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RESEARCH ARTICLE

The Differences Between Motor Relearning Programme and Bobath Method On Standing Balance in Stroke Patients

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Abstract

Introduction: Stroke is a disorder of the central nervous system that can impair vital functions of the brain such as impaired coordination, impaired posture control, sensation, motion reflexes, and balance disorders such as the balance of sitting and standing. Complementary therapies like Motor Relearning Program (MRP) and Bobath Method have been involved. The aim was to analyze the differences between MRP and Bobath Method to increase standing balance in stroke patients. Method: A quasi-experimental research design is conducted, and respondents were divided into two groups. The treatment group was given the MRP and the control group was given the Bobath Method. Total sample 24 stroke patients were included as participants and obtained by simple random sampling. The independent variables were the MRP and Bobath Method. The dependent variable was standing balance. The data obtained by the Berg Balance Scale (BBS) analyzed using paired t-test and Independent t-test with a significance value of $\alpha \leq 0.05$. Results: The MRP ($p=0.000$) and Bobath method ($p = 0.010$) can improve standing balance. The differences in the effectiveness between MRP and Bobath Method showed a significance value of ($p=0.006$). Conclusion: Bobath method cause complex interactions of the sensory system and musculoskeletal and then regulated in the brain. Thus, MRP was more effective because it causes the cognitive, associative and autonomic to increase standing balance in stroke patients.

Keywords: *Bobath method; Stroke; Motor relearning program; Standing stability.*

Introduction

Stroke is a disorder of the central nervous system that is most often disrupts functional activity. The problems after stroke are very complicated for human life [1]. The Disturbances of vital brain functions such as impaired coordination, posture control, sensation, motion reflexes, balance disorders such as sitting and standing balance. These will decrease the daily functional activities of individuals [2].

Stroke is a global health problem. The data of WHO in 2010 was estimated that 15 million people are scattered throughout the world suffer a stroke, in which approximately five million people die and five million others survive, but suffer permanent disability and live dependent on relatives and society [3]. South-East Asian Medical Information Center (SEAMIC) data shows that the most significant stroke death rate occurs in Indonesia, there are 15 million strokes every ten years between 55 and 85 years.

In developing countries stroke also ranks third as a leading cause of death after coronary heart disease that leading of hypertensive, non-adherence drugs [4], and cancer. The number of stroke patients in Indonesia from year to year increased continuously. Immoral lifestyles can cause it. At present Indonesia is the country with the most significant amount of stroke sufferers in Asia [5].

According to Basic Health Research / Riskesdas data (2018), the prevalence of stroke in Indonesia is 10.9%, an increase in 2013 about 7 per cent. Approximately 88% of Stroke survivors begin their lives at home and the majority of them face permanent disability [6]. The impaired of standing balance in stroke patients is related to the inability to regulate body weight transfer and decreased muscular ability, so that body balance drops . To do the functional activities well, the right balance is also needed [7].

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Therefore, it is necessary to improve standing balance in stroke patients with pharmacological and non-pharmacological therapy. There are many kinds of non-pharmacological treatments, including the MRP and Bo bath Method [8]. The MRP was developed by Janet H. Carr and Roberta Shepheard around 1982 in Australia [9]. The MRP method is a specific program that involves cognitive processes, the application of motion and psychological science and training [10]. The aim was to analyze the differences between MRP and Bobath Method to increase standing balance in stroke patients.

Method

The type of this research is a quasi-experimental pre-post test with control group design by involving the control group and the treatment group. In the treatment group, the patients will be trained by the MRP while the Bobath Method will train the control group. The two groups were pre-tested and after the treatment was re-measured (Post-test) [11].

The populations in this study were stroke patients in Hospital in June to August 2019 and fulfilled the inclusion and exclusion criteria of Samples came from populations that could be used as research subjects through sampling. The inclusion criteria are patients able to communicate well and follow the instructions, cooperative and patients who impaired in standing balance.

The exclusion criteria are patients in the acute phase of unstable mental condition, blood pressure ≥ 160/100 mmHg and muscle strength in scale 1-2 with measurement of Manual Muscle Testing (MMT). In this study, a sample of 24 respondents was divided into treatment and control groups. In this study, the variables are the independent variables, Motor Relearning Program (MRP) and the Bobath Method and the dependent variable is standing balance.

MRP consists of 7 training components, namely bridging exercises, exercises from sleep to sitting, sitting balance exercises, upper limb function exercises, exercises from sitting to standing, standing balance exercises and walking balance exercises. This MRP exercises will improve standing balance in stroke patients. Bobath Method is a training therapy in Stroke, which assumes that stroke patients seem to return to the age of the baby so that its growth the development is by the growth of a healthy baby.

Therefore strokes must be trained to start from the lying position, tilt, stomach, crawling, sitting, standing and walking [12]. Interventions carried out for 40 minutes each exercise, three times a week for one month. This research has been conducted ethics due diligence by Health of commission ethics of Stikes Ngudia Husada Madura.

Results

Table 1:Characteristic respondents

Characteristics	MRP		Bobath Method	
	n	%	n	%
Age				
< 50 years old	2	17	1	8
50 – 59 years old	6	50	5	42
> 60 years old	4	33	6	50
Gender				
Male	7	58	10	83
Female	5	42	2	17
Stroke type				
Ischaemic	7	58	12	100
Hemorrhagic	5	42	0	0
Attack to				
First	10	83	6	50
Second	2	17	6	50
Duration of stroke				
< 4 months	4	33	0	0
4 – 9 months	7	59	4	33
> 9 months	1	8	8	67
Cholesterol history				
Yes	4	33	2	17
No	8	67	10	83
Hypertension history				

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Yes	12	100	6	50
No	0	0	6	50
Smoker				
Yes	7	58	7	58
No	5	42	5	42
Alcoholic				
Yes	0	0	0	0
No	12	100	12	100

The age of respondents in the MRP group was mostly 50 - 59 years old (50%). In the bobath method, most of the age of > 60 years was six people (50%). Based on the gender of respondents in the MRP group, most of the male was seven people (58%). In the bobath method, most of the male was ten people (83%). Based on the stroke type of respondents in the MRP group, most of the impark types were seven people (42%).

In the bobath method, all of the stroke types of respondent's impark type were 12 people (100%). Based on the attack of stroke of respondents in the MRP group, most of the attacks to the first time were ten people (42%). In the bobath method, most of the attack to the first time was six people (50%). Based on the duration of stroke of respondents in the MRP group, most of the duration, 4 -9 months were seven people (59%). In the bobath method, most of the duration > nine months were eight people (67%). Based on the Cholesterol history of respondents in the MRP group, most of the respondent doesn't have history were eight people (67%). In the bobath method, most of the respondent doesn't have history were ten people (83%). Based on the hypertension history of respondents in the MRP group, all of the respondents have histories were 12 people (100%).

In the bobath method, most of the respondents have histories were six people (50%). Based on the smoker history of respondents in the MRP group, most of the respondents have histories were seven people (58%). In the bobath method, most of the respondents have histories were seven people (58%). Based on the alcoholic history of respondents in the MRP group, all of the respondents don't have history were 12 people (100%). In the bobath method, all of the respondents don't have history were six people (50%). (Table 1)

Table 2: Distribution of standing balance in stroke patients for both groups, Motor Relearning Programme (MRP) and Bobath Method (n=24)

Group	Pre		Post		p*	p**
	mean± SD	min± max	mean± SD	min± max		
MRP	30.92±9.414	14 ± 44	35.67±9.188	13±45	0.010	0.006
Bobath Method	32.50±6.802	23±40	43.50±4.563	35±48	0.000	

Based on the results of the study, it was concluded that there was a difference in increasing standing balance by conducting the MRP and Bobath Method, as shown in the tables below. From the results of the Paired T-test, it was found that in the post group of the Motor MRP and post-Bobath Method, the mean of standing balance was 35.67 and 43.50. In the results of the Paired t-test, the MRP group was obtained p=0.010 and the Bobath Method was obtained p=0.000.

Thus, the significance is smaller than the degree of error determined by researchers, namely 5% (0.05). Thus, it can be concluded that there was a difference in standing balance between pre and post given by the Motor Relearning Program (MRP) and Bobath Method.

Based on the table, the p-value was 0.006 so that the significance is lower than the degree of error (0.006 <0.05) determined by the researcher, namely 5% (0.05). Thus, it can be concluded that there are differences in standing balance in Stroke patients between the MRP and Bobath Method.

Discussion

In this study, it was found that there were differences in the effectiveness of the MRP and the Bobath Method of standing balance in stroke patients. The Bobath Method will cause complex interactions. It can produce functional integration in the sensory system (vestibular, visual, and somatosensory) and musculoskeletal (muscle, joint, and soft tissue) which are then regulated in the brain (motor control, sensory, basal ganglia, cerebellum, and association area).

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The balance arises from the complex interactions of neural and musculoskeletal that are integrated and modified in the central nervous system that is responded to environmental conditions, both internal and external. So by given this exercise will be able to improve standing balance in stroke patients [13].

But in theory, the MRP is more favored because it has different mechanisms. MRP is given to patients who experience impaired standing balance resulting in neuroplasticity or increased quality of the brain and nervous system, which will cause neurogenesis or neuron quality improvement, synaptogenesis or synaptogenesis quality improvement or angiogenesis blood [14]. This will cause the cognitive, associative and autonomic of stroke patients to increase and the impact will be an increase in postural and motor control to develop so that the patient is able to stand in balance in increase readiness on discharge planning [15]. Thus, by conducting the MRP, it can improve standing balance more significantly. The researcher thought that, the implementation of MRP simultaneous leasing to resilience on facing stroke condition [12].

Conclusion

Based on the result of this research, it can be concluded that there is a difference in the effectiveness of the MRP and the Bobath Method to increase standing balance in stroke patients, But the Bobath Method gives a more significant effect than MRP. It is hoped to develop further research on other therapies to improve standing balance in stroke patients, for example, Proprioceptive Neuromuscular Facilitation (PNF), Constraint-Induced Movement Therapy (CIMT) or Rood Method. Although these exercises can be applied in the hospitals, community or in health centers to improve standing balance in stroke patients

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