



**EFFECTIVENESS OF *RANGE OF MOTION (ROM) THERAPY AND WARM WATER COMPRESS WITH THE OREM SELF CARE THEORY APPROACH TOWARDS IMPROVEMENT STRENGTH MUSCLES IN NON-HEMORRHAGIC STROKE PATIENTS***

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**ABSTRACT**

Non-hemorrhagic stroke occurs when blood flow to the brain is stopped due to atherosclerosis or a blood clot that has blocked a blood vessel to the brain. As a result of brain disorders, it causes hemiplegia and hemiparesis. Many types of interventions are available for physical problems of hemiparesis, one of which is ROM therapy and Warm Water Compress. The purpose of this study was to analyze the effectiveness of Range Of Motion (ROM) therapy and Warm Water Compress with the Orem Self Care theory approach to Increasing Muscle Strength in Non-Hemorrhagic Stroke Patients. The design in this study was a Quasy Experiment with Pretest t and Posttest . The sample size was 44 with a Simple Random Sampling technique with 22 intervention groups and 22 controls. The intervention group was given ROM Exercises and Warm Water Compresses. Analysis used the Wilcoxon and Mann-Whitney tests to identify differences between the intervention and control groups with a significance level of a <0.05. The results obtained from the Wilcoxon Signed Rank Test analysis of Muscle Strength in Non-Hemorrhagic Stroke Patients in the intervention group p value = 0.000 and control p value = 0.000. The results show that there is an effect of ROM exercises and warm water compresses on increasing muscle strength in non-hemorrhagic stroke patients. ROM exercises and warm water compresses can be used as non-pharmacological therapy in the rehabilitation process for non-hemorrhagic stroke patients.

Keywords: muscle strength; non-hemorrhagic stroke; range of motion exercises; self-care; warm water compress

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**INTRODUCTION**

Stroke is considered a neurological emergency and requires immediate treatment. Because arterial obstruction causes a wave of necrosis to develop rapidly in the brain, early identification of a stroke is crucial to determine the most effective treatment (Barella, 2023) . Non-hemorrhagic stroke occurs when blood flow to the brain is interrupted due to atherosclerosis (cholesterol buildup on blood vessel walls) or a blood clot that blocks a blood vessel, disrupting blood supply to the brain (Komul et al., 2024) . This disruption to the brain can lead to hemiplegia and hemiparesis (Rafiudin et al., 2024) . Among the serious neurological deficits caused by stroke are: the most significant is the loss motor function, as well as induced paralysis, pathological reflexes, and spasticity, which interfere with a person's independent mobility (Pérez-De la Cruz, 2020) .

According to the World Health Organization (WHO) in 2015, every year 15 million people worldwide suffer from stroke, of which 5 million die and another 5 million suffer permanent disability. Stroke is the second leading cause of death worldwide among people aged 60 years and over and the fifth leading cause of death among people aged 15-59 years. Stroke remains the third leading cause of death. The World Stroke Organization is an international organization dedicated to increasing knowledge, awareness, and treatment of stroke. Based on valid scientific data, the World Stroke Organization is able to provide reliable and up-to-date information on stroke rates and their consequences in all countries in the world (Butar-butur et al., 2023) . Based on the results of the

2018 Basic Health Research (Risikesdas), the prevalence of stroke in Indonesia was 10.9% of a total of 713,783 cases, with East Kalimantan province ranking first with the most cases at 14.7%, followed by Yogyakarta at 14.6%, and Central Java at 11.8%. Stroke cases in Semarang City are the highest in Central Java with 3,986 cases in 2018, with 51.83% of patients undergoing routine check-ups, 33.15% undergoing non-routine check-ups, and 15.02% not undergoing re-check-ups after a stroke diagnosis. (Vania et al., 2024) .

Factors that influence stroke are divided into non-reversible and reversible factors. Non-reversible stroke factors include age, gender, and heredity. Reversible risk factors include high blood pressure, diabetes, overweight, dyslipidemia , stress, high cholesterol, and lifestyle habits such as smoking, drug use, and alcohol consumption (Rakhma et al., 2023) . Stroke can cause varying degrees of impairment, such as decreased muscle tone, decreased sensitivity in parts of the body, decreased ability to move the affected limb, and ineffectiveness in performing daily activities (Sihotang et al., 2023) .

There are many types of interventions available, tailored to meet each patient's specific needs. Among them, physical therapy is the most common type of rehabilitation treatment provided after a stroke. Physical therapists work with stroke patients to improve strength, coordination, and balance, with the goal of helping them regain the ability to perform daily activities such as walking, dressing, and bathing. One such therapy is range-of-motion exercises. and warm water compresses to widen blood vessels so that oxygen and nutrients can enter the body's tissues (Shahid et al., 2023) .

Range of motion exercises are a fundamental nursing intervention that can contribute to the success of a patient's therapeutic regimen and prevent permanent disability in stroke patients. This can reduce the patient's dependence on family, improve self-esteem, and enhance coping mechanisms (Harahap, 2021) . ROM exercises can be classified into two categories: passive ROM exercises and active ROM exercises. Passive ROM exercises involve the patient performing each movement with the assistance of a nurse/family member. Active ROM exercises involve the nurse providing direction, intervention, and guidance to the client in performing joint movements independently within the normal range of motion (Nofrel et al., 2020) .

Applying warm compresses to stroke patients can be an alternative non-pharmacological therapy to increase capillary permeability, boost cellular metabolism, relax muscles, and reduce post-stroke discomfort. Warm compress therapy can help reduce joint stiffness and muscle spasms because heat causes blood vessels to dilate (vasodilate), which encourages the flow of oxygen, nutrients, and white blood cells into the body's tissues (Pawestri & Listrikawati, 2023) . Scientifically, warm water has a physiological impact on the body. The warmth of the water improves blood circulation. Warm water can lower high blood pressure, which is a risk factor for stroke. Therefore, treating ischemic stroke patients requires more than just medication. Complementary non-drug therapies can include simple, gentle, and natural methods such as conduction warm water compresses, which can be administered anywhere and anytime (Yora Nopriani & Lia Ariska, 2022) .

Self-Care is an intervention to help improve the patient's capacity to be independent in fulfilling their life activities, so that patients can prevent and control their illnesses and comply with treatment and guidance from medical personnel and family (Rizki, 2024) . ROM exercises and warm water compresses with a consistent self-care approach in non-hemorrhagic stroke patients can contribute to improving better activities, eliminating limitations, reducing independence, reducing the burden of disease and premature mortality in non-hemorrhagic stroke patients and improving quality of life higher than other treatments (Lusiana Lestari, 2023).

## **METHOD**

The design of this study is a Quasy Experimental with Pretest and Posttest . The population in this study were all non-hemorrhagic stroke patients at RSI Jemursari Surabaya from January to

February. The sample size was 44 with a Simple Random Sampling technique with 22 respondents in the Intervention group and 22 respondents in the control group. The range of motion therapy intervention and warm water compresses were carried out 2x/day in 1 week and each meeting was carried out for 20-30 minutes. The variable studied was muscle strength. Analysis used the Wilcoxon and Mann-Whitney statistical tests to identify differences between the treatment and control groups.

**RESULT**

The results of the general data characteristics in this study, including Age, Gender, Medical History, Education, Hemiparase , Smoking, Occupation and Scale of Disability in non- hemorrhagic stroke patients at RSI Jemursari Surabaya are as follows:

Table 1.

Frequency distribution of respondent characteristics

Respondent Characteristics	Intervention group		Control group	
	f	%	f	%
<b>Age</b>				
40-50	4	18.2	3	13.6
51-60	12	54.5	8	36.4
>60	6	27.3	11	50.0
<b>Gender</b>				
Man	16	72.7	13	59.1
Woman	6	27.3	9	40.9
<b>Education</b>				
Elementary School	4	18.2	3	13.6
Junior High School	5	22.7	3	13.6
Vocational School/SMS	7	31.8	8	36.4
Diploma/Bachelor's Degree	6	27.3	8	36.4
<b>Medical History</b>				
Hypertension	8	36.4	7	31.8
Stroke	8	36.4	7	31.8
DM	3	13.6	6	27.3
Cholesterol	3	13.6	2	9.1
<b>Hemiparalysis</b>				
Right	12	54.5	13	59.1
Left	10	45.5	9	40.9
<b>Smoke</b>				
Yes	15	68.2	15	68.2
No	7	31.8	7	31.8
<b>Work</b>				
Doesn't work	8	36.4	12	54.5
Farmer	2	9.1	0	0.0
Private	10	45.5	9	40.9
civil servant	2	9.1	1	4.5

Table 1 shows that respondents in the intervention and control groups met the inclusion criteria, namely between 40-60 years. In the intervention group, the age of 50-60 years was 54.5%, and in the control group 50.0%. Respondents with male gender in the intervention group were 72.7%, and in the control group with male gender were 59.1%. The level of education for respondents with high school/vocational school graduates was 31.8% and the control group 36.4%. and in the control group 36.4% with D3/S1 graduates. Respondents with right hemiparase in the intervention group were 54.5% and respondents with right hemiparase in the control group were 59.1%. Respondents with a history of hypertension and stroke in the intervention group were 36.4% and 31.8% in the control group. The average number of respondents who smoked in the intervention group was 68.2% and 68.2% in the control group. Respondents in the control group were unemployed, 54.5% of whom worked in the private sector, and 45.5% of respondents in the intervention group.

Kolmogorov-Smirnov and Shapiro-Wilk tests were used on the descriptive characteristics of the research variables to assess the characteristics of data distribution in a normal distribution or not with a total of 44 respondents.

Table 2.  
Results of the normality test for the intervention group and the control group

Group Variable	Normality Normality	
	<i>Kolmogorov-Smirnov<sup>a</sup></i>	<i>Shapiro-Wilk</i>
Muscle Strength (Pre)	<i>Sig</i> Intervention . 0.001	<i>Sig</i> . 0.001
	Control 0.000	0.000
Muscle Strength (Post)	<i>Sig</i> Intervention . 0.000	<i>Sig</i> .0.004
	Control 0.000	0.000
Group normality test	<i>Sig</i> Intervention . 0.000	<i>Sig</i> 0,000
	Control 0.000	0.000

Data analysis of normality test using *Shapiro Wilk test* because  $n < 50$ . In this study, the data has been tested whether the data is normally distributed or not, and the results of the data are not normal because the *sig value*  $< 0.05$ . Data is said to be normally distributed if the *sig value*  $> 0.05$ . Because the data is not normally distributed, the tests used are *Wilcoxon* and *Mann Whitney*.

Table 3 the intervention and control groups in non- hemorrhagic stroke patients before and after administering Range therapy. Of Motion (ROM) and Warm Water Compress with Self-Help Theory Approach Care Orem in Non Hemorrhagic patients .

Muscle Strength Scale	Intervention Group Control Group							
	<i>Pretest</i>		<i>Posttest</i>		<i>Pretest</i>		<i>Posttest</i>	
	f	%	f	%	f	%	f	%
A little	6	27.3	0	0	11	50.0	0	0.0
Bad	11	50	6	27.3	8	36.4	12	54.5
Currently	5	22.7	10	45.5	3	13.6	8	36.4
Good	0	0	4	18.2	0	0.0	2	9.1
Normal	0	0	2	9.1	0	0.0	0	0.0
	Total 22 100%		22 100%		22 100%		22 100%	

Based on the statistical results, it shows that the intervention group before (*pretest*) was given intervention, namely the muscle strength scale "Little" as much as 27.3% but after being given intervention (*posttest*) the results fell to 0%. In addition, the level of muscle strength "Bad" before treatment (*pretest*) was as much as 50% but after (*posttest*) giving treatment fell to 27.3%, and the Muscle Strength Scale "Medium" before (*pretest*) given treatment was as much as 22.7%, but after (*posttest*) given treatment the average rose to 45.5%. While the muscle strength scale "Good" before the intervention was 0% but after being given intervention rose to 18.2%. This is the same as the muscle strength scale "Normal" namely before (*pretest*) given intervention was 0%, but after being given (*posttest*) the results showed that there were respondents whose muscle strength became "Normal" namely 9.1%. The results of this study describe that 22 respondents experienced an increase in muscle strength after being given *range of motion* exercises and warm water compresses using the Orem *self-care* theory approach.

Meanwhile, the results of the analysis above show that in the control group before (*pretest*) given muscle strength treatment with a scale of "Little" on average 50% but after (*posttest*) given treatment the results decreased to 0%. In addition, the scale of muscle strength "Poor" before (*pretest*) treatment is 36.4% but after treatment (*posttest*) is 54.5%. The level of muscle strength "Moderate" in the control group before the *pretest* is 13.6% and after *the posttest* treatment is 36.4%. In addition, muscle strength in the control group with a degree of "Good" before *the pretest* is 0% but after *the posttest* the results show as much as 9.1%.

Table 4.  
Results of the *Wilcoxon Signed Rank Test* analysis in the intervention group and the control group.

Intervention Group		Control Group	
Pretest - Posttest Muscle strength		Pretest - Posttest Muscle strength	
Negative Ranks	0 <sup>a</sup>	Negative Ranks	0 <sup>a</sup>
Positive Rank	22 <sup>b</sup>	Positive Rank	18 <sup>b</sup>
Ties	0 <sup>c</sup>	Ties	4 <sup>c</sup>
Total	22	Total	22
Asymp. Sig. (2-tailed)	.000	Asymp. Sig. (2-tailed)	.000

In decision analysis for *Wilcoxon test data*, namely the significance value smaller than  $<0.05$  then the hypothesis is accepted. The results of the *Wilcoxon Signed Rank Test analysis* obtained on the increase in muscle strength at RSI Jemursari in the intervention group  $p\text{ value} = 0.000$  and in the control group  $p\text{ value} = 0.000$ . So from the results of this analysis test, it was found that there was effectiveness of *range of motion (ROM) therapy and warm water compresses with a self-care theory approach* to increasing muscle strength in non-hemorrhagic stroke patients at RSI Jemursari Surabaya.

Table 5.

The following are the results of the Muscle Strength Scale difference test between the intervention group and the control group in non-hemorrhagic stroke patients at RSI Jemursari Surabaya.

Muscle Strength	Group	
	Control	Intervention
	n%	n%
Little	0 0%	0 0%
Bad	6 27.3%	12 54.5%
Medium	10 45.5%	8 36.4%
Good	4 18.2%	2 9.1%
Normal	2 9.1%	0 0%
Total	22 100%	22 100%
<i>Mann Whitney Test</i> statistical test		
<i>Asymp Sig (2-tailed) = 0.038</i>		

The table above shows that in the intervention group, after receiving treatment, almost half (45.5%) of respondents experienced a moderate increase in muscle strength. Meanwhile, in the control group, the majority (54.4%) of respondents experienced a poor increase in muscle strength. The *Mann test results whitney* with the level of significance  $\alpha = 0.05$  obtained a P value of 0.038 ( $0.038 < 0.05$ ) so  $H_0$  is rejected which means there is a difference in effectiveness between the intervention group and the control group in increasing muscle strength in non-hemorrhagic stroke patients at RSI Jemursari Surabaya.

## DISCUSSION

**The results of the analysis of muscle strength levels in patients before administering *Range of Motion (ROM) exercises and Warm Water Compresses with the Orem Self Care theory approach in Non-Hemorrhagic Stroke patients.***

Non-hemorrhagic strokes, which are usually caused by cerebral blood vessel obstruction, often cause muscle paralysis, also known as hemiparesis. Therefore, interventions to restore muscle strength are crucial. Based on the initial data (*pre-test*), it was found that in the intervention group the majority of patients had prominent muscle weakness, namely 50% who had a 'Poor' muscle strength level, while *the pre-test* in the control group the average respondent experienced 50% with a 'Little' muscle strength scale and no patients were in the 'Good' or 'Normal' (0%) category from the intervention group or the control group. These results are in line with previous research which showed that the muscular ability of stroke patients before ROM exercises was obtained, the majority of respondents' strength was on a scale of 3 as much as 67.9% and a minority of muscle strength on a scale of 4 as much as 10.7% (Fitria Kudadiri et al., 2024). This is in accordance with the findings of Marbun & Sagala, (2024) where the level of muscle strength in respondents in *the pre-test category* showed that the majority of respondents who experienced arm muscle strength with a little category were respondents (18.2%) and the less category were 18 respondents (81.8%). This research is in accordance with previous research which stated that muscle strength in elderly non-hemorrhagic stroke before being given *Range of Motion (RPM)*, namely the average value is 1.91, the minimum value is 1 and the maximum value is 3 (Deva et al., 2022). This data is in

accordance with the results of previous research where the muscle strength of stroke patients before intervention for 3 days in the Nusa Indah room of Kraton Regional Hospital was 3/2. Muscle strength in patients increased by 4/3 after the range of motion action was performed. This shows that doing range of motion can affect muscle strength (Syifa et al., 2025) .

The results of this study indicate that all respondents, both in the intervention and control groups, started with a less than optimal functional state. Muscle weakness is a common consequence of ischemic stroke, especially in the acute or subacute stages, where the disruption of blood supply results in the loss of motor function in the brain. This directly affects muscle tone and the capacity to contract muscles optimally. Non-hemorrhagic strokes disrupt blood flow to specific areas of the brain, causing damage to blood vessel tissue, particularly in the motor areas. This damage reduces the transmission of nerve impulses to muscles, leading to muscle weakness or paralysis. During this period, neuromuscular function is severely impaired, and if not actively or passively stimulated, this problem can progress to muscle spasms and joint contractures. This severe state of muscle weakness necessitates restorative interventions such as range-of-motion exercises and warm compresses, based on the "Orem" self-care theory. Range-of-motion exercises not only help maintain joint mobility but also contribute to reducing the potential for other complications such as spasticity, decreased muscle strength, and muscle atrophy.

Because none of the respondents were in the "Good" or "Normal" muscle strength category, it can be said that the need for treatment is very necessary and urgent. Therefore, the effectiveness of *the range of motion intervention* and warm water compresses with the "Orem" self-care theory approach in increasing muscle strength is an important concern in this research. Although there are differences in the initial conditions in the two groups (intervention and control), with variations of "Poor" and "Slight", it can still be used as a reference for comparison, provided that the difference is not statistically significant. This is used as the main benchmark to examine whether the range of motion intervention and warm water compresses with the "Orem" self-care theory approach have a significant effect on increasing muscle strength in non-hemorrhagic stroke patients.

### **Results of muscle strength levels in patients after administering Range of Motion (ROM) therapy and Warm Water Compresses with the "Orem" Self Care theory approach in Non-Hemorrhagic Stroke patients.**

*Posttest* results , it was found that respondents in the intervention group with a 'Moderate' muscle strength scale after being given treatment averaged 45.5%. In addition, the 'Good' muscle strength level after ( *posttest* ) intervention was 18.2%, and the "Normal" Muscle Strength Scale after ( *posttest* ) treatment was 9.1%. The results of this study also showed that *Positive Ranks* of 22 respondents who were given treatment experienced an increase in muscle strength after being given *range of motion (ROM)* exercises and warm water compresses with the *Orem self-care* theory approach , and from these results, *Negative Ranks were obtained* , namely 0% or no respondents experienced a decrease in muscle strength after being given treatment. *Wilcoxon signed rank* test results with level of significance  $\alpha= 0.05$  obtained *p value* = 0.000 (0.000 <0.05) then  $H_0$  is rejected which means there is effectiveness of *range of motion (ROM)* therapy and warm water compresses with *Orem's self-care* theory approach to increasing muscle strength in non-hemorrhagic stroke patients at RSI Jemursari Surabaya.

This data is supported by previous research conducted by Widyastuti & Listrikawati (2023). which examines body movement disorders through active range of motion exercises and warm compresses. The study stated that warm compresses were given for 5 days every morning and evening for active ROM morning and evening for warm compresses. Before active ROM was performed, a warm compress was first applied for 5 minutes, after which active ROM exercises were performed for 20 minutes effectively to increase muscle strength in non- hemorrhagic stroke patients. There is also another study examining the combined effects of range of motion exercise therapy, rubber balls and warm water compresses on upper motor skills and cortisol levels in post -

stroke patients. The study explained that exercises combined with Movement Exercises, the use of rubber balls and warm compresses, if applied properly, will provide increased muscle capacity and range of motion ability in the joints (Indrawati & Supriani, 2022) . This is in line with the study of Purwoko et al., (2025) which explained that the action of providing ROM therapy can increase the scale of muscle tone strength with an average scale value before being given ROM exercises was 3.57 in the upper extremities and 2.5 in the lower extremities. The average scale increased to 3.64 in the upper extremities and 2.64 in the lower extremities. This is supported by previous research on the effect of active *range of motion* (ROM) exercises on the level of muscle strength of the extremities in stroke patients. In a study conducted by Widya Addiartha et al., (2023) it was found that before being given ROM treatment, 11 respondents (61.1%) had poor muscle tension and before undergoing acupuncture intervention, 15 respondents (83.3%) had poor muscle tone. However, after the *range of motion intervention* , 13 respondents (72.2%) had good muscle tone and after the acupuncture intervention, 14 respondents (77.8%) had poor muscle tone. These results support previous research which found that before *range of motion exercises* , the majority (66.7%) of respondents had poor muscle strength. However, after *range of motion exercises*, there was a change in more than half (57.1%) of respondents having good muscle strength. He concluded that active ROM exercises can be used as an alternative nursing action to increase muscle strength in non-hemorrhagic stroke sufferers (Weliyana Nidar et al., 2025) .

*Post-test* data show happen change strength muscles of the group interventions that get exercise range movement and warm water compresses. These changes prove effectiveness giving intervention can stimulate Work neuromuscular, smooth circulation local blood and repair stability , flexibility network muscles and joints. However, the group control relatively No show significant improvement , so that strengthen contribution intervention active on phase stroke rehabilitation. ROM exercises and warm compresses are non-pharmacological, effective, harmless, and low-risk alternative therapies. They are relatively easy to implement both in the hospital and at home, thus supporting continuity of care. They can be administered directly by medical professionals or trained nurses, thus encouraging family involvement in the care process. As muscle strength improves, non-hemorrhagic stroke patients have a greater opportunity to reduce dependence on others and recover motor function and activities, such as walking, changing positions, and performing daily activities. This condition promotes comprehensive healing, not only physically but also psychosocially, because independence will increase *self-esteem* and quality of life for patients.

In a way physiological , warm water compress produce vasodilation localized Where happen improvement circulation blood and oxygen flow to all over network muscles . When combined with ROM exercises , this helps launch circulation blood and help lower stiffness . As a result , the muscles fitter for contract and receive stimulation nerve . Change strength visible muscles on group intervention show existence combination exercise *range movement* and warm water compress No solely effective in terms of clinical , however Also consistent with principles maintenance self , namely in a way gradually return independence patients, especially from the dimension mobility body in doing activities. Orem's self-care theory, this intervention falls within the scope of supportive and educational nursing actions, where the patient is facilitated to meet his/her self-care needs, especially in terms of mobility and maintaining physical function . movement help patient slowly get return strength For do activity maintenance self , while warm water compress help relieve and improve relaxation muscles , at the same time accelerate fitness body For do movements active .

**The results of the analysis of differences in strength scales in the intervention group and the control group after being given Range of Motion (ROM) therapy and Warm Water**

## Compresses with the Orem Self Care theory approach to Increasing Muscle Strength in Non-Hemorrhagic Stroke Patients

Based on research that has been done, known after treatment, some large (45.5%) respondents on group intervention feel change strength muscle in the "Medium" category. On the other hand, in the group control, majority respondents (54.4%) noted improvement strength muscle is at in the "Bad" category. This indicates there is difference response to treatment given, where group experiment own more results Good than group control. This supported with through results statistical test with use test *Mann-Whitney test*, which states mark  $p$  of 0.038 ( $p < 0.05$ ). Due to the value  $p$  more smaller than the value significance ( $\alpha = 0.05$ ), then the hypothesis accepted. This states that There is significant difference according to statistics between group interventions and groups control in increase strength muscle.

Findings the supported by study previously said The effect of range of motion exercises creates energy in movement and increases the intensity of smooth muscles in the legs, thereby facilitating or maximizing the ROM process. Regular and consistent therapy is needed to facilitate and increase blood flow so that it can channel energy to all muscles (Yuni Salmawanti & Siyanti, 2025). Temporary warm water compress functioning For increase circulation local blood, relieves stiffness muscles, and reduce pain, so that patient more comfortable in move. This result is in line with study (Setiyawan et al., 2019) explains that warm water compress therapy is also an alternative therapy that can provide hydrostatic, hydrodynamic, and warm effects that can help blood circulation throughout the body. Warm water, in addition to improving blood flow, can also help the body relax.

This proves that the intervention given to the treatment group, namely *Range of Motion* exercises and Warm Water Compresses with the "Orem" self-care theory approach, is more effective in increasing muscle strength than the treatment given only according to the standards carried out on the control group. The intervention applied capable stimulate ability muscle or raise utilization muscle so that produce improvement more power good. In theory, the increase strength muscle influenced various factors, namely focus of training, intensity, duration and engagement muscle on movements that are carried out. Through programmed and gradual handling on group intervention, evolution neuromuscular and increased performance functional muscle have a chance big happen rather than group control. Effective ROM intervention For reduce contracture, help increase flexibility and stimulation ability muscle passive and active.

However, the combination of the two provides optimal neuromuscular stimulation, which is essential for the brain's neuroplasticity during stroke rehabilitation. Range-of-motion exercises help develop movement and strengthen weak muscles, while warm compresses improve circulation and reduce muscle stiffness. This approach gradually guides the patient's rehabilitation process toward physical dependence. The "Orem" *Self-Care* theory approach is an important foundation in empowering non-hemorrhagic stroke patients. With improvement strength muscle, non-hemorrhagic stroke patients capable participate more active in activity maintenance self, such as eating, dressing, and mobility light. This is in line with draft Orem, that patient have the capacity to independent If given appropriate support and intervention with needs. *Self-Care* Theory Orem give support education motivation For increase his abilities in do maintenance self.

## CONCLUSION

Range of motion therapy and warm water compresses with the "Orem" self-care theory approach can increase muscle strength in non-hemorrhagic stroke patients. There was a difference between the intervention group given range of motion therapy and warm water compresses with the "Orem" self-care theory approach and the control group given therapy according to hospital operational standards. After treatment, an average of 45% of respondents in the intervention group experienced an increase in muscle strength in the Moderate category. Meanwhile, in the control group, the majority (54.4%) of respondents experienced an increase in muscle strength in the "Poor" category. Range of motion therapy and warm water compresses with the "Orem" self-care theory approach

have proven effective in increasing muscle strength in non-hemorrhagic stroke patients at RSI Jemursari Surabaya.

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