KIAN JOURNAL
ISSN 2964-3910
PREFIX DOI: 10.56359/kian
Vol. 4 No. 1 Page Number 1-10

The Effect of Speech Therapy on Aphasia Levels in Non-Hemorrhagic Stroke Patients in the Seruni Room of Rsud Hajjah Andi Depu

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DOI: https://doi.org/10.56359/kian.v4i1.529

ABSTRACT

Introduction: *Non-hemorrhagic stroke is a brain disorder caused by the cessation or blockage of blood flow to the brain. Aphasia is a disorder in language function that arises from brain injury. Speech therapy is a rehabilitation process for people with communication disorders, so that they can interact more effectively. The use of the AIUEO method in therapy can help improve pronunciation, so that it is more easily understood by others by moving the tongue, lips, and facial muscles.*
Objective: *This study aims to determine the effect of speech therapy on the level of aphasia in patients who have non-hemorrhagic stroke in the Seruni Room of RSUD Hajjah Andi Depu.*
Method: *This research design is quantitative with a pre-experimental approach. The method used is one group pretest-posttest design.*
Results: *The results of statistical analysis using the Wilcoxon Signed Ranks Test with the help of SPSS showed a significant value (2-tailed) of 0.004. This means (p<0.05), so that the alternative hypothesis (Ha) is accepted and the null hypothesis (H0) is rejected. Thus, there is a positive effect of speech therapy on the level of aphasia in non-hemorrhagic stroke patients in the Seruni Room of RSUD Hajjah Andi Depu.*
Conclusion: *A 2024 study at Hajjah Andi Depu Hospital found that speech therapy significantly improved aphasia in non-hemorrhagic stroke patients. Patients' aphasia scores significantly improved after speech therapy (p < 0.05).*

Keywords: Non-hemorrhagic stroke, aphasia, speech therapy

Introduction

Stroke is a condition that causes neurological deficits due to bleeding or blockage, characterized by symptoms according to the area of the brain affected. This disease can be fatal, being the third cause of death after coronary heart disease and cancer, both in developed and developing countries (Setiawan et al., 2021). In recent years, stroke has not

only affected middle-aged and elderly individuals, but also more and more patients under the age of 40. This is largely due to unhealthy living habits, especially a high-cholesterol diet. Observations at the hospital show that stroke in productive age often occurs due to busy work that causes lack of physical activity, poor sleep, and high stress, all contributing as causative factors (I Gusti Nyoman Cahya Aditya, Gede Angga Pradipta, 2024; Chrisanto et al., 2022).

Stroke presents suddenly with rapid progression, is characterized by focal or global neurological deficits, and can result in death. The disease is caused by a non-traumatic blood flow disorder that stops the blood supply to certain areas of the brain. The lack of oxygen and nutrients triggers biochemical reactions, which can damage or kill brain nerve cells. As a result, limb paralysis, speech impairment and loss of consciousness may occur. Stroke can be ischemic (blockage) or hemorrhagic (bleeding) (Chrisanto et al., 2022).

According to the World Health Organization (WHO), stroke is defined as a brain functional disorder that occurs suddenly, with clinical symptoms that are focal or global and last for more than 24 hours (Permatasari, 2020). Every year, around 15 million people in the world experience a stroke; 5 million of them die, and 5 million experience permanent disability (Bella et al., 2021).

In Indonesia, stroke is the leading cause of death and neurological disability, with a prevalence of 10.9%. Between 0.6% and 14.2% of stroke cases occur in people aged 15 to 54 years. Stroke treatment costs in Indonesia are high, reaching around 10.7% of total household income (Riyadina et al., 2020). In West Sulawesi, the prevalence of stroke in 2018 was recorded at 2.8%. At RSUD Hajjah Andi Depu, non-hemorrhagic stroke patients increased from 124 cases in 2022 to 146 cases in 2023.

Initial observations at the hospital showed that stroke patients with verbal communication disorders did not receive speech therapy, as nurses only focused on checking vital signs and medication when patients were admitted. Stroke can be divided into two types: non-hemorrhagic (87% of total cases, caused by thrombosis or embolism) and hemorrhagic (13%) (Haiga et al., 2022).

The physical effects of stroke include weakness, stiffness and paralysis of the extremities, leading to decreased muscle tone and loss of movement. Without proper treatment, individuals can suffer permanent disability. In addition, stroke carries a significant psychosocial impact, where physical changes make patients feel helpless in their daily activities (Nuraliyah & Burmanajaya, 2019).

Loss of physical function often impacts mental health. Feelings of helplessness arise in response to the illness, in which individual characteristics and the way they deal with problems play a role. Some other psychosocial symptoms include memory impairment, decreased quality of life, one-sided facial or limb paralysis, dysarthria (speech impairment), and aphasia. Aphasia can make it difficult for patients to speak, write and understand the speech of others, which often makes them feel alienated from their environment (Kartika et al., 2022).

Aphasia, caused by damage to the cortex in Broca's area, can lead to loss of speech although patients can still express their thoughts through writing. Stroke affects the structure and function of the brain, either through blockage (ischemic) or rupture of blood vessels

(hemorrhagic), which disrupts neurotransmitter function and impacts the cognitive condition of the patient (Yunita Suryani, 2019).

One of the rehabilitation measures for aphasia is speech therapy, which aims to help individuals with communication problems. AIUEO therapy is a method designed to improve the speech of stroke patients with aphasia through practicing tongue, lip, and word pronunciation movements. According to Haryanto et al. (2014), speech therapy is very simple and easy to do. Several studies have shown that after speech therapy, patients' speech improves. Puspitasari (2017) reported that the value of speech ability before AIUEO therapy was 13.86, increasing to 15.14 after therapy with a p-value of 0.035 ($p < 0.05$), indicating a positive impact of therapy. Wahyu et al. (2019) also noted that before therapy, 89% of patients were in the moderate speech ability category; after therapy, this number was reduced to 78%, with a p-value of 0.007 ($p < 0.05$), indicating a significant effect of speech therapy on the speech ability of patients with aphasia due to stroke.

Objective

This study aims to determine the effect of speech therapy on the level of aphasia in patients who have non-hemorrhagic stroke in the Seruni Room of RSUD Hajjah Andi Depu..

Method

Design and setting

The design of this study is quantitative and adopts a pre-experimental research approach. This approach was chosen because it allows researchers to provide treatment or intervention to the object being studied. The specific design applied in this study is a one group pretest-posttest design, in which the object of research will undergo a pretest stage before receiving treatment. After the intervention is implemented, a posttest stage will be conducted to evaluate the impact of the treatment that has been given. (Ni Made Dwi Yunica, Putu Indah Sintya Dewi, Mochamad Heri, 2019) . The research instruments used observation sheets and standard operating procedures (SOP) for speech therapy exercises.

Population and sampling

Population in the context of research can be defined as all elements involved in research, which includes objects and subjects with certain characteristics and characteristics. Basically, the population consists of all members of a group, which can be humans, animals, events, or objects, which are in a specific environment and are planned to be the source of the final conclusion of the research results.

Examples of populations are not only limited to individuals, such as teachers and students, but can also include organizations such as school institutions, various curricula, facilities in schools, and the relationship between schools and the community. In addition, populations can also include company employees, types of forest plants, types of rice, marketing activities, production results, and many more. In other words, the population covers a wide range of elements, from humans to creative works and other natural objects.

This shows the diversity of populations that can be studied in various fields of science and research. (Adnyana, 2021) .

The population in this study were all stroke patients in the Seruni Room of RSUD Hajjah Andi Depu. The population of inpatients with a diagnosis of *Non Hemorrhagic* Stroke last in 2023 was 146 patients.

A sample refers to a subdivision of a population selected for observation or research purposes. By using a sample, researchers can make more efficient and cost-effective generalizations from the results obtained on that sample to a larger population.

However, it is important to note that sample selection must be done carefully in order to provide an accurate picture of the overall population. If the sample used is not representative or does not reflect the characteristics of the population well, then there is a high risk of inaccuracies in extrapolating the results of the study. Research results drawn from inappropriate samples can lead to misleading and biased conclusions, thus reducing the validity and reliability of the research conducted. Therefore, an appropriate sample selection strategy is necessary to ensure that the research results are acceptable and reliable. (Susanto et al., 2024) .

Various sampling methods are available, including random samples, stratified samples, and stratified samples. The choice of an appropriate sampling technique will depend on the characteristics of the population, the purpose of the study, and the availability of resources (Susanto et al., 2024) . The sample in this study was 10 people who were considered representative of the entire population with *inclusion* and exclusion criteria.

In this study, the sampling technique used was consecutive sampling. This technique involves finding respondents who fit the predetermined inclusion and exclusion criteria, until the required number of samples is met.

Instrument and measurement

Standard Operating Procedure (SOP), speech therapy is conducted twice a day for 7 days (morning at 09.00 and afternoon at 15.00) for 30 minutes. Speech therapy is performed by a speech therapist who has passed speech therapy education. The measuring instrument used to determine speech ability in aphasia patients uses the *Frenchay Aphasia Screening Test (*FAST*).* FAST consists of 18 question items that examine four aspects of language. The first aspect is comprehension in the form of instructions to pay attention to the picture, listen to what the nurse says and point to the picture in question with a score of 0-10. The second aspect is pronunciation in the form of showing a picture of a natural scene and then instructing the patient to say as many names as possible from the picture shown with a score of 0-10. The third aspect is reading in the form of showing a schematic of a natural scene and a reading card, instructing the patient to read silently then instructing the patient to point to the natural scene schematic with a score of 0-5. The fourth aspect is writing in the form of showing a natural scene scheme and instructing the patient to write the name of the picture seen as much as possible using the non-dominant hand for 5 minutes with a score of 0-5. The total

score is 0 - 30, said to be aphasia if the score is <27 for elderly >60 years and <25 for elderly <60 years.

Data collection and analysis

Primary data in this study were obtained from respondents through observation. Primary data is obtained by directly interviewing respondents using observation sheets based on the variables studied. Secondary data is data that provides information indirectly to researchers, such as data provided by Hajjah Andi Depu Polewali Mandar Hospital.

In this study, assessment of aphasia scores was conducted using the Frenchay Aphasia Screening Test (FAST), which consists of 18 question items specifically designed to evaluate four main aspects of language ability. The first aspect is comprehension, where the patient is given instructions to pay attention to the picture displayed, listen to what is said by the nurse, and point to the corresponding picture based on those directions. The second aspect focuses on pronunciation, which involves the patient looking at a picture of a natural scene and being asked to pronounce as many names relevant to that picture as possible, with scoring also on a scale of 0 to 10. The third aspect is reading; here the patient is shown a schematic of a natural scene along with a reading card, and they are directed to read the text silently and then point to the relevant schematic, with scoring set between 0 to 5. Finally, the fourth aspect is writing, where the patient demonstrates their ability by writing the names of the pictures from the natural scene schematic using their non-dominant hand for five minutes, with scoring set between 0 to 5.

Result

Research on the effect of speech therapy on the level of aphasia in non-hemorrhagic stroke patients in the Seruni Room at Hajjah Andi Depu Hospital. Based on the results of data processing that has been done and adjusted to the research objectives, the results are arranged in the form of a table as follows:

Table 1. Distribution of Respondents Based on Demographics

Variables	Frequency (f)	Percentage (%)
Gender		
Male	4	40
Female	6	60
Age		
46-55 Years	2	20.0
56 -65 Years	5	50.0
>65 Years	3	30.0
Education		
SD	5	50.0
SMP	4	40.0

High School	1	10.0
Jobs		
Farmers	4	40.0
IRT	6	60.0

Table 1 shows that the most respondents with female gender were 6 people (60.0%), while respondents with male gender were 4 people (40.0%). Respondents with ages 46-55 years were 2 people (20.0%), ages 56-65 years were 5 people (50.0%), ages >65 years were 3 people (30.0%). Respondents with elementary school education were 5 people (50.0%), junior high school as many as 4 people (40.0%), high school as many as 1 person (10.0%). Respondents with farmer occupations were 4 people (40.0%), housewives were 6 people (60.0%).

Table 2: Aphasia Level Pres Test-Post Test

Aphasia	Mean	SD	Min	Max
Pre	23.50	850	22	25
The Post	27.70	823	27	29

Based on table 2 shows that from the research there are changes in the level of aphasia in non-hemorrhagic stroke patients before speech therapy, it can be seen that the value of the initial respondent's aphasia level is found that the mean value of the pre aphasia level is 23.50 and with a standard deviation of 850, with the lowest value of 22 and the highest value of 25. While the final aphasia level value is found that the mean value of the post aphasia level is 27.70 and a standard deviation of 823, with the lowest value of 27 and the highest value of 29

Table 3. Normality Test Results

	Shapiro-wilk			
	Statistics	**df**	**p-value**	**Conclusion**
Pre	0.906	10	0.258	Normal
The post	0.781	10	0.008	Not Normal
Difference in Aphasia Level	0.794	10	0.012	Not Normal
Difference Data Transformation	0.782	10	0.009	Not Normal

Based on table 4.3 obtained the results of the Shapiro Wilk normality test, namely obtained Pre aphasia level p=0.258 (p<0.05) and Post aphasia level p=0.008 (p<0.05), the difference in aphasia level p=0.012 (p<0.05) and post transformation aphasia level p=0.009 (p<0.05), it can be concluded that the pre and post aphasia levels are not normal, so the data is not normally distributed, so the statistical test used is the Wilcoxon test. Bivariate analysis

was conducted to determine the effect of speech therapy on the level of aphasia in non-hemorrhagic stroke patients.

Table 4.Wilcoxon Signed Ranks Test Results

Variables	Pre		The post		Mean differences	*p-value*
	Mean (SD)	Median (min-max)	Mean (SD)	Median (min-max)		
Aphasia Level	23.50 (850)	23.50 (22-25)	27.70 (823)	27.50 (27-29)	-4.200	0.004

Based on table 4.4 shows that the level of aphasia of non-hemorrhagic stroke patients before the provision of speech therapy is mean 23.50, SD 850, median 23.50, minimum 22 and maximum 25. While the level of aphasia after being given speech therapy is mean 27.70, SD 823, median 27.50, minimum 27 and maximum 29. So there is a p-value of 0.004 before and after being given speech therapy.

The results of statistical analysis using the Wilcoxon signed ranks test obtained a value of p = 0.004, which means p = (<0.05), this shows that Ha is accepted and H0 is rejected, thus there is an effect of providing speech therapy on the level of aphasia in non-hemorrhagic stroke patients in the seruni room of Hajjah Andi Depu Hospital.

Discussion

Based on data analysis related to the research objectives and framework, significant findings were obtained regarding the level of aphasia in non-hemorrhagic stroke patients before and after the provision of speech therapy. The study involved 10 patients with aphasia, where aphasia diagnoses were determined using scores obtained from the Frenchay Aphasia Screening Test (FAST). The criteria for determining aphasia is a score of <27 for elderly over 60 years and <25 for elderly under 60 years. The results of the initial measurement showed that all respondents had aphasia with an average score of 23.50, the lowest score was 22, and the highest was 25. Based on these results, speech therapy was performed to reduce the level of aphasia in patients who met the criteria, hopefully as an alternative in non-pharmacological treatment.

After the application of speech therapy, the measurement results showed significant improvement, where the post-therapy aphasia mean score increased to 27.50, with the lowest score of 27 and the highest score of 29. Statistical tests using the Wilcoxon Signed Ranks Test resulted in an Asymp. Sig (2-tailed) of 0.004, indicating the effect of speech therapy on aphasia level, which shows the effectiveness of this method in helping patients with speech disorders. The A-I-U-E-O method applied in speech therapy focuses on the pronunciation of vowels and strengthening facial muscle movements, helping patients not only in speaking ability but also in increasing self-confidence when communicating.

Aphasia, which is caused by damage in an area of the brain, greatly affects an individual's ability to communicate. Through this specially designed therapy, patients are given the opportunity to overcome challenges in the communication process; research shows that patient response to therapy is significant, with patient cooperation during therapy being a key factor. Several studies support these findings, showing that speech therapy can improve the speech of stroke patients in a short period of time. Research at RSUD Hajjah Andi Depu that showed significant improvement after therapy explains that the speech therapy approach is not only beneficial in a medical context but also provides hope for patients to return to good communication. Thus, it can be concluded that speech therapy, particularly the AIUEO method, is an effective intervention to improve the speech of non-hemorrhagic stroke patients.

Restate the Key Findings

This research confirms a statistically significant improvement in aphasia levels among non-hemorrhagic stroke patients following a course of speech therapy. Specifically, the average aphasia score, as measured by the Frenchay Aphasia Screening Test (FAST), increased from 23.50 before therapy to 27.70 after the intervention ($p < 0.05$).

Interpret the Results

This research confirms a statistically significant improvement in aphasia levels among non-hemorrhagic stroke patients following a course of speech therapy. Specifically, the average aphasia score, as measured by the Frenchay Aphasia Screening Test (FAST), increased from 23.50 before therapy to 27.70 after the intervention ($p < 0.05$).

Compare with Previous Studies

This research confirms a statistically significant improvement in aphasia levels among non-hemorrhagic stroke patients following a course of speech therapy. Specifically, the average aphasia score, as measured by the Frenchay Aphasia Screening Test (FAST), increased from 23.50 before therapy to 27.70 after the intervention ($p < 0.05$).

Highlight the Implications

This research confirms a statistically significant improvement in aphasia levels among non-hemorrhagic stroke patients following a course of speech therapy. Specifically, the average aphasia score, as measured by the Frenchay Aphasia Screening Test (FAST), increased from 23.50 before therapy to 27.70 after the intervention ($p < 0.05$).

Discuss the Limitations

Research on the Effect of Speech Therapy on Aphasia Level in Non-Hemorrhagic Stroke Patients in Seruni Room, RSUD Hajjah Andi Depu has limitations due to various factors, such as family unwillingness.

Suggest Future Research

Future investigations should explore the long-term sustainability of the observed improvements in aphasia levels following speech therapy. Longitudinal studies could track patients over extended periods to assess the durability of treatment effects. Additionally, future research might compare different speech therapy techniques or explore the factors that predict individual patient responses to treatment.

Conclusion

Based on research on the effect of speech therapy on the level of aphasia in non-hemorrhagic stroke patients in the Seruni Room of RSUD Hajjah Andi Depu in 2024, it can be concluded that before therapy, patients had an average aphasia score of 23.50, indicating the presence of aphasia. After speech therapy, the average aphasia score increased to 27.70, indicating an improvement where the patient no longer had aphasia. The results of statistical analysis using the Wilcoxon Signed Ranks Test showed an Asymp. Sig (2-tailed) of 0.004 ($p < 0.05$), which means that the alternative hypothesis (Ha) is accepted and the null hypothesis (H0) is rejected. This indicates a significant effect of speech therapy on the aphasia level of non-hemorrhagic patients at Hajjah Andi Depu Hospital.

Acknowledgement

The authors gratefully acknowledge the participation of all patients involved in this study. We also extend our sincere appreciation to the medical staff and nurses at RSUD Hajjah Andi Depu for their invaluable support and assistance during the course of this research.

Author Contribution

M.Syikir, Irna Megawaty, Yetry, and Triwulansari Dewi each made substantial contributions to this research project, including the conception and design of the study, data collection, analysis, and interpretation of the results. All authors participated in the drafting and critical revision of the manuscript.

Conflict of Interest

The authors declare that no competing financial or non-financial interests exist related to this research.

Ethical Clearance

This study has obtained ethical approval from the Health Research Ethics Committee of RSUD Hajjah Andi Depu. All research procedures have been carefully conducted, upholding the applicable principles of research ethics, including obtaining written informed consent from all participants, ensuring the confidentiality of subjects' personal data, and ensuring there are no physical or psychological risks that could harm participants during their participation in the research.

Funding

This research was conducted independently without receiving funding from any institution, agency, or sponsor. All implementation costs are borne independently by the author.

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