



Application of Squishy Intervention With Combination Active ROM To Increase Muscle Strength Hands On Stroke Patient

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ABSTRACT

Introduction– Stroke is a non-communicable disease that has an impact on the loss of motor skills in the extremities. One intervention that can overcome this problem is the application of squishy with a combination of active ROM.

Purpose– The purpose of this case study was to conduct nursing care on the application of squishy intervention to increase hand muscle strength in stroke patients.

Methodology/Approach – The method used in writing is a case report which was carried out for 6 days with Active ROM combination squishy intervention.

Findings– The results of this scientific work show that with the active ROM combination squishy intervention for 6 days, there is a significant increase in muscle strength in the right upper extremity before the intervention is worth 2 and after the intervention is worth 4.

Conclusion– The effectiveness of the application of nursing care standards in increasing muscle strength given to patients shows a change in muscle strength on the third day to the fifth day with a muscle strength value of 3 and the sixth day with a muscle strength value of 4.

Keywords: Squishy Intervention, Muscle Strength, Stroke.

INTRODUCTION

Stroke is one of the non-communicable diseases that is increasing globally along with communicable diseases with ineffective lifestyle and health management (Fransisca, 2011). Stroke is the most serious and major health problem for modern society today. This is because strokes that come suddenly can cause death, physical and mental disability both at productive age and old age (Setyopranoto, 2011). *Global Stroke Statistics*(2019) reported that the death prevalence rate due to stroke in the world increased from 2016 to 2018 accounting for 5.5 million deaths. This disease has remained the leading cause of death globally in the last 15 years. According to (Gregory A Roth, 2020) explaining that in 2019 the prevalence rate of stroke death increased significantly to 7.02 million and the morbidity rate was 111 million. The Global Burden of Stroke (2017) recorded 204 countries and regions with the highest contributors to stroke rates, including Indonesia.

Data from Basic Health Research (2018) shows the prevalence of stroke is 12.1 per 1,000 population. The prevalence of stroke in Indonesia based on the diagnosis of health workers is 7 per 1,000 population. The prevalence of stroke based on diagnosis by health workers was highest in the Special Region of Yogyakarta (14.6%), followed by North Sulawesi (10.8%), Bangka Belitung and DKI Jakarta with 9.7% per mile each. Basic Health

Research (2018) states that stroke is the number one non-communicable disease in the Special Region of Yogyakarta. The increasing prevalence of stroke has various impacts on health. Problems that arise in stroke patients such as pelo, self-care deficits, swallowing disorders, difficulty changing positions, limited fine and gross motor skills, limited range of movement of muscles and joints and slow movements. The high prevalence rate has an impact on contractures or stiffness in the muscles of the extremities (Siswanto, 2018).

Stroke causes disruption of the supply of oxygen and nutrients to the brain resulting in damage to brain tissue. Stroke is also said to be an acute neurological function disorder caused by a sudden disturbance or blockage of cerebral blood circulation (within seconds) or quickly (within hours) symptoms and signs appear in accordance with the disturbed focal area (World Health Organization, 2021). . Signs and symptoms of non-hemorrhagic stroke such as slurred speech, paralysis on one side, muscle weakness on one side and tingling (Ghani, 2016). This results in having difficulty with daily activities, inadequate in meeting basic needs, limited muscle tone, limited reflexes and barriers to physical mobility (Winstein CJ, 2017).

The impact experienced by stroke patients needs treatment to restore their health status (Aziz, 2013). Stroke patients need self-care in meeting their basic needs as well as physical activity to help restore function. Nurses have an important role in stroke patients in providing care by helping with basic needs, improving health status, increasing knowledge and restoring patient health. One way to restore health is to do physical exercise (Triyas Sulistyoningih, 2018).

Stroke patients need physical exercise. Physical exercise is one of the exercise programs that can be given to non-hemorrhagic stroke patients to regain muscle strength in the patient's extremities (Prok W, 2016). To assist the recovery of the arm or upper extremity, techniques to stimulate the hands are needed, such as the spherical grip exercise which is a functional hand exercise by holding a round object such as a ball on the palm (squishy). Squishy intervention therapy as a physical exercise with a new breakthrough in preventing muscle stiffness and increasing muscle strength in the extremities that can be done independently (Aisling Kelliher, 2019).

According to Daya's research (2017) explaining that there is a significant effect on active therapy of gripping a rubber ball on muscle strength in non-hemorrhagic stroke patients. Squishy therapy can accelerate the healing of stroke patients, because it will affect the sensation of motion in the brain. Le Mone (2016) revealed that physical exercise therapy by gripping a rubber ball can help recovery stroke patients, increased use of extremities and strengthened weak muscles. The purpose of physical exercise therapy intervention with the squishy method is to increase upper extremity muscle strength and prevent complications in stroke patients. Therefore, knowledge of health education and physical mobility is needed for stroke patients and their caring families related to problems with physical mobility disorders. The purpose of this case study is to provide nursing care to stroke patients with squishy intervention to improve hand muscle strength.

METHOD

The method used in this case study is a case report. The author provides nursing care to non-hemorrhagic stroke patients with impaired physical mobility who are treated at hospital B by involving the family. The first intervention that was carried out was with the muscle strengthening exercise technique which included explaining muscle function and the function of squishy therapy physical exercise, setting a follow-up schedule to maintain motivation. The second intervention with joint strengthening exercises is by doing a squishy intervention with Active ROM (Range of Motion). The intervention was given for 6 days and the squishy intervention was given every day with 3 times, namely morning, afternoon and evening.

The use of squishy in this therapy is to have physical characteristics of a soft, elastic texture and the size of the squishy used is round like a ball with a diameter of 7 cm. The patient was given a squishy intervention to increase the strength of the weak muscles in the upper right extremity. Patients were given therapy with squishy media combined with active ROM movements (range of motion) which were carried out 3 times a day, namely in the

morning, afternoon and evening for 10 minutes. Patients were informed to do squishy gripping therapy independently with regular family assistance.



Fig.1 Squishy intervention with ROM of Motion

RESULT

Prior to the intervention, the patient had muscle weakness and movement in the right upper extremity. After squishy therapy with active ROM for 6 days, it was found that there was an increase in muscle strength in the right upper extremity. Following are the results of the evaluation of the patient's progress:

Data	Hari 1		Hari 2		Hari 3	
	Sebelum tindakan	Sesudah tindakan	Sebelum tindakan	Sesudah tindakan	Sebelum tindakan	Sesudah tindakan
TD	122/82 mmHg	125/85 mmHg	138/75 mmHg	131/77 mmHg	127/88 mmHg	128/79 mmHg
Nadi	79 x/menit	88 x/menit	75 x/menit	85 x/menit	85 x/menit	78 x/menit
Suhu	35,9°C	36,2°C	36,3°C	36,4°C	36,4°C	36,3°C
RR	22 x/menit	22 x/menit	22 x/menit	21 x/menit	20 x/menit	21 x/menit
SPO2	100 %	99%	99%	100%	99%	99%
Kekuatan Otot	2	2	2	2	3	3

Data	Hari 4		Hari 5		Hari 6	
	Sebelum tindakan	Sesudah tindakan	Sebelum tindakan	Sesudah tindakan	Sebelum tindakan	Sesudah tindakan
TD	117/82 mmHg	115/77 mmHg	130/87 mmHg	131/80 mmHg	115/77 mmHg	119/85 mmHg
Nadi	69 x/menit	77 x/menit	75 x/menit	77 x/menit	84 x/menit	88 x/menit
Suhu	36,8°C	36,8°C	36,4°C	36,6°C	36,9°C	36,7°C
RR	21 x/menit	19 x/menit	22 x/menit	19 x/menit	21 x/menit	22 x/menit
SPO2	97%	100%	99%	98%	100%	100%
Kekuatan Otot	3	3	3	3	4	4

(Sumber Data Primer, 2021)

Table 1. Results of Hemodynamic Observations

Evaluation on the first day showed that the patient said he could move his hands and fingers but still felt weak. The patient's right extremity appears to be able to move and can grip the squishy. Motor movement looks still weak. The results of the patient's hemodynamic observations were blood pressure 125/85 mmHg, respiration rate 22 x/minute, temperature 36°C, oxygen saturation 99%, pulse 88 x/minute and the value of muscle strength was 2 in the right upper extremity.

The results of the evaluation on the second day showed that the patient said that currently the right extremity and fingers were able to grip objects and could be moved, although only limitedly. Motor movement looks still weak. The patient's range of motion is not stiff and can grip the squishy. The results of the examination of the patient's vital signs showed blood pressure 131/77 mmHg, respiration rate 21 x/minute, temperature 36.4 oC, oxygen saturation 100%, pulse 85 x/minute and the value of muscle strength remained no increase with a value of 2 in the upper extremities dextra.

The intervention on the third day showed that the patient said that after being given therapy for 3 days, he felt a change. The patient states that the right extremity and the fingers are movable and can be lifted. Motor movement seems to have increased. The extremities and fingers seem to be able to defy gravity. The results of hemodynamic observations of the patient were blood pressure 128/79 mmHg, respiration rate 21 x/minute, temperature 36.3 0C, oxygen saturation 99 %, pulse 78x/minute and the value of muscle strength increased with a value of 3 in the right upper extremity.

Evaluation on the fourth day of the patient's condition showed a good improvement with the result that the patient said that he was now able to do squishy therapy independently. The patient said that the right extremity had been moved frequently and performed independent ROM, reflex movements were seen, the right extremity and the fingers had no muscle stiffness, the fingers could grip the squishy with a duration of 10 seconds for each ROM movement. The patient's hemodynamic results were blood pressure 115/77 mmHg, respiration rate 21 x/minute. temperature is 36.8 0C, oxygen saturation is 99%, pulse is 77 x/minute and the value of muscle strength is still 3 in the right upper extremity.

The fifth day of intervention showed that the patient's condition began to improve. The patient said he felt the condition of the right extremity was easy to move without stiffness. The right hand has a motor reflex tone. The right extremity can withstand gravity for 10 seconds. The extremities and fingers have no muscle stiffness. The patient's hemodynamic results were blood pressure 131/80 mmHg, respiration rate 19 x/minute, temperature 36.6 0C, oxygen saturation 98%, pulse 77 x/minute and the value of muscle strength remained at 3 in the right upper extremity.

The results of the evaluation on the sixth day of the patient's condition improved significantly. The patient said he was happy after being treated because his condition began to improve. Families and patients said they could understand the therapy being taught and were able to do it independently. The right extremities and fingers have motor reflexes and are able to withstand gravity for 10 seconds. The fingers can grip the squishy with a duration of 15 seconds each ROM movement. The right extremity and fingers have no muscle stiffness. The hemodynamic results of the patient's blood pressure were 119/85 mmHg, respiration rate was 22 x/minute, temperature was 36.7 0C, oxygen saturation was 100%, pulse was 88 x/minute and the value of muscle strength increased significantly with a value of 4 in the right upper extremity.

The result of the value of muscle strength in the upper right extremity is 4, namely there is muscle contraction, able to move joints, can move against resistance or gravity for 10 seconds. Meanwhile, in the upper left extremity, the right and left lower extremities have a value of 5, which means they can move against resistance or gravity with full strength and can maintain their function.

DISCUSSION

Evaluation after implementation on the first and second days the patient was able to move his hands and fingers but was still weak. Motor movement looks weak in grasping squishy and strength scores with a score of 2. Supported by Guru singa's research (2017) which revealed that muscle strength on the first day of the intervention had movement but could not fight gravity. This is influenced by lack of movement, unstable energy sources in the form of ATP and decreased muscle mass. Belagaje (2017) explains that the value of muscle strength with a score of 2 is influenced by reduced muscle mass, reduced muscle strength due to lack of physical exercise and stretching. So that the intervention has not described an increase in muscle strength.

Evaluation on the third, fourth and fifth days showed that the patient said that after 3 days of therapy he felt a change. The results of the observation that the patient's muscle strength is worth 3 and is able to fight gravity. Supported by Yurida Oliviani's research (2017) which revealed that the muscle strength of stroke patients who experienced muscle weakness given active ROM holding a rubber ball (squishy) gave a clear picture of an increase in muscle strength with a score of 3.

This is in line with Ricko Armando's research (2020) which explains that rubber ball handheld therapy as a therapy is used to increase muscle strength by stimulating the hands to make movements or muscle contractions. During the several days of intervention, the result of the muscle strength scale was worth 3 with the interpretation of being able to move the palms and fingers. This is influenced because during therapy the patient received within five days causing physiological changes in the body resulting in stronger contractions resulting in an increase in the motor unit produced by acetylcholine, resulting in contractions. The mechanism through which more has an impact on increasing muscle strength is better (Irsyam, 2012).

Results from the implementation of day six the value of muscle strength increased significantly with a value of 4 in the right upper extremity. This is influenced by the effectiveness of the range of motion physical exercise by holding the squishy. Squishy therapy affects the patient's range of motion when done with a frequency of three times a day for six days and for 10-15 minutes in one exercise (Chaidir & Zuardi, 2014). Philantip's research (2015) also proves that exercise three times a day for 6 days with a time of 10-15 minutes will affect the respondent's range of motion.

Susanti (2019) found that ROM exercise holding a rubber ball has an effect on muscle flexibility in the right and left hands who suffer from stroke. This shows that there is an influence between ROM on muscle strength in stroke patients because each patient experiences an increase in the muscle strength scale after the Range of Motion is holding the ball. Range of Motion as an effective joint movement therapy exercise with movements that allow contraction and muscle movement both passively and actively in stroke patients (Winstein et al., 2016).

Results hemodynamic monitoring of the patient for 6 days was quite stable, the patient's blood pressure was in the range of 115/77 mmHg to 138/75 mmHg. Pulse in the range of 69-88 x / min. The temperature is in the range of 35.9 C to 36.8 C. The respiratory rate is in the range of 19-22 x/minute. The patient's oxygen saturation is 98% to 100%. The patient's hemodynamic status is stable because it is influenced by the treatment received in the hospital, care and squishy therapy with Active ROM.

Supported by Handayani's research (2016), it was found that range of motion physical exercise has an effect on decreasing blood pressure because physical exercise can increase changes in blood circulation in the heart, thereby lowering blood pressure. Smooth blood circulation due to muscle contractions caused by these progressive movements so that oxygen and nutrients can be well distributed throughout cells and tissues. In addition to this, of course, it is supported by the administration of drugs to lower blood pressure and improve blood circulation. ROM physical exercise has benefits, namely improving nerve function, increasing joint muscle stimulation and nerves to respond to the motor function of muscle tone,(Cicilia Mardiyanti, 2021).

CONCLUSION

The application of squishy intervention in non-hemorrhagic stroke patients with hand muscle weakness can effectively increase muscle strength. For 6 days it was found that there was an increase in muscle strength in the right upper extremity in patients with non-hemorrhagic stroke, where the range of motion in the upper and lower extremities was worth 4, namely there was muscle contraction or reflex motion, able to move joints, able to defy gravity for 10 seconds.

RECOMMENDATION

The successful implementation of the squishy intervention requires family support as the patient's caregiver, which is expected to maximize in providing care and intervention by providing emotional support, instrumental support, informational support and appreciation support in performing squishy intervention therapy to restore the patient's extremity function.

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