**Journal of Health Science and Medical Therapy**
E-ISSN 3024-8132 P-ISSN 3024-8116
Volume 2 Issue 03, September 2024, Pp. 181-190
DOI: https://doi.org/10.59653/jhsmt.v2i03.974


# Analysis of Melodic Intonation Therapy (MIT) on Speech Ability in Stroke Patients with Aphasia at Srondol Health Center

**Sherly Metasari[1*], Elisa[2]**
Poltekkes Kemenkes Semarang, Indonesia[1]
Poltekkes Kemenkes Semarang, Indonesia[2]
Corresponding Email: sherlymetha.sm@gmail.com*

*Received: 01-06-2024* *Reviewed: 15-06-2024* *Accepted: 01-07-2024*

## Abstract

The Irreversible brain disorders that cause sequelae in the form of motor aphasia or speech disorders which are mostly clinical manifestations in post-stroke patients cause inability to move, speech problems, perspective, because there are problems with brain function. Melodic Intonation Therapy (MIT) is the development of music as a therapeutic medium to improve language skills that use musical elements (intonation and beats) as therapy to improve language skills for people with aphasia. The purpose of this study is to analyze Melodic Intonation Therapy (MIT) on Speech Ability in Stroke Patients With Aphasia with the research stage based on field research in the Srondol community who experienced Stroke with speech difficulties/Aphasia. This research method uses an experimental quasy with a pre-post test with control group design with a sample of 30 respondents with the results of speech development of aphasia patients, international publications, and guidelines for the management of Melodic Intonation Therapy (MIT) in Stroke Patients with Aphasia. Based on the results of the study, it was found that patients who experienced stroke of the families of stroke patients supported him because family support was very important to maintain and maximize physical and cognitive recovery.

**Keywords:** Stroke, Aphasia, Melodic Intonation Therapy

## Introduction

A condition in which there is a circulatory disorder in the brain that causes focal and global neurological dysphysis due to a cessation of blood supply to the brain which can be aggravated and lasts for 24 hours or more (WHO, 2018). Meanwhile, according to (Sofiatun I, 2015) Stroke is an irreversible brain disorder that causes sequelae in the form of motor aphasia or speech disorders which are mostly clinical manifestations in post-stroke patients causing inability to move, speech problems, perspective, because there are problems with brain function.

*The American Heart Association* (AHA) states that stroke is the fifth most frequent cause of death, killing around 130,000 people per year (Benjamin, 2017). Indonesia ranks 97th in the world for the highest number of stroke sufferers with the number of deaths reaching 138,268 people or 9.7% of the total deaths that occurred in 2011 (WHO, 2018). The results of Basic Health Research in 2018 show that the incidence of Stroke in Central Java Province reached 11.5%.

Verbal communication disorder or aphasia is the inability to use or understand language (Damanik, 2018). Aphasia is a language dysfunction caused by trauma or disease in the brain center, which causes impaired reading and writing skills, speaking, listening, counting, inferring, and understanding body attitudes (Amila, 2022). Aphasia causes a loss or decrease in communication and language skills that is the result of brain damage (usually in the left hemisphere) and occurs in more than one-third of people who survive a stroke (Dickey, 2020). One of these forms of aphasia is brocade or motor aphasia where it still functions simple verbal comprehension skills but has difficulty understanding complex syntactic and expressive sentences of language, they experience word retrieval difficulties and grammatical and syntactic deficits, apraxia, which affect the planning or programming of speech skills (Zumbansen, 2022).

MIT is a therapy program used on patients with very poor verbal volume caused by abnormalities in the left (dominant) hemisphere, with the right hemisphere still functioning intact (Khayudin K. , 2022). *Melodic intonation therapy* is a form of therapy from behavioral therapy that can be applied to patients with motor aphasia (Hutagalung, 2021). The MIT method was initially based on observations of aphrodisiacs who were able to sing previously known songs/music, but had no impact on language proportionality. However, it is estimated that the right hemisphere where the musical process occurs will affect the damaged left hemisphere (Zumbansen, 2022). MIT is different from singing, which is only using limited musical tones. Only 3 to 4 of these tones are enough to carry out therapy. The intonation of this melody should have a slower tempo and be lyrical than regular speech, with a more precise rhythm and a more pronounced difference in pressure. The MIT method has a basis for channeling melodic stimulation from the right hemisphere towards the left hemisphere (Kyrozis, 2019).

A special intervention carried out to restore facial symmetry is *Melodic intonation therapy* (MIT). MIT is the management of language production in patients with severe nonfluent aphasia. This method is based on the observation that these patients can often sing words that they cannot produce during speech. Treatment involves repeated chanting with short sentences, while hands tap while rhythmically (Seniow, 2019). MIT is different from singing. MIT only uses limited musical tones, namely 3 to 4 notes are enough to carry out therapy. The intonation of this melody (singing a melody) should have a slower tempo and be lyrical than ordinary speech, with a more precise rhythm and a more pronounced difference in pressure (Astriani NMDY, 2019).

The general purpose of this study is to analyze *Melodic Intonation Therapy* (MIT) on speech ability in stroke patients with aphasia (Sunusi, 2019). Meanwhile, the specific objectives of this study include identifying the general characteristics of stroke patients with

aphasia: age, gender, frequency of stroke attacks, caring family, identifying speech skills and before and after receiving (Wiarawan, 2019). *Melodic Intonation Therapy* in the intervention group, identifying speech skills and before and after receiving *Melodic Intonation Therapy* In the control group, the analysis identified speech skills and before and after receiving *Melodic Intonation Therapy* in the intervention group and the control group (Seniow, 2019). This study uses a measuring tool in the form of *a questionnaire Frenchay Aphasia Screening Test/FAST* to help measure the improvement of respondents' speaking skills.

## Literature Review

### 1. Concept Stroke

Stroke is divided into two, it can be a non-hemorrhagic stroke and a hemorrhagic stroke. Non-hemorrhagic stroke occurs due to the formation of thrombus or embolism (Puspitasari, 2012). Non-hemorrhagic stroke is a stroke that occurs due to blockage of blood vessels so that blood flow to the brain is stopped due to blood clots or atherosclerosis, blockage of these blood vessels occurs along the arterial pathway to the brain (Marinelli, 2022).

Non-hemorrhagic stroke is a blockage of a blood clot, a narrowing of an artery leading to the brain, an embolus that causes a blockage in one or more extracranial arteries. This stroke is also caused by thrombus that causes permanent occlusion, preventing the reperfusion of the infarcted organ causing anemia or ischemic state. Of all stroke patients, non-hemorrhagic stroke patients account for about 70-80% and the rest are hemorrhagic stroke patients (Khayudin K. , 2022). Non-hemorrhagic stroke is damage or death of brain tissue caused by inadequate blood supply that interferes with the need for blood and oxygen to the brain (Cahyaningtyas, 2022). The definition that can be concluded from the above explanation is that non-hemorrhagic stroke is a disease that causes damage to brain tissue due to blockage of blood vessels so that the need for oxygen is inhibited.

### 2. The Concept of Verbal Communication Disorder

Aphasia is a condition in which a person loses the ability or experiences impairments in understanding and expressing language, caused by damage to the brain that can affect the function of cortical and subcortical structures on both sides of the hemisphere (Ghofir, 2020).

Aphasia is a clinical symptom and not a disease. Aphasia can occur as a result of injury to the brain or pathological processes in the frontal, temporal, or parietal lobes that regulate language skills such as Broca's area, Wernicke's area, and the pathway that connects the left and right hemispheres of the brain. In most people, language skills are regulated by the left hemisphere (Damanik, 2018).

Brain damage that causes aphasia can be caused by stroke, traumatic brain injury, brain hemorrhage, and so on. About 80% of aphasia cases are caused by ischemic infarction, while hemorrhagic cases are rare and the location is not limited by vascular damage. Infarction results in lesions in the motor area supplied by the anterior cerebral

artery that provides the cortex of the frontal lobe and parietal lobe. The cerebellar artery of the media supplies the lateral cortex and the cerebral artery media which branches off from the internal carotid artery (Kyrozis, 2019).

If the cerebral arteries of the media that supply the Wernicke, Broca areas and the arcuate fascicle area are damaged, there will be difficulties in understanding words, speaking fluently, and repeating words (Zumbansen, 2022).

**3. Melodic Intonation Therapy (MIT)**

MIT is different from singing. MIT only uses limited musical tones, namely 3 to 4 notes are enough to carry out therapy. The intonation of this melody (singing a melody) should have a slower tempo and be lyrical than ordinary speech, with a more precise rhythm and a more pronounced difference in pressure (Irianto, 2021). According to *the American Aphasia Association* said that MIT therapy can be carried out for a minimum of 3 weeks with a frequent duration or for 3 – 6 weeks. This is done because the patient learns a new way of speaking, and not a set of sentences, the verbal material must be numerous, varied, and presented so as to avoid the use of rote memory (Zumbansen, 2022).

Conducted a study on *the efficacy and timing of Melodic Intonation Therapy in Subacute Aphasia* on 27 respondents consisting of 16 experimental groups and 11 control groups, with a duration of 6 weeks (1 week 5 hours) showing results significant changes in verbal communication in the intervention group (Lumbantobing, 2021).

A similar thing was stated by (Benjamin, 2017) who presented the results that in the 1st respondent of his study there was an increase in the production *of wh-questions* (*who, what, or when, where - questions*) of one *wh-morphem* maintained at 6 weeks post-treatment. For the 2nd respondent, there was an increase in question production for the two morphemes, but with varying performance 6 weeks after treatment. For both participants, there was a slight increase in the percentage of consonants at 6 weeks post-treatment.

## Research Method

The design of this study used an quasy experimental with a pre-post test with control group with a sample of 30 respondents in the intervention group and control with *Melodic Intonation Therapy* (MIT) for 2 weeks with intervention intervention 2 times in 1 day for 30 minutes using *the Frenchay Aphasia Screening Test/FAST* question help measure the improvement of respondents' speaking skills. This analysis aims to explain the characteristics of the variables studied and the data test in this study uses an independent t-test.

**Result/Findings**

**1. Age Distribution**

Table 1. Age Distribution

| Age | Sum | Presented |
|---|---|---|
| 45-55 | 10 | 33% |
| 56-65 | 15 | 50% |
| 66-75 | 5 | 17% |

Table 1. explains that there are 15 patients aged 45-55 years (50%), 10 people aged 56-65 years (33%), and 5 people aged 66-75 years (17%).

**2. Gender Distribution**

Table 2. Distribution of Gender

| Gender | Sum | Presented |
|---|---|---|
| Law Law | 6 | 20% |
| Woman | 24 | 80% |

Based on Table 2,, it was found that 6 people (20%) were male and 24 people (80%) were female.

**3. Stroke Attack Distribution**

Table 3. Distribution of Stroke Attacks

| Frequency | Sum | Presesntase |
|---|---|---|
| 1x | 11 | 37% |
| 2x | 13 | 43% |
| 3x | 6 | 20% |

Based on Table 3., as many as 11 people (37%) experienced 1x stroke, 13 people (43%) experienced 2x stroke, then there were 6 people (20%) who experienced 3x stroke.

**4. Distribution of caring Families**

Table 4. Distribution of Caring Families

| Care | Sum | Presented |
|---|---|---|
| Want to Take Care | 25 | 83% |
| Unwilling to Take Care | 5 | 17% |

Based on Table 4., the families who want to treat patients who have had a stroke are 25 people (83%), while the families who do not want to take care of patients who have had a stroke are 5 people (17%).

**5. Distribution of Respondents' Frequency Based on Speech Ability Before and After Therapy**

Table 5. Distribution of Respondents' Frequency Based on Speech Ability Before and After Therapy

| **Variable** | **Before** | | **After** | |
|---|---|---|---|---|
| Speech skills | N | % | N | % |
| Not Experiencing Speech Disorders | - | - | 3 | 10% |
| Mild speech disorder | 13 | 43% | 13 | 43% |
| Moderate speech disorder | 15 | 50% | 12 | 40% |
| Severe speech disorder | 2 | 7% | 2 | 7% |
| Total | 30 | 100 | 30 | 100 |

Based on Table 5., the results were obtained that there was a change in the speech ability of patients with moderate speech impairment decreased from 15 respondents (50%) to 12 respondents (40%), while in mild speech impairment the total number of respondents remained as many as 13 respondents (43%) in line with severe speech impairment as many as 2 respondents (7%) and after the intervention there were 3 respondents (10%) who did not experience speech impairment after therapy.

**6. Effect of Melodic Intonation Therapy on Aphasia Patients**

Table 6. Effect of Melodic Intonation Therapy on Aphasia Patients

| **Therapy** | **Mean** | **SD** | **Selisih Mean** | **Value p** |
|---|---|---|---|---|
| Before | 34.54 | 12.321 | 28.98 | 0.000 |
| After | 63.52 | 12.231 | | |

Table 6. shows that the results of statistical test analysis using *the Paired T Test* obtained *a p value* of 0.000 ($p < 0.05$) which means that Ho is rejected and Ha is accepted, indicating that there is an effect *of Melodic Intonation Therapy* therapy on the speech ability of stroke patients with aphasia.

## Discussion

According to the results of the study, 15 people (50%) of patients aged 45-55 years, 10 people (33%), and 5 people (17%). One of the risk factors that cannot be controlled is age or age (Rowe, 2018). The risk of stroke increases with age, and the risk increases after the age of fifty-five and the most common age of the community is at the age of 56-65 years. According to (Rachmawati, 2022), age greatly affects physical changes, but this is not the same as old age. With age, the function of organs in the body will decrease, and blood vessels will undergo changes that cause vasoconstriction, narrowing of blood vessels, and plaque attached to blood vessels can clog the blood supply to the brain, causing stroke (Rachman, 2021). With age, the function of organs in the body will decrease, and blood vessels will undergo degenerative changes that cause vasoconstriction, narrowing of blood vessels, and plaque attached to blood

vessels can block the blood supply to the brain, causing a stroke. The elderly population is particularly vulnerable to various syndromes and diseases such as stroke (Lemone, 2020).

According to (Damanik H. , 2018), women are more susceptible to stroke than men. Meanwhile, the cause of death due to stroke is more common in women than men because in general, women have strokes at an older age. In addition, the existence of special circumstances in women is also suspected to be a trigger, namely pregnancy, childbirth and menopause related to hormonal imbalances. A study by (Kyrozis, 2019) found that women reported more incidents of aphasia. Found that there was no sex difference in aphasia recovery, and there appeared to be no gender difference in aphasia recovery. In other words, there is evidence that In short, research shows that gender predicts functional recovery from aphasia (Indrawati, 2019).

The results showed that the type of initial stroke, age, associated diseases, risk factors, and duration of previous strokes varied. 11 people (37%) had 1 stroke, 13 people (43%) had 2 strokes, and 6 people (20%) had 3 strokes (Junaidi, 2021).

The results showed that the family supported most of the intervention and control groups. A study conducted by (Amila, 2022) found that there was a relationship between family support, increased social activity, and quality of life of stroke patients. Family support is essential for stroke survivors to maintain and maximize their physical and cognitive recovery. In addition, families who have learned from health workers can also do physical recovery. Partners, family members, close friends, and close and harmonious relatives usually provide support. To achieve healing or recovery, families must support stroke patients, both in the acute and post-acute phases (Benjamin, 2017).

The results showed that patients with moderate speech impairment experienced a decrease in speech ability from 15 respondents (50%) to 12 respondents (40%), while patients with mild speech impairment remained 13 respondents (43%), along with 2 respondents (7%). After therapy, 3 respondents (10%) did not experience speech disorders anymore. Speech therapy is a rehabilitation method for people who have communication disorders so that they can interact with the environment naturally without experiencing psychosocial problems (Rachman, 2021).

This speech therapy focuses on building speech organs so that they can make sounds correctly. Positioning the tongue precisely, shaping the jaw, and controlling the breath to produce the right sound are usually part of this therapy. The sound made by Sarfa auditory hears the vibrations of the air. Stimuli are received and processed as information through the auditory nerve. So that this speech therapy can help make it easier for stroke patients to better speak and recover (Ghofir, 2020).

The method used to teach aphasia patients is to move the speech muscles to pronounce the symbols of language sounds that conform to standard patterns so that the patient can understand them. This is called articulation of the speech organs. Three components work together to articulate the sounds of language or voices: motor (breathing), vibrating (throat with vocal cords), and resonant (speech cavities: nose, mouth, and chest) (Puspitasari, 2012).

This is in accordance with what Gunawan (2008, p.55) did, which uses phonetic placement methods and imitation methods. This method of phonetic placement requires the patient to pay attention to the movement and position of the speech organs. By doing this, the patient will be able to control the movement of the speech organs to form or make the correct speech. Vocal membrane vibrations are used to create vowels when you exhale freely through your mouth.

Language recovery Several factors, such as the severity of aphasia, age, and lateration, can affect the way stroke patients with motor aphasia speak. Here, the nurse's function is not only as a provider of nursing care to patients but also to bridge patients to get maximum management from the therapy carried out. The extent of the injury that may have additional impacts such as visual, motor, auditive, memory impairment, and emotional impairment (Amila, 2022). The shape and location of the tongue, lips, jaw, and soft palate (velum) are important vocal formations (Ghofir, 2020). This is also reinforced a stroke patient who has speech and communication disorders, one of which can be treated with therapy that moves the muscles of the face, lips, tongue, and speaking words (Benjamin, 2017). Aphasia-speaking recovery depends largely on how effective the treatment is. One of the assessments is the level of intensity of treatment. This study showed the intensity of treatment in therapy hours during the learning period (Wiarawan, 2019).

Intensive exercise can improve neural plasticity, cortical map reorganization, and motor function. Changes in brain tissue activity known as brain neuroplasticity reflect the brain's adaptability. With this ability, the motor ability of clients who have regression due to stroke can be relearned. Brain neuroplasticity occurs through a substitution process that relies on external stimuli, exercise therapy, and a compensation process, which can be achieved through specific exercises (Sofiatun I, 2015).

## Conclusion

Based on the results of the study, it was found that patients who experienced stroke were on average at the age of 45-55 years as many as 15 people (50%), most people who experienced stroke were female compared to men, namely with a total of 28 people (85%), the average number of people who experienced a heart attack 3 times a year was as many as 13 people (43%) and most of the families of stroke patients supported him because family support was very important to maintain and maximize physical and cognitive recovery.

## References

Amila. (2022). Effect of Augmentative and Alternative Communication (AAC) on Functional Communication Ability and Depression of Stroke Patients with Motor Aphasia at Garut, Tasikmalaya, and Banjar Hospitals. *University of Indonesia*.

Astriani NMDY, D. P. (2019). AIUEO Therapy on Speech Ability (Motor Aphasia) in Stroke Patients. *J Telenursing*, 1(2):396–405.

Benjamin, E. J. (2017). Update: A Report From the American Heart Association. *Heart Disease and Stroke Statistics*.

Cahyaningtyas, N. N. (2022). Family Nursing Care with Physical Mobility Disorders in Non-Hemorrhagic Stroke Patients at the Jetis Health Center, Blora City. *Repository Poltekkes Semarang*, http://repository.poltekkes-smg.ac.id/index.php?p=show_detail&id=33079.

Damanik. (2018). The Relationship between Hypertension Patients' Knowledge about Stroke and Stroke Prevention Behavior at Helvetia Health Center Medan. 1(1), 73–84.

Dickey, L. A. (2020). Incidence and Profile of Inpatient Stroke Induced Aphasia in Ontario. *Archives of Physical Medicine and Rehabilitation 91 Canada*.

Ghofir, A. (2020). *Management of Stroke and Other Vascular Diseases.* UGM Press: https://books.google.co.id/books?id=TTUWEAAAQBAJ .

Hutagalung, M. S. (2021). *Getting to Know Stroke and the Characteristics of Haemorrhagic and Non-Haemorrhagic Stroke Sufferers: A Complete Guide to Stroke.* Nusamedia: https://books.google.co.id/books?id=kqNsEAAAQBAJ.

Indrawati, L. S. (2019). Care Yourself Stroke. *Penebar Plus. https://books.google.co.id/books?id=SX_wCwAAQBAJ*.

Irianto, K. (2021). *Understand various kinds of diseases.* Alphabeta.

Junaidi, I. (2021). *Stroke, Beware of the Threat.* Yogyakata: Offset., Andi.

Khayudin. (2022). Stroke Nursing Care for students and professional nurses. *Guepedia*, https://books.google.co.id/books?id=cO9ZEAAAQBAJ.

Kyrozis, A. e. (2019). Incidence and Predictors of post-stroke aphasia : The Arcadia Stroke Registry. *European Journal of Neurology*, 16 (6), pp.733-739.

Lemone, P. B.-J.-s. (2020). Nursing : Critical Thinking in Client Care. *French Forest, N. S.W: Pearson Australia*.

Lumbantobing, S. (2021). Clinical neurology physical and mental examination . *FKUI Publisher Center*.

Marinelli, C. V. (2022). Different Cognitive Profiles of Patients with Severe Aphasia. *Behavioural Neurology*, 1–15. https://doi.org/10.1155/2017/3875954.

Puspitasari, D. (2012). The Effect of AIUEO Therapy on Communication Skills in Post-Stroke Patients in Pontianak City. *Journal of Nursing*, 1 (3), 1-2.

Rachman, R. (2021). Implementasi Case Based Reasoning Mendiagnosa Penyakit Stroke Menggunakan Algoritma Probabilistic Symmetric. *Jurnal Informatika*, 8(1), 10–16. https://doi.org/10.31294/ji.v8i1.8563.

Rachmawati, D. M. (2022). Differences in risk factors for stroke in the elderly and adolescents. *Bali Medika Journal*, 9(3), 207–221. https://doi.org/10.36376/bmj.v9i3.281.

Rowe, e. a. (2018). Save your Life: Overcoming the 9 deadliest diseases. *Allen & Unwin*.

Seniow. (2019). The Relationship Between Non-Linguistic Cognitive Deficits and Language Recovery in Patients with Aphasia. *Journal of the Neurological Sciences*, 283 (1-2) : 91-94 https://doi.org/10.1016/J.Jns.2009.

Seniow, J. M. (2019). The Relationship Between Non-Linguistic Cognitive Deficits and Language Recovery in Patients with Aphasia. *Journal of the Neurological Sciences,* 283 (1-2) : 91-94 https://doi.org/10.1016/J.Jns.2009.

Sofiatun I, K. S. (2015). The Effectiveness of AIUEO Therapy and The Token Test Therapy on the Speaking Ability of Stroke Patients with Motor Aphasia at Mardi Rahayu Kudus Hospital. 3(2):230–8.

Sunusi, G. M. (2019). Analisis Mean Platelet Volume (MPV), Platelet Distribution Width (PDW), dan Jumlah Trombosit pada Stroke Hemoragik dan Non Hemoragik. *Indonesian Journal Of Clinical Pathology and Medical Laboratory*, 25(2), 202.

WHO, W. H. (2018). Global Health Estimates. *Global Health Observatory (GHO). Swiss*.

Wiarawan. (2019). Stroke Rehabilitation in Primary Health Services. *Smf Medical Rehabilitation Fatmawati Hospital. Maj Kedokteran Indonesia*, 59 (2).

Zumbansen, A. I. (2022). Melodic Intonation Therapy: Back to Basics for Future Research. *Frontiers in Neurology 5*, https://doi.org/10.3389/fneur.2014.00007.