

# Exercise Range Of Motion (ROM) Passive and Microwave Diathermy to Increase Extremal Muscle Strenght in Stroke Patient in the Neurology Room of M.Natsir Hospital in 2019

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## ABSTRACT

**Background:** Disruption of functional activity is the biggest impact on stroke patients. To maintain, develop, restore motion, stimulate circulation, we need Range of Motion (ROM) and collaborate with Physiotherapists using Microwave Diathermy.

**Aim:** To determine the effect of Range of Motion (ROM) and Microwave Diathermy on upper limb muscle strength in stroke patients in the neurology room of M.Natsir Regional Hospital in 2019.

**Methods:** The study design was a Quasi One-Group Pre-Post Test Design experiment, the intervention was carried out for six days with a once-daily treatment Range of Motion (ROM) and Microwave Diathermy therapy. The population in this study was a stroke patient of 40 respondents with a data collection method with purposive sampling, measurement of muscle strength before and after an intervention using a manual Muscle Testing instrument. Data analysis uses Paired t-test statistics. The results obtained, the age of the respondents ranged from 30-50 years, female sex, long suffered from 1-5 years of stroke. Paired t-test test results. Obtained Pvalue 0,000 with  $\alpha = 0.05$  ( $p < \alpha$ ) There is an influence between Range of Motion (ROM) and Microwave Diathermy on muscle strength in stroke patients because each respondent experienced an increase in muscle strength scale after being given training and Microwave Diathermy.

**Results:** Recommend the results of this study to conduct Range of Motion (ROM) and collaboration with physiotherapists using Microwave Diathermy as a nursing intervention for stroke patients who experience weakness of the upper limb.

**Conclusion:** Recommend the results of this study to conduct Range of Motion (ROM) and collaboration with physiotherapists using Microwave Diathermy as a nursing intervention for stroke patients who experience weakness of the upper limb.

**Keyword:** ROM, Stroke, Microwave Diathermy

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## INTRODUCTION

Stroke is defined as a deficit (disturbance) of nervous system function that occurs suddenly and is caused by brain blood circulation disorders. Stroke occurs due to disorders of blood vessels in the brain. Disorders of cerebral blood circulation can be in the form of cerebral artery blockage or rupture of blood vessels in the brain. The brain which is supposed to get a supply of oxygen and nutrients becomes disturbed. Lack of oxygen supply to the brain will cause the death of nerve cells (neurons). Impaired brain function will cause stroke symptoms (Pinzon, 2010).

National stroke prevalence based on Riskesdas 2018 West Sumatra Province is in position 14 of 34 provinces in Indonesia. The prevalence of stroke is based on age group: > 75 years by 50.2%; 65-74 years at 45.3%; 55-64 years at 32.4%; 45-54 years at 14.2%; 35-44 years at 3.7%; 25-34 years at 1.4%; and 15-24 years at 0.6%. Based on gender, namely male by 11.0%; women by 10.9% (Balitbangkes, 2018).

In the condition of Stroke or Brain Blood Vessel Disorders, a problem that often arises by patients is usually the presence of muscle weakness in the affected limbs. Other problems include balance disorders, postural disorders, respiratory problems, atrophy, impaired functional abilities (Irfan, 2010). The impact of a stroke can be paralysis or weakness of the extremities (hemiplegia /

hemiparesis). Paralysis generally occurs in some extremities. Some weaknesses in the extremities occur because some extremities occur because of damage to the motor area of the cerebral cortex which supplies the extremities. Damage to the right brain causes weakness in the left limb. Conversely damage to the left brain causes weakness in the right extremity (Dharma, 2018).

Rehabilitation that can be given to reduce this impact is by providing exercise therapy in the form of passive movements that are very useful in maintaining the physiological properties of muscle tissue and joints. (Dharma, 2018). Range of Motion (ROM) exercise is a form of exercise in the rehabilitation process which is considered to be effective enough to prevent disability in patients with stroke. This exercise is one of the fundamental forms of nurse intervention that can be carried out for the success of the therapeutic regimen for patients and in efforts to prevent the occurrence of permanent disability conditions in post-hospitalized patients so as to reduce the level of dependence of patients on the family (Marlina, 2011).

Collaboration with physiotherapists is needed to improve recovery from paralysis due to stroke. One electrotherapeutic method as the chosen method is Microwave Dathermy. Benefits of Microwave Dathermy improves the process of tissue repair or repair physiologically. Changes in temperature cause local reactions, the tissue will be able to increase the metabolism of cells and can increase vasomotion so that local

hemostatic arises and eventually local vasodilation occurs. In connective tissue, it can increase the elasticity of tissues such as muscles, tendon ligaments, joint capsules. Otot can increase the elasticity of muscle tissue, while in nerve tissue it can increase the elasticity of nerve wrapping and can increase nerve conductivity.

Research that has proven the success of Passive ROM Exercise in increasing muscle strength is Marlina (2011) who examined the "Effect of ROM Exercise on Increasing Muscle Strength in Ischemic Stroke Patients in Banda Aceh Regional Hospital". The interventions carried out were for 6 days. From the results of his research showed that the influence of Passive ROM exercises on the muscle strength of stroke patients in Banda Aceh Regional Hospital (Marlina, 2011).

Range of Motion (ROM) exercise is a therapeutic recovery by means of muscle training to improve the patient's ability to move the joints normally and completely, this is not important the collaboration is also done with physiotherapy to provide Microwave Dathermy which functions as dilatation of blood vessels for oxygen supply and increase cell metabolism and improve nerve tissue.

Based on the above, the authors would like to know "Effect of Extremity Muscle Strength on Before and After Given Passive ROM and Microwave Dathermy Exercise to Stroke Patients in Neurology Room Solok Hospital in 2019".

## RESEARCH METHODS

This research was conducted at the M.Natsir Regional General Hospital on February 16- August 14, 2019. This study used a Quasi-experimental design with One-Group Pretest-Posttest Design. In this design the measurements were carried out twice, namely the measurement of muscle strength carried out before and after given Passive ROM and Microwave Dathermy exercises), using the Muscle Testing instrument. Interventions carried out for six days carried out Range of Motion (ROM) and Microwave Dathermy therapy every day. The population in this study were all stroke patients treated in the Neurology Room of M. Natsir Regional Hospital as many as 40 respondents, with a total sample of 40 respondents. In this study sampling by means of Purposive Sampling statistical tests using Paired t-test.

## RESULTS AND DISCUSSION

The results of the study are based on the characteristics of the respondents: Based on Table 1 that the majority of respondents aged 30-50 years, as many as 32 people with a percentage of 80%.

Based on Table 2, it shows that the male sex of the respondents were 17 people with a percentage of 42.5%, while the female sex were 23 people with a frequency of 57.5%.

From the diagram above we get a picture of the strength of the upper limb muscles in numerical form before and after given Passive ROM exercises and Microwave Dathermy Therapy.

Table 1 Distribution of Frequency of Respondents by Age in Neurology Room M.Natsir Regional Hospital, Solok City in 2019

Age	Frequency	%age
<30	3	7.5
30-50	32	80
>50	5	12.5
Total	40	100

Table 2: Distribution of Respondent Frequencies by Gender in the Neurology Room of M.Natsir Regional Hospital, Solok City in 2019

Gender	Frequency	%age
Man	17	42.5
Woman	23	57.5
Total	40	100

Picture 1. Differences in Muscle Strength of the Upper Extremities Before and After being given Passive ROM exercises and Microwave Diathermy therapy

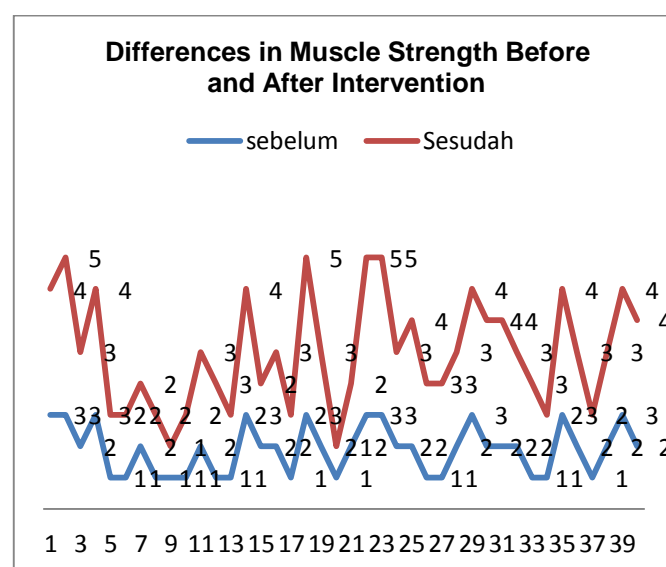


Table 3: Differences in Upper Extremity Muscle Strength Before and After a Passive ROM and Microwave Diathermy Exercise for Stroke Patients in the Neurology Room of M.Natsir Regional Hospital in 2019

Muscle strength	Mean	SD	Average Difference	P value	N
Upper limb			-1.18	0.000	40
Before	1.90	0.778			
Upper extremity					
After	3.08	1.071			

Based on the above table, the average upper limb muscle strength obtained before intervention is 1.90 with a standard deviation of 0.778. Whereas after the intervention was given the mean value was 3.08 with a standard deviation of 1.071. Obtained Pvalue 0,000 with  $\alpha = 0.05$  ( $p < \alpha$ )

Based on the results of this study that Passive ROM exercises are proven to increase muscle strength of stroke patients. Evidenced by the results of research that researchers get is the influence between limb muscle strength before and after given Passive ROM exercises and Microwave Dathermy.

Effect of ROM Exercise on Increasing Muscle Strength in Ischemic Stroke Patients in Banda Aceh Regional General Hospital, the results of the study indicate that the results of the respondents' average muscle strength in ROM exercises before the intervention were 3.68 with a standard deviation of 1, 62. In the measurement after intervention, an average of 4.60 was obtained with a standard deviation of 0.81. The mean difference between the first and second measurements is 0.92 with a standard deviation of 1.07. Statistical test results obtained value (Pvalue = 0,000) so that it can be concluded that there is a significant effect of the muscular strength before and after ROM action in ischemic stroke patients (Marlina, 2011).

According to Susanti's research, and Difara Bistara's Nobel Prize on the Effect of Range of Motion on Muscle Strength in Stroke Patients the results stated there was 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 (Susanti & Bistara, nd).

According to Elisa Ling Dinanti's research, Mugi Hartoyo, Wulandari M, regarding the Effect of Passive Range of Motion (ROM) on Increasing the Extremity Range of Motion Angle of Stroke Patients in Tugurejo District Hospital Semarang. Stating the results of the study showed that there was an effect between the administration of passive ROM with an increase in the angle of motion of the extremities in stroke patients (Dinanti, Haryoto, & Wulandari, 2013).

The administration of Passive ROM exercise therapy is very beneficial in maintaining the physiological properties of muscle tissue and joints. This type of exercise can be given as early as possible to avoid complications due to lack of movement, such as contractures, joint strength, and others (Irfan, 2010).

Risk factors for stroke that cannot be changed are age, gender, race, family history, and previous stroke history. The older a person is, the more susceptible to stroke. Stroke can occur at any age, but more than 70% of cases occur at over 65 years of age. Men are more prone to strokes. This is due to the higher incidence of stroke risk factors (eg hypertension) in men (Tilong, 2014).

This Passive ROM exercise has also been studied by Anggriani, which is about the effect of ROM on Extremity Muscle Strength in Non-Hemorrhagic Stroke Patients. The study found that the average hand muscle strength of respondents before ROM was 2.5 and increased to 3.52 after ROM administration. Then the average value of leg muscle strength before ROM was 3.11 and increased to 3.93 after getting ROM treatment. The results above show that there is an increase in the average muscle strength in both the hand muscles and leg muscles after ROM

administration. Of the two increases, the greatest increase in muscle strength was in the increase in the strength of the respondent's hand muscles which increased by an average of 1.0 while the leg muscle strength increased by only 0.82.

## CONCLUSION

Range of Motion (ROM) and collaboration with physiotherapists using Microwave Diathermy affect the strength of muscles in the upper limb. Recommend the results of this study to conduct Range of Motion (ROM) and collaboration with physiotherapists using Microwave Diathermy as a nursing intervention for stroke patients who experience weakness of the upper limb.

## REFERENCES

1. Balitbangkes. (2018). *Riskesdas*.
2. Brunner, & Suddarth. (2013). *Keperawatan Medikal-Bedah*. Jakarta: EGC.
3. Darmawan. (2012). *WASPADAI GEJALA PENYAKIT MEMATIKAN (I)*. Jakarta Selatan: PT.SUKA BUKU.
4. Dharma, K. K. (2018). *PEMBERDAYAAN KELUARGA MENGOPTIMALKAN KUALITAS HIDUP PASIEN PASKA STROKE*. Yogyakarta: CV.BUDI UTAMA.
5. Dinanti, elisa ling, Haryoto, M., & Wulandari. (2013). Pengaruh Range Of Motion (ROM) Pasif Terhadap Peningkatan Sudut Rentang Gerak Ekstremitas Atas Pasien Stroke di RSUD Tugurejo Semarang. *Jurnal Ilmu Keperawatan Dan Kebidanan*.
6. Irfan, M. (2010). *Fisioterapi Bagi Insan Stroke*. Yogyakarta: Graha Ilmu.
7. Marlina. (2011). Pengaruh Latihan ROM Terhadap Peningkatan Kekuatan Otot Pada Pasien Stroke Iskemik di RSUDZA Banda Aceh. *Idea Nursing Journal*.
8. Notoatmodjo, S. (2012). *Metodologi penelitian Kesehatan*. Jakarta: Rikena Cipta.
9. Potter, & Perry. (2010). *Buku Ajar Fundamental Keperawatan Konsep, Proses, dan Praktik*. (Y. Asih, Ed.) (7th ed.). Jakarta: EGC.
10. Pinzon, R. (2010). *Awat STROKE! Pengertian, Gejala, Tindakan, Perawatan, dan Pencegahan*. Yogyakarta.
11. Robinson, J., & Lyndon, S. (2014). *Visual Nursing (Medikal-Bedah)* (1st ed.). Tangerang Selatan: BINARUPA AKSARA.
12. Susanti, & Bistara, nobel B. (n.d.). Pengaruh Range Of Motion terhadap Kekuatan Otot pada Pasien Stroke. *Jurnal Kesehatan Vokasional*, 4 No 2.
13. Tilong, adi D. (2014). *Waspadai Penyakit-Penyakit Mematikan tanpa Gejala Menyolok* (1st ed.). Yogyakarta: Buku Biru.
14. Trisnowiyanto, Bambang. 2012. *Instrumen Pemeriksaan Fisioterapi Dan Penelitian Kesehatan*. Yogyakarta : Nuha Medika.
15. Widyanto, F. C., & Triwibowo, C. (2013). *TREND DISEASE Trend Penyakit Saat Ini*. Jakarta: CV.Trans Info Media.
16. Yueniawati, Y. (2015). *Deteksi Dini Stroke iskemia* (1st ed.). Malang: UB Press.