

The Effect of Rubber Ball Grip Exercises on Changes in Muscle Strength In Mrs. “S,” A Patient With Non-Hemorrhagic Stroke in The Lovebird Room of Bhayangkara Hospital Makassar

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ABSTRACT

Non-Hemorrhagic stroke is a stroke caused by thrombosis or embolism that causes blockage of blood vessels in the brain, which reduces the supply of glucose and oxygen to the brain, and causes cell or tissue death. This stroke is divided into two, namely ischemic or non-hemorrhagic stroke and hemorrhagic stroke is blockage of blood clots and which is caused by narrowing of an artery or several arteries leading to the brain or due to embolism. Non-Hemorrhagic stroke tends to occur in the elderly, Data obtained from medical record data from the Bhayangkara Hospital Makassar with the number of inpatients in 2023 as many as 113 people, and the number of outpatients as many as 3,906 people. The data collection techniques used were observation interviews, physical examinations, documentation with research subjects directed at nursing problems of physical Mobility Disorders in Non-Hemorrhagic Stroke Patients. By implementing Rubber Ball Grip Exercise on Mrs “S” to increase muscle strength in Non-Hemorrhagic stroke patients in the Lovebird Room of Bhayangkara Hospital Makassar for three days the results showed that the patient’s muscle strength before the implementation.

INTRODUCTION

Stroke is a disease caused by narrowing of the blood vessels and disruption of blood flow to the brain. Narrowing or obstruction of cerebral blood vessels can reduce the supply of blood and oxygen, causing nerves associated with body organs to become difficult to move and, in severe cases, to become damaged or unable to function (Alviana N., 2022). According to World Health Organization (WHO) data from 2019, approximately 13.7 million new cases of stroke occur each year, with around 5.5 million deaths attributable to stroke. Approximately 70% of stroke cases and 87% of stroke-related deaths and disabilities occur in low- and middle-income countries. Stroke is the second leading cause of death worldwide and the third leading cause of disability. On average, stroke causes more deaths in low- and middle-income countries than in high-income countries (Anggardani, 2023).

Based on Riskesdas data, stroke is one of the leading causes of death in Indonesia, with a prevalence of 8.3 per 100 population based on health-worker diagnosis. The highest prevalence based on diagnosis was reported in North Sulawesi (10.8%), followed by Yogyakarta (10.3%), while Bangka Belitung and DKI Jakarta each reported 9.7 per mille. Based on symptoms, the highest prevalence was reported in South Sulawesi (17.9%), followed by Central Sulawesi (16.6%) (Ryan, 2021). Data from the South Sulawesi Provincial Health Office showed an increase in cases, from 530 in 2016 to 627 in 2017 and 633 in 2018. Each year, millions of people experience death or disability as a result of non-hemorrhagic stroke. Approximately 50% of cases occur in patients younger than 70 years, while 5% occur in those younger than 44 years. Men accounted for 53% of deaths or disabilities due to non-hemorrhagic stroke, while women accounted for 47% (Nurshiyam M. A., 2020). Medical record data from Bhayangkara Hospital Makassar showed an increase in patients treated with a diagnosis of non-hemorrhagic stroke. In 2023, there were 113 inpatients and 3,906 outpatients (Medical Records Unit, Bhayangkara Hospital Makassar).

Stroke patients frequently experience nervous system disorders that may cause symptoms such as paralysis of the limbs, speech disturbances such as slurred speech, impaired balance leading to frequent falls, decreased consciousness, and visual disturbances (Jamaluddin et al., 2020). Stroke complications depend on the side or area of the brain affected, the severity of the attack, the size of the lesion, and the presence of collateral circulation. Complications in acute stroke include: (1) sudden facial or unilateral limb paralysis (hemiparesis); (2) sensory disturbances affecting one or more limbs; (3) decreased consciousness; (4) aphasia; (5) dysarthria; (6) diplopia; and (7) ataxia and vertigo (Elsi, 2019). Patients with non-hemorrhagic stroke frequently experience neuromusculoskeletal problems that can affect mobility. Paralysis is one of the clinical manifestations of stroke (Nurshiyam M., 2020).

Several studies have shown that rubber ball grip exercises can improve muscle strength. One study by Dewi Retno Sari, using a handgrip dynamometer, reported an average increase in muscle strength from 12.7 kg to 13.1 kg after rubber ball grip therapy. Based on this background, the authors were interested in examining the application of rubber ball grip exercises to improve muscle strength in a client with non-hemorrhagic stroke (Margiyati, 2022).

METHODS

The design used in this study was a case study with a single-case design. The intervention consisted of rubber ball grip exercises to improve muscle strength and address impaired physical mobility in Mrs. “S,” who had non-hemorrhagic stroke and was treated in the Lovebird Room of Bhayangkara Hospital Makassar..

RESULTS

Based on the assessment, the nursing diagnosis formulated was decreased muscle strength related to impaired physical mobility. This was evidenced by the patient's statements that she could not move, that both hands could not be moved, that she experienced pain in parts of the body, and that she was unable to perform activities. The patient's muscle strength was initially scored at 2. Her face appeared asymmetrical and pale. Physical examination showed blood pressure of 150/80 mmHg, temperature of 36.7°C, pulse rate of 80 beats/minute, and respiratory rate of 24 breaths/minute. The intervention provided to address the problem was rubber ball grip exercise to improve muscle strength.

Table 1. Application of Rubber Ball Grip Exercises

Day/Date	Time	Nursing Intervention	Nursing Outcome
I / Thursday, 7 March 2024	07:00	Observation: Assess muscle strength using the muscle-strength scale; assess for muscle weakness. Therapeutic: Provide a rubber ball and conduct grip exercises to train and improve muscle strength for 10–15 minutes. Education: Explain how to improve muscle strength.	Within 3 × 24 hours, impaired physical mobility and muscle strength are expected to improve. Initial criteria included decreased movement, decreased muscle strength, moderate range of motion, increased pain, increased anxiety, increased joint stiffness, decreased physical weakness, and moderately decreased limited movement.
II / Friday, 8 March 2024	09:00	Observation: Monitor changes in the right upper and lower	Within 3 × 24 hours, impaired physical mobility and muscle

		extremities. Therapeutic: Train the patient to grip the rubber ball for 10–15 minutes. Education: Encourage the patient to report any changes in muscle strength.	strength improve, characterized by increased extremity movement and increased muscle strength. Other expected outcomes include improved range of motion, decreased anxiety, decreased joint stiffness, decreased physical weakness, and reduced limitation of movement.
III / Sunday, 10 March 2024	10:00	Observation: Monitor movement and improvement in muscle strength; monitor mobility and individual activity. Therapeutic: Train the patient to grip the rubber ball for 10–15 minutes. Education: Teach the technique for improving muscle strength.	Within 3 × 24 hours, impaired physical mobility and muscle strength improve, characterized by increased extremity movement, increased muscle strength, improved range of motion, decreased pain, decreased anxiety, decreased joint stiffness, reduced physical weakness, and reduced limitation of movement.

Evaluation Of The Intervention

The evaluation of the nursing intervention consisted of rubber ball grip exercises, with muscle strength assessed using a muscle-strength scale to determine changes in the patient's strength.

Table 2. Evaluation of Rubber Ball Grip Exercise

Day	Patient	Muscle Strength	Description
1	Mrs. "S"	Before: 2 (25%) After: 3 (50%)	Before: Able to move the limb without gravity. After: Able to grip, but still weak; unable to squeeze and open/close the hand continuously for 3 minutes.
2	Mrs. "S"	Before: 3 (50%) After: 4 (75%)	Before: Able to grip partially and squeeze, but the middle and ring fingers were still unable to move adequately to open and close the hand; duration 5 minutes. After: Able to grip fully; the ring and middle fingers could move to open and close the hand for 7 minutes.
3	Mrs. "S"	Before: 4 (75%) After: 5 (100%)	Before: Able to grip fully and squeeze, opening and closing the hand for 8 minutes. After: Able to grip fully; the middle and ring fingers could move to open and close the hand for 10 minutes.

Rubber ball grip exercise is intended to help improve muscle strength and to monitor the patient's movement and muscle strength. Physical examinations, including blood pressure, temperature, pulse, and respiratory rate, should also be performed. Several studies have shown that rubber ball grip exercise can improve muscle strength. One study by Dewi Retno Sari, using a handgrip dynamometer, reported an average increase from 12.7 kg to 13.1 kg. The

intervention is performed by gripping a rubber ball for approximately 15 minutes. The protrusions on the ball may stimulate acupressure points on the surface of the hand, with sensory stimulation transmitted to the brain and processed by the sensory cortex through sensory pathways associated with the C7–T1 spinal segments that innervate the motor function of the fingers. Processing of the stimulus can produce a rapid neural response that facilitates the corresponding motor action.

CONCLUSION AND RECOMMENDATIONS

Rubber ball grip exercises were shown to improve muscle strength in a patient with non-hemorrhagic stroke. A change in muscle strength was observed before and after the intervention, with the muscle strength score increasing from 2 to 5 following the rubber ball grip exercises. Muscle strength increased, pain decreased, and movement improved. Recommendations are addressed to the following for Educational Institutions: It is expected that this study will broaden knowledge and serve as a reference for the development of nursing science, particularly in the provision of nursing care to patients with non-hemorrhagic stroke experiencing impaired physical mobility. For author Authors: this study is expected to broaden knowledge and experience regarding disease concepts and the implementation of nursing care for stroke patients with impaired physical mobility.

REFERENCES

- alviana, N. (2022). Universitas Muhammadiyah pekajangan. Penerapan genggam bola untuk meningkatkan kekuatan otot genggam bola pasien stroke non hemoragik di ruang truntum RSUD bendan.
- anggardani, a. (2023, oktober). jurnal riset rumpung ilmu kesehatan. penerapan rom exercise bola karet untuk meningkatkan kekuatan otot genggam pasien stroke.
- Ardhina Nugrahaeni S, T. (2022). Pengantar Anatomi Fisiologi Manusia Anak Hebat Indonesia. yogyakarta.
- Azizah, N. (2020, januari). DIII Keperawatan Akper Husadah Semarang. Genggam Untuk Mengatasi Hambatan Mobilitas Fisik Pada Pasien Stroke Non Hemoragik, 35-40.
- Dea, e. n. (2023, mei). Fakultas kedokteran dan ilmu kesehatan universitas muhammadiyah yogyakarta. Implementasi terapi genggam bola karet dalam asuhan keperawatan pada pasien lansia dengan stroke.
- Elsi, R. (2019, agustus). Fakultas Ilmu Kehatan Dehasen Bengkulu. Analisa Peningkatan Kekuatan Otot Pada Pasien Stroke Non Hemoragik Dengan Hemiparase Melalui Latihan Rom.
- Faridah, U. (2018). Universitas Muhammadiyah Kudus. Pengaruh Rom Exerice Bola Karet Terhadap Kekuatan Otot Genggam Pasien Stroke Di Rsud Raa Sowondo Pati, 36-43.
- Gulto, E. L. (2019). music movement pada pasien non hemoragik untuk mengatasi gangguan mobilitas.
- Haksara, N. (2021). Patwhay stroke non hemoragik.
- hartati, l. (2021, oktober). studi kasus pada pasien stroke non hemoragik dengan hambatan mpbilitas fisik.
- Hermanto, S. M. (2020). Terapi Cermin Dalam Asuhan keperawatan Stroke. (A. H. Nadana, Ed.) Malang.
- jurnal riset rumpung ilmu kesehatan . (2023, oktober). penerapan rom exercise bola karet untuk meningkatkan kekuatan otot genggam pasien stroke.
- Margiyati, A. (2022, januari). STIKES Kesdam IV/ Diponegoro Semarang. Penerapan Latihan Genggam Bola Karet Terhadap Kekuatan Otot Pada Klien Stroke Non Hemoragik.
- Nurshiyam, M. A. (2020). Asuhan Keperawatan Pemenuhan Kebutuhan Mobilisasi Fisik Pada Pasien Strok Non Hemoragik Di RSKD DADI Makassar. JurnalL Media Keperawatan Poltekhnik Kesehatan Makassar, 11.
- Nurshiyam, M. A. (2020, januari). Rumah Sakit Khusus Daerah Dadi Makassar poltekkes kemenekes. Asuhan Keperawatan Kebutuhan Mobilitas Fisik Pada Pasien Stroke Non Hemoragikdi Rskd Dadi Makassar, 2087-0035.
- Ridwan. (2023). caring a patient with brain injury experiencing increased intracranial preassure : A case report. journal of Holistic Nursing Science, 123-128.

- Rismawati. (2022, april). Stikes Nazhatut Tullab sampang Universitas . Penarapan terapi ROM latihan genggam bola karet terhadap gangguan mobilitas fisisk pada pasien stroke.
- rosyandi, A. k. (2023). program studi Ners unversitas karaya husada semarang. Rom Exrcise bola karet terhadap kekuatan otot pada pasien stroke .
- Ryan, L. R. (2021). Program Studi Keperawatan,fakultas kedokteran universitas tanjung pura.
Pebandingan Kemandirian Antara Pasien Stroke Hemoragik Dan Non Hemoragik
- SDKI, T. (2018). Standar Diagnosa Keperawatan Indonesia DPP PPNI. Jakarta. SDKI, T. P. (2017). Standar diagnosis keperawatan. jakarta.
- SIKI, T. (2018). Standar Intervensi Keperawatan Indonesia. Jakarta.
- SLKI T, D. (2018). Standar Luaran Keperawatan Indonesia DPP PPNI. Jakarta.
- zulkifli. (2023, juni). terapi genggam bol karet meningkatkan kekuatan otot mendoronf pemulihan pasca stroke. profesional healt journal, 4.