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Cognitive Stimulation Therapy (Indonesian Version): Effects on Factors Associated with Cognitive Function in Middle Adult

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Abstract: Cognitive development in adulthood involves the ability to better integrate emotion and logic to make decisions and a reduced ability to process information quickly. In late adulthood, cognitive development is characterized by neurocognitive disorders, intellectual changes, and memory changes. When cognitive decline is regarded as a continuous process from normal cognitive function to mild cognitive impairment and dementia, the identification and management of influential factors such as cognitive decline-related demographic characteristics, comorbid diseases and health habits may contribute to the delay or prevention of dementia. Cognitive Stimulation Therapy (CST) is an intervention that aims to stimulate the cognitive function of middle adult individuals aged 50-60 years with cognitive activities. This study aims to determine the effect of Cognitive Stimulation Therapy on factors of cognitive function of middle adult individuals aged 50-60 years in Kemiri Village, Kebakkramat District, Karanganyar Regency. This research is a quantitative-research with a pre-experimental design with one group pre-post test. The sampling technique used was purposive sampling with a sample size of twenty-seven people. The instrument used was the Indonesian Version of the Montreal Cognitive Assessment (MoCA-Ina). Cognitive Stimulation Therapy (CST) was carried out in 6 sessions over 8 weeks. Data analysis using paired t-test (paired t-test). Paired t-test results Sig. (2-tailed) = 0.000, which means p-value < 0.05, which shows that Cognitive Stimulation Therapy has an effect on the cognitive abilities of middle adult individuals aged 50-60 years in Kemiri Village, Kebakkramat District, Karanganyar Regency.

Keywords: Cognitive; Dementia; Elderly; MoCA-Ina; Stimulation therapy

Introduction

Middle adulthood or what is usually called middle age is often defined as the phase of life from the age of 40 to 60 or 69 years (Willis & Martin, 2005). Park et al. (2013), and Sánchez-Izquierdo et al. (2021) stated that almost all cognitive functions show a decline with age. The cognitive abilities that decline in middle adulthood include: number ability, word fluency, verbal ability, spatial orientation, delayed recall, and reasoning. This fact is reinforced by the statement by Kurth et al. (2017) who added that a decline in cognitive abilities also occurs in middle adults aged 50-60 years almost all over the world. The decline in cognitive abilities that occurs in middle adults aged 50-60 years, includes reduced ability to improve intellectual function, reduced efficiency of nerve transmission in the brain. This results in slowed information processing, reduced ability to accumulate new information and retrieve information from memory, as well as the ability to remember past events then it is better than remembering events that have just happened (Setiati et al., 2009).

The main problem faced by middle adults aged 50-60 years is a decline in cognitive level which affects them in acting, concentrating, attention span, memory and problem solving (Pudjiastuti & Utomo, 2003). If

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cognitive problems experience problems, the ability to organize information efficiently and purposefully in carrying out daily activities will be disrupted (Thompson & Peircy, 2001). This is in accordance with the statement by Grieve et al. (2013) that cognitive impairment will impact every aspect of life and can result in difficulties in all areas of occupational function. Thus, it is important to understand cognitive changes during middle adulthood itself and to anticipate the cognition of middle adulthood individuals as a "gateway" to cognition in old age.

Since no effective drug and treatment for cognitive impairment and dementia is currently available, early detection of modifiable risk factors for cognitive impairment and prevention of cognitive impairment and delaying the onset of dementia through related early intervention is an important task of the dementia management (Puspitosari & Putri, 2024). To anticipate the decline in cognition in middle adult individuals is to stimulate existing cognitive functions and improve declining cognitive functions as recommended by WHO in 2019. This recommendation is based on the WHO global program on Public Health Response to Dementia 2017-2025 for several countries, one of which is Indonesia. In line with the WHO program, one intervention that can be given is to prevent prevalence of dementia is with Cognitive Stimulation Therapy. Cognitive Stimulation Therapy is a cognitive-based non-pharmacological intervention in the form of involvement in discussion activities aimed at improving cognitive and social function in general (Orgeta et al., 2020). Lowrani et al. (2020) stated that individuals who are involved in lots of physically and mentally stimulating activities will experience less risk of cognitive decline in later stages of age, and have a reduced risk of dementia.

Based on the explanation above, it is important to know the effect of Cognitive Stimulation Therapy on the cognitive abilities of middle adult individuals as a preventive measure to deal with cognitive decline in old age.

Method

The research design in this study is a quantitative one-group pretest-posttest design. The research population was middle adult individuals in RW 8 Kemiri Village, Kebakkramat District, Karanganyar Regency. The final research sample was 42 with a purposive sampling technique. The inclusion criteria used were: individuals in the middle adult category aged 50-60 years, having a Montreal Cognitive Assessment Indonesian Version (MoCA-Ina) score of at least 10, having no physical mobility barriers, and willing to be a sample study.

The researcher provided an explanation of the aims and stages of the research to the sample. Researchers conducted non-formal interviews and took measurements using the MoCA-Ina instrument to determine cognitive function abilities before the intervention and will be measured again after the intervention is complete. The Cognitive Stimulation Therapy intervention was carried out 6 times for approximately 70 minutes with 12 cognitive activities.

Data analysis was performed in SPSS software using the Paired t-test. This research has received ethical approval from the Surakarta Ministry of Health Health Polytechnic Health Research Ethics Committee with number LB.02.02/1.1/ 6318 /2024.

Result and Discussion

The Table 1 is the frequency distribution of the characteristics of the research sample.

Table 1. Characteristic Samples

Parameters	N	Percent (%)
Gender		
Male (M)	0	-
Female (F)	27	100
Occupation		
Housewives (HW)	17	63
Labor (Lbr)	9	33.3
Civil Servant (CS)	1	3.7
Level Education		
Elementary (ES)	17	63
Middle school (MS)	2	7.4
High school (HS)	8	29.6

Table 1 shows twenty-seven participants in this study were all women, 63% worked as housewives with 63% educational status at a low level of education.

Table 2. Level of Cognitive Ability Pretest Posttest

Level	Pre test		Post test	
	N	%	N	%
Heavy	1	3.7	0	0
Moderate	19	70.4	11	40.7
Light	6	22.2	11	40.7
Normal	1	3.7	5	18.5

Table 2 shows that the cognitive abilities of middle adult individuals aged 50-60 years based on pre-test scores are dominated by samples with moderate cognitive impairment at 68.18%. The cognitive abilities of middle adult individuals aged 50-60 years based on post-test scores are dominated by samples in the moderate and light categories, each at 45.45%.

Table 3. Level Cognitive Based on Characteristic Samples

Characteristic	Pre test (%)				Post test (%)			
	Normal	Light	Moderate	Heavy	Normal	Light	Moderate	Heavy
Gender								
M	0	0	0	0	0	0	0	0
F	3.7	22.2	70.4	3.7	18.5	40.7	40.7	0
Occ.								
HW	5.9	23.5	70.6	0	17.6	41.2	41.2	0
Lbr	0	11.1	77.8	11.1	11.1	44.4	44.4	0
CS	0	100	0	0	100	0	0	0
Lv.Edu.								
ES	0	17.6	76.5	5.9	5.9	41.2	52.9	0
MS	0	50	50	0	50	50	0	0
HS	12.5	25	62.5	0	37.5	37.5	25	0

Table 3 shows that middle adult individuals aged 50-60 years, female, with moderate cognitive impairment dominated the pre-test results (70.4%), while mild and moderate cognitive impairment dominated the post-test results (40.7%). Sample characteristics based on work show that housewives with moderate cognitive impairment dominate the pre-test results (70.6%), while mild and moderate cognitive impairment dominate the post-test results (41.2%). The characteristics of the sample based on the latest education show that, middle adult individuals aged 50-60 years who received the last elementary school education with moderate cognitive impairment dominated the pre-test results (76.5%), while the post-test results were also dominated by moderate cognitive impairment with statistics percentage decrease.

Tabel 4. Normality Result

Parameters	Shapiro-Wilk	
	N	Sig.
MoCA-Ina pre test	27	0.336
MoCA-Ina post test	27	0.942

Table 3 shows that the p-value of the pre-test score is 0.336 and the MoCA-Ina post-test is 0.942, which means the value is > 0.05 so the data distribution is declared normal.

Tabel 5. Hypothesis Result

Result		Paired T-Test
	N	Sig. (2-tailed)
MoCA-Ina pretest post test	27	0.000

Table 5 shows that the output from the Paired Sample T-test pre-test and post-test is 0.000, which means the value is <0.05 so it can be concluded that the hypothesis is accepted, namely that there is an effect of providing Cognitive Stimulation Therapy on the cognitive abilities of adult individuals. aged 50-60 years in Kemiri Village, Kebakkramat District, Karanganyar Regency.

The Cognitive Stimulation Therapy program has a significant positive effect on cognitive function (Streater et al., 2016), social relationships, and psychological health (Cheung & Peri, 2014). Streater et al. (2016) stated that the CST program provides significant benefits to individual cognitive functions, including: memory, orientation, language and visuospatial abilities. Language skills include naming, word finding, and comprehension. The results of the analysis showed that the cognitive improvements caused were as effective as several Dementia drugs (Streater et al., 2016). Cognitive stimulation can help improve the cognitive functions of older individuals, including in the domains of visuospatial/executive abilities, recall, naming, and language (Park et al., 2019). Cognitive Stimulation Therapy can stabilize and improve the cognitive function of individuals with cognitive disorders, especially in the domains of attention and working memory (Sanchia & Halim, 2019).

The factor that influences the cognitive abilities of middle adults aged 50-60 years is gender. Dumas (2017) stated that various studies show that gender factors greatly influence cognitive abilities in middle adults aged 50-60 years. Women tend to have a greater risk of impaired cognitive function compared to men. Women are even at higher risk of developing Alzheimer's Disease, especially if the woman carries the APOE4 allele. This is caused by hormonal changes during menopause which have many biochemical effects on a woman's body, including the brain (Dumas, 2017). The hormone estrogen, which plays an important role in maintaining brain function in postmenopausal women, decreases so that the risk of neurodegenerative diseases increases. One of the manifestations is the ability to control oneself which becomes uncontrolled where women use their emotions more, causing emotional turmoil and behavioral instability. Several studies show that declines in cognitive function when entering premenopause occur in certain domains including memory, attention, problem solving, and motor skills (Greendale et al., 2010).

Apart from that, another factor that influences the cognitive abilities of middle adult individuals aged 50-60 years is work. Dumas (2017) stated that changes in functional brain activation patterns between older and younger adults are influenced by the type of task, subject performance, and the amount of dementia progression. The type of task in question is work-related. Jobs that require high thinking abilities, in this case mathematical abilities, such as traders, teachers, or laborers, apparently show higher cognitive ability results than the work of housewives. One lifestyle factor that has the potential to improve cognition and produce more efficient brain function is involvement in social activities (Dumas, 2017). In this study, jobs that require a greater frequency of social involvement are workers and civil servants so that the cognitive abilities of these 2 groups are higher than those of the housewife group. Apart from that, there are cultural values that place women in domestic affairs in the household so that they cannot develop their potential. Apart from the prevailing cultural values, this condition is also caused by an education pattern that does not lead them to become trained personnel. The results of this research are in accordance with research conducted by Shiddieqy et al. (2022), namely that the majority of samples of middle adults aged 50-60 years who work as housewives have a lower cognitive category than middle adults aged 50-60 years who are about to enter retirement.

The last educational factor is also a factor that is no less important in influencing the cognitive abilities of middle adult individuals aged 50-60 years. Tamher (2009) states that individuals with a high level of education have a low risk of decreasing cognitive function, because with a continuous educational process individual will increasingly use their thinking abilities. Researchers are of the opinion that the level of education has an influence on cognitive function, because the higher the level of education, the more often the individual uses his thinking abilities compared to someone with less education.

Kushariyadi (2013) administered a therapeutic dose of CST 2 times a week for 2 weeks for around 15 minutes and at the end of the 2nd week a cognitive post-test was carried out in the control group and intervention group. Apóstolo et al. (2014) and Hall et al. (2013) made the CST therapy dose in the experimental group of 14 sessions carried out for 7 weeks with a frequency of 1 time per week and a duration of 45 minutes carried out in groups, while the control group would receive usual care. Sanchia et al. (2019) administered the CST intervention dose to the experimental group twice a week for 15 meetings with a duration of 45 minutes, while the control group did not receive any therapy. Meanwhile, Gomez-Soria et al. (2020) prescribed a dose of CST to the intervention group for 10 weeks with 1 session per week for 45 minutes and the results will be compared with a control group of 68 elderly people who did not receive the intervention. The studies above show that there is an increase in cognitive abilities after being given Cognitive Stimulation Therapy intervention. In this study, the intervention was carried out for 8 weeks with a frequency of 1x per week with a duration of 70 minutes per session. There are 6 sessions consisting of 12 cognitive activities using group therapy methods in their implementation.

In its implementation, the Cognitive Stimulation Therapy intervention is carried out in groups. Apóstolo et al. (2014) stated that providing Cognitive Stimulation Therapy activities in groups had an impact on increasing the cognitive abilities of older adults, in this case middle adult individuals aged 50-60 years. Group therapy is an activity carried out in groups with the aim of forming interaction dynamics between members (Karundeng et al., 2020). Group therapy can use activities, one of which is providing Cognitive Stimulation Therapy which aims to improve cognitive function through increasing functional connectivity (Schultheisz et al., 2018). This intervention can combine various cognitive functions such as attention, concentration, response speed, perception and memory, orientation, verbal and linguistic abilities, mathematical concepts, and problem-solving including concept formation and executive function.

Conclusion

The results of the research show that there is an influence of providing Cognitive Stimulation Therapy (CST) intervention on factors that influence the cognitive abilities of middle adult individuals aged 50-60 years in Kemiri Village, Kebakkramat District, Karanganyar Regency. Cognitive Stimulation Therapy intervention is an intervention method to stimulate the cognitive function of middle adult individuals aged 50-60 years with 6 themes packaged in 12 cognitive activities in Kemiri Village, Kebakkramat District, Karanganyar Regency. This intervention was carried out for 70 minutes per session, with a frequency of once a week for 6 therapy sessions as measured by the MoCA-INA instrument. The sample in this study consisted of 27 samples with the dominant gender being female, the dominant occupation being housewife, and the dominant education being middle adult individuals aged 50-60 years who had elementary school education. The cognitive abilities of middle adult individuals aged 50-60 years are influenced by factors such as gender, age, type of work and level of education.

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Conflicts of Interest
The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

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