

Managing Stroke Rehabilitation in Elderly

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ABSTRACT

The world's elderly population is predicted to triple every year, and have complex consequences such as the incidence of non-communicable diseases, one of which is stroke. Stroke is a disease of impaired brain function that is a global health problem. As many as 2.5% of the 500 thousand stroke sufferers experience disability and even mortality in Asian countries, especially Indonesia. The study describes a rehabilitation program for the stroke elderly with a family approach. Three elderly stroke survivors were given passive and active range of motion exercises in the extremities by their families accompanied by nurses for 10 consecutive days. The results were obtained that all three elderly experienced an increase in muscle strength in part of their extremities at one rate better. From this study, it can be seen that rehabilitation with a family approach can be used as an alternative to improve the mobility ability of the elderly after stroke at home.

Keywords: stroke, elderly, rehabilitation, exercise, family centered care.

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INTRODUCTION

In 2025, the global population will face an increase in the elderly population to reach three times per year (1). The increase in population has complex consequences such as the incidence of non-communicable diseases, one of which is stroke in the elderly (2). Stroke is a disease of impaired brain function that is a global health problem. The disease is caused by various factors, one of which is an unhealthy lifestyle (3). Stroke is the third cause of disability in the world because sufferers can experience visual impairment, speech, mobility disorders, and paralysis of the face and extremities (4). In Asia itself, especially Indonesia, every year it is estimated that 500 thousand people experience strokes. Of these, around 2.5% of them died and the rest experienced mild and severe disabilities (5). Physical limitations and even paralysis cause a decrease in the self-image of the elderly and even the inability of the elderly to do their ADL (6).

Tao Jing developed the concept of post-stroke rehabilitation in China with modern technology, namely a PSS (product service system) machine for the rehabilitation of the Upper Extremity Exoskeleton. In his research, significant results were obtained on reducing disability, treatment costs and treatment resources in stroke patients (7). Recent research on stroke rehabilitation for the elderly has been conducted in China by Ning Min, et al. In her study, she concluded that early rehabilitation through cognitive care, language function, motor function and daily activity exercise in stroke elderly is able to improve the initiation of active moving ability, the outcome of maintaining body position, and the level of cooperation of the elderly in nursing care (8). Hashim, N. N., et al conducted a case study of rehabilitation exercises in stroke patients in Malaysia and obtained the result that an elderly person after being given strength training in the upper and lower extremities showed his significant ability to flexibility of both knees, increased muscle strength, and lowered symptoms of depression (9). Sheehy Lisa, et al researched

stroke rehabilitation for the elderly in China using virtual reality (VR) to practice sitting balance and obtain the results of improving the balance of their sitting position without being supported by the ladder (10). Chaidir & Zuardi once researched the provision of rehabilitation for ischemic stroke patients in Indonesia in 2014. One of them is the use of two daily ROM exercises in stroke patients which has been shown to improve muscle ability compared to giving therapy once a day.

Recent research in these countries provides solutions in the rehabilitation of the elderly post-stroke. (However), these solutions or strategies are difficult to implement in developing countries such as Indonesia, especially for rural communities. Indonesia as one of the developing countries has a rural area with a unique community character and technological limitations, so it requires solutions that are applicable compared to the solutions offered by these researchers. This study aims to describe physical and psychophysical rehabilitation for the elderly after stroke in rural areas in order to optimize their physical mobility. This research can be a model that can be applied by countries that have a community character in rural areas that are almost the same as Indonesia.

METHOD

The design of this study uses a case study approach involving three elderly respondents aged 65 years and over, especially those who have had a stroke with physical mobility barriers and are willing to be involved as respondents in the case study. The case study was carried out in the working area of the Tunjungan Health Center in April 2022. In the study respondents were given passive ROM intervention with a frequency of 2 times a day for 2 consecutive weeks. Furthermore, the elderly will be measured muscle strength using muscle strength assessment instruments. The case study instrument used is the muscle strength scale. The instrument comprehensively assesses the level of muscle strength. The muscle strength measurement scale consists of 5 categories (0-5) with certain categories at each scale level, with 0 indicating a lower function level

and 5 higher function levels. Meanwhile, the data collection method is carried out by interview and observation techniques, both sourced from primary data and secondary data. Further the results of the study are presented in the form of descriptive analytics.

RESULT

The three post-stroke elderly people studied in this study have met the inclusion criteria and have characteristics. The elderly are given nursing care, especially in physical mobilization rehabilitation with the full support of the closest family. This study was conducted from April 11 to 23, 2022.

Client I: an elderly woman with the initials Mrs.L aged 65 years with a history of hypertension and had her first stroke in April 2022. During home treatment, the client obtained drug therapy Amlodiphine 0.5 Mg, Anastan 500 Mg, Huvaneuron 500 Mg. the client's family said that Mrs. had received physical rehabilitation but only once because the rehabilitation facility's mileage was far from her home. The results of the current study obtained data focusing on the patient's muscle strength, namely that the upper right extremity appears weak but can lift or resist gravity without load resistance. The lower right extremity is only capable of shifting and cannot lift independently. In the upper left extremity muscle strength there is no paralysis and the lower left extremity is able to move against gravity with little resistance. Researchers with the family have conducted a 10-day range of motion physical exercise program in the morning and evening. The client seemed very excited and on the fifth day his condition improved. On the fifth day, the upper right extremity improved. Originally only able to lift a little, at this time the client was able to hold a little prisoner in his hands. The condition is able to be maintained by the client until the last day of practice.

Client II : an elderly male with the initials Mr. J aged 67 years with a history of hypertension had a second stroke in December 2020. During the study, it was seen that the mouth was asymmetrical, speech was muttering and incoherent, difficulty swallowing, and data obtained on the right and lower extremities had contractions but were unable to move. In the upper left extremity there is complete paralysis, the lower left extremity atrophy occurs and there is no muscle contraction. Mr.J's family said during his home treatment, Mr. J took 0.5 Mg of Captopril treatment. Antalgin 500 Mg, CTM 0.5 Mg, Neurovit 500 Mg, and was never given rehabilitation or mobile exercises. Researchers provide exercises and mentoring to families to perform joint range of motion to clients for 10 days. On the ninth day there is an increase in muscle strength of the upper right extremity, initially unable to move to be able to lift a finger. On the tenth day, the upper left extremity undergoes a complete improvement in total paralysis in the presence of tricep muscle contractions.

Client III : a 69-year-old male (Mr. L) was first diagnosed with stroke in February 2022. When the assessment was obtained data focused that the client appeared weak, the extremities of the upper and lower left sides could not be moved, the mouth pouted inward, there were difficulties swallowing, mobility and fulfillment of physical needs were fully

assisted by the family. Muscle strength values in the upper right extremity 5, lower right 5, upper left 2, and lower left 1. During home treatment, the client was given treatment Captopril 0.5 Mg, Antalgin 500 Mg, Sakaneuron 500 Mg. The client's son said that his father was never trained in physical movement because he did not know the way and the impact caused. During this study, Mr. L was given nursing care with a family approach. Researchers provided education and accompanied Mr. L's family to train the range of motion (ROM) every day in the morning at 8 o'clock and in the afternoon at 4 o'clock. Researchers conduct examinations of the client's motor system including inspection, palpation, assessment of passive movements and active movements, as well as assessment of muscle strength. The procedure is carried out continuously for 10 days. On the eighth day there is an increase in muscle strength of the upper left extremity. At first, the upper left extremity was only able to shift the arm and there was an improvement in being able to move the arm against gravity for 2 seconds. On the ninth day, the upper left extremity is able to maintain the arm against gravity of 5 second accompanied by an increase in the ability of the muscles of the lower left extremity to be able to shift slightly. The condition can be carried out by the client until the tenth or last day of practice.

Table 1. The Value of Muscle Strength in the Three Elderly

Client	Muscle Strength Progress On Day									
	1	2	3	4	5	6	7	8	9	10
I (Mrs.L)	$\frac{3}{2} \mid \frac{5}{4}$	$\frac{3}{2} \mid \frac{5}{4}$	$\frac{3}{2} \mid \frac{5}{4}$	$\frac{3}{2} \mid \frac{5}{4}$	$\frac{4}{2} \mid \frac{5}{4}$	$\frac{4}{2} \mid \frac{5}{4}$	$\frac{4}{2} \mid \frac{5}{4}$	$\frac{4}{2} \mid \frac{5}{4}$	$\frac{4}{2} \mid \frac{5}{4}$	$\frac{4}{2} \mid \frac{5}{4}$
II (Mr.J)	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{1}{1} \mid \frac{0}{0}$	$\frac{2}{1} \mid \frac{0}{0}$	$\frac{2}{1} \mid \frac{1}{0}$
III (Mr.L)	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{2}{1}$	$\frac{5}{5} \mid \frac{3}{1}$	$\frac{5}{5} \mid \frac{3}{2}$	$\frac{5}{5} \mid \frac{3}{2}$

DISCUSSION

Stroke is a common acute cerebrovascular disease, with characteristics of sudden onset, rapid development, and many sequelae (8). Hemiplegia is one of the common sequelae and is also the main reason for the limited ability to control physical mobility and the reduced ability to live after the onset of the disease. The results of this study show that although stroke patients have received timely and effective treatment, there is still an incidence of hemiplegia and even muscle atrophy in patients. Limited physical mobility in stroke sufferers is usually caused by loss of motor function so that post-stroke patients generally experience muscle weakness in the limbs, postural disorders and even muscle atrophy (11). In the elderly, the decrease in muscle strength is not only caused by the spread of stroke, but also due to a decrease in the interaction of the peripheral nervous system, central hormonal, nutritional status, and lack of physical activity in the aging process (12). Previous studies have also explained that the incidence of stroke increases rapidly with age, even positively correlated to more severe strokes and even mortality in the population over 65 years of age (13).

As a tertiary prevention, rehabilitation programs play an important role in reducing the sequelae of stroke (14). This study has also described the results of a family-based stroke sufferer physical rehabilitation program, namely by training and accompanying the patient's family to provide daily exercise of their own range of motion to their family members who have suffered a stroke. The improved condition of physical mobility in the elderly post-stroke is evidenced by an increase in the value of muscle strength in their extremities. The process of restoring physical mobility in the three elderly has different characteristics. The

first stroke sufferer has a history of hypertension and experiencing an increase in muscle strength, especially in the upper extremities, takes five days of exercise. Patients with second stroke II who suffer a second stroke accompanied by hypertension take 9 days in achieving muscle strength repair. The third oldest stroke sufferer without comorbidities, takes 8 days to achieve an increase in muscle strength after having a stroke for the first time. Various factors that affect the progress of improving the condition of stroke sufferers were not studied in this study. However, in previous studies, it was stated that even gender factors, especially men, are more at risk of suffering a stroke because in men there is a testosterone hormone that can increase LDL or cholesterol levels in the blood (5). The improvement of the mobility ability of stroke sufferers depends on the initial handling of rehabilitation as explained in previous clinical studies that the optimal rehabilitation period for elderly patients with stroke hemiplegia is within 3 months after onset. As for reducing sequelae and improving exercise function, experts point out that early rehabilitation interventions are needed after the sufferer has an attack (15). In this study, the average patient had entered 12 months or even more after they had a stroke. So the increase in muscle strength that occurs has not been so significant close to normal. Previous studies have provided insights into post-stroke recovery to achieve the ability to walk requiring high-intensity rehabilitation. In acute stroke care, although most patients can return to walking, their mobility conditions are not optimal and still have limited walking at home. Balance, age, leg strength, nutritional status, and upper limb function are important predictors that play a role in post-stroke mobility

KETERBATASAN

This study consists of only three case report, it is necessary to follow up on the effects of the intervention and various influential factors for the development of future research.

ETIKA PENELITIAN

The study has obtained approval from respondents through their signed informed consent.

KONFLIK KEPENTINGAN

The authors declare that they have no conflicts of interest.

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PENUTUP

The conclusion of this case report demonstrates that family-based stroke sufferers' physical rehabilitation programs can be applied independently to improve range of motion or muscle strength in stroke sufferers who experience physical mobility barriers. The improved condition of physical mobility in the elderly post-stroke is evidenced by an increase in the value of muscle strength in their extremities. However, since this study consists of only one case report, it is necessary to follow up on the effects of the intervention and various influential factors for the development of future research.

REFERENSI

1. Jehaman I, Asiyah NUR, Berampu S, Tantangan R, Serdang D, Utara PS. Pengaruh Otago Exercise Dan Gaze Stability Exercise Terhadap Keseimbangan Pada Lanjut Usia. 2021;4(1).
2. Kiik SM, Vanchapo AR, Elfrida MF, Nuwa MS, Sakinah S. Effectiveness of Otago Exercise on Health Status and Risk of Fall Among Elderly with Chronic Illness. *J Keperawatan Indones*. 2020;23(1):15–22.
3. Saraswati, D R. Transisi Epidemiologi Stroke Sebagai Penyebab Kematian Pada Semua Kelompok Usia Di Indonesia. *J Kedokt [Internet]*. 2021;2(1):81–6. Available from: <https://conference.upnvj.ac.id/index.php/sensorik/article/view/1001>
4. Oktarina Y, Nurhusna, Kamariyah, Mulyani S. Edukasi Kesehatan Penyakit Stroke Pada Lansia. *Medic*. 2020;3(2):106–9.
5. Daulay NM, Hidayah A. Pengaruh Latihan Range Of Motion (ROM) Pasif Terhadap Kekuatan Otot dan Rentang Gerak Sendi Ekstremitas Pada Pasien Pasca Stroke. *J Kesehat Ilm Indones (Indonesian Heal Sci Journal)*. 2021;6(1):22.
6. Lindawati NY, Kurniawati E, Puspitasari D, Pratimasari D. Peningkatan Kualitas Hidup Lansia dalam Penanganan Stroke bagi Kader PKK dan Kesehatan di Giliran, Banjarsari, Surakarta. *J Surya Masy*. 2019;1(2):139.
7. Tao J, Yu S. Developing conceptual pss models of upper limb exoskeleton based post-stroke rehabilitation in China. *Procedia CIRP [Internet]*. 2019;80:750–5. Available from: <https://doi.org/10.1016/j.procir.2019.01.031>
8. Ning M, Chen F, Wu H, Zheng H, Zheng C, Li S. Effect of Early Rehabilitation and Nursing Intervention on the Rehabilitation Prognosis of Elderly Stroke Hemiplegia Patients in the Department of Neurology. *Appl Bionics Biomech*. 2022;2022.
9. Hashim NN, Azizan A, Rahman F. Exercise training with adaptation activities on strength and depression in elderly with post-stroke Dementia: A case study. *Int J Aging Heal Mov*. 2022;4(1):1–9.

10. Sheehy L, Taillon-Hobson A, Sveistrup H, Bilodeau M, Finestone H. Implementation of a randomized controlled trial on an inpatient stroke rehabilitation unit: Lessons learned. *Contemp Clin Trials Commun* [Internet]. 2020;18:100563. Available from: <https://doi.org/10.1016/j.conctc.2020.100563>
11. Sumarni T-, Yulastri Y. Latihan Range of Motion Terhadap Rentang Gerak Sendi Ekstremitas Atas Pasien Stroke di RSUD M.Natsir. *J Sehat Mandiri*. 2021;16(2):109–17.
12. Nayasista AH, Tinduh D, Alit Pawana IP, Mei Wulan SM, Utomo DN, Soenarnatalina M. Effect of combined locomotor training and aerobic exercise on increasing handgrip strength in elderly with locomotive syndrome: A randomised controlled trial. *Ann Med Surg* [Internet]. 2022;78(6):103800. Available from: <https://doi.org/10.1016/j.amsu.2022.103800>
13. Gueye T, Dedkova M, Rogalewicz V, Grunerova-Lippertova M, Angerova Y. Early post-stroke rehabilitation for upper limb motor function using virtual reality and exoskeleton: Equally efficient in older patients. *Neurol Neurochir Pol*. 2021;55(1):91–6.
14. Yamaura R, Kaneko T, Ishikawa KB, Ikeda S, Fushimi K, Yamazaki T. Factors Associated with Time to Achieve Physical Functional Recovery in Patients with Severe Stroke After Inpatient Rehabilitation: A Retrospective Nationwide Cohort Study in Japan. *Arch Rehabil Res Clin Transl*. 2022;100229.
15. Fini NA, Bernhardt J, Churilov L, Clark R, Holland AE. Adherence to physical activity and cardiovascular recommendations during the 2 years after stroke rehabilitation discharge. *Ann Phys Rehabil Med* [Internet]. 2021;64(2):101455. Available from: <https://doi.org/10.1016/j.rehab.2020.03.018>