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Original Article

Efficacy of Melodic Intonation Therapy in Patients with Chronic Broca's Aphasia: Speech Language Pathology Perspective

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ABSTRACT

Aphasia is a linguistic problem that occurs after brain damage. It's a broad term that encompasses everything from modest word retrieval challenges to a complete inability to produce and interpret language. Fluent and non-fluent aphasia are two types of aphasia. Non-fluent aphasia is characterized by sluggish, effortful speaking and is caused by a stroke in the left frontotemporal areas. These patients' language production is mainly limited to one- or two-word utterances. Non-fluent aphasic patients can sing fluently despite their significant language production handicap, which has led to the use of singing and music in aphasia rehabilitation. **Objective:** To examine the effectiveness of Melodic Intonation Therapy (MIT) in patients with chronic Broca's aphasia**. Methods:** A descriptive study was conducted from March 1 to September 30, 2021, at NUR International University to investigate the efficacy of MIT in patients with persistent Broca's aphasia. For this purpose data was collected from almost 50 speech therapists working with chronic Broca's aphasic patients through a self-designed questionnaire. The questionnaire was used as a data collecting instrument that was designed by expert opinion and literature review. **Results:** Results indicated that MIT is effective in patients with chronic Broca's aphasia. On asking the respondent about the efficacy of MIT almost 88% responded that MIT is effective, 8% were not sure about the efficacy of MIT and 4% responded MIT is not effective in chronic aphasic patients. On asking the respondent about the development of expressive language 64 % responded that expressive Language is improved while 36 % were not sure about the development of expressive language development. On asking the respondent whether MIT reduces psychological stress on individuals regarding the necessity to speak correctly, 88 % responded with yes while 12 % responded with No that MIT reduces psychological stress. **Conclusions:** It is concluded from this study that MIT is effective in patients with chronic Broca's aphasia**.**

INTRODUCTION

Aphasia is a linguistic problem that develops as a result of brain injury. It's a broad term that encompasses everything from modest word retrieval challenges to a complete inability to produce and interpret language [1]. Aphasia is a type of acquired communication difficulty that affects 21-40% of persons who have a stroke during the acute phase; it's anticipated that half of these patients will have considerable language impairment 18 months following the stroke. After a first stroke, the probability of acquiring aphasia is estimated to be 4%. Age and a history of cardio-embolism have both been linked to the development of aphasia [2]. Broca's aphasia is one of the most common and, maybe, iconic types of aphasia. Broca's aphasia is characterized by impaired speech production, sparing but not necessarily normal auditory comprehension, and agrammatism in the majority of cases [3]. With an increasing amount of research, a wide range of language treatments are available. Aphasia is frequently classified

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into two types: fluent and non-fluent. Slow, effortful speech is a symptom of non-fluent aphasia, which is caused by a stroke in the left frontotemporal areas. These individuals' utterances are usually limited to one or two words. Despite their significant language production handicap, non-fluent aphasic patients can sing well, promoting the use of singing and music in aphasia rehabilitation [4]. MIT is one of the most formalized music-based aphasia therapy approaches. MIT is a therapy strategy that combines melodic intoning and rhythmic tapping with simple phrase creation to improve verbal output in aphasic patients [5]. MIT is a well-studied speech and language therapy (SLT) strategy for people with non-fluent aphasia [6]. For almost a century, clinicians have known that persons with nonfluent aphasia can sing words they can't utter. As a result, employing melody and rhythm to increase the fluency of aphasic patients has long been recommended [7]. Despite the fact that MIT was founded in the 1970s, few types of research have been undertaken to determine the overall efficacy of programmers as well as their capacity to generalize abilities to other communicative contexts. MIT is an evidence-based treatment strategy that involves intoning (singing) to help patients with aphasia enhance their expressive language. The method takes advantage of the right hemisphere's intact parts by involving language-capable areas. The melodic and rhythmic prosody, a slower rate of articulation, and continuous voicing that MIT produces are supposed to minimize reliance on the left hemisphere [8]. Aphasia is most typically caused by brain injury caused by a stroke, a TBI, a brain tumor, a brain infection, or the degenerative illness Alzheimer's. According to studies, aphasia is the leading cause of prolonged hospitalization and greater usage of rehabilitation services in acute stroke patients. Aphasia is at its most severe right after a stroke. This is determined by the severity of the incident and the degree of brain damage sustained [9]. Within a few days, a natural healing process begins and is influenced by a variety of factors such as age, general physical health, the amount and location of brain damage, and the quality of services provided. Spontaneous recovery is observed within the first six months following the occurrence, but beyond more than a year, only minor spontaneous gains in linguistic functions are expected [10]. Successful aphasia rehabilitation is mostly interdisciplinary, involving collaboration between medical and paramedical experts. Rehabilitation efforts have had positive results, as evidenced by several performance indexes for SLT. According to another research in neurorehabilitation, which takes into account evidence of the brain's ability for reconstruction, intensive language training (several hours per week) appears to be the premise for substantial improvement of language capabilities in the chronic stage [11]. At MIT, 'musical' language features like rhythm and intonation are used to help people develop better language. The patients repeat short melodically intoned sentences. The therapy employs a number of therapeutic techniques, including left-hand tapping and speech rate decrease. The speech-language therapist (SLT) gradually reduces the amount of assistance provided until the patient is able to produce a trained utterance on his or her own. The Amherst campus of the University of Massachusetts is attempting to improve connected speech [12].

METHODS

A descriptive study was conducted from March 1 to September 30, 2021, at NUR International University to investigate the efficacy of Melodic Intonation Therapy in patients with persistent Broca's aphasia. For this purpose data was collected from almost 50 speech therapists working with chronic Broca's aphasic patients through a self-designed questionnaire. The questionnaire was used as a data collecting instrument that was designed by expert opinion and literature review. Data was analyzed using SPSS version 21 and the results were reported accordingly.

RESULTS

Results indicated that out of 50 participants 16 % were male and 84% were female. On asking the respondent about their qualifications 84% responded that they had done BSSLP, 26% responded that they had done MSSLP and10% responded that they had degrees other than BS or MS like PGD in speech-language therapy. Experience of Speech therapists indicated that 68% of speech therapists had less than 5 years of experience, 18% of speech therapists had 6-10 years of experience and 14% of speech therapists had more than 10 years of experience. On asking the respondent about their work setting 362% responded that they were working in hospital settings and 38% responded that they were working in rehabilitation centers as shown in Table 1.

Demographics		N=Frequency	%Frequency
Gender	Male	8	16 %
	Female	42	84%
Qualification	BS	32	64%
	MS	13	26%
	Others	5	10%
Experience	1-5 Yrs	34	68%
	6-10 Yrs	9	18%
	>10 Yrs	7	14%
Work setting	Hospitals	31	62%
	Rehab- Centers	19	38%

Table 1: Participants' Characteristics

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On asking the respondent about the efficacy of MIT almost 88% responded that MIT is effective, 8% were not sure about the efficacy of MIT and 4% responded that MIT is not effective in chronic aphasic patients as shown in Table 2.

Responses	N=Frequency	% Frequency
Agree	44	88 %
Undecided	4	8 %
Disagree	2	4 %
Total	50	100 %

Table 2: Effectiveness of MIT with chronic Broca's aphasic Patients

In another question on asking the respondent about improvement of language while using MIT in patients with chronic Broca's aphasia almost 40% participants responded strongly agree , 34% participant responded undecided and 26% responded with disagree as shown in Table 3.

Responses	N=Frequency	% Frequency
Agree	20	40 %
Undecided	17	34
Disagree	13	26
Total	50	100

Table 3: Language is improved with using MIT

In another question, participants were asked whether MIT reduces psychological stress on individuals regarding the necessity to speak correctly. Almost 88% of participants responded with agree, 10% participants responded undecided and only 2% responded with disagreeing that MIT reduces psychological stress on individuals regarding the necessity to speak correctly as shown in Table 4.

Responses	N=Frequency	% Frequency
Agree	44	88
Undecided	5	5
Disagree	1	2
Total	50	100

Table 4: Reduction of psychological stress on individuals

In another question asking the respondent about the usage of MIT regarding other language disorders almost 84% of participants responded strongly agree, 8% of participants responded undecided and 8% responded with disagree as shown in Table 5 below.

Responses	N=Frequency	% Frequency
Agree	42	84
Undecided	4	8
Disagree	4	8
Total	50	100

Table 5: Language disorder can be treated with MIT

DISCUSSION

The goal of the study was to see if MITcan help people with Broca's aphasia. Research showed that MIT is effective in Broca's aphasic patients. Following a review of the literature, the findings backed up Monica Strauss Hough's 2010 study, which sought to ascertain "MIT and aphasia: Another variation on a theme" at East Carolina University, Greenville, NC, USA. The results showed that 75 % accuracy on automated phrases was obtained four weeks into the treatment program and that this accuracy was maintained throughout the maintenance phase and both follow-up sessions. Performance on self-generated sentences was 55% after 8 weeks after treatment, and this was sustained at both follow-up sessions [13]. According to research, when patients with chronic Broca's aphasia use MIT, their language improves. When asked about language progress in individuals with chronic Broca's aphasia while using MIT, over 40% of respondents said they strongly agreed, 34% said they were undecided, and 26% said they disagreed. On reviewing other literature, the finding was supportive of the study that was conducted by rslneke van der Meu in 2014 to determine "The Efficacy and Timing of MIT in Subacute Aphasia" at University Medical Center. The findings revealed that for learned items, MIT had a significant influence on language repetition, but untrained items had mixed outcomes. Verbal communication improved dramatically after attending MIT. Finally, postponing MIT resulted with less improvement in the repeat of previously learned content [14,15]. A study conducted on the efficacy of MIT concluded that postponing MIT was linked to a decrease in the repeat of previously learned material. In these patients with subacute severe non-fluent aphasia, language production treatment with MIT proved beneficial. It's likely that you'll obtain better results if you start therapy sooner [16]. Furthermore, aphasia is linked to other cognitive deficiencies and might result in secondary effects such as depression and social isolation. We need a better knowledge of the relationships between these elements in order to personalize individual treatments and improve recovery [17]. Evidence-based procedures and experimentally validated treatments for linguistic dysfunction following traumatic brain injury and stroke are now available and can be used to construct linguistic rehabilitation guidelines for aphasia patients [18]. Effective aphasia treatment will ultimately rely on earlier and more accurate diagnosis (improved syndrome characterization), more accurate disease and disability staging, and the discovery of new biomarkers that can target tissue pathology and track therapeutic effects dynamically, before irreversible brain atrophy (improved signaling of underlying proteinopathy) [19]. Future research should concentrate on determining the best cost-effective intervention combination[20].

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CONCLUSION

It is concluded from this study that MIT is effective in patients with chronic Broca's aphasia.

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