
THE EFFECTIVENESS OF EXERCISE THERAPY TO IMPROVE PATIENTS WITH STROKE CONDITIONS: SYSTEMATIC REVIEW

Yoel Kristian Adi Candra (1), Daniel Saka Pratama (1), Mianti Nurriszky Sutejo (2)

- 1) *Physiotherapy Study Program, STIKES Telogorejo Semarang, Indonesia*
- 2) *Department of Physiotherapy, STIKES Telogorejo Semarang, Indonesia*

*Correspondence to: 720022@stikestelogorejo.ac.id

Abstract:

Background : According to the World Health Organization (WHO) stroke is a symptom that is defined as a functional brain disorder that occurs suddenly with clinical signs and symptoms both focal and global lasting 24 hours or more. Stroke in Indonesia has also experienced an increase in prevalence. In Indonesia, this disease occupies the third position after heart disease and cancer. Therefore, from several studies that we have, giving exercise therapy is effective in improving patients with stroke.

Research purposes: To determine the effectiveness of exercise therapy in improving patients with stroke.

Methodology: A systematic review of an article related to providing exercise therapy to stroke patients.

Results: With exercise therapy can provide a significant effect to improve the condition of stroke patients.

Conclusion: Provision of exercise therapy can increase daily physical activity in patients with stroke conditions.

Research contributions: Yoel Kristian Adi Candra is the main researcher who selects topics, writes papers, and collecting data. Daniel Saka Pratama searched, reviewed study documents, and collected data. Deasy Virka Sari reviewed the study documents.

Keywords: Stroke, Exercise Therapy, Physiotherapy

INTRODUCTION

Physiotherapy is a form of health service aimed at individuals and or groups to develop, maintain and restore body movement and function throughout the life cycle using manual handling, increased movement, equipment (physical, electrotherapeutic and mechanical), function training, communication.

Stroke is defined by the World Health Organization (WHO) as acute, focal or diffuse brain dysfunction of vascular origin and lasting more than one day. Stroke is a major cause of morbidity and mortality worldwide, even being the third leading cause after heart disease and cancer. Stroke can be broadly classified as non-hemorrhagic and hemorrhagic (Hendrik et al., 2018)

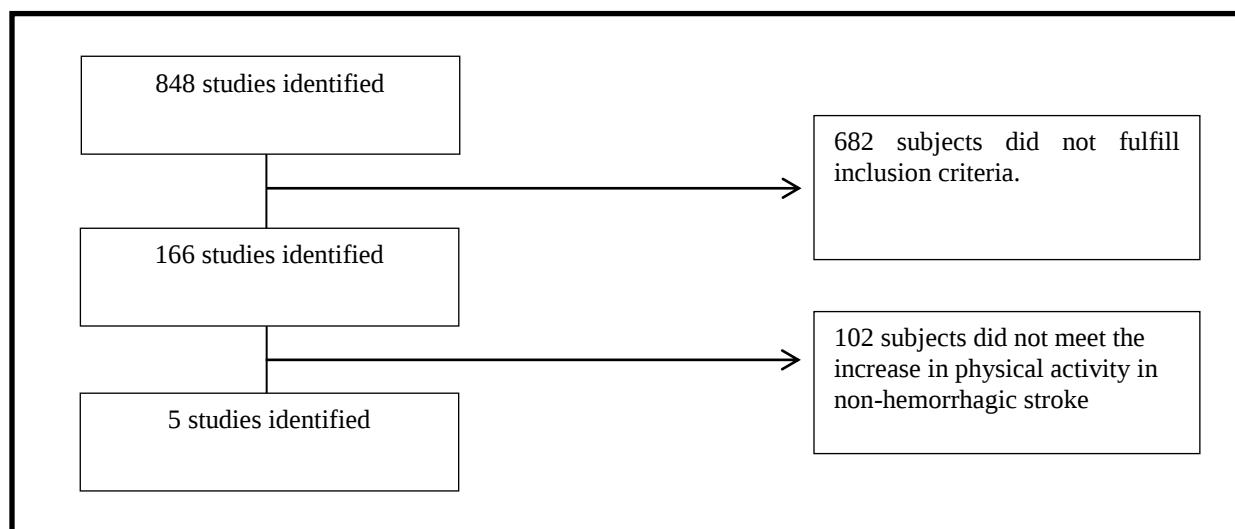
Non-hemorrhagic stroke or infarction is a brain injury associated with obstruction to cerebral blood flow resulting from the formation of a thrombus in the cerebral artery or embolism that flows to the brain and elsewhere in the body. Non-hemorrhagic stroke is a process of ischemia due to cerebral embolism and thrombosis which usually occurs after a long period of rest, just getting out of bed or in the morning and there is no bleeding. Clinical manifestations of ischemic stroke include paralysis, paresis, ataxia, vomiting, and stares. The specific location of the lesion will determine the symptoms and signs that will appear in the patient (Yani et al., 2017).

Physiotherapy services play an important role for stroke patients according to the stages of the patient's condition both during the treatment period at the hospital and the recovery period at home with the aim of achieving optimal and independent functional abilities.



METHOD

This research method uses a systematic review journal. This study determines whether there is an improvement in movement function with the exercise therapy method in the daily physical activity of stroke patients. The search for effective was deliberately limited to English, with interesting studies in geriatric patients published within the last 11 years. The literature research was conducted on the Google Scholar, and PubMed, electronic databases for the period between January 2011 and January 2022.



Sample inclusion criteria, namely: 1) post-stroke hemiparesis patients who experienced limb spasticity, 2) unable to walk, 3) willing to participate in this study, 4) subject age: 40 - 65 years and 5) able to communicate well. while the exclusion criteria were: 1) stroke patients with diabetes mellitus, 2) post-stroke hemiplegia patients and 3) blood pressure more than 140/90 mmHg (Suharto & Takko Podding, 2021).

RESULTS AND DISCUSSION

Stroke can strike anyone, the older a person is, the more likely that person is to have a stroke. Stroke sufferers are more common at the age of over 50 years compared to those under 50 years of age. Where at that age all the organs of the body including the blood vessels of the brain become fragile. Signs and symptoms of non-hemorrhagic stroke are mild or very mild headache, no seizures and vomiting during attack, mild or very mild loss of consciousness, paresis of one or both limbs and/or face, aphasia, ataxia and visual disturbances. Based on the results of the 2018 Basic Health Research (Riskesdas), the prevalence of stroke in Indonesia is increasing every year. The prevalence of stroke cases in Indonesia has reached 10.9% per mil, compared to 2013 the incidence of stroke in Indonesia reached 7.0%. The highest cases of stroke diagnosed by health workers were those aged 75 years and over, namely 50.2% and the lowest were in the age group >55 years, namely 32.4%.

In general, the problems of physiotherapy in stroke patients are hemiparesis or hemiplegic limbs (usually only one side of the body), impaired muscle tone, namely flaccid (hypotonic) or spastic (hypertonus), sensory disturbances, depression, postural alignment/postural control, balance disorders (usually due to immobilization, impaired sensation and impaired spatial perception), impaired gait,



depression and impaired functional abilities and daily activities (Saunders, Greig and Mead, 2014).

A physiotherapist must see the patient's condition first before providing exercise therapy to improve the function of his body movements. If the patient is spastic, the physiotherapist must control the spasticity, during the spastic stage it is necessary to carry out therapy such as normalizing muscle tone with the aim of reducing spasticity and simultaneously strengthening weak antagonistic muscles (Raj, 2006). Normalization of muscle tone can use techniques such as passive motion exercises, joint mobilization in areas where weakness occurs, bridging exercises with the help of a healthy side and enhanced by facilitation, namely using the assisted exercise method. One way to open a hand that is experiencing spasticity is to release the tendon or you can also use the PNF (Proprioceptive Neuromuscular Facilitation) method, which is to open the pattern. With spasticity, it will be difficult to carry out functional daily activities in the right pattern. A high level of spasticity will result in the patient's inability to maintain posture, motor movements and ultimately interfere with the functional ability of daily activities. If the patient has flaccid, a physiotherapist can increase his muscle tone first (Díaz-Arribas et al., 2020).

Physiotherapy treatment for non-hemorrhagic stroke patients is to enable stroke patients to achieve optimal physical and functional potential and consists of using stimulation techniques and facilitating movement re-learning, understanding movement problems, preventing secondary complications, maintaining body physiology and increasing functional abilities (Stack and Stokes, 2011). In the acute phase, physiotherapy can provide treatment, namely positioning, chest physiotherapy, weight bearing, and education for patients and families (Raj, 2006; Stack and Stokes, 2011).

Of the several physiotherapy approaches in stroke patients, the approach that is often used is Bobath and Proprioceptive Neuromuscular Facilitation (PNF). (Abdullahi et al., 2015). In the bobath concept, the initial response in balance and daily functional activities can be achieved because it accommodates patients in the early recovery stage of stroke patients (acute stage). During a period of neuroplasticity, the patient must practice specific task-oriented movements provided by the therapist to encourage plasticity and regain lost function (Hendrik et al., 2018)

The Babath method is a method of exercise therapy for stroke which assumes that stroke sufferers are as if stroke patients return to their infancy so that their growth and development are in accordance with normal infant growth. Therefore strokes must be trained starting from lying down, tilting, prone, crawling, sitting, standing, and walking. The bobath method can also be used to treat excessive muscle tone, providing inhibition positions (positions that can prevent hypertonus) and facilitation (positions that can reduce hypertonus). The goal of the bobath method intervention is to optimize function by increasing postural control and selective movement through facilitation, as stated by IBITA 1995. In principle, exercises with the Bobath method approach are individual in nature, depending on the problems found during the examination. The initial step in bobath exercise therapy is to activate the internal trunk muscles (abdominal muscles, paraspinal muscles, pelvic floor muscles). These muscles are the muscles that provide the main stability to the posture (Yani et al., 2017)

Daily functional exercises or often abbreviated as ADL (activity daily living), need to be given to increase the independence of stroke patients. Some of the functional activities provided of course require adjustments to the abilities of stroke patients. Beginning with simple activities but activities that are routinely carried out by stroke patients before having a stroke, such as wearing clothes, bathing, going up and down stairs and being involved which is a stroke patient's hobby.

Proprioceptive Neuromuscular Facilitation (PNF) is a form of flexibility training with stretching assisted by others during contraction and relaxation. The PNF technique has broader benefits than other conventional stretching methods. In addition, PNF can increase relaxation in the muscles that are stretched, moreover, the PNF technique is best for developing or building body flexibility techniques. PNF



can be used for muscle stretching in stroke patients. This technique helps develop muscle strength and endurance, joint stability, mobility, neuromuscular control and coordination

Based on several studies that compared these two methods, the result was that there were no significant changes in these two methods. In the Bobath group, there was an increase in weight on the hemiplegic/hemiparesis or sick side, control of balance, functional independence of activity daily living (ADL) within four weeks compared to the PNF group (Wang et al., 2005; Bhalerao, Kulkarni, Kapoor, 2011)

First author/ year	Type of study	sample	Assessment and intervention	Clinical outcome	Significance
Krisnawati, D., & Anggiat, L. (2021)	Systematic Reviews and Meta-Analyzes	1 patients	Assessment: Barthel index, ADL (Activity daily living) Intervention: Physical Exercise, bobath, PNF, MRP.	There are significant changes in the ADL of stroke patients.	P < 0.01
Yani et al., 2017	systematic review and meta-analysis	9 patients	Assessments: Barthel Index, ADL (Activity daily living), MMT, ROM, Romberg test. Interventions: Bobath, PNF, NMT (Neuromuscular Tapping), Feldenkrais, Hydrotherapy, Electrotherapy, Actiotherapy.	The bobath method is effective for reducing the risk of falling, the PNF method is effective for increasing sensory in patients.	P<0.005
Hendrik et al., 2018	Experiment with the pre-post test group approach.	10 patients	Assessments: MMT, ROM Interventions: PNF (Proprioceptive Neuromuscular Facilitation)	Providing PNF training can increase the endurance of the lower limb muscles of stroke patients.	P < 0.05
Suharto, et al., 2021	Research was pre-experimental with pre-test - post-test one group design	12 Patient	Assesments: Asworth scale, measuring walking ability using the Timed Up and Go Test	Bobath exercise can improve walking ability and reduce spasticity of stroke patients, so treatment of stroke patients should use this method	P < 0.05
Maria J.Diaz-	A systematic	120 Patient	Randomized	The Bobath concept is not	P<0.05



Arribas., et al
2019

literature review

controlled trials. This scale comprises 11 questions with yes or no answers (yes = 1; no = 0) superior to other approaches for regaining mobility, motor control of the lower limb and gait, balance and activities of daily living of patients after stroke. There is moderate evidence regarding the superior results of other approaches in terms of the motor control and dexterity of the upper limb.

CONCLUSION

From all these results, it can be concluded that the administration of exercise therapy, bobath, and PNF is effective in restoring lost movement patterns in post-stroke patients. With these exercises can also increase muscle tone, and lost movement coordination. Giving this therapy will show a significant increase if done routinely. This is of course balanced with a balanced diet and has adequate nutrition.

THE AUTHOR'S CONTRIBUTION

Yoel Kristian Adi Candra is the principal researcher who selects topics, writes papers, and collects data. Daniel Saka Pratama searched, reviewed study documents, and collected data. Deasy Virka Sari reviewed the study documents.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest in this writing.

CONFESSION

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