

Pengaruh Latihan Bio Energy Power terhadap Aktivitas Kehidupan Sehari-hari pada Pasien Stroke di RSUP Yastroke Yogyakarta

The Effect of Bio Energy Power Exercise on Activities of Daily Living in Stroke Patients at Yastroke Yogyakarta

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Abstrak

Latar Belakang : Stroke merupakan manifestasi klinis dari gangguan fungsi otak secara fokal atau global yang terjadi secara mendadak, berlangsung lebih dari 24 jam atau dapat menyebabkan kematian tanpa disertai adanya kelainan pembuluh darah. Stroke juga merupakan urutan penyakit ketiga setelah penyakit jantung dan kanker yang menyebabkan kematian. World Stroke Organization tahun 2022 menunjukkan bahwa lebih dari 12,2 juta atau satu dari empat orang diatas usia 25 tahun akan mengalami stroke atau lebih dari 101 juta orang yang hidup saat ini. Data Survei Kesehatan Indonesia menunjukkan stroke mencapai 8,3 per mill. Dan salah satunya menyebabkan penurunan *activity daily living*. **Tujuan :** Penelitian ini bertujuan untuk mengetahui pengaruh *senam bio energy power* terhadap *activity daily living* pada pasien stroke di Yastroke Yogyakarta.

Metode : Desain penelitian menggunakan metode *quasi-eksperimental* dengan pendekatan *one grup desain pretest-posttest*. Sampel dalam penelitian berjumlah 16 orang pasien stroke yang berada di Yastroke Yogyakarta sesuai dengan kriteria inklusi. Alat yang digunakan dalam penelitian ini menggunakan kuesioner *Indeks Katz* yang diukur sebelum dan sesudah intervensi. Intervensi yang diberikan adalah *senam bio energy power* 2x dalam seminggu selama 4 minggu dengan waktu 20 sampai dengan 30 menit. **Hasil dan pembahasan :** Hasil uji menggunakan *wilcoxon signed-rank test* menunjukkan bahwa $p < 0,05$ ($p = 0,000$) hal ini menunjukkan adanya pengaruh signifikan dari *senam bio energy power* terhadap *activity daily living* pada pasien stroke dan intervensi ini dapat menjadi salah satu pilihan dalam rehabilitasi nonfarmakologis bagi pasien stroke terutama dalam meningkatkan kualitas hidup melalui peningkatan aktivitas fungsional pasien. **Kesimpulan :** *Senam bio energy power* ini memberikan pengaruh terhadap *activity daily living* pada pasien stroke.

Kata kunci: **Senam Bio Energy Power; Activity Daily Living; Stroke**

Abstract

Background: Stroke is a clinical manifestation of sudden focal or global brain dysfunction that lasts more than 24 hours or can result in death without any vascular abnormalities. It is the third leading cause of death after heart disease and cancer. According to the World Stroke Organization (2022), over 12.2 million people—or one in four individuals over 25 years old—may experience a stroke, with more than 101 million people currently living with the condition. Data from the Indonesian Health Survey reports a stroke prevalence of 8.3 per thousand. And one of them causes a decrease in daily living activities.

Purpose: This study aims to examine the effect of Bio Energy Power Exercise on the activities of daily living (ADL) in stroke patients at Yastroke Yogyakarta. **Method:** The research design uses methods using a quasi-experimental design with a pretest-posttest one-group approach. The sample consisted of 16 participants who met the inclusion criteria. Data were collected using the Katz Index questionnaire, administered before and after the intervention. The intervention involved Bio Energy Power Exercise performed twice a week for four weeks, with each session lasting 20 to 30 minutes. **Result:** The results of the test using the Wilcoxon signed-rank test showed that $p < 0.05$ ($p = 0.000$), this shows that there is a significant influence of bio energy power gymnastics on daily living activities in stroke patients and this intervention can be one of the options in non-pharmacological rehabilitation for stroke patients, especially in improving the quality of life by increasing the patient's functional activities. **Conclusion:** Bio Energy Power Exercise has a significant positive effect on the activities of daily living in stroke patients, highlighting its potential as a beneficial rehabilitation intervention.

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Doi : 10.35451/5eva0005

Received : April 22, 2025. Accepted: July 31, 2025. Published: October 31, 2025

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Keywords: *Bio Energy Power Exercise; Activity Daily Living; Stroke*

1. INTRODUCTION

The prevalence of non-communicable diseases is increasing at a faster rate than communicable diseases, with stroke being one of the most significant. Stroke is a clinical condition characterized by a sudden disruption of focal or global brain function, lasting more than 24 hours or potentially leading to death without any vascular abnormalities[1]. It is the third leading cause of death after heart disease and cancer[2]. According to the World Stroke Organization (2022), more than 12.2 million people—or one in four individuals over the age of 25—are at risk of experiencing a stroke, with over 101 million people currently living with the condition[3]. Data from the 2023 Indonesian Health Survey indicate that the incidence of stroke in Indonesia has reached 8.3 per thousand individuals aged 15 years and older, with Yogyakarta reporting the highest prevalence at 11.4 per 1,000 people[4]. There are two main types of stroke: hemorrhagic stroke, which results from the rupture of an artery in the brain[5] and non-hemorrhagic stroke, which occurs due to a blockage in blood flow to the brain caused by atherosclerosis[1].

Stroke can occur in individuals with several conditions, including hypertension, diabetes mellitus an unhealthy lifestyle, lack of physical activity, smoking, and hypercholesterolemia[5]. Its clinical symptoms include facial asymmetry, weakness on one side of the body, slurred speech, numbness or tingling sensations, sudden blurred vision, sudden headaches, and disturbances in homeostatic functions, such as vertigo or difficulty with movement coordination[6]. Stroke occurs when a blood vessel carrying oxygen to the brain becomes blocked due to a blood clot or minor bleeding, leading to brain cell death from a lack of oxygen and nutrients[1]. Prompt medical treatment is essential to minimize complications, as delays beyond three hours can result in permanent disability, muscle weakness or paralysis in one side of the body, muscle stiffness, impaired coordination or balance, loss of bladder control, and, in severe cases, death[7].

In addition, a decline in activity of daily living (ADL) is common due to impaired consciousness and dysfunction in specific brain regions caused by disrupted blood flow or ruptured blood vessels, this decline leads to deterioration or limitations in performing daily activities, resulting in dependency[8]. Several factors influence the decline in ADL, categorized into internal and external factors. Internal factors include age over 50, as aging leads to a decline in bodily functions[9], and the duration of stroke, as a prolonged condition further hinders the ability to perform ADL[10]. External factors include environmental conditions, as an unsupportive environment can cause stress, making patients feel like a burden to their families[11], family support is also crucial, as it can motivate patients in their recovery process[12]. *Activity daily living* serves as a measure of functional capacity related to daily activities, helping assess whether stroke patients require assistance[13]. One commonly used assessment tool is the Katz Index, which evaluates independence in activities such as bathing, dressing, toileting, eating, bowel and bladder control, and mobility[14]. The intervention applied in this study is Bio Energy Power Exercise, a form of self-therapy combining energy regulation and movement exercises to optimize the body's ability to heal itself, both physically and mentally[15]. The prescribed regimen includes sessions twice a week for four week[16][17].

Given these considerations, investigating the effects of Bio Energy Power Exercise on the activity of daily living (ADL) in stroke patients is both relevant and necessary, as this intervention has been underexplored in previous research. Most existing studies on Bio Energy Power Exercise have focused on its impact on Vo2Max in prison inmates[18] and its role in improving sleep quality among the elderly in nursing homes[16]. This study is unique in that it specifically examines how Bio Energy Power Exercise influences ADL in stroke patients and whether it enhances their functional independence. By integrating this intervention, the research aims to address functional limitations that could lead to dependency in stroke patients. Therefore, this study seeks to evaluate the effect of Bio Energy Power Exercise on ADL, identify impairments in daily activities, and assess the level of independence among stroke patient.

2. METHOD

2.1 Study Design

The design and method used are quasi-experimental which aims to determine the effect of bio energy power exercise on daily living activities in stroke patients. The design used is one group pre-test and post-test by conducting pre-test interviews with respondents, given treatment, then conducting post-test interviews again with the same respondents.

2.2 Population And Sample

The population consisted of 16 stroke patients according to the characteristics determined by the researcher. The sample in this study was determined using the Total Sampling method so that the sample was the same as the population, namely 16 stroke patients. The variables in the study were divided into 2, namely: The independent variable is bio energy power exercise and The Bound Variable is daily living activity.

2.3 Instrument and Research Method

The instrument in this study was the Katz Index questionnaire containing questions related to 6 daily activities. The data used in the study were primary data through data collection in the form of distributing questionnaires to respondents or their closest family.

2.4 Data Analysis

The data analysis conducted was descriptive statistical analysis to determine the characteristics of each respondent, the next stage was the normality test to determine whether the data distribution was normally distributed or not normally using the Shapiro-Wilk test, and the last stage was the hypothesis test using the Wilcoxon Signed-rank test because the data was not normally distributed and the Katz Index questionnaire data scale was ordinal.

3. RESULT

3.1 Distribution of Respondent

The characteristics of 16 respondents were determined based on age, gender, duration of stroke, history of stroke, and type of stroke. The following is the distribution of characteristics based on frequency and percentage presented in Table 1

Table 1. Distribution Respondent.

Characteristics	Frequency	Percentage
Age		
51-60	4	25,0%
61-70	9	56,3%
71-80	3	18,8%
Total	16	100%
Gender		
Male	6	37,5%
Female	10	62,5%
Total	16	100%
Long Stroke		
< 1 years	1	6,3%
1-5 years	8	50,0%
6-10 years	5	31,3%
11-15 years	1	6,2%
16-20 years	1	6,2%
Total	16	100%

History of Stroke		
Hypertension	7	43,8%
Cholestrol	2	12,5%
Diabetes	2	12,5%
Other history	2	12,5%
> 1 history	3	18,7%
Total	16	100
Type Stroke		
Hemorrhagic Stroke	5	31,3%
Non Hemorrhagic Stroke	11	68,7%
Total	16	100

Table 1 explains that the largest number of respondents aged 61-70 years was 9 people (56.3). Based on gender, the largest number was female with 10 people (62.5%). Based on the duration of stroke, the largest number was 1-5 years with 8 people (50.0). Based on the history of stroke, the largest number was hypertension with 7 people (43.8%). Based on the type of stroke, the most common were non-hemorrhagic strokes with 11 people (68.7%).

Table 2 shows that the results of the normality test using the Shapiro Wilk-test on the group before treatment with a P value = 0.021 and after treatment with a P value = 0.000, it can be concluded that from both P value < 0.05, the data is not normally distributed.

Table 2 Data Normality Test

Variable	Nilai p	
	Pre-Test	Post-Test
Normality of The Katz Index	0.021	0.000

Based on table 3, the results of the Wilcoxon test on the provision of bio energy power exercise on daily living activities with 16 respondents, the mean value of daily living activities before the intervention was 3.75 and after the intervention was 5.31. The SD value of daily living activities before the intervention was 1.291 and after the intervention was 1.078 with a P value of 0.000 ($P < 0.05$) so it can be concluded that this bio energy power exercise has an effect on daily living activities in stroke patients.

Table 3 The Effect of Bio Energy Power Exercise on Activity Daily Living

Variable	N	Mean	SD	P -Value
ADL (<i>pre-test</i>)	16	3.75	1.291	0,000
ADL (<i>post-test</i>)	16	5.31	1.078	

4. DISCUSSION

4.1 Characteristic on Age

Based on the research results, the majority of respondents were aged 61-70, amounting to 9 people (56.3%). This finding indicates that older adults are more susceptible to stroke, and this directly impacts their level of independence in performing Activities of Daily Living (ADLs). Advanced age is a significant risk factor for decreased functional ability, as during this phase the body undergoes various complex degenerative changes. One of the main impacts of the aging process is decreased blood perfusion to the brain caused by atherosclerosis, the buildup of fatty plaques on blood vessel walls that narrow the lumen and impede blood flow. When the supply of oxygen and nutrients to brain tissue is disrupted, it becomes damaged or dies, ultimately leading to a significant decline in motor and sensory function. This functional decline is the primary reason why elderly stroke patients have a harder time regaining independence in daily activities. This is supported by previous research [19], which found that the risk of stroke increases significantly after the age of 55. In addition to vascular and metabolic factors, limitations in the neural recovery process are also a major obstacle. In this regard, the concept of neuroplasticity—the brain's ability to form new neural pathways and redirect functions to other brain areas—becomes crucial. However, with advancing age, neuroplasticity tends to decline drastically, making the rehabilitation process to restore patient independence more complex and time-consuming. This finding is consistent with research [23]

which showed that elderly stroke patients had lower ADL scores than younger age groups. Most of them experience high dependence on others in carrying out basic activities such as bathing, dressing, eating, and moving around.

4.2 Characteristic on Gender

Based on gender, the majority of the gender is female, as many as 10 people. This is because in women who have gone through menopause, the production of the estrogen hormone will decrease, where this hormone has many benefits for the body[20]. And in women who have atrial fibrillation or heart rhythm disorders, it will cause blood clots to form in the heart which will block blood vessels in the brain and pregnancies with preeclampsia which is characterized by high blood pressure will increase the risk of vascular disease.

4.3 Characteristic on Long Stroke

Based on the duration of stroke, the most average is 1-5 years, as many as 8 people (80.0%). This is because most of the recovery phase in stroke occurs 2 years to 3 years, especially 6 months after stroke, where the faster the rehabilitation phase, the better the opportunity to be independent and the patient will feel accustomed to the passage of time and the exercises carried out[21].

4.4 Characteristic on History Stroke

Based on the cause of stroke, the average stroke patient has the most hypertension, as many as 7 people (43.8%). Hypertension occurs due to increased peripheral blood pressure which causes a poor hemodynamic system and thickening of the blood vessels and hypertrophy of the heart muscle[22]. In addition, there will be damage to the artery walls which will encourage plaque deposition which will increase the risk of stroke[23].

4.5 Characteristic on Type Stroke

Based on the type of stroke, the most common is non-hemorrhagic stroke as many as 11 people (68.7%). Non-hemorrhagic stroke occurs due to unhealthy eating patterns, for example, high fat content, a history of hypertension, and lack of exercise[24]. In addition, based on other research it states the high incidence of non-hemorrhagic stroke is because respondents do not limit their consumption of fast food and foods that are processed by frying or using coconut milk, such as seafood, salted fish, offal, and vegetables that use coconut milk because these food ingredients are cheap and easy to find, thus increasing the frequency of consuming foods high in salt and high in fat[25]. This can lead to accumulation plaque or atherosclerosis.

4.6 The Effect of Bio Energy Power Exercise on Activity Daily Living

Based on the statistical analysis, it can be concluded that Bio Energy Power Exercise has a positive effect on ADL. This indicates that the exercise plays an important role in preventing further deterioration in daily function. Data from the Katz Index questionnaire in this study also showed changes in the scores of 16 respondents between before treatment (pre-test) and after undergoing treatment (post-test) which is in line with their studies have reported that interventions like seated Tai Chi show significant improvements in functional capacity; for example, one study reported a p-value of 0.824 one week after the intervention, which then improved to 0.001 at weeks 4, 8, and 12[26].

In addition, other studies also state that active Range of Motion exercises in stroke patients can also increase daily living activities through stimulation of motor neurons (brain) with the release of transmitters (acetylcholine) to stimulate cells by activating calcium so that protein integrity occurs. If calcium and troponin C are active, actin and myosin can be maintained so that skeletal muscle function can also be maintained so that contractions and increased muscle tone will occur which will affect muscle strength in stroke patients which will make it easier to

carry out daily activities[27].

Bio Energy Power Exercise is a form of autotherapy that combines energy training with movement, designed to optimize the body's capabilities[15]. Although this exercise primarily involves breathing techniques, it also incorporates self-directed movements performed without assistance, thereby enhancing flexibility and muscle strength. It also incorporates self-directed movements performed without assistance, thereby enhancing flexibility and muscle strength. This study aligns with previous research showing that active range-of-motion exercises—where patients perform movements independently—positively impact activities of daily living (ADL) in stroke patients[28]. The exercise specifically targets improvements in ADL, enabling patients who previously required assistance in their daily activities to become independent, ultimately reducing the prevalence of stroke-related functional limitations.

4. CONCLUSION

This study indicates that Bio Energy Power Exercise significantly improves activities of daily living, which is crucial for preventing further functional decline and enhancing the quality of life in stroke patients. Moreover, it is important to conduct long-term evaluations to understand the sustained effects of this exercise. Future research should incorporate larger sample sizes and extend the duration of the intervention to further validate these results.

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