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Application of Physical Exercise in Non-Hemorrhagic Stroke Patients with Physical Mobility Impairment at Gunung Jati Hospital, Cirebon City

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ABSTRACT

Background & Objective: Stroke is damage to the brain that occurs due to a sudden decrease or interruption in the flow of oxygen in the blood. The objective of this study is to provide appropriate nursing care for patients with non-hemorrhagic stroke in a detailed and comprehensive manner, with a focus on the application of physical exercise for patients with non-hemorrhagic stroke and physical mobility impairments at RSD Gunung Jati Hospital in Cirebon City. **Method:** This study adopts a descriptive design using a case study approach. The steps include data collection, diagnosis, planning, intervention, and evaluation. The study was conducted at RSD Gunung Jati Hospital in Cirebon City in February 2025, with data collected through interviews, observations, physical examinations, and medical records. **Result:** After undergoing *Range of Motion* (ROM) training, patients showed improvements in flexibility, muscle strength, and movement coordination. **Conclusion:** These findings indicate that an approach using joint strengthening exercise techniques contributes to reducing physical mobility issues and enhancing patients' independence in performing daily activities.

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Introduction

Non-communicable diseases (NCDs) remain a serious challenge in global health. One of the most deadly NCDs is stroke, particularly non-hemorrhagic or ischemic stroke, which is the most common type of stroke, accounting for approximately 83% of all stroke cases (Setyawati & Retnaningsih, 2024). Non-hemorrhagic stroke occurs due to blockage or narrowing of blood vessels, which disrupts blood flow to the brain. This condition causes sudden brain tissue death, leading to partial or total loss of

bodily functions. Data from the World Health Organization (WHO) indicates that over 15 million people experience stroke annually, with approximately 5 million of them suffering permanent disabilities (World Health Organization, 2021).

In Indonesia, stroke is the leading cause of death in hospitals, with the number of cases continuing to rise each year. The 2018 Basic Health Research (Riskesdas) results indicate that the prevalence of stroke increased from 7% in 2013 to 10.9% in 2018, with the highest prevalence occurring in the elderly and urban areas (Ministry of Health of the Republic of Indonesia, 2018). West Java Province is recorded as the region with the highest number of stroke patients, including in the city of Cirebon. This indicates that stroke is a serious health issue requiring immediate and appropriate intervention, not only from a medical perspective but also in terms of nursing care, particularly regarding post-stroke patient mobility recovery.

One of the primary effects of non-hemorrhagic stroke is motor system impairment, leading to reduced muscle strength and mobility. This impairment can hinder daily activities and diminish the patient's quality of life. To address physical mobility impairments, nursing interventions such as Range of Motion (ROM) exercises have proven effective in maintaining and improving muscle and joint flexibility and strength (Parmilah et al., 2022). ROM exercises involve passive and active movements that help prevent complications such as muscle atrophy and joint stiffness, as well as accelerate the recovery of stroke patients' bodily functions (Kamesyworo & Hartati, 2024).

Given the importance of ROM exercises as a nursing intervention in the recovery of non-hemorrhagic stroke patients, the application of this technique is highly relevant for further research. Especially at RSD Gunung Jati Hospital in Cirebon City, which is one of the referral hospitals in West Java.

Objective

Based on this, the researcher was interested in conducting a study entitled "The Application of Range of Motion (ROM) in Non-Hemorrhagic Stroke Patients with Physical Mobility Impairments at Gunung Jati Regional General Hospital in Cirebon City." This study aims to contribute to the development of nursing interventions to improve the physical mobility of stroke patients and enhance their overall quality of life at the hospital. Gunung Jati Hospital in Cirebon City.

Method

This study employs a descriptive approach using a case study method, aiming to describe the application of Range of Motion (ROM) exercises in non-hemorrhagic stroke patients with physical mobility impairments. The study was conducted on one patient who met the criteria, namely experiencing lower extremity muscle weakness due to non-hemorrhagic stroke. The case study approach was chosen because it can comprehensively describe the patient's condition, the interventions provided, and the patient's progress after the ROM intervention. The study was conducted from January 30 to February 2, 2025, in the Stroke Unit of RSD Gunung Jati Hospital in Cirebon City.

The study subject was a 67-year-old male patient named Mr. R, with a history of non-hemorrhagic stroke and hypertension. The patient experienced physical mobility impairment with weakness in both legs, as indicated by a muscle strength score of 1 for the legs, while the muscle strength score for the hands was 5. During hospitalization, the patient was unable to perform basic daily activities such as eating,

bathing, changing positions, and elimination without assistance. The intervention provided consisted of passive ROM exercises conducted over three consecutive days, involving family members in the process to motivate and assist the patient in movement training.

Data collection techniques included interviews with the patient and family, observation of the patient's response during exercises, and physical examinations that included muscle strength assessment and mobility evaluation. Additionally, medical documentation such as medical records and nursing intervention notes were used to reinforce the data obtained. ROM exercises were conducted using a systematic approach, starting with education, flexion and extension movement training, and other simple passive movements aimed at improving flexibility and preventing muscle stiffness. The exercises were given gradually and continuously with daily evaluations of muscle strength and movement ability progress.

Data analysis is conducted using descriptive qualitative methods, presenting the results of observations and the patient's progress day by day during the intervention. The results of the ROM exercises show that by the third day, the patient began to be able to move their toes independently and could lift their leg with the help of their hands, indicating an improvement, though not yet significant. This intervention is considered beneficial as part of the physical mobility recovery of stroke patients, and the results indicate that ROM can enhance muscle strength when performed routinely, systematically, and supported by family involvement in patient care.

Results

TABLE 1. Implementation of *Range of Motion* (ROM) exercises

Day	Date	ROM Action	Patient Response	Muscle Strength Score
Day 1	January 31, 2025	• Education and demonstration of passive ROM (flexion, extension, hyperextension) • Observation of muscle strength	• The patient complains that his legs still feel heavy • Wants to try exercising with the help of his own hands • Enthusiastic about participating in the initial exercises	Hands: 5 Feet: 1
Day 2	February 1, 2025	• Passive ROM training of the lower extremities • Involve the family in the exercises	• Legs still feel heavy • Can bend knees with assistance • Can practice toe movements with family support	Hands: 5 Feet: 1

Day 3	February 2, 2025	• Advanced passive ROM exercises • Motivation for independent exercise	• Can bend toes independently • Able to lift legs with the help of hands • Highly motivated and wants to exercise independently	Hands: 5 Feet: 2

Description:

1. Muscle strength is measured on a scale of 0–5 (0 = no muscle contraction; 5 = normal strength).
2. Progress on the third day showed an increase in leg muscle strength from 1 to 2, indicating a positive effect of ROM exercises, although long-term follow-up is still needed.

The implementation of Range of Motion (ROM) exercises over three consecutive days on a non-hemorrhagic stroke patient named Mr. R at RSD Gunung Jati Hospital in Cirebon City showed significant progress in lower extremity muscle strength. On the first day, the patient was unable to move both legs and could only participate in passive exercises with hand assistance, but showed high enthusiasm for recovery. On the second day, the patient began to be able to bend the legs with assistance and move the toes. On the third day, the patient was able to bend the toes independently and lift the legs with hand assistance, with an increase in muscle strength from 1 to 2. These results were supported by regular pharmacological therapy, including Citicoline as a neuroprotector to repair nerve damage (1 ampoule/day), Mecobalamin (3x1) to accelerate sensory-motor nerve regeneration, and Aspilet (1x80 mg) as an antiplatelet agent to prevent recurrent strokes. Additionally, the patient received Amlodipine (1x10 mg) to control hypertension, Atorvastatin (1x20 mg) to lower bad cholesterol (LDL), and Betahistin (1x20 mg) to reduce vertigo caused by cerebral dysfunction. Other supportive medications such as Cefoperazone (2x1) as an antibiotic to prevent infection, and Ranitidine (2x1) to control stomach acid were also administered. The combination of ROM exercises and appropriate medication therapy showed positive results.

Discussion

During the assessment and when asked about his complaints, Mr. R revealed that both of his legs felt heavy and immobile since he was admitted to the hospital. Physical examination results showed muscle strength in the lower extremities with a score of 1, while the muscles in the hands scored 5. This indicates significant physical mobility impairment due to the non-hemorrhagic stroke he experienced. This type of stroke is typically caused by a blockage in the brain's blood vessels, leading to impaired oxygen supply to the motor nerve tissue (Tamburian, 2020). The decline in motor nerve function causes the patient to experience difficulties in daily activities, such as changing positions, walking, or performing self-care. Therefore, rehabilitation interventions such as Range of Motion (ROM) exercises are essential from the early stages to prevent further complications such as joint contractures, pressure ulcers, and muscle atrophy.

Over the three days of ROM exercise intervention, a gradual increase in leg muscle strength was observed. On the first day, the patient could only follow movements with their own hands, but on the second day, they began to bend their legs with family assistance, and by the third day, they could move their toes independently. ROM exercises have been proven to help maintain joint flexibility and improve blood flow and nutrient supply to muscle tissue (Parmilah, Nafi'ah, & Anisah, 2022). This success was also supported by the active involvement of the family, who consistently accompanied and motivated the patient during the exercises. Family involvement is crucial in the rehabilitation process, as it not only enhances the effectiveness of exercises but also strengthens the patient's motivation to recover (Firdarany et al., 2022).

In addition to physical interventions, the patient was also administered pharmacological therapy to support neurological recovery and control risk factors. The medications administered include Citicoline 1 ampoule/day IV, which functions as a neuroprotector and aids in the regeneration of nerve cell membranes; Mecobalamin 500 mcg IV 3x1, to repair peripheral nerve damage; and Aspilet 80 mg PO 1x1, as an antiplatelet to prevent recurrent stroke. Other medications such as Amlodipine 10 mg PO once daily are administered to control blood pressure, Atorvastatin 20 mg PO once daily to lower cholesterol levels, and Betahistin 20 mg PO once daily to alleviate vertigo symptoms caused by balance disorders. The therapy is supplemented with Cefoperazone as an antibiotic and Ranitidine to control stomach acid during treatment. The combination of ROM interventions and pharmacological therapy produces a synergistic effect on improving the patient's physical condition, particularly in enhancing muscle strength and readiness to continue independent exercises at home (Feigin et al., 2025).

Thus, ROM exercises have proven effective as an initial nursing intervention in addressing physical mobility impairments in non-hemorrhagic stroke patients. The rapid improvement in Mr. R's muscle strength demonstrates that this exercise can yield significant results when performed regularly and supported by family involvement and medical supervision. These findings underscore the importance of early functional rehabilitation in stroke patients to prevent long-term complications and enhance overall quality of life.

Conclusion

Based on the results of nursing care and Range of Motion (ROM) exercise interventions in non-hemorrhagic stroke patients, it can be concluded that regular passive ROM exercises conducted over three days can have a positive impact on improving lower extremity muscle strength and physical mobility in patients. The improvement in muscle strength from a score of 1 to 2 indicates that, despite being conducted over a short period, the ROM intervention is effective in preventing complications such as joint stiffness and muscle atrophy. This exercise becomes more optimal with high patient motivation and active involvement from family members as companions during the rehabilitation process. In addition to physical exercise, pharmacological therapy such as Citicoline, Mecobalamin, Aspilet, Amlodipine, and Atorvastatin also supports neurological recovery and prevents recurrent strokes. The combination of nursing interventions involving ROM exercises and appropriate medication administration demonstrates a synergistic effect in accelerating the recovery of physical mobility impairments. Therefore, ROM exercises are highly

recommended as part of standard care for non-hemorrhagic stroke patients, especially when performed routinely, systematically, and with family involvement in their implementation to sustainably improve the patient's quality of life.

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