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# Passive Range of Motion Therapy for Increasing Muscle Strength with non-Hemorrhagic Stroke in RSUD dr. R. Goeteng Taroenadibrata: Case Study



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## ABSTRACT

**Background:** Stroke is a life-threatening thing, so it is a serious thing to be handled in society. The number of stroke cases in Central Java is 2.1% or around 31,871 cases. Stroke is a functional disorder that occurs suddenly with clinical signs both focal and global lasting more than 24 hours. Non-pharmacological techniques that can overcome the disturbance of this stroke are passive range of motion (ROM) therapy.

**Purpose:** to report the results of implementing passive ROM therapy to increase muscle strength in stroke patients who experience weakness in the extremities

**Results:** After being given therapy for 3 consecutive days, the strength of the extremity muscles increased by 1 level or by 25 %. **Conclusion:** ROM intervention for 3x24 hours is effective for increasing extremity muscle strength in SNH patients

**Conclusion:** ROM intervention for 3 days with a frequency of 2 times in a day is effective for increasing limb muscle strength in SNH patients.

**Keywords:** passive ROM, Muscle Strength, Hemorrhagic Stroke

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## INTRODUCTION

Stroke is a life-threatening thing, so it is a serious thing to be handled in society. Based on data from the 2018 World Health Organization (WHO), stroke is the second most common cause of death after heart disease with 9.4 million deaths. According to the Ministry of Health of the Republic of Indonesia 2018 in Mauliddiyah et al. (2022), the prevalence of stroke in Indonesia has increased from 2013 to 2018, namely 7% in 2013, while in 2018 it rose to 10.9%. Specifications for men 11.0%, women 10.9%. The number of stroke cases in Central Java is 2.1% or around 31,871 cases (Mauliddiyah et al., 2022)

Stroke is a focal or global disturbance of brain function which can cause death or abnormalities. This stroke is caused by an interruption of the blood supply to the brain due to a blockage in the blood vessels. This

causes the interruption of the intake of nutrients and oxygen to the brain tissue (Anggriani, Gunawan, et al., 2018). Stroke patients generally experience symptoms of weakness in body parts, so therapy is necessary to overcome this, one of which is Range of Motion (ROM) therapy which aims to reduce weakness in stroke patients. ROM therapy is an exercise to maintain or repair joints to increase muscle mass and muscle tone. According to Anita & Sara (2020) optimal exercise for stroke patients is exercise that is not tiring, of short duration, and can be done regularly. Based on these reviews, the authors are interested in reporting a case of giving passive ROM therapy to SNH patients in the ICU of RSUD dr. R. Goeteng Taroenadibrata.

## METHOD

This research is a case study research on 1

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sample . This research was conducted for 3 consecutive days and carried out 2 treatments in 1 day. Providing Range of Motion intervention done in the morning and evening for 10-15 minutes . Auto power measurement carried out before and after therapy as an evaluation of the actions given.

## RESULT

### Case Overview

Based on the results of the study on TN. L with a medical diagnosis of non-hemorrhagic stroke (SNH) on June 13 2022, it was found that the patient experienced a decrease in consciousness with GCS E4 Vafasia M3 somnolence level of consciousness. TTV results obtained HR 84x/minute , BP 143/72 mm Hg, MAP 1 01 , temperature 3 6.1oC . \_ \_ The patient experienced weakness in his extremities, especially in the right extremity. The upper and lower right extremity has a value of 2, which is capable of carrying out two or more joint movements, unable to resist minimal resistance movements. The left extremity has muscle strength 4, that is, it is capable of lifting the limb/body, but cannot fight against the examiner's maximum resistance. Based on the results of the CT scan, the results obtained were extensive infarction in the cortex-subcortex of the left frontotemporo parietoccipital lobe ec susp embolism.

Blood Glucose Monitoring Results During the Implementation of Swedish Massage

NO	Before Therapy	After therapy
1.	June 13, 2022	
	Muscle strength	Muscle strength
	4   2	4   2
	4   2	4   2
2.	June 14, 2022	
	Muscle strength	Muscle strength
	4   2	4   2
	4   2	4   2
3.	June 15, 2022	
	Muscle strength	Muscle Strength
	4   3	4   3
	4   3	4   3

Based on the table above, it is known that there is a change in the results of implementing ROM therapy for 3 days, there is a change in the level of right limb muscle strength by 1 level or 25% in patients. Nursing implementation was carried out for 3 days, namely on June 13-15 2022. The implementation carried out was ROM therapy, previously carried out an assessment related to muscle strength before carrying out implementation and after carrying out implementation

## DISCUSSION

Non-hemorrhagic stroke (SNH) or ischemic stroke is a condition where blood vessels to the brain are blocked by blood clots and blood clots

resulting from thrombus formation. These obstacles cause the supply of oxygen to the brain is hampered. This non-hemorrhagic stroke is the most common stroke, usually occurring in the morning, after a long rest, and waking up from sleep (Azizah, 2021) . According to Nusatirin (2018) , the causes of ischemic stroke are cerebral thrombosis, embolism, general hypoxia, and local hypoxia.

Ischemic stroke is caused by thrombosis in the presence of vascularization that occurs in the brain and emboli that originate outside the brain and are in the arteries of the brain. Slowly, this blood flow will cause a thrombus. The existence of thrombus and emboli in these blood vessels will break off and settle in distal blood vessels, resulting in disruption or reduced blood flow to the brain. This results in a lack of nutrients and oxygen in the brain, resulting in acidosis which later results in neurological deficits (Chang, 2019 in Rachmatun, 2019) .

In this study Mr. L is 70 years old where the age of the client enters the elderly , where age is a risk factor that cannot be modified for stroke ( Sultradewi Kesuma et al. 2019) . One of the signs and symptoms that arise in non-hemorrhagic stroke patients is the occurrence of sensory hemidifisit, such as impaired sensibility in one or more limbs. At Mr. L experienced weakness in his extremities, especially in the right limb.

The evaluation was carried out at the end of the shift, on the last day the results showed that the patient's general condition was good, the level of consciousness CM with GCS E4 Vafasia M6 with TTV results blood pressure 128/77 mm Hg, MAP 54, Pulse 70x/m , Temperature 36.4 C SPO2 100%, RR 19x/m. On the last day, the patient can respond well to communication and use his hands to communicate. The patient looks comfortable, and has no difficulty breathing. The patient's acral feels warm, and the patient is then transferred to the ward.

The results of this implementation are in line with the research of Ari Permadhi et al., (2022), that ROM therapy can increase muscle strength in SNH patients who experience weakness in body parts. In addition, this study is also in line with (Rahmadani & Rustandi, 2019) which states that there is a relationship between ROM therapy and changes in increased limb muscle strength in SNH patients.

Contraction mechanisms can increase smooth muscle in the extremities. Passive ROM exercises can cause stimulation thereby increasing chemical, neuromuscular and

muscular activation. Smooth muscle of the extremities contains actin and myosin filaments that have chemical properties and interact with each other. The interaction process is activated by calcium ions, and adeno triphosphate (ATP), is further broken down into adeno diphosphate (ADP) to provide energy for limb muscle contractions. Stimulation via neuromuscular will increase the stimulation of the limb muscle nerve fibers, especially the parasympathetic nerves which stimulate the production of acetylcholine, resulting in contraction. The mechanism through the muscles, especially the smooth muscles of the extremities, will increase metabolism in the metachondria to produce ATP which is utilized by the smooth muscles of the extremities as energy for contraction and increases the tone of smooth muscle of the extremities (Anggriani, Zulkarnain, et al., 2018).

Based on the implementation carried out by (Noviyanti & Rosnawanty, 2022), giving ROM therapy to stroke patients has a change in the value of muscle strength. Before the intervention, the client complained that it was difficult to move the right extremity, felt weak and weak, making it difficult to do activities. After the intervention there was an increase of 25% or an increase in muscle strength by 1 level, the client felt calm and relaxed, and was able to move his extremities slowly. Based on the explanation above, it can be concluded that range of motion therapy has an effect on increasing muscle strength in non-hemorrhagic stroke patients.

### CONCLUSION

Mr. L (L) is 70 years old with a medical diagnosis of non-hemorrhagic stroke (SNH), with a nursing diagnosis that is impaired physical mobility related to impaired sensory perception. After being given range of motion (ROM) therapy which aims to increase muscle strength in extremities that experience weakness for 3 days with a frequency of 2 times a day has increased by 25%. Range of motion (ROM) therapeutic interventions have been shown to increase muscle strength in extremities that experience weakness in non-hemorrhagic stroke (SNH) patients.

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