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The Effectiveness Massage Therapy on Motoric Status among Non-Hemorrhagic Stroke Patients

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Abstract. Background – Stroke is the third largest cause of disability globally, representing a high economic and social burden on society. **Objectives -** The study aimed to determine the effectiveness of massage therapy on motor status among non-hemorrhagic stroke patients. **Method –** This study was a literature review. The article was searched using Science Direct, PubMed, Elsevier, Garuda Portal, Pro-quest, EBSCO, National Library, Google Scholar. The term keywords were massage, aromatherapy, motor status, stroke patients. **Results –** A total of 25 journals from 7,747 published journals were identified based on inclusion and exclusion criteria. This shows massage therapy was an intervention that can be applied to improve motor status in non-hemorrhagic stroke patients and does not cause harmful effects to be carried out as an intervention. **Conclusion –** The focus form of the intervention provides feedback or information that can be on motor status. Intervention in the form of massage therapy is one of the complementary therapies that can be used by health professionals in handling and improving motor status in non-hemorrhagic stroke patients.

Keywords: *Massage Therapy, Motoric Status, Stroke Patients.*

Introduction

Worldwide, cerebrovascular accidents (stroke) are the second leading cause of death and the third leading cause of disability. Stroke was the second leading cause of death globally for the 15 years to 2018 and has maintained its status as one of the world's biggest killers. Stroke is also the third-largest cause of disability globally, representing a high economic and social burden on society(1). Stroke is potentially lethal and causes a limitation of symptoms for motor and sensory dysfunction [2]. Stroke is a cardiovascular disease of neurological emergency, the sudden death of some brain cells due to lack of oxygen when blood flow to the brain is lost due to blockage or rupture of blood vessels [3, 4].

World Health Organization (WHO) stated that in 2016, an estimated 41 million deaths occurred due to non-communicable diseases (NCDs), accounting for 71% of the total 57 million deaths. The majority of these deaths were caused by the four main NCDs, namely: cardiovascular disease (17.9 million deaths; accounting for 44% of all NCD deaths); cancer (9.0 million deaths; 22%); chronic respiratory disease (3.8 million deaths; 9%); and diabetes (1.6 million deaths; 4%)[5].

Globally, 70% of strokes and 87% of stroke-related deaths and disability-adjusted years of life occur in low- and middle-income countries. Over the decades, the incidence of stroke has decreased by 42% in high-income countries(3).

In Indonesia, 500,000 people have a stroke every year, of which 125,000 people die, and the rest have mild or severe disabilities. The incidence of ischemic stroke is about 80% of the total stroke cases, while the incidence of hemorrhagic stroke is 20% of the total stroke cases(6).

The results of basic health research 2018, the prevalence of stroke in Indonesia is increasing. Stroke cases with patients aged over 15 amounted to 10.9%, the highest stroke diagnosed by health workers aged 75 years and over (50.2%) and the lowest at the age of 15-24 years (0.6%). Based on the residence, the prevalence of stroke in urban areas is higher (12.6%) than in rural areas (8.8%). From the diagnosis data, the incidence of stroke in Central Java in 2018 was 11.51%.[6]

The stroke will impact various body systems, including causing paralysis or problems controlling movement, sensory disturbances, pain, problems in memory use, and emotional disturbances [7]. The deficit caused is a decrease in motor function, which can ultimately affect mobility[7, 8]. Research shows stroke survivors after six months will experience the impact of 50% hemiparesis, 30% unable to walk without assistance, 46% cognitive deficits, 35% depressive symptoms, 19% aphasia, 26% dependent on activities of daily living(9).

Current technological advances support comprehensive treatment and care for stroke patients, and appropriate therapy is needed[10]. There are two stages of treatment; the first is acute to save neurons and prevent pathological processes that can threaten brain function. This stage is needed to repair and maintain optimal brain function. The second stage is a post-acute or comprehensive treatment that minimizes disability. The therapy target is focused on rehabilitation, prevention of complications so that they can return to meaningful activities[11].

Management of hemiparesis that occurs in stroke patients is aimed at improving motor function and preventing contractures. In addition to muscle weakness, common manifestations of upper extremity motor impairment include muscle weakness or contractures, changes in muscle tone, joint liability, and impaired motor control. This disorder causes disability in general activities such as reaching, picking up, and holding objects[12].

Management of stroke patients with hemiparesis can be in the form of interventions massage to improve motor status to minimize symptoms and complications. The mechanical effect caused is the stretching of the muscles. The

massage mechanism is by applying mechanical pressure to muscle tissue to reduce tissue adhesion[13]. Increases tendon muscle by mobilization and provides a lengthening effect on connective tissue. The increase in muscle strength reduces muscle-tendon stiffness. The study results show that massage can improve motor skills and various kinds of movements in children with cerebral palsy. Massage therapy increases the erector temperature of the vast laterals muscle and affects the blood flow of the tissue being massaged. The effects of massage include causing relaxation in the patient and increasing sweat production and blood flow to the skin, which helps lower the hormone cortisol[14].

Massage therapy has been shown, like Thai massage and herbal treatments, to improve daily function, mood, pain, and sleep patterns when given to stroke survivors[15]). Thai massage involves deep massage and passive stretching of the affected muscles. The practitioner uses the thumb, elbow, palm, and foot to apply continuous mechanical pressure during the massage[16]. It has also been shown that the Malay sequence, a traditional Malay massage technique, provides a positive experience[17]. Improved speech, fine motor skills, and daily functions for stroke sufferers [18].

Massage therapy is a complementary therapy that stroke patients can use. Followed by the results of research conducted on stroke patients, stroke patients using complementary massage therapy aims to overcome the symptoms and complications of a stroke. Relaxation massage using deep massage and passive stretching for stroke patients aims to stimulate muscle strength. Major signal points (MSP) or massage points used to increase motor strength and reduce hypercholesterolemia in stroke patients are located on the face, back, arms, shoulders, neck, and legs.

Symptoms in stroke patients who experience motor disorders increase the stretch reflex in muscle and tendon tone excessively[19]. Increased muscle resistance can be caused by reflex hyperexcitability and can change the nature of muscle tissue. Massage as a complementary nursing intervention aims to inhibit nerve activity, reduce muscle stiffness, and improve the surrounding connective tissue.

The previous studies found that massage positively affects muscle strength, improves motor function, functional status, and anxiety in stroke patients. This intervention also affects gross motor scores and sensory sensitivity behavior among children[19].

Previous interventions carried out to improve motor status in stroke patients are in the form of ROM interventions. The hypnosis therapy in the research results can increase muscle strength and range of motion in stroke patients in 32 stroke patient respondents. Hypnosis therapy and ROM exercises are given two times a day for 30 minutes in 30 minutes in 3 days. In the intervention group, the increase in upper muscle was 1.06 (43.44%) (p=0.000), while in the control group, the average muscle increase was 0.13 (4.8%) (p=0.162), which showed no significant difference with the control group[20].

Based on the study results on 38 respondents of non-hemorrhagic stroke patients, the 14-point acupressure intervention increased the muscle strength of the upper and lower extremities from day 2 to day 7 in the intervention group reaching an average value of 3.95. The control group experienced an increase from day 2 to day 7, getting an average value of 2.16. This shows that the improvement in the range of motion in upper and lower extremities among intervention and control groups has increased. In the intervention group, the increase in range of motion occurs more quickly. In the intervention group, the improvement of the upper range of motion began to increase on day 3 to day 7, reaching an

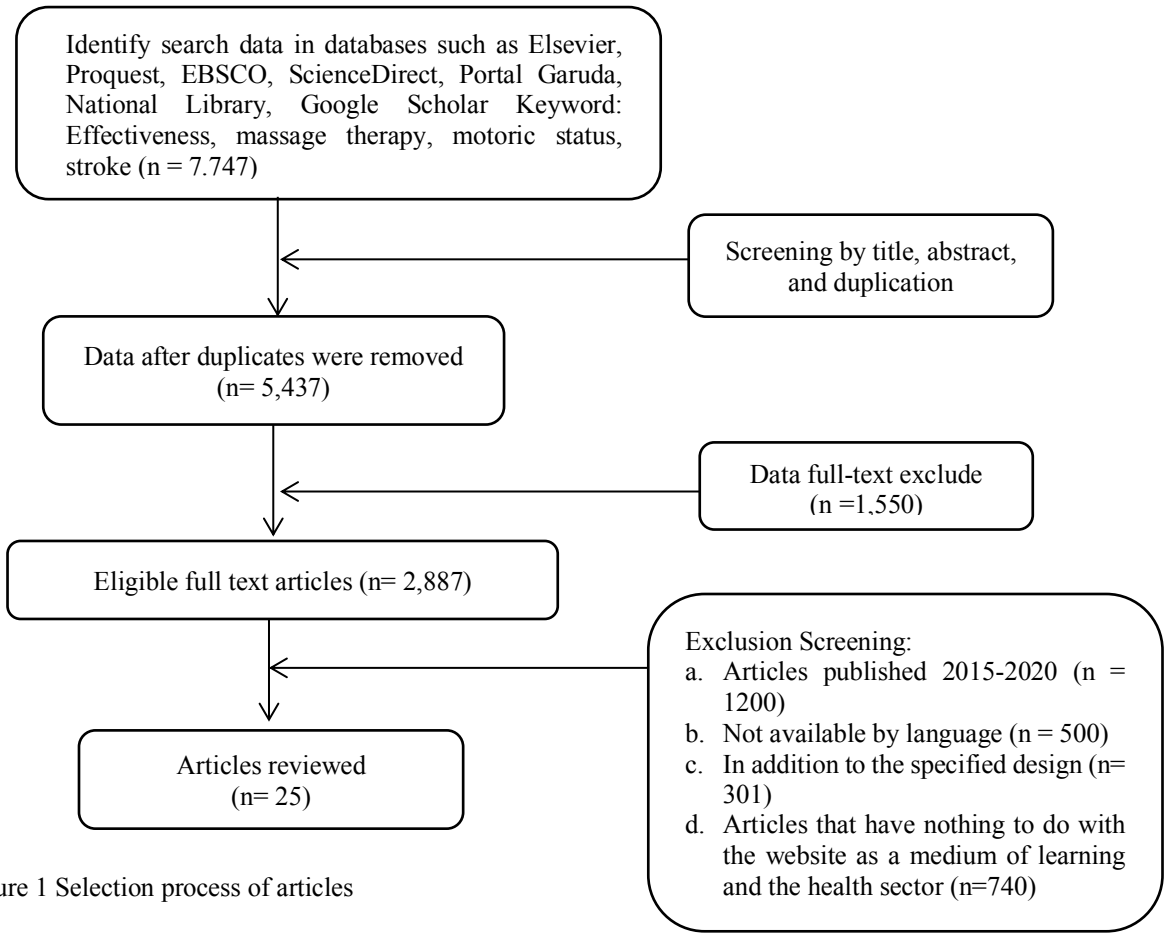

Figure 1 Selection process of articles

The average value of 65. While in the control group, an improvement from day 5 to 7 reached an average value of 49.47[21].

Various descriptions of phenomena on this background need the development of learning innovations for health institutions in carrying out nursing actions as an alternative to improving motor status in stroke patients, one of which is massage therapy.

THEORETICAL FRAMEWORK

The design of this study uses research with the Preferred Reporting Items for Systematic Literature Review (SLR) model. Systematic Literature Review is an organized, precise, comprehensive literature study by identifying, analyzing, evaluating, and interpreting all research findings on research topics to answer research questions relevant. With the use of the SLR method, a systematic review and identification of journals can be carried.

Out, which in each process follows the steps or protocols that have been set[22].

SLR research aims to help researchers better understand the background of the study that is the subject of the topic being sought and understand why and how the results of the research can be used as a reference for new research. The advantage of using systematic reviews is that it provides a summary of evidence for clinicians and need makers who do not have much time to search for a large number of primary evidence and understand one by one this study using systematic literature reviews.

METHODS

Literature Search Literature

The relevant articles were searched online, such as MEDLINE, Academic Search Complete, ACM Digital Library, Elsevier (SCOPUS), Emerald, IEEE Xplore, PubMed, Science-Direct, and Google

Scholar Garuda Portal, National Library. The keyword of searching the articles was massage Therapy, Motoric Status, Stroke Patients.

Selection of Literature

After collecting the articles, researchers divided the articles following the inclusion criteria. Firstly, researchers read the title and abstract, which are relevant would be included for reviewing. Then read the complete or partial article that was not eliminated in the previous stage to determine whether the article should be included in the following study by the eligibility criteria.

Inclusion Criteria of Study

The inclusion criteria of this study comprised : (1) Population Non-hemorrhagic stroke patients; (2) The subject used is human; (3) Type of journal original article, research or journal review, available full text; (4) Theme of journal content is Theme of massage therapy, motor status, stroke; (5) Publication will start in 2015-2020; (6) The language used is Indonesian, Chinese, English, Francis.

Exclusion Criteria

The researchers excluded studies based on the following inclusion criteria: (1) Studies on patients other than stroke other; (2) Subjects than humans; (3) Type of journal is not the full text of journal; (4) Not related to the method interest; (5) Publication before 2020; (6) Language that included addition.

Statistical Analysis / Data Analysis

The data used in this study was a descriptive analysis of massage therapy intervention on the motor status of stroke patients, which was carried out by combining all data that met the inclusion criteria, analyzing the contents of the journals, the journals reviewed. The data that has been collected is then searched for similarities and differences and then conducts a discussion to conclude.

RESULTS

The articles analyzed in a systematic review were 25 articles. There were 6 articles from Indonesia, 5 from China, 3 from Iran, 3 articles from Australia. Another is an article from Japan, 1 article from Hungary, 1 article from Germany, 1 article from Brazil, 1 article from Sweden, 1 article from India, 1 article from Grace, 1 article from Poland, and 1 article from Romania.

Several studies demonstrated the massage therapy has 12 articles in a combination of massage therapy. Another study used ROM interventions (1 article). Only one study focused on acupressure, and other articles focused on interceptive accuracy, electricity, and arm flange test.

In a journal that was used as a reference in doing a systematic review, massage can be used and is helpful as an increase in motor status in stroke patients. It was in line with the purpose of this study, which is to determine the magnitude of the effect given after the intervention, which is being able to control motor status in stroke patients. As we know, non-hemorrhagic stroke or ischemic stroke is a stroke that occurs due to a blockage in the blood vessels in the brain. In post-stroke patients, disorders of the innervation pathways in the limbs can also cause paralysis. If the paralyzed nerves are not used, the muscle cells will shrink (atrophy). Massage is an effective way to increase blood circulation, including muscle cells.

DISCUSSION

This massage process helps heal and regenerate unused muscle cells during the acute phase of stroke. Massage combined with physiotherapy such as muscle stretching will improve motor function and reduce muscle and joint stiffness after stroke.

The study results revealed that massage therapy intervention sessions were very effective in improving the motor status of stroke patients. Massage will stimulate the sensory nerves and will be directly conveyed by the motor nerves to

the desired organ. These were non-invasive hemodynamic parameters that release serotonin, histamine, bradykinin, slow-reacting substances (SRS). It causes capillary and atrial dilatation and flare reactions, resulting in improved blood vessel microcirculation and steadily lower blood pressure. In mild stroke patients, when the stability of non-invasive hemodynamic parameters of stroke patients is maintained, it will be easier to restore motor status.

The results of Rahayu's research (2018) show that the massage therapy used effects improving the motor status of stroke patients. Massage Therapy is very effective in increasing the stimulation of muscle work in stroke patients. In this regard, it is recommended that this group of patients is prepared for intervention with massage therapy and aromatherapy because they are an appropriate combination in improving the motor status of non-hemorrhagic stroke patients. Several studies have assessed or reported the effectiveness of massage therapy on the motor status of stroke patients.

A previous study proved that the upper extremity muscle strength after *frirage* massage and acupressure was significantly different among the intervention group than the control group (1,64). This study demonstrated that the combination of *frirage* massage and acupressure also impacted muscle strength compared to the control group. Farage massage is a massage to perform body treatments that include friction, *effrage*, traction, and repositioning. At the same time, acupressure is a Chinese medicine technique using emphasis acupuncture points. In addition, massage is a manipulation that aims to relax tense muscles, improve blood and lymph circulation. Tight muscles can interfere with blood circulation, lymph vessels, and nerves. Adding acupressure on specific points around the extremities speeds up the recovery process of the part experiencing weakness.

The previous study demonstrated that Ayurvedic massage with massages carried out every day for ten sessions accompanied by steam applications with measurement of the results obtained by Brunn storm's foot development, time to reach a standing position requires very minimal time. Patients were categorized as patients with simple stroke or complicated stroke based on their pre-rehabilitation events. Patients classified as complex or straightforward patients who received ayurvedic massage had lower MAS. Patients can stand with minimal assistance more quickly and have better mobility. The results obtained from ayurvedic massage treatment in post-stroke patients with flaccidity can encourage faster standing with minimal help and reduce the need for anti-spastic drugs.

This literature study was conducted to review the extent of the program used as a learning medium in health education for stroke patients. The purpose of the intervention related to the use of this intervention was to provide interventions on how to increase muscle strength with treatment in the form of massage therapy in stroke patients. A literature study shows that educational interventions play a role in behavior change. Massage therapy and aromatherapy interventions are referred to as a form of independent intervention in helping to overcome health problems through learning activities for non-hemorrhagic stroke patients.

Research shows that respondents experience changes in scores that differ from one another. This is possible because respondents do massage therapy at home regularly. Therapy that is carried out still requires guidance and support from researchers. The role of the family is also very supportive.

The study results revealed that the intervention session was very effective in increasing muscle strength in the experimental group. The results of this study have agreed with the current hypothesis and are in line with other studies. The results of this study strengthen previous studies that considered the use of massage therapy and ylang aromatherapy interventions in non-

hemorrhagic stroke patients. According to the effects mentioned above, the intervention effectively increased muscle strength in the Experimental group and could be used in non-hemorrhagic stroke patients. Concerning these results, it is recommended that this group of patients is prepared for a class intervention with individual therapy. Several studies have assessed or reported the effectiveness of treatment to therapeutic massage in stroke patients. From this perspective, the results obtained are essential.

The high incidence of hypertension in the elderly demands health workers' role to prevent complications that can arise due to hypertension, such as stroke, heart attack, kidney failure, and vision damage. Until now, many researchers have developed non-pharmacological treatments to control blood pressure in patients with hypertension. Several studies have shown that non-pharmacological approaches can be used in patients with hypertension, such as stress reduction techniques, weight loss, restriction of alcohol, sodium, and tobacco. Exercise also increases high-density lipoprotein, and relaxation is a mandatory intervention that must be carried out in every hypertension therapy[23].

In theory, age is one of the risk factors for hypertension that cannot be controlled. The older a person gets, the higher their blood pressure, so older people tend to have a higher blood pressure than younger people. This is because the arteries lose elasticity or flexibility and blood pressure increases with age[23].

Improvements in hemodynamic measures were reported in studies that identified the effects of massage on individuals with hypertension. The reported decrease in pain intensity is in line with a recent meta-analysis showing a reduction in postoperative pain in patients after massage. Evidence suggests beneficial effects of massage in improving hemodynamic parameters and reducing pain and anxiety intervention. Massage appears to be a practical approach to improve several outcomes in ICU patients. It is essential to ensure the safety and feasibility of such interventions by training the person or caregiver, especially in cases where non-professionals carry out the intervention. In order to move towards broader implementation, provider-specific training and evidence-based guidelines, and unit-specific protocols will be essential and needed.

Research from Jokinen 2015 mentioned that cognitive impairment is common after stroke, but the prevalence and long-term significance of various neuropsychological deficits in functional outcomes are unknown. The frequency and prognostic value of domain-specific cognitive impairment were investigated in a large cohort of non-hemorrhagic stroke patients. After being evaluated by clinical and neuropsychological studies for three months post-stroke patients, this study studied consecutive patients (n=409) aged 55-58 years at the University Hospital of Helsinki, Finland. Damage was found in nine cognitive domains. Damage in this domain was determined according to age-appropriate normative data from a random healthy population. Functional disability was evaluated by MRS scale 3 and 15 months after stroke. Overall, 83% of patients showed impairment in one cognitive domain, while 50% had impairment in more than three domains.

Conclusion

From 26 journals that have been reviewed, massage therapy was an intervention that can be applied to improve motor status in non-hemorrhagic stroke patients and does not cause harmful effects to be carried out as an intervention. The focused form of intervention massage therapy provides feedback that can change motor strength in stroke patients and is safe for stroke patients. This is in line with previous studies that have proven that massage therapy can be used and is safe to use for conventional therapy performed on stroke patients.

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