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Management of cognitive function disorders in non hemoragic stroke patients with auditory stimulation: Murottal Shalawat

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ABSTRACT

Background

Stroke is a disease that is caused due to the blockage and narrowing of blood vessels in the brain so that the flow of oxygen in the brain vascular becomes reduced. This can cause the impact of cognitive function disorders. Cognitive functions are functions that include memory power, thought processes, language and speech skills, and decision making abilities. Non-pharmacological management that is with auditory murottal shalawat stimulation and is expected to improve cognitive function.

Aim

Proving the auditory murottal shalawat stimulation affects cognitive function.

Method

The study used True Experiments with Randomized Controlled Trials "pre and posttest with control group design". Simple random sampling technique in 30 respondents was divided into intervention group n = 15 given auditory stimulation of shalawat pressure 60-70 dB, for 15 minutes, 2 times a day, for 5 days and pharmacological therapy from the hospital, and the control group n = 15 received pharmacological therapy from the hospital. The cognitive function measurement tool is the MMSE questionnaire. Data analysis uses paired samples t. test.

Results

Murottal shalawat auditory stimulation has an influence on cognitive function p = 0,000.

Conclusion

Murottal shalawat auditory stimulation can improve cognitive function in non-hemorrhagic stroke patients

Keywords: Cognitive Function, Murottal Shalawat, Non-Hemorrhagic Stroke

INTRODUCTION

A stroke or a brain attack is a disease that can occur suddenly and unexpectedly and is a major factor causing serious disability [1]. Data of the World Health Organization (WHO) in 2016 explains that stroke ranks second in the world of causes of death and disability. Stroke in Indonesia also ranks second leading cause of death after heart disease, where 80% of the cases of stroke are ischemic strokes, and 20% of hemorrhagic strokes [2]. According to WHO, the prevalence of stroke according to WHO are 15 million people per year, stroke sufferers in Southeast Asia are 4 million

people and in 2020 it is estimated as many as 7.6 million people died from stroke [3]. Riskesdas 2018 data states that the prevalence of stroke in Indonesia is 10.9% or 109 sufferers per 1,000 populations. Central Java Province ranks second with the highest number of strokes after East Java, 96,794 patients (11.8%) [4].

Stroke is caused due to the blockage and narrowing of blood vessels in the brain so that the flow of oxygen in the brain vascular becomes reduced. Food substances and oxygen supply that should reach the brain become obstructed, thus disrupting the work of nerve cells [5]. This cerebrovascular disease can cause disruption in various body systems, one of which is cognitive function. Cognitive functions are functions that include memory power, thought processes, language and speech abilities, and decision making abilities [6]. Management is non-pharmacological with nursing interventions, one of which is complementary therapy. This therapy is needed because it has no adverse effects and can provide support both psychologically and spiritually [7]. Complementary therapy using auditory stimulation is considered more effective, inexpensive, and easy to use [8]. Therapy using music has proven effective in post-stroke rehabilitation. Research suggests the use of music can contribute to brain plasticity, where the restoration of brain function can be improved naturally [9].

Auditory stimulation with music therapy is a medium in the healing process that combines aspects of the situation and physical / bodily, emotional, mental, cognitive, and social needs of a person [10]. Music therapy is a therapeutic tool that is easily accepted by the hearing organ and delivered to the limbic system to aid physical, cognitive, and psychological recovery in stroke [11]. Murotal therapy is more effective as an intervention for cognitive development [12].

Murottal auditory stimuli include listening to remembrance, verses from the Koran and the blessings of the Prophet. The study of listening to shalawat has an effect on calmness and peace in the soul [13]. Shalawat according to the meaning of language is prayer, praise or glory to the Prophet Muhammad. Shalawat is an expression of gratitude to Rasulullah SAW for all his services and sacrifices that have led us to the right path. Shalawat is a reminder of privilege in every step of life, as well as gratitude to Allah SWT [14]. Murottal auditory stimulation with a pressure of 60 dB has a constant, regular rhythm, and there are no sudden changes [15]. This has a relaxing effect and can reduce anxiety. Auditory stimulation given with duration of 15 minutes, 2 times / day for 5 days can improve cognitive function [16].

Based on the above background, researchers are interested in conducting research on the management of cognitive dysfunction in non-hemorrhagic stroke patients with auditory stimulation of syottawat shalawat pressure 60-70 dB given with a duration of 15 minutes, 2 times / day for 5 days to improve cognitive function.

METHODS

This research was conducted in the stroke unit room of RSUD Dr. Loekmono Hadi Kudus. The research design is True Experiment with Randomized Controlled Trials "pre and posttest with control group design". The sampling technique is done by probability sampling with simple random sampling. The measuring instrument used to measure cognitive function is the Mini Mental State Examination (MMSE) questionnaire. The tools used for auditory stimulation are mp3 players and headphones. In the intervention group given auditory murottal shalawat pressure of 60-70 dB duration of 15 minutes, carried out 2 times / day for 5 days and therapy from the hospital, while the control group only received therapy from the hospital. Measurements were made before the intervention on the first day and after the intervention on the fifth day.

RESULTS

Analysis of the variables in this study was carried out univariate and bivariate. Univariate analysis is used to describe the results of research of each variable studied. Bivariate analysis was used to determine the relationship between the dependent variable and the independent variable, the Paired Sample T. tests. Respondent characteristics consisted of age, gender and therapeutic window.

Characteristics of respondents

Table 1 Frequency Distribution of Respondent Characteristics by Gender, Therapeutic Window and age

Category	Respondent Group				P *value* *)
	Intervention		Control		
	n (15)	%	N (15)	%	
Gender					
Male	6	40	10	66,7	0,478
Girl	9	60	5	33,3	
Therapeutic Window					
<12 Jam	7	46,7	9	60	0,526
>12 Jam	8	53,3	6	40	
Category	**Mean**	**Min**	**Mean**	**Min**	**P *value***
	SD	**Max**	**SD**	**Max**	
Age	56,33	45	61,93	45	0,071
	7,058	70	7,086	70	

Based on table 1 the results of gender research in the intervention group most of the women (60%) and the control group was mostly male (66.7%) respondents. Therapeutic window in the intervention group was mostly more than 12 hours (53.3%), in the control group it was mostly less than 12 hours (60%). The average age of the intervention group was 56.33 years and the control group was 61.93 years.

Effects of Murotttal Shalawat Auditory Stimulation on Cognitive Function

Table 2 Overview of cognitive functions before and after interventions in the second

Measurement	Intervention				Control				P value **)
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Kognitif_Pre	13.73	6.017	4	23	17.47	3.944	10	23	0,054
Kognitif_Post	18.40	5.193	10	27	17.40	3.924	11	24	0,557
Delta Kognitif	4.67	1,988			-0.07	1,387			0,000
P *value* *)	0,000				0,855				

*) *dependent t.test* **) *independent t.test*

Table 2 shows that on average the intervention group of respondents who had been given treatment experienced an increase in cognitive function by 4.67, while in the control group it decreased by 0.07. Paired sample t test results in the intervention group obtained a significance value of 0.000 (<0.05), it can be concluded that the administration of murottal auditory stimulation shalawat pressure 60-70 dB, duration of 15 minutes, performed 2 times / day for 5 days has a significant effect on improving cognitive function in non-hemorrhagic stroke patients. The results of the independent t-test on the mean delta difference between the intervention group and the control group showed a significant difference with the p value = 0,000 (<0.05).

The change in the mean of cognitive function measurement from the pretest and posttest for 5 days in both groups is shown in the graph below.

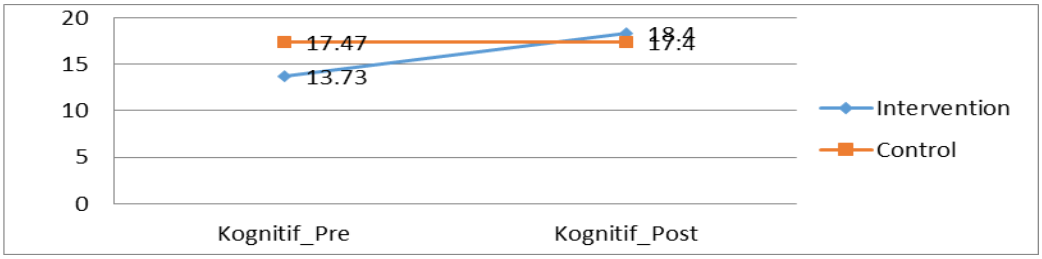

Figure 1 Graph of changes in cognitive function in the intervention and control groups

DISCUSSION

The results of the analysis of the dependent test t.test and independent t.test in studies using the MMSE (Mini Mental State Examination) scale show that the auditory stimulation of sholawat shalawat pressure of 60-70 dB, duration of 15 minutes, performed 2 times / day, for 5 days has an effect improve cognitive function with a significance value of p = 0.000 (<0.05) means that Ho is rejected and the results of intergroup analysis obtained p = 0,000 (<0.05) 95% CI then Ho is rejected, with an average score of 18.40 in the intervention group and a score of 17.40 in the control group.

Shalawat as one of murottal auditory stimulations becomes a therapy in providing spiritual support to patients in achieving the balance needed to maintain health. Spirituality has a major role in supporting patients to achieve a balance between body, mind and spirit in maintaining health, well-being, and in adapting to disrupted physical conditions. Shalawat according to the meaning of language is prayer, praise or glory to the Prophet Muhammad, expression of gratitude and thanks to Allah SWT and Rasulullah SAW [17]. This stimulation can improve the quality of awareness of God so that it can stimulate the brain to be in alpha waves, where the brain is in a calm state so that it can think clearly by activating the sympathetic system to become parasympathetic [14].

Murottal shalawat auditory stimulation enhances cognitive function in a way where the sound that is heard provides vibrational energy transmitted through the middle ear to the cochleal basilar membrane in the inner ear which is the area of resonance and plays a role in the frequency of vibrations, through the ciliary hair as a receptor sensory that connects to the auditory nerve (the auditory nerve) then this signal is delivered to the auditory cortex in the temporal lobe to activate the limbic system. This system is a system that regulates cognitive functions in the hypothalamus, thalamus, and hippocampus. So that the brain reorganizes itself (plasticity). Murottal shalawat auditory stimulation contributes to brain plasticity, whereby brain function can be restored and improved naturally [18]. This is consistent with research which states that there is an effect of murratal listening to the Qur'an on increasing the ability to concentrate [9]. Other research also states that Al Qur'an therapy has an effect on the cognitive function of ischemic stroke patients with a p value> 0.05 [19, 20].

According to Dr. Hermawan that stroke patients after going through an acute period can be given additional therapy in the form of music therapy, in addition to drug therapy and infusions given medically because this therapy is able to accelerate the healing and return of stroke patients from disability both motor and cognitive [21]. Music therapy or auditory stimulation has an influence extraordinary to cure stroke patients because it can stretch the sympathetic nerves to become parasympathetic in the body. Proper auditory stimulation is able to cause synchronization between the right and left hemispheres of the brain. [1] This is consistent with research conducted by Metasari which explains stroke patients who are not given musical intervention show insignificant results [16].

The results of this study can be concluded that the auditory stimulation of murottal shalawat pressure of 60-70 dB, duration of 15 minutes, performed 2 times / day, for 5 days affects the improvement of cognitive function in stroke patients and is proven by significant results with a p value of 0,000 (< 0.05).

CONCLUSIONS

Based on the results of research and discussion it can be concluded that the auditory stimulation of murottal shalawat pressure of 60-70 dB with a duration of 15 minutes carried out 2 times / day for 5 days affects the average increase in cognitive function in non-hemorrhagic stroke patients.

Suggestions for nursing services can carry out auditory murottal shalawat stimulation as one of the complementary therapies in nursing services in improving cognitive function in non-hemorrhagic stroke patients.

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