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THE DIFFERENCES IN THE EFFECTIVENESS OF MRP *(MOTOR RELEARNING PROGRAMME)* AND *BOBATH METHOD* TO INCREASE STANDING BALANCE IN STROKE PATIENTS

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ABSTRACT

Introduction. Stroke is a disorder of the central nervous system that can impaired vital functions of the brain such as impaired coordination, impaired posture control, sensation, motion reflexes, and balance disorders such as balance of sitting and standing. Some complementary therapies that are used to improve standing balance are MRP (Motor Relearning Program) and Bobath Method. The purpose of this study was to analyze the differences in the effectiveness of MRP (Motor Relearning Program) and Bobath Method to increase standing balance in stroke patients. ***Method.*** This study uses a quasy-experimental research design, where respondents are divided into two groups. The treatment group was given the MRP (Motor Relearning Program) and the control group was given the Bobath Method. The population in this study were stroke patients that had fulfilled the inclusion and exclusion criterias. Samples were taken using simple random sampling as many as 24 respondents. The independent variables are MRP (Motor Relearning Program) and Bobath Method, while the dependent variable is standing balance. The instrument in this study used the Berg Balance Scale (BBS). Data were analyzed using paired t-test and Independent t-test with a significance value of $\alpha \leq 0.05$. ***Results.*** Paired t-test results show that MRP (Motor Relearning Program) can improve standing balance ($p = 0{,}000$) and Bobath Method can also improve standing balance ($p = 0.010$). Independent t-test showed a significance value of $p = 0.006$. So it can be concluded that there are differences in the effectiveness of MRP (Motor Relearning Program) and Bobath Method on increasing standing balance in stroke patients. ***Discussion.*** Bobath method cause complex interactions of the sensory system and musculoskeletal which are then regulated in the brain. But in this case MRP is more effective than Bobath Method because MRP cause the cognitive, associative and autonomic of stroke patients.

Keywords: *Stroke, MRP (Motor Relearning Programme), Bobath Method, Standing Stability*

INTRODUCTION

Stroke is a disorder of the central nervous system that is most often cause the disruption of functional activity. The problems after stroke are very complex for human life. 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 (Black, 2014)

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 decreases. The Berg Balance Scale (BBS) was developed to measure the standing balance by assessing the performance of functional tasks consisting of 14 types of static and dynamic balance tests on a 0-4 scale, with a balance score of 41-56: Low risk of falling, 21-40: moderate risk of falling and 0-20: High Risk of falling (Apriati, 2018).

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 (Intan, 2018). South East Asian Medical Information Center (SEAMIC) data shows that the largest stroke death rate occurs in Indonesia, there are 15 million strokes every 10 years between 55 and 85 years. In developing countries stroke also ranks third as a leading cause of death after coronary heart disease and cancer.

The number of stroke patients in Indonesia from year to year increased continuesly, it can caused by bad lifestyles. At present Indonesia is the country with the largest number of stroke sufferers in Asia (Annisa, 2018). According to Basic Health Research / Riskesdas data (2018), the prevalence of stroke in Indonesia is 10.9%, an increase in 2013 about 7 percent. The prevalence of stroke according to the province 2013-2018, the highest prevalence is in East Kalimantan (14.7%), Yogyakarta Special Region (14.6%), North Sumatra (14.4%), and EastJava (11%) at number 8. Approximately 88% of Stroke survivors begin their lives at home and majority of them face permanent disabilty.

The impaired in standing balance of stroke patients is related to the inability to regulate body weight transfer and decreased muscle ability, so that body balance decreases. This can cause many problems of functional activities. To do the functional activities well, a good balance is also needed (I Pramita, 2017). Therefore, it is necessary to improve standing balance in stroke patients with pharmacological and non pharmacological therapy. There are many kinds of non pharmacological therapies, including the MRP (Motor Relearning Program) and Bobath Method

The Motor Relearning Program (MRP) was developed by Janet H. Carr and Roberta Shepheard around 1982 in Australia. The MRP method is a specific program that involves cognitive processes, the application of motion and psychological science and training (Apriati, 2018). 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 Motor Relearning Program (MRP) exercises will improve standing balance in stroke patients.

Bobath Method is a method of 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 in accordance with the groth of a normal baby. Therefore strokes must be trained starting from the lying position, tilt, stomach, crawling, sitting, standing and walking (Sugiritama, 2015)

The aim of the intervention with the Bobath Method approach is to optimize function by increasing postural control and selective movement through facilitation. In achieving these objectives, the Bobath method will be carried out including: identifying specific areas of

antigravitatory muscles that have decreased power, increasing the ability to input propioceptive, identifying disturbances of the functioning of each individual and being able to carry out "normal" efficient function activities , facilitation of specific motor activity, minimizing compensatory movements as a reaction to motion disorders and identifying movements become more effective. The practice of Bobath method is expected to improve the standing balance in stroke patients.

METHODS

The type of this research is a quasi-experimental pre-post test with control group design by involving the control group and the experimental group. In the treatment group the pastients will be trained by the Motor Relearning Program (MRP) while the control group will be trained by the Bobath Method. The two groups were pre-tested and after the treatment was re-measured (Post-test) (Nursalam, 2008).

The population in this study were stroke patients in Hospital in June to August 2019 and fulfilled the inclusion and exclusion criterias of 56. Samples came from populations that could be used as research subjects through sampling. The inclusion criterias are patients able to communicate well and follow the instructions, cooperative and patients who impaired in standing balance. The exclusion criterias are patients in acute phase or 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 were 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.

RESULT

The data of socio demography respondents consist of gender, age and education. In MRP group, 7 respondents (58%) were man, the range of age was 47-75 years old and the education 10 respondents (83%) were elementery school. Then in Bobath Method group, 10 respondents (83%) were man, the range of age was 45-78 years old and the education 7 respondents (58%) were junior high school.

Based on the results of the study, it was concluded that there was a difference in increasing standing balance by conducting the Motor Relearning Program (MRP) and Bobath Method as shown in the tables below.

Table 1. The Result of Paired t-test, before and after given by *Motor Relearning Programme* (MRP) dan *Bobath Method*

Group	Asymp. Sig. (2-tailed)	Mean	Std. Deviation
Pre-post MRP	0.000	11.000	4.134
Pre-post BM	0.010	4.750	5.111

From the results of the Paired T-test, it was found that in the Pre-post group of the Motor Relearning Program (MRP) and Pre-post Bobath Method, the average of standing balance was 11,000 and 4,750.

In the results of the Paired t-test, the Motor Relearning Program (MRP) group was obtained ρ: 0,000 and the Bobath Method was obtained ρ: 0.010. So the significance is smaller than the degree of error determined by researchers, namely 5% (0.05). So 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.

Table 2. The Result of Independent t-test for both groups, *Motor Relearning Programme* (MRP) and *Bobath Method*

Groups	Asymp. Sig. (2-tailed)
Standing Balance by *Motor Relearning Programme* (MRP) dan *Bobath Method*	0.006

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

DISCUSSION

In this study it was found that there were differences in the effectiveness of the Motor Relearning Program (MRP) and the Bobath Method of standing balance in stroke patients. According to Darmawan (2014) the Bobath Method will cause complex interactions. It can cause the good 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). Apriati (2018) also explained that balance arises from the complex interactions of sensory 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.

But in theory, the Motor Relearning Program (MRP) is more favored because it has different mechanisms. According to Chung (2014) Motor Relearning Program (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 synaptogenic quality improvement or angiogenesis blood. 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. So by conducting the Motor Relearning Program (MRP), it can improve standing balance more significantly.

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CONCLUSION

Based on the result of this research, it can be concluded that there is a difference in the effectiveness of the Motor Relearning Program (MRP) and the Bobath Method to increase standing balance in stroke patients, But the Motor Relearning Program (MRP) gives more significant effect than the Bobath Method.

RECOMMENDATION

It is hoped to develop the further research on other therapies to improve standing balance in stroke patients, for example Propioceptive Neuromuscular Fascilitation (PNF), Constraint

Induced Movement Therapy (CIMT) or Rood Method. Although these exercise can be applied in the hospitals, community or in health centers to improve standing balance in stroke patients
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