT-B) from 213 demented older adults in Canada (JSDC, 2010; Veragiat et al., 2016).

There is no treatment currently available to cure dementia. Numerous new treatments are being investigated in various stages of clinical trials (WHO, 2017). Because cure is not possible, pharmacological and non-pharmacological therapy is aimed to slowing cognitive decline. The pharmacological therapy depend on the chronic disease, such as the first line medication for Parkinson's disease is levodopa or carbidopa to increase the amount of dopamine in the brain and inhibits hyperactive cholinergic activity; the treatment of Alzheimer's disease and dementia with lewy body is cholinesterase inhibitors [CIs], it is works by blocking the breakdown of acetylcholine. Caring for older adults with dementia requires combination of pharmacological and non-pharmacological approaches (Touhy, 2016).

Non-pharmacological therapy for people living with dementia are developing year by year (Katsuo Yamanaka 2013).There are several study reviews on non-pharmacological therapy and there is limitation in the efficacy in pharmacological therapy (Karharina Luttenberger 2012, Tuppen 2012, Dannhauser 2014). Non-pharmacological therapies, such as cognitive-based, psychosocial, movement or sensorial therapies have been suggested to help prevent or manage dementia. Cognitive-based intervention rely on brain plasticity theory, it is including cognitive training, cognitive rehabilitation, and cognitive stimulation (Gardette, Coley, & Andrieu, 2010). Cognitive stimulation is therapy engage in a range of activities and discussions (in group) to enhance cognitive and social functioning. It is showing that cognitive stimulation give significant improvement on the MMSE, alzheimer's disease assessment scale-cognitive subscale [ADAS-Cog] (Onder, et al, 2005). This is supported by Spector, Thorgrimsen, & Woods (2003) that reality orientation and cognitive stimulation therapy [CST] in 7 weeks, twice in a week, 45 minute for each session from 201 participants could significant improvements on the MMSE scale, ADAS-Cog and quality of life – Alzheimer disease [QoL-AD] also cost-effective.

CST-Hong Kong in 7 weeks have benefit cognition, communication, and quality of life in elder with mild up to moderate cognitive impairment [MCI], and the effect might extend to everyday life (Chung et al., 2017) it was show that the CST

program easily adaptable and integrated into routine practice (Wong, Yek, Zhang, Lum, & Spector, 2012) and in the perspective of stakeholders, it were satisfying in five main themes such as improved communication, enhanced socialization, intensified commitment, strengthened self-efficacy and better interpersonal relationship (Wong et al., 2012). CST-J or cognitive stimulation therapy in Japanese version in 7 weeks (2 times in a week), it is showed that there is benefit, improving cognition and quality of life of people with dementia (Katsuo Yamanaka 2013). In another study in Brazil found that CST was applicable to a Brazilian older adult with dementia, but special attention should be paid to adjusting the procedures to participants and local characteristic (Magrobi & Morris, 2017). In Indonesia, there is no program such as CST in nursing home but there is group activity and nurses as the leader, the group activity such as art therapy (drawing and singing), play games (puzzle, guessing voice of animal and throwing ball), and exercise (healthy gym).

The program is non - pharmacological which less cost compare with pharmacological therapy, the benefit of cognitive stimulation program in nursing home could help nurses to improve skill of care of older adults with dementia as a person-centered care, rather than addressing symptoms of the disease, nurses need to more focus on the personality and how she or he is leading his or her everyday life, which is intimacy conversation with demented older adult are essential elements of care. The program is non - pharmacological, it is easy to apply by nurse because there is not side effects to demented older adults. In the future this program might be able to be upgrade to application that could use by every nurse even care giver.

In Indonesia, maybe there is few in demented study especially non-pharmacological therapy and maybe less of government or private agencies have created guideline of non - pharmacological therapy for people with dementia, compared with the original guideline. In the nursing home, cognition level data got from nursing students practice in the nursing home, found that > 60 % older adults with moderate cognitive impairment (Ratna, personal communication, 17th March 2018). Therefore, we examined the effects of the program on cognitive ability with mild to moderate dementia in nursing home and following the manual (Elisa Aguirre 2012).

Research objective

To examined the effect of a cognitive stimulation therapy program on cognitive ability of demented older adults.

Research hypothesis

After receiving the CST program, demented older adults in the experimental group have higher difference of mean score of cognitive ability than difference of mean score of cognitive ability of demented older adults in the control group.

Scope of the study

This study examined the effects of cognitive stimulation therapy program on cognitive ability of demented older adults. Independent variable was cognitive stimulation therapy program, dependent variable was cognitive ability. Sample were 54 demented older adults who lived in a nursing home (East Java, Indonesia), data collection performed March - May 2018.

Conceptual framework

Cognitive Stimulation therapy was develop after a systematic review of the effectiveness of reality orientation [ROT], reminiscence therapy [RT], validation therapy [VT] and memory training for dementia. The most effective elements of these therapies were combine by (Aguirre et al., 2012; Spector, Orrell, Davies, & Woods, 2001; Tuppen, 2012). Reality orientation therapy is a type of cognitive stimulation to reorient the demented older adults through repeated multimodal stimulations with respect to his or her personal history, environment and time (Gardette et al., 2010; Menna, Santaniello, Gerardi, Di Maggio, & Millan, 2016). Reminiscence therapy is based on group discussion about past activities, events and experiences, and usually using articles such photograph and favorite song (Gardette et al., 2010; Pringle & Somerville, 2013). Validation therapy is a activities to promote communication with the demented older adults and stimulate remaining communication skills, no matter how nonsensical or illogical it may seem, is viewed as an attempt to facilitate interpersonal connection (Gardette et al., 2010; Parkinson, 2008).

Reality orientation therapy [ROT] is an intervention for patients with amnesic deficits, episodes of confusion, and spatial temporal disorientation. It is principal objective is to reorient the patient through repeated multimodal stimulations with respect to his or her personal history, environment and time (Menna et al., 2016).

Reminiscence therapy [RT] is a positive pastime for people with dementia and there is evidence suggest that it is helpful in improving overall psychological wellbeing and preventing further psychological deterioration. Reminiscence therapy has positive impact such as improving quality of life, behavior, communication, maintaining identity and self-esteem. Reminiscence therapy things need to include personal photographs, general photographs pertinent to them, including pictures of local schools, shops, cafes and work environments; a personal playlist of songs that had significance for them (Pringle & Somerville, 2013)

Validation therapy [VT] is psychosocial treatment using a method for communicating with elderly people who suffer dementia (Deponte & Missan, 2007; Parkinson, 2008). The therapist uses empathic listening, emotional and physical mirroring and therapeutic touch to join the demented person in their own reality. All verbal and non-verbal communication by dementia patients, no matter how nonsensical or illogical it may seem, is viewed as an attempt to facilitate interpersonal connection and as an expression of that person's internal experience of reality (Parkinson, 2008).

Cognitive stimulation therapy program based on the brain plasticity, which the brain may be able to achieve new or regain lost functions by changing it in to internal connectivity network according to environmental. The mechanism of enhancing cognitive ability is the interaction between neuronal plasticity and cognitive plasticity. Aging brain can be reorganized by cognitive demand (cognitive plasticity) but the reorganization relays on intact enhance neuronal plasticity mechanisms (submission to creativity or innovation from learning or training, and exercise). Neuronal plasticity concerns to durable changes at the neuronal level that have been shown by empirical work to be stimulated by experience, both cognitive and physical. Examples of neuronal plasticity are neurogenesis (birth and maturation of new neurons), synaptogenesis (expansion and growth of synapses), dendritic arborization (increased branching of dendrites), and network re-organization

(alterations in connections between brain regions). Cognitive plasticity concerns to age-related changes in the patterns of cognitive behavior; for example, increased susceptibility to task-irrelevan events and greater use of executive control processes. Manifestations of cognitive plasticity depend on mechanism of neural plasticity. It can promote cognitive performance and preserve brain structure in healthy old age (Greenwood & Parasuraman, 2012).

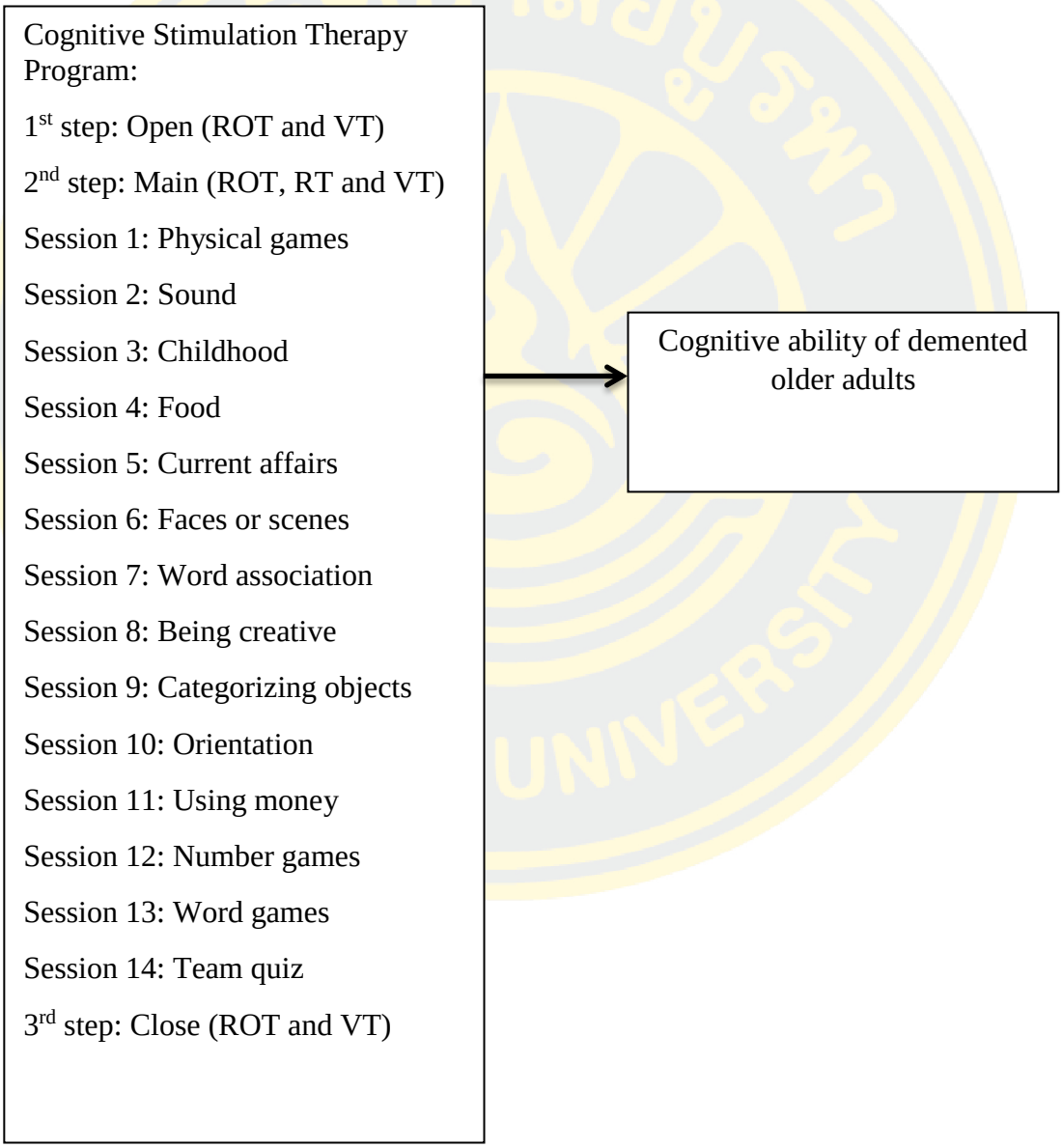

Figure 1 Research framework

Operational definitions

Demented older Adult refers to person who age 60 and over with screening by mini mental state examination Indonesian version (mild to moderate cognitive impairment) by researcher and living in nursing home (Folstein, 1978).

Cognitive stimulation therapy program is a systematic activities with set of activities containing 14 sessions, usually carried out 5 weeks in small groups, each group consist 9 older adults, led by a researcher. Each session covers a different topic and is designed to improve the mental abilities and memory of demented older adult. Each session follows the same structure, though the theme changes. Each session take 45 minute in group. Every session has to be 3 steps (Spector et al., 2003). Cognitive Stimulation Therapy was develop after a systematic review of the effectiveness of [ROT], reminiscence therapy [RT], validation therapy [VT] and memory training for dementia. The most effective elements of these therapies were combine by (Aguirre et al., 2012; Spector et al., 2001; Tuppen, 2012). Reality orientation therapy is a type of cognitive stimulation to reorient the demented older adults through repeated multimodal stimulations with respect to his or her personal history, environment and time (Gardette et al., 2010; Menna et al., 2016). Reminiscence therapy is based on group discussion about past activities, events and experiences, and usually using articles such photograph and favorite song (Gardette et al., 2010; Pringle & Somerville, 2013). Validation therapy is an activity to promote communication with the demented older adults and stimulate remaining communication skills, no matter how nonsensical or illogical it may seem, is viewed as an attempt to facilitate interpersonal connection (Gardette et al., 2010; Parkinson, 2008).

Regular activity refers to daily activity that older adults can do in nursing home. In the morning wake up, goes to bathroom after that having breakfast together, continue with physical activity such as plant watering, bed making, they come to their friend room to talk or some of them sit inside of their bed room until noon having lunch together, after that napping. Continue with taking a shower and then watching TV together. Perform exercise every Friday

Cognitive ability refers to the ability to process of thought demented older adults in language, thought, memory, executive function, judgment, attention, and perception; it can be measured by MMSE Indonesian version (Folstein, 1978).

CHAPTER 2
LITERATURE REVIEWS

In this chapter, the researcher presents an overview of demented older adults, cognitive ability, and cognitive stimulation therapy [CST].

1. Demented Older Adult
   1.1 Definition of dementia
   1.2 Etiology
   1.3 Sign and symptoms of dementia
   1.4 Impact of dementia
   1.5 Category of dementia by using mini mental state examination Indonesian version
2. Cognitive ability in older adults
   2.1 Definition of Cognitive ability
   2.2 Cognitive ability of aging
   2.3 How to measure cognitive ability assessment
   2.4 Factors related cognitive ability in demented older adults
3. Dementia therapy
   3.1 Pharmachological therapy
   3.2 Non-pharmachological therapy
4. Cognitive stimulation therapy program
   4.1 History of cognitive stimulation program
   4.2 Definition of cognitive stimulation therapy
   4.3 Procedures of CST program
5. Effect of cognitive stimulation therapy on cognitive ability

Demented older adults

Definition of dementia

Dementia is a neurocognitive disease characterized by progressive, global deterioration in intellectual abilities including memory, learning, orientation, language, comprehension, and judgment (Toh et al., 2016).

Dementia is a brain disorder characterized by impaired cognitive functioning that can affect learning and memory, mood and behavior, as well as the ability to conduct daily activities and high level functioning such as management of other chronic conditions (Touhy, 2016)

Dementia is a syndrome of progressive decline in multiple areas of cognitive function eventually leading to a significant inability to maintain occupational and social performance (Miller, 2012).

Dementia is a individual with generated lower competence ratings, greater death-thought accessibility and more fear, empathy and pity than normal or health individual (O'Connor & McFadden, 2012).

Dementia is an additional health burden of multiple comorbid conditions (Ibrahim & Davis, 2013).

Dementia is a symptoms that characterized by cognitive decline including orientation, language, concentration, constructional praxis, and memory. It is progressive, degenerative brain dysfunction caused by certain diseases and it is interferes with a person's daily functioning. They will lose their memory; lose their language skill and visuospatial skill. It's used to be part ageing disease but today dementia could affect to younger up to mild age, people in their 30 years old could diagnosed with dementia. Some researcher have examined its showing no distinction between race, social background or geographical location (Mauk 2010, Booth 2012)

Etiology

Dementia is caused by the death of nerve cells in brain. These cannot be replaced which means that dementia is a progressive disease. One of the most is Alzheimer disease [AD], because there are beta-amyloid plaques and neurofibrillary tangles, the plaques interfere with normal nerve cell function. Second most common type of dementia is vascular dementia and combination with AD or mixed dementia. It is because arthrosclerosis affected by factors such as hyperlipidemia, smoking and hypertension, causing decreased blood flow to the brain and neuronal death. Third is Parkinson disease [PD] , its target motoric and later cognitive symptoms in next step. Fourth is dementia with Lewy bodies, it's characterized by abnormal deposits of a protein, alpha-synuclein. This deposit can displace other cellular structure and make cell death. Affected deficit neurotransmitter production leading to deficit cholinergic

and dopaminergic, there is less acetylcholine make cognitive dysfunction. Fifth is Frontotemporal dementia or frontal lobe dementia make difficulty making decision, making plan and interpreting the world around us (Mauk 2010, Booth 2012, Florian G.Metzger 2016, Touhy 2016)

Sign and symptoms of dementia

The symptoms of dementia are depending on types of dementia. The most common types of dementia in older adults are AD, vascular dementia, Mixed Alzheimer's or vascular dementia, Parkinson dementia, levy body dementia, front temporal lobe dementia (Touhy, 2016). Dementia affects to key functions of the brain include remembering, communicating, understanding, thinking, learning, reasoning, planning, evaluating. It's important to remember that its unique symptom to each person. The common symptoms of dementia are memory loss (short-term memory), disorientation, impaired cognitive abilities, changes in behavior, lack of physical coordination. We can knew possible warning signs of dementia such as frequent forgetfulness, difficulty with common tasks, forgetting common words, becoming lost in familiar areas, poor judgment in finances, misplacing object in unusual places, changes in mood, behavior and personality, lack of interest in life activities (Mauk 2010, Booth 2012)

Impact of dementia

Dementia could effect to the society, especially to the older adults and care giver (family). There are impact people living with mild to moderate dementia and their families and friends might have to face, such as changes in comprehension, behavior and ways of coping. This could upset for family and friends who are take care the older adults. Need specific attention given to the changes such as eating and drinking, also using the toilet.

Older adults

Older adults have difficulties to meet their nutritional needs; this is explanation of eating and drinking issues in demented older adults such as impaired recognition of food and drink. This might result from their being given food that they are not used to. Loss ability to express likes, dislike and preferences, impaired ability to concentrate on a meal, impaired ability to use cutlery and impaired hand-mouth co-ordination. (Caceres et al., 2014; Springate & Tremont, 2014)

The next is difficulties with using the toilet, there are obstacles such as older adults cannot express clearly they need to go to toilet, not be able to find their way to the toilet, have difficulty actually using the toilet, successfully use the toilet but then have difficulty in cleaning themselves and re-adjusting their clothing. All of this might make older adults having an accident and make them embarrassment and have bad feelings. (Pulsford & Thompson, 2012; Springate & Tremont, 2014)

Older adults could have sleep disturbances, especially people with dementia with lewy bodies or parkinsons disease. It is because older adults have pain or discomfort, prostat problems make increased need to use the toilet, depression could wake up early morning, environmental disturbance, restless leg syndrome or uncontrolled limb movements. (Pulsford & Thompson, 2012)

Older adults with dementia will have impacts in their life as follow:

1. Discomfort: disorder in memories and learning become the main problem for demented older adult who are constantly forgetting things are therefore much more feel stress and discomfort. Forgetfulness in patients with dementia tends to be accompanied by these negative emotions (JSDC, 2010; Mauk, 2010).

2. Anxiety: being unable to recall the purposes or goals for going to a certain destination after one has arrived there can be a distressing thing. The demented older adults feel uncomfortable and anxious because the time does not flow in one direction and daily living is just an assemblage of unconnected fragments of experience (JSDC, 2010; Touhy, 2016).

3. Confusion: decline in executive function make demented older adults cannot make good decision and disorder in ability to predict; it becomes increasingly difficult for them to get an accurate grasp of what is happening to them (JSDC, 2010; Mauk, 2010).

4. Sense of victimhood and paranoia: because of all path of memory was gone, demented older adults have common phenomenon, they belief their possessions have been stolen (JSDC, 2010; Touhy, 2016).

5. Lack of spontaneity and depression: demented older adult perceived dehumanization by society because of their clinical condition, people close to them may feel increasingly compelled to point out patient’s mistake and failures, which can

lead to growing conflicts in patients interpersonal relationships (JSDC, 2010; O'Connor & McFadden, 2012)

6. Extreme mood fluctuations: demented older adult feel more fear and pity and it became increasingly irate and prone to fluctuations in their moods, becoming easily aroused to anger at even the slightest stimulation. (JSDC, 2010; O'Connor & McFadden, 2012)

Care giver

1. Social and economic impacts

Dementia has significant social and economic implications in terms of direct medical and social care costs, and the costs of informal care. There is considerable potential for cost increases in coming years, there is also likely to be a trend in low- and middle-income countries for social care costs to shift from the informal to the formal sector, because of financing for long time. In 2010, the total estimated worldwide costs of dementia were US$604 billion, about 70 % of the costs occurred in Western Europe and North America (Wimo, Jonsson, Bond, Prince, & Winblad, 2013). It is increase In 2015, the total global societal cost of dementia was estimated to be US$818 billion, equivalent to 1.1 % of global gross domestic product [GDP]. The total cost as a proportion of GDP varied from 0.2 % in low- and middle-income countries to 1. 4 % in high-income countries (WHO, 2017).

2. Families and careers

Dementia is overwhelming for the families of affected people and for their careers. Physical, emotional and economic pressures can cause great stress to families and careers, and support is required from the health, social, financial and legal systems (WHO, 2017).

There were five main categories of behavior of older adults that make the families and friends may find difficult as bellow:

1. The older adults lack awareness that their actions will put them at risk of coming to harm. For example if the older adults living alone and forget to turn the gas off after making meal; tries to drive when their judgement is impaired may risk having an accident and so on.

2. The older adult's manner and actions indicate that they are in distress. They have difficulty in intellectual and language make they cannot express how they are feeling reflect to their emotion.

3. The older adults behaves in ways that are considered socially inappropriate. Executive function impairment will affect their judgement in social situations.

4. The older adults tries to get their needs met through behaving aggressively or with hostility.

5. The older adults seem to be unwilling to accept help from others and their basic needs such as eating and drinking or using the toilet compromised.

Factor analysis revealed three dimensions of caregiver burden: direct impact of caregiving upon caregivers' lives, guilt, and frustration or embarrassment. Spouses and female caregivers experience greater caregiver burden, distress, increased rates of depression, as well as decreased sleep related to behavior disturbances, which impacts their health and wellbeing. (Caceres et al., 2014; Springate & Tremont, 2014)

Category of dementia by using mini mental state examination Indonesian version

In this study the researcher use category of dementia by mini mental state examination Indonesian version with interpretation of mini mental state examination scores as follows:

Table 1 interpretation of mini mental state examination score

Score	Degree of impairment	Formal psychometric assessment	Day to day functioning
25 – 30	Questionably significant	If clinical signs of cognitive impairment are present, formal assessment of cognition may be valuable	May have clinically significant but mild deficits. Likely to affect only most demanding activities of daily living
20 – 25	Mild	Formal assessment may be helpful to better determinate pattern and extent of deficits	Significant effect. May require some supervision, support and assistance
10 – 20	Moderate	Formal assessment may be helpful if there are specific clinical indications	Clear impairment. May require 24 hours supervision
0 – 10	Severe	Patient not likely to be testable	Marked impaimernt. Likely to require 24-hour supervision and assistance with ADL

(Folstein, 1978)

Cognitive ability in older adults

Definition of cognitive ability

Cognitive abilities are process of the thought to carry out any task from the simplest to the most complex. They have more to do with the mechanisms of how we learn, remember, problem-solve, and pay attention, rather than with any actual knowledge. For instance, answering the telephone involves perception (hearing the ring tone), decision taking (answering or not), motor skill (lifting the receiver), language skills (talking and understanding language), social skills (interpreting tone of voice and interacting properly with another human being) (Lemaire, 2016; Solso, 2001).

Cognitive functions do not change homogenously, but cognitive performance change over time could be decreases, increases, or remain stable in normal older adults. For the example from studies of cognitive ability on perception, memory, reasoning, and language (Lemaire 2016). Cognitive functioning is difficulty in executive function such as learning, thinking, and remembering (Booth 2012). The brain is a network of nerve cells for the processes of thinking, learning, and remembering. The way information transferred are using tiny electrical impulses reaching the end of dendrite and release neurotransmitter, which is a chemical that transmits the message. Diseases prevent this transmitter and cause cognitive dysfunction, myth that cognitive aging are pervasive and long-standing in the society need to correcting by nurse using health promotion and encouraging older adults to do activities (Booth 2012, Miller 2012).

Cognitive ability of aging

Each individual in different age have different cognitive domains, tasks, and experimental conditions. Different individuals aging differently, could be have cognitive decline earlier or larger declines and individual characteristic influenced it, like levels of education, profession, life style, and socio-cultural activities, physical condition. It is showing how cognitive performance or ability change with age, it's showed that as of age 65, everyone has at least one declining cognitive ability; as of age 80, two abilities have declined in at least 80 % of individuals; at age 90, three abilities have deteriorated in around 50 % of the population, even at age 90, no one has experienced deterioration in all five abilities. it showed indicate that in some individuals, advancing age leads to the decline of one, two, or more abilities, and that the number of abilities that decline with age differs between individuals (Lemaire 2016).

Measuring cognitive ability

Majority researcher have examine the effect of cognitive stimulation therapy using MMSE and neurobehavioral cognitive status examination [COGNISTAT] (E. Aguirre 2012, Katsuo Yamanaka 2013, Lauren A Yates 2016) to measure cognitive function, some of them also use alzheimer's disease assessment scale-cognitive subscale [ADAS-Cog] (E. Aguirre 2012) and there is at least one researcher in the literature used positron emission tomography (18 F-FDG) to know changes in

cerebral glucose metabolism as cognitive function after 3 weeks gave transcranial direct current stimulation (tDCS) (Kyongsik Yun 2016).

The mini mental state examination was developed as a bedside tool to evaluate the cognitive status of elderly people in clinical settings; it has often been used in surveys to screen for cognitive impairment and dementia. It is brief and easy to administer, and has shown good reliability, validity as a screening test is generally acceptable (McDowell, Kristjansson, Hill, & Hebert, 1997).

Factors related cognitive ability in demented older adults

1. Physical activity

Physical activity is a significant moderator of age-related cognitive decline. Cardiorespiratory fitness is associated with more efficient cognitive functions. In longitudinal studies, older adults that participate in physical activity show less cognitive decline over 2 up to 10 year. In nationally representative samples of no institutionalized persons aged 50 years and older and across 11 European countries (Austria, Germany, Sweden, Denmark, Switzerland, the Netherlands, Belgium, France, Spain, Italy, and Greece) reported that individuals who participated in any type of regular physical activity showed less cognitive decline after 2.5 years. The impact of physical activity on cognition in older adults is more strongly supported by results from intervention studies, which generally show that older adults who have completed a physical activity program that produces significant increases in cardiorespiratory fitness often show enhanced cognitive performance (Bherer, Erickson, & Liu, 2013).

2. Physical frailty

Physical frailty, based on four components (grip strength, timed walk, body composition, and fatigue), In a cohort of more than 750 well-characterized older persons free of cognitive impairment at baseline, it was found that physical frailty was associated with a greater risk of developing MCI, whether defined as the first occurrence of or persistent MCI. This association remained in analyses that controlled for depressive symptoms, disability, and vascular risk factors and diseases. Furthermore, physical frailty was associated with a faster rate of decline in global cognition and five specific cognitive systems. These findings demonstrate that a higher level of physical frailty predicts the development of MCI and is associated

with an accelerated rate of cognitive decline in older persons. Together with prior studies showing an association between frailty, clinical AD, and AD pathology, these data may suggest that physical frailty and cognitive impairment share a common underlying pathogenesis (Boyle, Buchman, Wilson, Leurgans, & Bennett, 2010 b).

3. Blood glucose

High blood glucose was related to poorer overall performance on perceptual speed as well as greater rates of decline in general cognitive ability, perceptual speed, verbal ability, and spatial ability. Diet-based glycemic load was related to poorer overall performance in perceptual speed and spatial ability. Previous research indicates that type 2 diabetes mellitus [T2DM] is related to declines in verbal fluency, attention, executive functioning, memory, information processing speed, and brain atrophy. type II diabetes mellitus also increases the risk for dementia and cognitive decline (Seetharaman et al., 2015).

4. Purpose in life

Greater purpose in life is associated with a reduced risk of AD and MCI in community-dwelling older persons (Boyle, Buchman, Barnes, & Bennett, 2010 a).

Dementia therapy

There is no treatment currently available to cure dementia. Numerous new treatments are being investigated in various stages of clinical trials (WHO, 2017). The medications useful to treat dementia modify the mechanisms through which brain disease cause neuropsychiatric mental symptoms, both cognitive and noncognitive. Most currently available medications act by compensating for the damage produced by a disease (Rabins, Lyketsos, & Cynthia, 2006).

Pharmachological therapy

Currently there is no cure for Parkinson disease, but when the symptoms are such that they interfere with the person's functioning, pharmacological intervention are initiated. Drug therapy focuses on replacing dopamine or slowing its breakdown. Levodopa effective in reducing bradykinesia and rigidity, but have side effects such as hallucination. Caring for person with Parkinson disease require combination of

pharmacological and non-pharmacological approaches (Rabins et al., 2006; Touhy, 2016).

Pharmacological therapy for Alzheimer's disease is aimed at slowing cognitive decline. It has potential to help persons continue to fuction to the best of their ability longer, the effectiveness of the medications varies from person to person. Cholinesterase inhibitors (CIs) help slow the speed of cognitive decline but also help control any behavioral difficulties the person may be having as consequences of the brain damage, but have side effects such as nausea and diarrhea. Similar with pharmacological therapy for lewy body with dementia cholinesterase inhibitors helpful with symptoms such as fluctuations in cognition and mood, incidence of hallucinations, another medicine is benzodiazepines with effects side such as risk of falling and increased confusion (Rabins et al., 2006; Touhy, 2016).

Non-pharmachological therapy

The pharmacological interventions currently available have limited ability to improve dementia symptoms (cognition, function, behavioral). Therefore, there has been a growing non-pharmacological approaches. Several therapies have been suggested to help prevent and manage dementia such as cognitive-based therapies, psychosocial therapies, movement therapies and sensorial therapy (Gardette et al., 2010).

1. Cognitive-based intervention

Rely on the brain plasticity hypothesis, which theorizes the brain may be able to achieve new or regain lost functions by transforming its constituent elements or internal connectivity network according to environmental stimulation. Cognitive-based intervention divides in 4 types such as cognitive training, cognitive rehabilitation, cognitive stimulation and reality orientation (Gardette et al., 2010; Spector et al., 2003).

2. Psychosocial therapy

It is an intervention that is intended to enhance self-esteem, well-being and social or communication skills and decrease behavioral disturbances. Psychosocial therapy divides in 2 types such as reminiscence therapy and validation therapy (Gardette et al., 2010; Lai, Chi, & Jones, 2004).

3. Sensory therapy

It is an intervention that stimulates the sensory of demented people it havebeen developed including aromatherapy, music therapy, light therapy and snoezelen therapy (stimuli sight, hearing, touch, taste, and smell) (Gardette et al., 2010).

4. Movement therapy

It is physical activity helpful slow down or prevent functional decline associated with aging and improve muscle mass, arterial compliance, energy metabolism, cardiovascular fitness, muscle strength and overall functional capacity (Gardette et al., 2010).

Cognitive stimulation therapy [CST]

Cognitive stimulation therapy is a non-pharmacological group intervention that targets cognitive and social functioning. Cognitive stimulation therapy designed to give effects to cognitive especially reality orientation and social functioning (Aguirre, Spector, & Orrell, 2014; Orrell et al., 2012).

History of CST

Cognitive stimulation therapy supported by Clare and Woods (2004) that cognitive stimulation describes engagement in a range of activities and discussions purposed at the general enhancement of cognitive functioning. Cognitive stimulation therapy might be the most used in non-pharmacological therapy, there is evidence-based program that developing by Spector and colleagues in the United Kingdom. The target of this program is people with mild-to-moderate dementia. The effects of CST, from Spector found that intervention group had significantly improved relative to the control group from 201 participants. It shows benefit in cognition and quality of life (Aimee Spector 2003)

Definition of cognitive stimulation therapy (CST)

Cognitive stimulation therapy is learning activity with important principles (including multisensory methods, language stimulation and executive function stimulation). It was develop after a systematic review of the effectiveness of reality orientation, reminiscence therapy, validation therapy and memory training for

dementia. The most effective elements of these therapies were combine by (Aguirre et al., 2012; Spector et al., 2001; Tuppen, 2012). Cognitive stimulation therapy has found that increases the cognitive function and quality of life in people with mild-to-moderate dementia and improved made long life especially female gender (E. Aguirre 2012, Martin Orrell 2012, Katsuo Yamanaka 2013, Aguirre 2014, Lauren A Yates 2016). It appears that cognitive stimulation therapy could independently improve cognition and quality of life better than people were taking acetyl cholinesterase inhibitor [AChEI] (Aguirre 2014).

Procedures of the CST program

Cognitive stimulation therapy has 14 sessions of 45 minutes each, occurring twice a week for 7 weeks and the first country which applies it is United Kingdom and achieves the effectiveness and cost effectiveness. UK Department of health having difficulty to manage people with dementia until they apply the CST as therapy package which easy to use. The CST continued using by another country through research and adapted (E. Aguirre 2012, Aguirre 2014)

The intervention divides into 14 sessions in the period of 7 weeks. The following are brief overviews of the CST program for the experimental group:

Session1

Theme: Physical games

It is a game which involves teamwork, should be relaxed activity incorporating movement, touch and score calculations. There is two activities A and B, activity (A) throw a soft ball around, asking people to say something about themselves as they catch ball (name, where they come from, their former occupation, favorite food or color and activity (B) Play a physical game, such as pindah batu, congklak (Indonesia language).

Session 2

Theme: Sounds

It is a group activity using sound of animals and matching it with the picture also could bring instrument of music to play together. There is two activities A and B, activity (A) Play sounds effects tapes for the example sounds of animals and invite members to match the sounds with pictures for example cat, dog, bird, chicken.

Activity (B) Give percussion instruments to each person in the group, and use them to play along to familiar music for example gitar, ecek ecek, tifa (Indonesia language).

Session 3

Theme: Childhood

It is a group activity to remembering about the name of the member of family, the name of the school and asking people to discuss it together also could use oldest fashion or oldest play articles and demonstrate it. There is two activities A and B, activity (A) Ask members to fill out a printed sheet with their name, father's name, mother's name, school attended and so on. Invite people to make a plan or drawing of their childhood. Activity (B) Ask members to demonstrate the use of old-fashioned childhood toys, for example bekel, kelereng, katapel (Indonesia language).

Session 4

Theme: Food

It is a group activity that needs to make plan about what kind of menu need to prepare for dinner including planning about how much money need to spend on it also could need food and taste it so members of group could discuss about it. There is two activities A and B, activity (A) Using real groceries or miniature grocery replicas that have been priced (prices in big font size), give people budget and a scenario to plan, for example a dinner for four. Categories the groceries into foods for different mealtimes, special occasions, savoury or sweet. Activity (B) Taste food which as memory triggers or have personal meaning. For example pecel, gado gado, rawon , sate, soto (Indonesia food) brainstorm food categories on the whiteboard, list as many as possible.

Session 5

Theme: Current affairs

It is a group activity talking about hot topic or trend issue recently and asking about their opinion also could use cue cards to stimulate the member of group to discuss. There is two activities A and B, activity (A) Discuss issues from a selection of recent national and local newspaper and activity (B) Use questions on cue cards to stimulate conversation on news, views, attitudes, dreams and aspirations (what do you think of today's fashion?).

Session 6

Theme: Faces / scenes

It is a group activity talking about famous people by brings the photo and asking their opinion. There is two activities A and B, activity (A) Prepare multiple copies of laminated photographs of famous faces so that everyone can look use old postcards and ask them to identify the person for example Soekarno, Soeharto, Gusdur (President of Indonesia). Activity (B) use the same types of prepared cards in level A, but ask people opinion (who is the most attractive?).

Session 7

Theme: Word associations

It is a group activity together completing the missing word in one phrase also could use lyric of song and asking the group to singing the missing line. There is two activity A and B, activity (A) Ask group members to supply the missing word in a number of phrases and activity (B) present the first few words of a song (for the example We'll meet again....) and ask the group to sing a few lines for example Indonesia raya, Bunga mawar, rayuan pulau kelapa (Indonesia song).

Session 8

Theme: Being creative

It is free theme activity but need everyone to participate to divide the task, such as cooking. Activity (A and B) do creative such as cookery (simple cook): make pecel, bakwan (Indonesia food) or similar dish. Split the activity into separate tasks so that everyone can participate.

Session 9

Theme: Categorizing objects

It is activity that stimulate member of group to categorizing object based on one letter also could use color pictures and asking the member of group to categorizing it based on picture. There is two activity A and B, activity (A) ask people to think of words begining with a cretain letter (say 'A') in a particular category (say 'boys' names) write letters and categories on separate cards and use it to prompt the game. Activity (B) places 20 or so objects or colored pictures of objects on a table. Ask people to group the objects in different way (color or initial letter).

Session 10

Theme: Orientation

It is an activity talking about favorite places and which place that already changes during 20th century also could use map and asking group to discuss if they have been move from one area to another area. There is two activities A and B, activity (A) Depending where the group comes from, constructs a map of East Java Indonesia. Ask people favorite places and ask them which destination has change during 20th century. Activity (B) Marks on a large map where group member originate from. Discuss whether people have moved from area to area, and if so, where from and to. Discuss how long journey take, how far apart places are, transport links and landmarks.

Session 11

Theme: Using money

It is a activity guessing the price of items and matching it with the price also could use old money or coin and asking group to discuss about it. There is two activities A and B, activity (A) prepare laminated cut-outs of common objects from a catalogue (or have actual objects there) with prices marked on the back. Ask people to guess the prices of items or match the price tag. Activity (B) show examples of both old and new coins and comparing discuss changes prices and value (how much was your first pay packet?).

Session 12

Theme: Number games

It is a activity using numbers for the example using bingo also could use cards, and groups could guessing it will be higher or lower number. There is two activity A and B, activity (A) Play games involving the recognition and use of numbers, for example bingo and activity (B) play 'snap' with playing cards. Go around the group, with each person in turn taking the next card off a pack of cards and guessing whether it will be higher or lower than the previous card.

Session 13

Theme: Word games

It is a activity playing word identification and could use some game to involves the recognition and use the letters and words (if needed give clue) also could search puzzle use A3 paper with word on it. There is two activity A and B, activity (A) Play a word identification game such as 'hangman' which involves the recognition

and use the letters and words (if needed give clue) and activity (B) prepare a large-size crossword or word search puzzle on A3 paper at difficulty level geared to the group.

Session 14

Theme: Team quiz

It is free theme activity, can use game that group have enjoyed previously. Give prizes to everyone in the group. Discuss people's view on the group, activity (A and B) Play team games: divided the group into two teams asks them to choose a team name and then play ABC, or another game the group have enjoyed previously. Give prizes to everyone in the group. discuss people's view on the group.

Effect of cognitive stimulation therapy on cognitive ability

Dementia care is one of the most important health problems globally, and we need some treatment to improve older adults live. Pharmacological offer many kinds of medicine to improve cognition, but non-pharmacological approaches for people with dementia receiving considerable attention year by year (Katsuo Yamanaka 2013). There are several systematic reviews on non-pharmacological, such as a complex multimodal activity intervention, multimodal nondrug therapy, and noninvasive electrical stimulation. All of the non-pharmacological to improved cognition same as cognitive stimulation therapy, cognitive stimulation therapy have high-grade recommendation and mostly used to people with dementia. It appears that cognitive stimulation therapy could independently improve cognition and quality of life better than people were taking AChEI (Karharina Luttenberger 2012, Katsuo Yamanaka 2013, Aguirre 2014, Dannhauser 2014, Kyongsik Yun 2016)

Cognitive stimulation therapy improving cognitive ability explain through concept of brain plasticity, brain is a plastic organ capable of remodeling itself even in old age, in response to cognitive demands; manifestations of this remodeling process include neuronal structure, reorganization of cortical circuits, neurogenesis, and cortical structure. Mechanism of successful cognitive aging is the interaction between brain plasticity and cognitive plasticity. Aging brain can be reorganized by cognitive

demand (cognitive plasticity) but the reorganization relays on intact enhance neuronal plasticity mechanisms (submission to creativity or innovation from learning or training, diet and exercise). Neuronal plasticity concerns to durable changes at the neuronal level that have been shown by empirical work to be stimulated by experience, both cognitive and physical. Examples of neuronal plasticity are neurogenesis (birth and maturation of new neurons), synaptogenesis (expansion and growth of synapses), dendritic arborization (increased branching of dendrites), and network re-organization (alterations in connections between brain regions). Cognitive plasticity concerns to age-related changes in the patterns of cognitive behavior; for example, increased susceptibility to task-irrelevan events and greater use of executive control processes. Manifestations of cognitive plasticity depend on mechanism of neural plasticity. It can promote cognitive performance and preserve brain structure in healthy old age (Greenwood & Parasuraman, 2012).

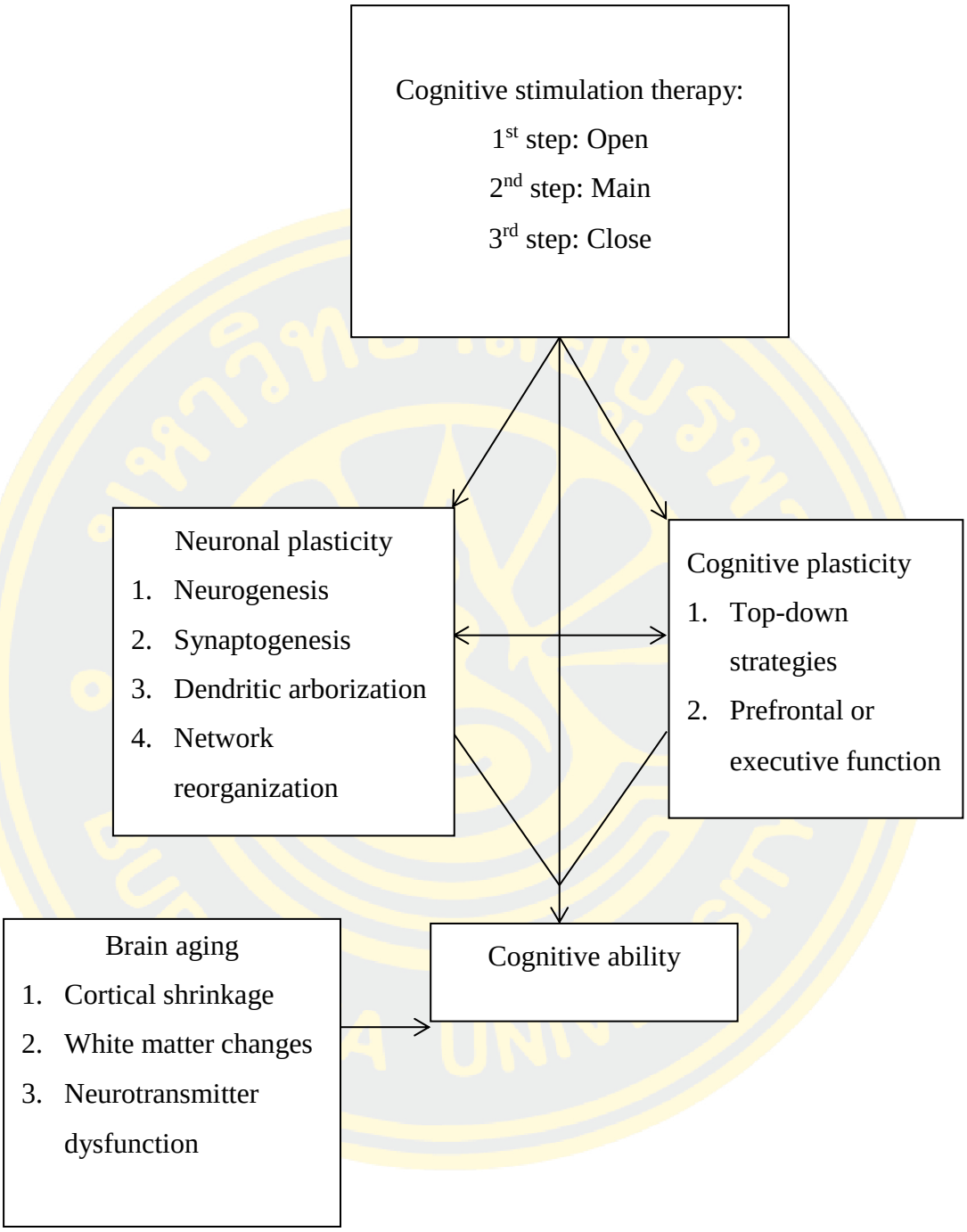

Figure 2 Effect of a cognitive stimulation therapy (on cognitive ability)
(Greenwood & Parasuraman, 2012)

CHAPTER 3
RESEARCH METHODOLOGY

This chapter discussed on the following aspects: research design, setting of the study, population and sample, research instruments, ethical considerations, data collection procedures, quality of instruments, and data analysis procedures.

Research design

Two group pretest and posttest with quasi-experimental design was applied in this study.

Setting of the study

The experiment was conducted at the East Java nursing home Indonesia. Using two nursing homes and the location in the different city. Both nursing homes have similar activities characteristic. First nursing home has 2 nurses, 17 care givers, 1 doctor and 2 nuns as the head of nursing home. This is private nursing home with 80 beds. It is open Sunday up to Saturday, start from 7 am to 2 pm and 3 pm to 9 pm. Second nursing home has 1 nurse and 15 care giver. This is private nursing home with 40 beds. It is open Sunday up to Saturday, start from 7 am to 2 pm and 3 pm to 5 pm.

Study Population and sample

Population

All Indonesian of older adults aged 60 years and older with mild to moderate cognitive impairment screening by nurse (screening by mini mental state examination of Indonesian version; cognitive mild impairment: 20-25; cognitive moderate impairment: 10-20).

Sample

The sample was demented older adults who stay in two nursing homes East Java Indonesia. They were participated in this study and meeting the following inclusion criteria:

1. Mild to moderate dementia (screening by mini mental state examination of Indonesian version; cognitive mild impairment: 20-25; cognitive moderate impairment: 10-20)
2. Capable to communicate and write in Indonesian
3. No limitation of movement
4. No hearing and visual problems

Participants were excluding in this study regarding exclusion criteria bellow:

1. Have chronic disease such as heart disease and respiration problem

Sample size

The sample size in this study was calculated by using a power analysis with G*Power 3.1.9.2 program (Faul, Erdfelder, Buchner, & Lang, 2009). *t*-test (match paired) selected as type of statistical test in G*Power program. The level of significance (α) was set at .05 and power at .80. The effect size estimate of 0.5, input parameters were set at one-tailed. From G*Power program, the sample size of this study is 54 demented older adults total group. Experimental group are 27 older adults and control group are 27 older adults with screening of dementia by researcher.

Sampling method

There are five nursing homes, the researcher did randomization and get two nursing homes that located in the different city. It was divided with two groups, the experimental group and the control group. The simple random sampling technique was used in this study to select the participants as described below:

Experimental group

Step 1 Picked up the label A (nursing home) as experimental group.

Step 2 Overall older adults 54 were screening by mini mental state examination in nursing home A, found 43 older adults met the inclusion criteria.

Step 3 Name of older adults (43) put inside the box, and mixed to pick up 27 older adults.

Step 4 Older adults (27) divided in 3 small group, each group there were 9 older adults.

Control group

Step 1 Picked up the label B (nursing home) as control group.

Step 2 Overall older adults 43 were screening by mini mental state examination in nursing home A, found 30 older adults met the inclusion criteria.

Step 3 Name of older adults (30) were put inside the box, and mixed to pick up 27 older adults.

Step 4 Older adults (27) were control group

Research instruments

The instruments were used in this study, including the demographic data questionnaire, mini mental state examination Indonesian version, and adapt of cognitive stimulation therapy (the program and the material) to the East Java culture, Indonesia.

1. Demographic data questionnaire

The demographic data questionnaire was developed by the researcher, asking about age, gender, last education, recent occupation, duration being demented older adults.

2. Mini mental status examination of Indonesian version

This instrument was used to measure cognitive ability of older adults. There is four components in this instrument, such as orientation (10 items), registration (3 item), attention and calculation (5 item), recall (3 item), and language (9 items). It is a 30-item scale that measures orientation, language, concentration, constructional praxis, and memory. There are some interpretations based on education, based on severity, and the researcher was focus on degree of impairment in this research. Based on degree of impairment 25-30 (questionably significant), 20-25 (mild), 10-20 (moderate), 0-10 (severe).

3. Cognitive stimulation therapy program

The book plan of the [CST] program (See appendix G)

The program was divided into 14 sessions, 3 times in a week, in the period of 5 weeks. The program start on 1st group in day 1 with session 1 in the morning at 07.30 am up to 08.15 am, 2nd group in day 2 with session 1 in the morning at 07.30 am up to 08.15 am and 3rd group in day 3 with session 1 in the morning at 07.30 am up to 08.15 am, continue 1st group with session 2 in the afternoon at 15.30 am up to

16.15 am. This schedule continues with different session every week until day 35 and all groups (3 groups) received 14 session of CST program.

Instrument translation

In order to be appropriate instruments for Indonesian, the cognitive stimulation therapy program including 14 sessions were translated into Bahasa Indonesia version by translator in Indonesia (See appendix F).

Validity and reliability of instruments

Validity

The instruments used in this study were original instruments, including the demographic questionnaire; mini mental state examination Indonesian version and translated cognitive stimulation therapy program. Validity test in translated cognitive stimulation therapy program was used content validity by 3 experts from Indonesia before conducting actual study (See appendix B). MMSE Indonesian version is valid in Indonesian population.

Reliability

Feasibility test in translated cognitive stimulation therapy was trying out in 4 participants in another nursing home of church in East Java, separate from setting of study. For internal consistency, Cronbach's alpha coefficient was used to determine the reliability of the questionnaires. The pilot study included 30 older adults in nursing home of East Java separate from setting study for mini mental state examination; the Cronbach's alpha was 0.91 respectively. These level of internal consistency was acceptable because it higher than 0.80.

Ethical considerations

The researcher proposal was approached from the institutional review board [IRB] with number of IRB approval 06-02-2561, Faculty of Nursing for Graduate Studies, Burapha University, Thailand and director of nursing home East Java, Indonesia. A written consent form was signed by the participant who interest to participate in the study. They were informing verbally about the topic and purpose of the study. The researcher assured that the personal identity and all data obtained kept

confidential and accessible only by researcher. They were also informed to discontinue their participation without any fear of penalties. All rights of the participants were reserved and researcher is accountable to the participant to answer any type of question regarding the study. The researcher ensured the rights and privacy of the participants and protect with high integrity. The participants were informed that they will not get any financial benefit by participating in this study, but the findings of the study will have benefit to them and others.

Data collection procedures

Data collection procedures in this study were performed by the researcher. The procedures for data collection were as follows:

Experimental group

There are 3 groups to cover sample size 27 demented older adults, in 1 group there are 9 demented older adults. 27 demented older adults receive the intervention in 5 weeks. Each group was received intervention 3 times in week.

On 21st March up to 1st May 2018 (1st - 5th week)

Day 1, the researcher and assistant researcher was doing pretest by use mini mental state examination Indonesian version.

Day 2, the researcher started to give the cognitive stimulation therapy program. 1st group was received intervention like follow:

Day 2, the theme was physical games (1st session), the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, give group name (involving all member of group), select the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre. Second step (duration 25 minute) was main activity throw a soft ball around, asking older adults to say something about themselves as they catch ball (name, where they come from, their former occupation, favorite food or color. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells.

Day 3, the theme was sounds (2nd session), the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of

group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) was main activity Play sounds effects tapes for the example sounds of animals and invite members to match the sounds with pictures for example cat, dog, bird, chicken. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells.

Day 4, the theme was childhood (3rd session), the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity (older adults could choose A or B) do (A) ask members to fill out a printed sheet with their name, father's name, mother's name, school attended and so on. invite people to make a plan or drawing of their childhood and (B) ask members to demonstrate the use of old-fashioned childhood toys, for example bekel, kelereng, katapel (Indonesia language).Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells.

Day 5, the theme was food (4th session), the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about

day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity using real groceries or miniature grocery replicas that have been priced (prices in big font size), give older adults budget and a scenario to plan, for example a dinner for four. categories the groceries into foods for different mealtimes, special occasions, savoury or sweet.Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells.

Day 6, the theme was current affairs (5th session), the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity discuss about old song or choose simple news in recent national and local newspaper. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells.

Day 7, the theme was faces or scenes (6th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity prepare multiple copies of laminated photographs of famous faces so that everyone can look use old postcards and ask them to identify the person for example actor and actress (Roy Marteen, Meriam Belina).Third steps was close (duration 10

minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 8, the theme was word association (7th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity (older adults could choose A or B) do (A) Ask group members to supply the missing word in a number of phrases and (B) present the first few words of a song (for the example We'll meet again....) and ask the group to sing a few lines for example Indonesia raya, Bunga mawar, rayuan pulau kelapa (Indonesia song).Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 9, the theme was being creative (8th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) was main activity (A and B) do creative such as cookery (simple food): make pecel, bakwan (Indonesia food) or similar dish. Split the activity into separate tasks so that everyone can participate. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 10, the theme was categorizing objects (9th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity ask older adults to think of words begining with a cretain letter (say 'A') in a particular category (say 'fruit' names) write letters and categories on separate cards and use it to prompt the game.Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 11, the theme was orientation (10th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) was main activity ask older adults near places of nursing home or famous place in Indonesia and ask them which way to go to those places? Such as near the nursing home is tea garden; Jakarta, or Borobudur temple. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 12, the theme was using money (11th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the

name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity prepare laminated cut-outs of common objects from a catalogue (or have actual objects there) with prices marked on the back. Ask older adults to guess the prices of items or match the price tag. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 13, the theme was number games (12th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity play games involving the recognition and use of numbers, for example monopoly. Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 14, the theme was word games (13th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity play a word identification game such as 'hangman' which involves the recognition and use the letters and words (if needed give clue) (use power point).

Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells

Day 15, the theme was team quiz (14th session) the intervention divide in 3 steps. First step was open (duration 10 minute) welcomed, draw attention to the name of group, remain every one of the activity in the last session, play soft-ball game, when throwing the ball, older adults may either state their own name, or the name person throwing the ball, singing together the theme song (can use music tape), discuss about day, month, year, season, weather, time, name, and address of the Centre, discuss opinions of recent event in the center, for example recent meal, weather, or something currently in the news. Second step (duration 25 minute) is main activity (A and B) Play team games: divided the group into two teams asks them to choose team name and then play ABC (it is old games, using finger, people show theirs finger and start counting word from “a,b,c, until the end of word according to finger and then start to said the name of fruit with first word “b”) or another game the group have enjoyed previously. Give prizes to everyone in the group. discuss people's view on the group .Third steps was close (duration 10 minute) thanked everyone individually for attending and contributing, sing theme song again, remind everyone of the time next appointment and content of the next session and say farewells.

The researcher did the same intervention to the 2nd and 3rd groups like the 1st group until day 35.

Day 36 On 2nd May 2018 (5th week)

1. The participant was evaluated using mini mental state examination Indonesian version

2. After having the whole information, data was coded and enter into a computer spreadsheet and were prepared for data analysis procedures by the researcher

Control group

There are 27 demented older adults receive regular activity in 5 weeks.

On 21st March up to 1st May 2018 (1st – 5th week)

1. Day 1, the researcher was doing pretest by use MMSE Indonesian version.

2. Day 2 up to day 35, the control group has regular activity in nursing home. The regular activity was in the morning wake up, goes to bathroom after that having breakfast together, continue with pray together. Have physical activity such as plant watering, bed making, they come to their friend room to talk or some of them sit inside of their bed room until noon having lunch together, after that napping. Continue with play chess then taking a shower and make some handcraft such as tablecloth. Perform exercise every Friday

Day 36 On 2nd May 2018 (5th week)

1. The participant was evaluated using MMSE Indonesian version

2. After having the whole information, data was coded and enter into a computer spreadsheet and were prepared for data analysis procedures by the researcher

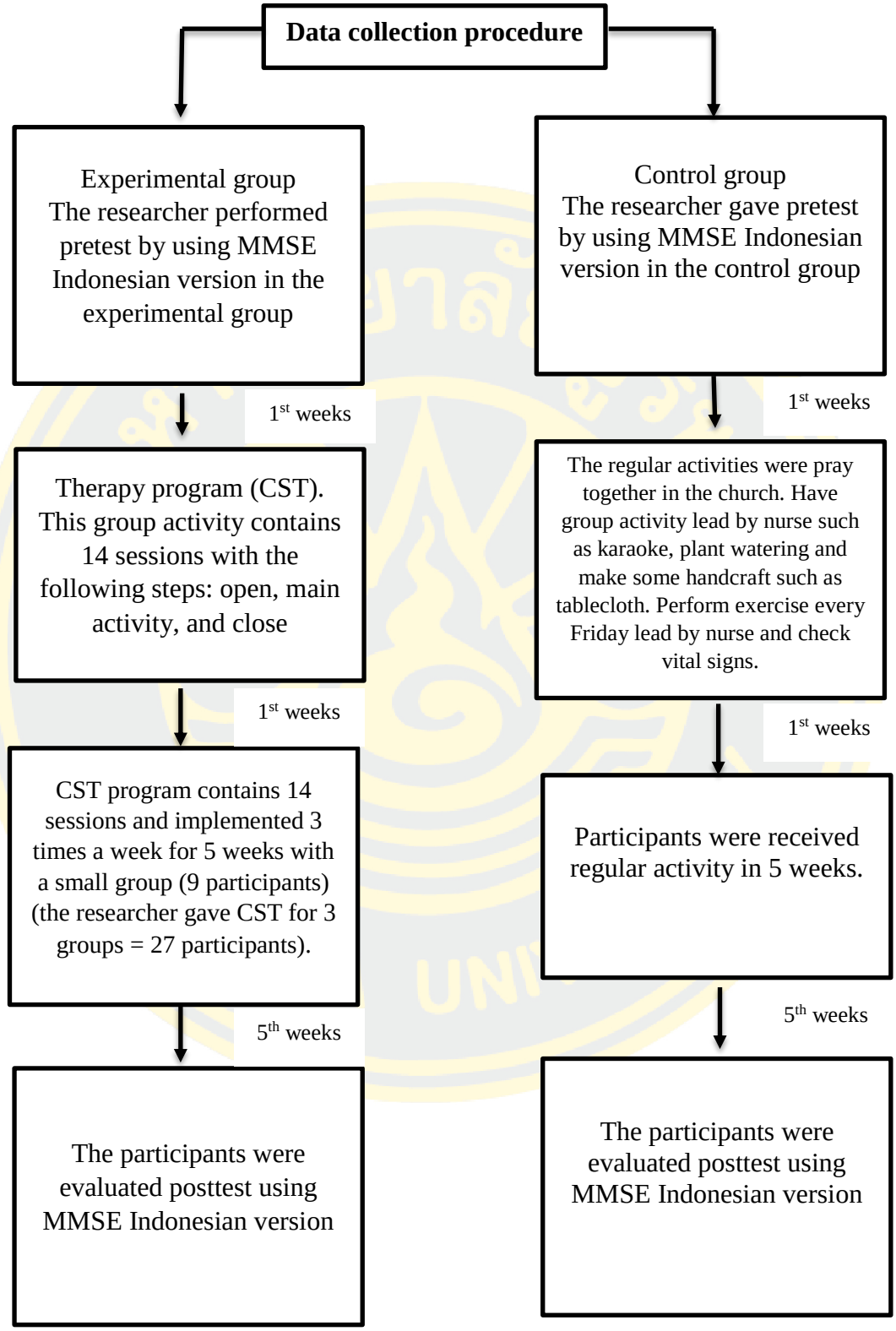

Figure 3 Data collection procedure

Research assistant

In this study there was one research assistant in each nursing home, the responsible of research assistant in each session of program was monitoring and evaluationing the older adults and helping the researcher to maintain the condition of main activity. Requirements of research assistant were as follows:

1. require diploma in nursing
2. have at least 3 years experiences in the field
3. has experience use to running group activity

Data analyses

Data entry and statistical analysis performed using the statistical software. The significance level of statistical test was set at $\alpha = .05$. Both descriptive and *t* statistic was used for data analysis. The data analysis procedures as follow:

1. Perform assumptions and the normality of the data. It has a normal distribution.
2. A descriptive statistics including Chi-square, Fisher Exact Test, mean, standard deviation, frequency, and percent distribution to describe the general formation.
3. Perform independent t-test to analyze the difference in the mean score from pretest to posttest regarding cognitive ability between experimental and control group.

CHAPTER 4
RESULTS

The purpose of this two-group quasi-experimental study was to examine the effect of a cognitive stimulation therapy program on cognitive ability of demented older adults in East Java. The study was conducted on 54 older adults who lived in nursing home in East Java who met the inclusion criteria from March up to May, 2018. In this chapter, the results of data analysis are presented along with relevant tables following the sequence of topics below:

Part 1 Comparison of demographic data between the control and the experimental groups.

Part 2 Comparative analysis of the difference in the size of mean score difference ($\overline{d}$) regarding dependent variable during before and after the period intervention between the experimental and the control groups.

Part 1 Comparison of demographic data between the control and the experimental groups

This part consist of general information with respect to age, gender, duration of dementia, level of education, marital status, and type of work (see table 2). The demographic characteristics of respondents can be presented as follows.

Table 2 Comparison of demographic data between the control and the experimental groups

Variable	**Control group (*n* = 27)**		**Experimental group (*n* = 27)**		***p***
	n	**%**	***n***	**%**	
Age (years)					.282 [C]
60 - 69	5	18.5	6	22.2	
70 - 79	14	51.8	13	48.1	
>80	8	29.7	8	29.7	
Min = 60, Max = 83, $\overline{X}$ = 73.48, *SD* = 7.24			Min = 60, Max = 95, $\overline{X}$ = 76.29 *SD* = 8.84		
Gender					.174[C]
Male	16	59.3	11	40.7	
Female	11	40.7	16	59.3	
Duration of dementia (month)					.327 [F]
12 - 24	23	85.2	19	70.4	
>24	4	14.8	8	29.6	
Level of education					.387[F]
Elementary school	11	40.7	7	25.9	
High school and >High school	16	59.3	20	74.1	
Marital status					1.0[F]
Not married	4	14.8	5	18.5	
Married	23	85.2	22	81.5	
Type of work					1.0[F]
Unemployed	6	22.2	7	25.9	
Private sector worker and laborers	21	77.8	20	74.1	

[C] = tested with Chi square, [F] = tested with Fisher exact test

From table 2 finding showed in the control groups, most of the older adults have age ranged from 70 - 79 years (51.8 %). The majority of samples were male

(59.3 %), have duration of dementia 12 - 24 month (85.2 %), most of them were at the high school and more than high school (59.3 %) level of education, married (85.2 %) , most of older adults has type of work as private sector workers and laborers (77.8%).

From table 2 finding showed in the experimental groups, most of the older adults have age ranged from 70 - 79 years (48.1 %). The majority of samples were female (59.3 %),have duration of dementia 12 - 24 month (70.4 %), most of them were at the high school and more than high school level of education (74.1 %) , married (81.5 %) most of older adults has type of work as private sector workers and laborers (74.1 %).

However, there was no statistical difference between these two groups as shown in table 2.

Part 2 Comparative analysis of the difference in the size of mean score difference ($\overline{d}$) regarding dependent variable during before and after the period intervention between the experimental and the control groups

Independent t-test was used to examine the difference in the increase of mean score from pretest to posttest after the period of intervention between the experimental and control group. The results are as follows:

Table 3 Comparison of the difference in the size of mean score difference ($\overline{d}$) regarding cognitive ability during before and after the period intervention (n = 27).

Variables	Before intervention		After intervention						
	$\overline{X}$	*SD*	$\overline{X}$	*SD*	$\overline{d}$	*SD*($\overline{d}$)	*t*	*df*	*p*
Cognitive ability									
Experimental group	17.26	2.47	22.85	2.60	5.59	0.13	4.862	52	0.000
Control group	16.48	3.19	18.04	4.44	1.56	1.25			

The result of table 3 show that the increase in mean score for cognitive ability from before and after the period of intervention in the experimental group ($\overline{d}$ = 5.59) was significantly larger than the increase mean score in the control group ($\overline{d}$ = 1.56) with $p < .001$.

CHAPTER 5
CONCLUSION AND DISCUSSION

This chapter includes a summary of the research findings and discussion, according to the research objectives. Additionally, the nursing implications of the study and the recommendations for further research are suggested.

Summary of the findings

The research results can be summarized as follows:

1. Comparison of demographic data between the control and the experimental groups

The older adults in both group had similar general characteristics. The majority of older adults in both experimental and control groups were in range age 70 - 79 years old, most of the participants in the control group were male (59.3 %), while most in the experimental group were female (59.3 %) respectively, and majority older adults in both experimental and control groups were in range 12 - 24 month of duration of dementia (85.2 % and 70.4 %, respectively). Most of the older adults both in control groups and experimental group had high school and more than high school of level education (59.3 % and 74.1 %). The majority of older adults in both experimental and control groups were married (85.2 % and 81.5 %, respectively), and the majority of older adults in both control and experimental groups were had type of work as private sector workers and laborers (77.8 % and 74.1 %). (See table 2)

2. Comparative analysis of the difference in the size of mean score difference ($\bar{d}$) regarding dependent variable during before and after the period intervention between the experimental and the control groups

The result show that the increase in mean score for cognitive ability from before and after the period of intervention in the experimental group ($\bar{d}$ = 5.59) was significantly larger than the increase mean score in the control group ($\bar{d}$ = 1.56) with $p < .001$. (See table 3)

Discussion

This section focus on the discussion related to two outcomes indicating the effectiveness of a cognitive stimulation program. The hypotheses tested in this study were in the posttest, mean score of cognitive ability in the experimental group was higher than mean score of the control group.

CST program improve cognitive ability demented older adults, this can be explained in this finding was consistent with some previous studies (Katsuo Yamanaka 2013). Cognition stimulation therapy showed significant effect for cognitive ability, similar to the original study (Spector et al., 2003). Most of older adults with some abilities are impaired but through cognitive stimulation therapy each older adult genuinely rebuild their cognitive ability one step at a time stimulated by social group activities without judgment and pressure but had fun activity together with another participant also the leader. Fun activity made older adults enjoying to communicate and impulsively improve the verbal abilities that involving mind to think about words and language.

New learning inside meaningful conversation in small groups is engagement with orientation information that in this program, reality orientation [ROT] was the most used inside 14 sessions, there were (session 1) physical games, (session 4) food, (session 6) faces or scenes, (session 7) word association, (session 8) being creative, (session 9) categorizing objects, (session 10) orientation, (session 11) using money, (session 12) number games, (session 13) word games, and (session 14) team quiz. In this activity stimulate the older adult to recall and also feel happy, by applied this session in as follows:

Session 1 physical games

When the older adults sing together along with the music, trying to catch the ball when the music stop and express themselves about their name, favorite color or talking about their experience today. This was stimulated another participant tried to give comment to their friend opinion.

Session 4 food

Using real groceries gave huge effects to older adults, with their group together they tried to follow scenario regarding budget and the price of the groceries to made lunch (pecel), they look have high interesting and exciting to join.

Session 6 faces or scenes

Using photograph of famous Indonesian actor or actress made the older adults trying to recall and some of their friend tried to help their friend that forgot the actor name.

Session 7 word associations

Using some missing words in lyric of old song, the older adults tried to recall the missing words. Song brings happiness and release tension of older adults, while learning they also happy with singing together.

Session 8 being creative

Older adults in small group make simple food (pecel) together. Pecel was the favorite food in Indonesia, in their physical limitation they tried their best to make pecel, made some coordination with another member of participant, and used their experience.

Session 9 categorizing objects

Some older adults need more time in categorizing object, some participant tried help their friend to categorize the object for example name of fruit start with word “A”.

Session 10 orientation

Older adults like to talk their favorite place or famous place in the past, in this session they recognize their friend in the past live in the same city and they started to talk about it (how to go there and the memory of the place).

Session 11 using money

The older adults like to calculate money (used fake money), either they wrong guess the prices, they still look happy and enjoy the session.

Session 12 number games

This session was used monopoly, this session made older adults have competition each other about bought properties inside the game with money.

Session 13 word games

Older adults tried to recall the words and guess by the clue from the leader.

Session 14 team quiz

It was free quiz for older adults, older adults like to do physical games, and they can share their experience together also sang a song together.

Based on that results, reality orientation make brain reorganized by cognitive demand that get submission (activity inside the session) could enhance neuronal to birth new neuron and re-make new network between brain region (Greenwood & Parasuraman, 2012) and the output could improve in verbal abilities, cognition, memory, learning, information and orientation. This output support by some previous studies (Gardette et al., 2010; Menna et al., 2016). In this activity providing better understanding of the older adults surroundings, give their sense of control , it was proof in the process of therapy day by day the older adults has confidentiality to talk or asking the participant that have been sick in their group.

Reminiscence therapy [RT] was used inside the 14 sessions; there were (session 2) sounds, (session 3) childhood, and (session 5) current affairs.

Session 2 sounds

The older adults tried to guess sounds effects tape, for example sound of animals and match with pictures, this session made older adults have curious to know more sound and picture of animals, because they admitted forgot some of animals .

Session 3 childhoods

Older adults like to play childhood toys, they expressing happiness also proudness when play it and have small conversation with their friend about it.

Session 5 current affairs

Older adults discuss about their favorite song, one of the participant sang her favorite Chinese song and their clap hands together, some like to sang dangdut (Indonesian music) and they dance together.

Based on that results reminiscence therapy is group discuss about experiences and events. Experiences and memory of happiness are factors that could improve dopamine and stimulating neuronal to birth and maturating new neuron through this activity could stimulate to expand the synapses (Greenwood & Parasuraman, 2012) that effects to improve cognition; abilities and social interaction; cope with emotional problems, communication skill, relationship and decrease behavioral disturbance (Gardette et al., 2010; Pringle & Somerville, 2013). Talking about good experiences for example places or favorite song were the favorite topic for older adults in this program, they can give their opinion about their experiences in

their group, some member of group trying to give comment, and they build good relationship better because they know more depth with each other.

Validation therapy [VT] was used in this program in the all three stage; open, main activity, and close. In the open stage each group have song group, they sang the song before and after or in close stage, also before start the session in open stage the leader ask the participant to remember the name of group, song of group, the name of nursing home, the date and the city their live. In this three stage made older adults want to communicate and express their feeling and emotion with their friends. No matter how nonsensical or illogical it seem, is viewed as an attempt to facilitate interpersonal connection. This activity stimulating neuronal to build re-make new network (Greenwood & Parasuraman, 2012) and the output could improve communication, memory, learning, orientation, relationship, emotional status and reduce physically and verbally aggressive (Gardette et al., 2010; Parkinson, 2008). Communication between participant was improve in this sessions, because it naturally stimulating their communication skills in older adults, it was showed day by day, they met and have activity together, made they respect each other, trying to help each other when one of their member forgot the word when have discussion.

In conclusion reality orientation, reminiscence therapy, and validation therapy, that including in 14 sessions of cognitive stimulation therapy program that can enhance cognitive ability of demented older adults.

Nursing implications and recommendations for future research

1. This study provides information with first guideline of cognitive stimulation program for 5 week therapy program. Nurse practice and health care team could apply the 5 week program in older adults in Indonesia.

2. The findings of the study contribute for nursing training and healthcare planners especially in Indonesia culture, implementing this program fit in culture of East Java, Indonesia.

3. Future research can focus not only in moderate and mild cognitive impairment but in various dementias.

Limitation

1. Instrument in this study use old version of mini mental state examination.
2. Researcher was not measure or control the medications of participant
3. Through process using instrument mini mental state examination, the researcher could be bias when conduct collect data.

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