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THE EFFECT OF RANGE OF MOTION (ROM) EXERCISES ON STROKE PATIENTS

Agustina Jeni Waruwahang [1]*,Lussy Afriyanti [2], Agung Ruhdiyat[3], Ana Faizah[4]
[1,2,3]Department of Nursing Profession, Faculty of Medicine, Universitas Batam, Kepulauan Riau, Batam 29464, Indonesia.

**Corresponding Author:*
Agustina Jeni Waruwahang
E-mail: agustinajeniwaruwahang8@gmail.com

Abstract

Stroke is a neurological disease that is often encountered and must be treated quickly and appropriately. Stroke is a brain function disorder that occurs suddenly and is caused by a disruption in brain blood circulation and can happen to anyone at any time (Muttaqin, 2012). Stroke can be ischemic and can also be hemorrhagic. In an *ischemic* stroke, blood flow to the brain stops because a blood clot has blocked a blood vessel (*aerosclerosis*), whereas in a hemorrhagic stroke it occurs because a blood vessel ruptures, so that blood circulation becomes abnormal, because blood seeps into the brain and damages it. *Haemorrhagic* stroke has a very dangerous impact because it usually causes a fatal condition, namely death (Hutagalung, 2019). fat and protein, leading to hyperglycemia (high blood glucose levels) (Maria, 2021). There are several factors that can cause this disease, one of which is hypertension which is the main factor; Cardiovascular disease-cerebral embolism originates from the heart; high cholesterol; Elevated hematocrit increases the risk of cerebral infarction; Diabetes is associated with accelerated atherogenesis; Smoke; Alcohol consumption. One method of overcoming the problem of patients with stroke in nursing is to provide interventions based on the patient's needs, one of which is providing *Range of Motion* (ROM) exercises to increase muscle strength and prevent contractures and stiffness in the joints. This method has of course been tested by Susanti & BIstara (2019) stating that there is a significant influence between passive and active ROM training on muscle strength in stroke patients. The results of this activity aim to provide an overview of nursing care for Stroke patients with impaired physical mobility as a nursing problem. The nursing intervention provided is *Range of Motion* (ROM) Exercises for Stroke patients.

Keywords: ROM exercise, stroke

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PENGARUH LATIHAN RANGE OF MOTION (ROM) TERHADAP PASIEN STROKE

Agustina Jeni Waruwahang [1]*,Lussy Afriyanti [2], Agung Ruhdiyat[3] Ana Faizah[4]
[1, 2,3]Department Profesi Ners , Fakultas Kedokterean, Universitas Batam, Kepulauan Riau, Batam 29464, Indonesia

**Corresponding Author:*
Agustina Jeni Waruwahang
E-mail: agustinajeniwaruwahang8@gmail.com

Abstrak

Stroke merupakan penyakit neurologis yang sering dijumpai dan harus ditangani secara cepat dan tepat. Stroke merupakan kelainan fungsi otak yang timbul mendadak yang disebabkan karena terjadinya gangguan peredaran darah otak dan bisa terjadi pada siapa saja dan kapan saja (Muttaqin, 2012). Stroke dapat berupa *iskemik* dan juga dapat berupa *haemoragik*. Pada *stroke iskemik*, aliran darah ke otak terhenti karena terjadinya bekuan darah yang telah menyumbat suatu pembuluh darah (*aerosklerosis*), sedangkan pada *stroke haemoragik* terjadi karena pecahnya pembuluh darah, sehingga peredaran darah menjadi tidak normal, karena darah merembes masuk ke otak dan merusaknya. *Stroke haemoragik* memiliki dampak yang sangat berbahaya karena biasanya menyebabkan kondisi yang fatal yaitu kematian (Hutagalung, 2019). lemak dan protein, mengarah ke hiperglikemia (kadar glukosa darah tinggi) (Maria, 2021). Ada beberapa faktor yang dapat menyebabkan terjadinya penyakit ini, salah satunya adalah Hipertensi merupakan faktor utama; Penyakit kardiovaskular-embolisme serebral berasal dari jantung; kolestrol tinggi; Peningkatan hematokrit meningkatkan risiko infark serebral; Diabetes terkait dengan aterogenesis terakselerasi; Merokok; Konsumsi alcohol. Salah satu metode dalam mengatasi masalah pasien dengan stroke pada keperawatan adalah dengan memberikan intervensi berdasarkan kebutuhan pasien, salah satunya memberikan Latihan Gerakan *Range of Motion* (ROM) untuk meningkatkan kekuatan otot dan mencegah kontraktur dan kekakuan pada persendian. Metode ini tentunya sudah teruji oleh Susanti & BIstara (2019) menyatakan bahwa ada pengaruh yang signifikan antara latihan ROM pasif dan aktif terhadap kekuatan otot pada pasien stroke. Hasil kegiatan ini bertujuan untuk memberikan gambaran asuhan keperawatan pada pasien Stroke dengan masalah gangguan mobilitas fisik sebagai masalah keperawatan, intervensi keperawatan yang diberikan adalah Latihan Gerakan *Range Of Motion* (ROM) pada pasien Stroke.

***Kata Kunci**:* Latihan ROM, Stroke

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INTRODUCTION

Stroke is a medical emergency. The slower medical assistance is obtained, the more nerve cell damage will occur, so the more time is wasted, the more nerve cells cannot be saved and the worse the disability will be (Oliviani & Rahmawati (2017). According to data from WHO also explained that the World Health Organization (WHO) estimates that around 15 million people suffer from stroke every year. Stroke is the second leading cause of death in the age group over 60. In poor and developing countries, such as Indonesia, the incidence of stroke tends to increase every year. year although it is difficult to obtain accurate data Purqoti (2020). Meanwhile, data from the American Heart Association (AHA, 2019) states that the global prevalence of stroke in 2019 was 101.5 million people, while ischemic stroke was 77.2 million, intracerebral hemorrhage was 20.7 million, and subarachnoid hemorrhage was 8.4 million. Overall, in 2019, the prevalence of intracerebral hemorrhage was high in Oceania and Southeast Asia. Data from the Pekalongan District Health Service in 2020-2021, strokes with new cases were 353 with visits as many as 481. In all health centers in Pekalongan Regency with the most stroke cases at the Karangdadap Health Center there were 69 old cases and this increased to 134 new cases.

According to research by Miyani & Arifiyanto (2023), stroke has its own impact which can endanger the sufferer, 80-90% have problems thinking and remembering, there is a partial/total reduction in arm and leg movement. The most common result of stroke is muscle weakness or dysfunction in the extremities. Muscle weakness in the extremities requires therapy to overcome it, such as ROM exercises. Rehabilitation and ROM exercises are one of the follow-up therapies for stroke patients after the acute phase has passed and they have entered the healing phase. It is hoped that this exercise can stabilize neurological hemodynamics which can affect neuroplastics, thereby enabling improvements in sensory-motor function to carry out remapping in areas of the brain that have experienced damage.

BASIC CONCEPTS OF STROKE

Stroke is a neurological disease that is often encountered and must be treated quickly and appropriately. Stroke is a brain function disorder that occurs suddenly and is caused by a disruption in brain blood circulation and can happen to anyone at any time (Muttaqin, 2012). Stroke is a cerebrovascular disease (brain blood vessels) which is characterized by the death of brain tissue (cerebral infarction), this occurs due to reduced blood and oxygen flow to the brain or a condition where brain cells are damaged, because they do not get enough oxygen and nutrients. . Stroke can be ischemic and can also be hemorrhagic. In an ischemic stroke, blood flow to the brain stops because a blood clot has blocked a blood vessel (aerosclerosis), whereas in a hemorrhagic stroke it occurs because a blood vessel ruptures, so that blood circulation becomes abnormal, because blood seeps into the brain and damages it. Haemorrhagic stroke has a very dangerous impact because it usually causes a fatal condition, namely death (Hutagalung, 2019).

Stroke is a sudden and acute occurrence of focal or global brain functional disorders that last more than 24

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hours due to disruption of cerebral blood flow. Stroke often causes disabilities in the form of paralysis of the limbs, impaired speech, thought processes, memory and other forms of disability as a result of impaired brain function (Esti & Johan, 2020).

According to Muttaqin (2012), risk factors that can cause stroke are as follows: Hypertension is the main factor; Cardiovascular disease-cerebral embolism originates from the heart; High cholesterol; Obesity; Elevated hematocrit increases the risk of cerebral infarction; Diabetes is associated with accelerated atherogenesis; Oral contraceptives (especially with hypertension, smoking and high estrogen levels); Smoke; Drug abuse (especially cocaine); Alcohol consumption.

The clinical manifestations according to Esti & Johan (2020) where a stroke causes neurological deficits, depend on the location of the lesion (which blood vessels are blocked), the size of the area with inadequate perfusion and the amount of collateral blood flow. A stroke will leave residual symptoms because brain function will not improve completely, such as: Paralysis on one side of the body (hemiparesis or hemiplegia); Paralysis on one side of the face (usually hemiparesis) that appears suddenly; Weak or stiff muscle tone; Decreased or loss of taste; Visual field disorders "Homonymous Hemianopsia"; Aphasia (slurred speech or difficulty understanding speech); Dysarthria (slurred or slurred speech); Perceptual disorders; Mental status disorders; Vertigo, nausea, vomiting, or headache.

The pathophysiology of stroke occurs due to cerebral infarction, where blood supply to certain areas of the brain is reduced. The extent of the infarction depends on factors such as the location and size of the blood vessels and the adequacy of collateral circulation to the area supplied by the blocked blood vessels. The blood supply to the brain can change (slower or faster) due to local disorders (thrombus, embolism, bleeding and vascular spasm) or due to general disorders (hypoxia due to lung and heart disorders). Atherosclerosis often/tends to be an important factor in the brain, thrombi can originate from atherosclerotic flakes, or blood can clot in areas of stenosis, where blood flow will be slow or turbulence occurs (Muttaqin, 2012).

Bleeding in the brain is more caused by arteriosclerotic rupture and blood vessel hypertension. Very extensive intracerebral hemorrhage will cause death compared to overall cerebrovascular disease, because extensive bleeding causes destruction of brain mass, increased intracranial pressure and what is more severe can cause brain herniation. Death can be caused by compression of the brain stem, brain hemispheres, and secondary brain stem hemorrhage or extension of bleeding to the brain stem (Muttaqin, 2012).

If cerebral circulation is obstructed, cerebral anoxia can develop. Changes caused by cerebral anoxia can be reversible for a period of 4-6 minutes. Irreversible changes if anoxia lasts more than 10 minutes. Cerebral anoxia can occur due to various disorders, one of which is cardiac arrest. Apart from damage to the brain parenchyma, the relatively large volume of bleeding will result in an increase in intracranial pressure and cause a decrease in brain perfusion pressure and disruption of brain drainage.

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ASSESSMENT

This assessment is carried out by taking an anamnesis on the patient. Complete data collected or studied includes:

1. Client identity

Includes name, age (mostly occurs in old age), gender, education, address, occupation, religion, ethnicity, MRS date and time, register number, medical diagnosis.

2. Health History

a. Main complaint

Usually there is weakness in one side of the body, slurred speech, and inability to communicate.

b. History of current illness

Hemorrhagic stroke attacks often occur very suddenly, while the client is doing activities. Usually there are headaches, nausea, vomiting and even seizures until unconsciousness, in addition to symptoms of paralysis of half the body or other brain function disorders.

c. Past medical history

History of hypertension, diabetes mellitus, heart disease, anemia, history of head trauma, long-term oral contraceptives, use of anti-coagulant drugs, aspirin, vasodilators, addictive drugs, obesity.

d. Family history of illness

Usually there is a family history of hypertension or diabetes mellitus.

3. Physical Examination

a. Motor paralysis/paresis: hemiplegia/hemiperesis, weakness of facial muscles, hands.
b. Sensory disturbances: loss of sensation in the face, arms, and lower extremities.
c. Dysphagia: difficulty chewing, swallowing, paralysis of the tongue and larynx.
d. Visual disturbances: double vision, narrowed field of view.
e. Difficulty communicating: difficulty writing, difficulty reading, dysatria (difficulty pronouncing articulation/slurred speech, lisp), weakness of facial muscles, tongue, upper palate, pharynx and lips.
f. Emotional abilities: feelings, facial expressions, acceptance of one's condition.
g. Memory: recognition of the environment, people, places, time, level of consciousness, bladder function and bowel function.

NURSING DIAGNOSES

1. Impaired physical mobility is related to the family's inability to care for a family member who suffers from stroke.
2. Ineffective health care related to the family's inability to care for a family member with stroke.
3. The risk of injury is related to the family's inability to modify the environment.

SUMMARY OF CASES MANAGED

Mr. H is 58 years old, the client currently lives in Kavling Senjulung Baru, RW 19, Kabil Nongsa Village. The person in charge of the client at this time is the client's wife. During the assessment on July 6 2023 at the client's home using the interview method of the client and his wife. Mrs. K says Mr. H has been suffering from a stroke for 2 years, his father often has difficulty carrying out activities at home, sometimes just lying in bed. Mrs. K says Mr. H also fell out of bed. Mrs. K said he had taken the client to the hospital for therapy but had never

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trained the client to mobilize at home. The client seems to have difficulty moving, lying down more often.

Based on the assessment that has been carried out, there are 3 nursing diagnoses taken, namely: Impaired physical mobility related to the family's inability to care for a family member who has suffered a stroke; Ineffective health care is related to the family's inability to care for a family member with stroke; The risk of injury is related to the family's inability to modify the environment.

DISCUSSION

Nursing interventions that have been carried out on Mr. H with stroke problems in Senjulung Baru RW 19 Kabil Nongsa Village, namely providing *Range of Motion* (ROM) exercises to increase muscle strength and prevent contractures and stiffness in the joints. In research conducted by Miyani & Arifiyanto (2023), the results showed that there was an influence between giving ROM training on muscle strength which could be proven by seeing an increase in muscle strength before and after giving intervention in the form of ROM training.

Rehabilitation and ROM exercises are part of one of the stroke therapies carried out after entering the recovery phase. ROM exercises are carried out for neurodynamic stabilization which allows improving sensorimotor function by remapping damaged brain areas. With this stimulation, the blocked blood vessels in the brain experience peri-infarction and can recover, although they do not return to normal completely.

Range of Motion exercises are carried out with the aim of maintaining or increasing muscle strength, maintaining joint mobility, stimulating blood circulation and preventing deformities. Shortened muscle tissue will slowly lengthen when doing range of motion exercises and the muscle tissue will begin to adapt to return muscle length to normal. Range of Motion (ROM) if done as early as possible and done correctly and continuously will have an impact on muscle strength.

Average ROM training can increase muscle strength and the effect of muscle strength. The aim of providing this active range of motion method is to train flexibility and strength of muscles and joints by using the muscles actively or independently so that they become more effective in increasing muscle strength (Purba et al, 2022).

Supported by research conducted by Setyawan et al (2017) stated that there was an effect after giving *Range of Motion* (ROM) therapy in healing stroke. Implementation of *Range of Motion* (ROM) therapy has been proven to increase muscle strength in stroke patients.

In research conducted by Eka et al (2019), it was stated that Range of Motion (ROM) training had been carried out to increase muscle strength in stroke patients. It was concluded that ROM training was effective in increasing muscle strength. By providing training, namely 2x a day every morning and evening for 15-35 minutes and doing 4 repetitions of each movement. The time for giving this exercise should be longer at least 4 weeks because it has been proven to have an effect on increasing muscle strength. This therapy is recommended for use because the technique is simple, does not require tools and materials, does not require special skills to apply it and can be done by all stroke patients who experience muscle weakness.

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CONCLUSION

Based on the nursing care provided to Mr. H with a diagnosis of stroke. Many health problems arise in stroke sufferers, one of which is impaired physical mobility, therefore Range of Motion (ROM) exercises are carried out on clients so that they can help clients increase flexibility and muscle strength, and can prevent stiffness in joint muscles. After giving ROM Movement Training, the client was able to move his hands, although still a little, but there was an improvement compared to before *Range of Motion* (ROM) therapy was carried out.

RECOMMENDATION

It is hoped that families will be more able to pay attention and help clients in carrying out *Range of Motion* (ROM) exercises. At a minimum, Rom training is done 2 times a day, namely in the morning and evening.

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