

Review

The Range of Motion (ROM) in Increasing Muscle Strength in Stroke Patients : Literature Review

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ABSTRACT

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Background: Proper care is essential for the prevention of mental and physical impairment in patients with Sroke illness. There is a golden time of less than six hours during which people can recuperate fully after a stroke. Disability and physical weakening, including a loss of muscle strength, may occur if treatment is not maximized within that time frame. The purpose of the literature review is to determine the importance of Range of Motion (ROM) in Increasing Muscle Strength in Stroke Patients.

Methods: Use PRISMA Approach. The research stage is to make selections by paying attention to the quality of the journal. Furthermore, articles from journals that are considered less relevant are excluded. Literature obtained from 7 articles relevant to Google Scholar, Indonesia One Search, DOAJ, and Garuda with the keywords Range of Motion, Muscle Strength, Stroke.

Results: After a review of selected articles, the results given Range of Motion have a good impact on increasing muscle strength in stroke patients.


Conclusion: The Range of Motion (ROM) can be applied in health program for in Increasing Muscle Strength in Stroke Patients

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
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Introduction

When blood flow to the brain is suddenly and severely reduced, a condition known as a stroke develops. Stroke symptoms often manifest 24 hours after the onset. Acute brain injury results from these rapidly worsening clinical signs. When blood flow to a portion of the brain suddenly stops, a condition known as a stroke occurs. Depending on the stroke's site, the area's size with poor perfusion, and the quantity of secondary or supplementary collateral blood flow, neurological diseases can develop.(Widya Ningrum & Nurfianti, 2019).

When it comes to non-communicable diseases that kill people, stroke is number two on the global list. Over 2 million people suffer a stroke annually. The World Health Organization reports that 130,000 people in the Americas die from stroke each year, making it the fifth leading cause of death in the region. Stroke incidence in Indonesia would reach 10.9% in 2020, up from 7% in 2018 according to Basic Health Research. With 302,987 cases, East Java has the third-highest stroke prevalence in Indonesia. (Mahyuvi & Nursalam, 2020).

In someone who has a stroke there is weakness in the hands and feet of the feet that affect muscle contraction due to



reduced blood supply to the brain so that it can inhibit the main conduction between the brain and the spinal cord, neurological abnormalities can increase because in stroke there is swelling of the brain which can cause damage to brain tissue (Lin et al., 2018). As a result of stroke, hemiparase and hemiplegia, both are forms of motor deficit caused by motor neuron disorders with characteristics of loss of control of voluntary movements, movement disorders, limited muscle tone and limited reflexes (Syafni, 2020).

Post-attack on a person suffering from stroke takes a long time to recover and gain function in optimal adjustment. Requiring rapid therapeutic treatment to anticipate further cerebral injury, one of the mobilization exercises in rehabilitation in stroke patients is Range of Motion (ROM) exercises with the intention to increase or maintain flexibility and increase muscle strength that is experiencing weakness (Sustika et al., 2020). The results of the study say that Range of Motion exercises can increase muscle strength in stroke patients. In the Range of Motion (ROM) intervention group there was a significant increase in muscle strength before and after the intervention where before the intervention the average value of muscle strength was 1.6 (SD: 1,140) and after the intervention the average value of muscle strength was 3 (SD: 1,581) (Syikir et al., 2020).

Methods

Use PRISMA Approach, After much deliberation and research, this piece is the end product. The results of prior studies on a certain subject are summed together in a review study. Researchers require a systematic review strategy to make use of the abundance of material in order to finish this research. Typically, the researcher is the one to conduct the literature search or review. In addition, other researchers independently extract and examine the retrieved literature to ensure that this research includes relevant and appropriate information. We use the search terms "range of motion," "muscle strength," and "stroke" to scour the Google Scholar database for relevant articles. Researchers will begin searching for articles using the terms range of motion, muscle strength, and stroke from March 7, 2024, through March 26, 2024. Lastly, the author has gathered seven publications and articles, which she has critically analyzed to extract the main ideas and arguments from each. Additionally, the last step is to write the review of the article.

Results

Review searches are reviewed and filtered according to the required variables. Furthermore, due diligence and critical thinking were carried out on the journal, then 15 journals were selected through the specified criteria so that they got 7 journals. The journal searches used in this study were Google Scholar, Indonesia One Search, DOAJ, and Garuda.

Tabel 1. Literatur Review

Title, Author and Year	Research Results
Application of Passive Range of Motion (ROM) Exercises to Increase the Strength of the Limb Muscles in Patients with Stroke Cases (Agusrianto & Rantesigi, 2020)	Evaluation after six days of intervention, the patient could move his hands and feet. In the upper/ lower right limb from scale 2 to scale 3 and the upper / lower left limb from 0 to 1. The conclusion after being given passive ROM exercises, stroke patients experienced increased muscle strength in both extremities.
Changes in the Strength of the Muscle of Extremity Through ROM (Range Of Motion) Exercise in Stroke Patients in the Working Area of Karangploso Health Center of Malang District (Sabira Astrid et al., 2017)	The results of observations show muscle strength is >3 in the good category, showing a significant increase between the muscle strength scale before and after ROM Exercise is done due to muscle contractions and movements that are often done so that muscle mass increases and makes muscle strength increase and maintain joint mobility.
The Effect of Range of Motion (ROM) Application on Muscle Strength in Elderly Stroke Sufferers at the Tresna Werdha Asisi Social Institute Sukabumi City the Year 2022 (Silalahi et al., 2023)	Range of Motion (ROM) is an exercise performed to maintain or improve the ability to move joints normally and completely to increase muscle mass and tone to prevent deformities, stiffness, and contracture.
Effect of ROM (Range of Motion) on The Strength of Muscle Extremity in Non-Hemoragic Stroke Patients (Anggraini et al., 2018)	ROM was influential in increasing the muscle strength of respondents' hands and feet. Hospitals should establish standard operating procedures for special treatment using ROM so that results obtained can be maximum and uniform for all muscle strength problems.
The Effect of Nursing Range of Motion on the Motor Function of Patients with Impaired Physical Mobility (Setyowati et al., 2023)	ROM exercises given immediately while in the hospital can increase muscle strength. Besides that, supporting families, dan emotional patients help maximize the result.
The Effect of Range of Motion on Muscle Strength in Stroke Patients (Susanti & Bistara, 2019)	There is an influence between Range of Motion (ROM) on muscle strength in stroke patients because each respondent experienced an increase in muscle strength scale after ROM by grasping the ball.
Effectiveness of Range of Motion (ROM) Fingers and Spherical grip to Extremity Strength in Non Hemorrhagic Stroke Patients (Hapsari et al., 2020)	Range of Motion (ROM) therapy of the fingers of the hands is effective against increased extremity strength in non-hemorrhagic stroke patients.

Discussion

Stroke is the 2nd leading cause of death after the heart, those who are able to survive often suffer from disabilities that require rehabilitation to help restore physical abilities and improve overall quality of life. Permanent paralysis due to stroke can be prevented by doing rehabilitative therapy. Therapy of rehabilitative measures is carried out as quickly as possible, that is, in the first days of the stroke after the patient is considered stable (Susanti & Bistara, 2019). The sooner to undergo rehabilitation, the greater the possibility of preventing the spread of disorders in the brain and reducing the consequences caused by stroke so that patients will quickly regain their quality of life. Stroke rehabilitation is a coordinated program that provides restorative care to maximize recovery and minimize disability caused by stroke. Stroke rehabilitation is proven to optimize recovery so that stroke sufferers get better functional outcomes and quality of life (Sustika et al., 2020).

One of the rehabilitation therapies in stroke patients that is often used is the Range of Motion (ROM) exercise program. Motion training in the form of Range of Motion (ROM) exercises can be done as often as possible. The advantage of Range of Motion (ROM) training is to maintain the flexibility of the muscles and joints by moving the muscles (Rhestifujiayani & Huriani, 2015). The goal of Range of Motion (ROM) is to restore muscle strength and joint flexibility so that patients can return to daily activities. Likewise, after returning home from the hospital, post-stroke patients still have to undergo daily activity skills exercises (Hapsari et al., 2020).

Based on the results of literature review and critical thinking in 7 journals, research results were obtained that stated that Range of Motion exercises are effective in increasing muscle strength in stroke

patients. Range of Motion exercise is a joint movement exercise that allows muscle contraction and stretching. The Range of Motion exercise can be done using the technique of muscle contraction and stretching for 10 minutes in a matter of 8 times with exercise 6 times a day (Anggraini et al., 2018).

Rehabilitation in stroke patients who start early, then the possibility of stroke patients experiencing a deficit in the ability to move will be smaller. The condition of post-stroke patients will improve with spontaneous healing, learning and practice. Range of Motion (ROM) with which is performed on strokes is quite good of the upper extremities and lower extremities. Most muscle strength of stroke patients before Range of Motion (ROM) tends to be better than before it was done. Muscle strength is closely related to the neuromuscular system, which is how much the nervous system is able to activate muscles to contract. So that the more muscle fibers that are activated, the greater the strength produced by the muscle (Setyowati et al., 2023).

Range of Motion (ROM) exercises are widely useful for patients who experience stiffness in the joints, especially in stroke patients with the presence of movement exercises in the joints can reduce stiffness in the joints. With the provision of passive and active Range of Motion (ROM) exercises is very influential on stroke patients after being given passive and active motion training. But it will work well and will get accurate results must be given regularly, on time, continuously and also programmatically. Therefore, it is very necessary to have SOPs (Standard Operating Procedures) for Range of Motion (ROM) exercises in stroke patients.

Conclusion

Giving Range of Motion (ROM) to stroke patients has a good impact on increasing the muscle strength of stroke patients, as well as improving the quality of life of stroke patients, which can increase rehabilitation activities and prevent complications from the disease suffered.

Authors Contributions

In this literature review endeavor, each author played a pivotal role in shaping the narrative and depth of analysis: one author spearheaded the identification of research gaps, conceptualized the study framework, and meticulously curated the literature; another author critically evaluated the quality and relevance of selected sources, conducted a meta-analysis, and contributed to the theoretical synthesis; while a third author meticulously revised the manuscript, ensured alignment with research objectives, and polished the language for clarity and coherence.

Conflicts of Interest

We hereby state that throughout the entire research process, from conception to publication, there were no relationships or activities that could be perceived as conflicts of interest, ensuring the objectivity and credibility of our findings.

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