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EFFECTIVENESS OF MELODIC INTONATION THERAPY IN THE MANAGEMENT OF COMMUNICATION DIFFICULTY OF PUPILS WITH NON-FLUENT APHASIA IN THE CLASSROOM SETTING

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Abstract

This study was conducted to evaluate the effects of melodic intonation therapy in the management of children with non-fluent aphasia. Twelve (12) samples of six (6) each in the two groups of experimental and the control were purposively selected from a Speech/Language Clinic in Ibadan, Oyo state, Nigeria. Melodic intonation therapy was the technique used with the samples in the experimental group, while those in the control group were rehabilitated through regular speech therapeutic exercises. With the aid of t-test statistics at 0.05 level of significance, the findings revealed a significant difference between the performances of the two groups. The outcome indicated that the experimental group performed significantly above those exposed to regular speech therapy (Cal.t=8.06, Crit. t=1.18, df = 10, P<.05). The results of the study showed that training effects yielded more superior gains than the pre-evaluation results (Cal.t=10.95, crit.t=1.18, df=10, P<.05). The paper therefore, recommends the use of melodic intonation therapy with the non-fluent aphasia and any other patients with speech impairment. Also, the paper concludes with some guidelines and suggestions to be followed in using the therapeutic package for effective gains.

Introduction

Over time it has been a difficult task to effectively rehabilitate children with non-fluent type of aphasia. The children under this classification are always unable to use words voluntarily for meaningful and intentional communication, due to their inability to produce understandable speech or writing, nor comprehend spoken or written language (Holland, 1988; Osisanya, 2007). Often times, these children are difficult to teach, for they are more responsive to stimuli from outside than within the classroom environment, since there is always a far distance between the sender (Classroom Teacher) and the receivers (Students). With this, they developed difficulties with interpretation of spoken and printed languages (Osisanya & Oyebola, 1998). Although, they exhibit such ability to produce more automatic verbalizations, such as counting, reciting days of the week and months of the year, memorized references, including prayers or songs, social expressions and emotional speech (Davis, 1983).

Naturally, there are three (3) types of persons with aphasia. According to Kolb & Whishaw (2003), the different types of aphasia can be divided into three (3) categories of pure aphasias, fluent aphasias, and non-fluent aphasias. The pure aphasias are the selective type of impairment in reading, writing or the recognition of words. Pure aphasias are pure alexia, agrapnia and pure word deafness. For instance, person with this type of aphasia may be able to read, but find it difficult to write, or vice versa.

The fluent aphasias, also called receptive aphasias exhibit difficult with input or reception of language. They experience difficulty either in auditory verbal comprehension or in the reception of words, phrases, or sentences spoken by others. Although, the speech may appear

easy and fluent, but there are difficulties related to the output of language as well as aphasia (Kolb & Whishaw, 2003).

The non-fluent aphasia, called the expressive aphasia with difficulties in articulation, but in most cases there is relatively good auditory verbal comprehension. Most times their auditory comprehension appears better, but declines rapidly for more complex conversations. They may be totally non-verbal, and/or only use facial expression and gestures to communicate. Holland and Forbes (1993) observed that each of the two (2) fluency groups: The fluent and non-fluent aphasias individual exhibit common difficulties of total deviation from biochemical norms of anatomical, physical, psychological, psychiatric and physiological deficiencies in language, neuro-psychological and motor functions. The fluent ones have moderate disruption of words formation, transcortical sensory difficulties, reception impairment and transmission of meaning through symbols. They show limited ability to repeat patterns set-out for them, and they have difficulties in reproducing digits, nonsense syllables and sentences in the correct order (Holland, 1988). In the same vein, the non-fluent ones exhibit array of severe losses as a result of problems in the Broca's areas, transcortical motor areas and mixed transcortical (isolation) syndrome (Aronson, 1996). This group of aphasias always exhibit difficulties in perceiving, storing and re-calling the serial order of information received through auditory channels. In fact, they have extremely short auditory span with an evidence of difficulties in recalling both the verbal and non-verbal configurations (Osisanya, 2007). In the classroom setting, this non-fluent aphasia always finds it difficult to discharge their tensions and anxieties by the way of verbal exchange. It seems difficult for them to perfectly verbalise their anger and aggression, as a result they are forced to melt into background because of their poor conceptual and linguistic skills. With observation, it was noticed that some of them get themselves encouraged by trying to sing the memorized songs solitarily (Osisanya & Oyebola, 1998).

Going by the aforementioned difficulties experienced by the non-fluent aphasias, to effectively articulate their speech and needs, there is need to attend to their communication difficulties. Therefore, this study is aimed at rehabilitating a group of non-fluent aphasias attending speech therapeutic programmes. This study made use of Melodic Intonation Therapy (MIT) to rehabilitate the non-fluent aphasias in a clinical setting. This therapeutic package helped better in meeting the speech/language rehabilitative needs and educational cum psycho-social challenges of this group of aphasias. In fact, MIT is such a therapeutic programme used by either the Music therapist and/or speech pathologist to help patients with communication disorder caused by brain damage, in which aphasia is one of them. This method uses a style of singing called melodic intonation to stimulate activity in the right hemisphere of the brain so as to assist in speech production (Carroll, 1996). MIT is a technique of rehabilitation which involves singing in intoned phrases, as the patient repeats them simultaneously. This technique helps to increase the patient's ability to retrieve words, and facilitate the relatively easy transition to normal speech (Roper, 2003). Also, it involves keeping the same melodic line as the intoned sentences appear in proceeding order, except that the constant pitch of the intoned words is replaced by the variable pitch of speech (Carroll, 1996; Roper, 2003).

In the light of the aforementioned, Melodic Intonation Therapy has a mechanism to influence good verbal communication among children with speech difficulties, most especially with the

patients who have hemispheric brain damage. The enjoyable techniques used in line with musical intonation always make MIT to have positive effects in the communication skills of any patient with brain damage. In fact, in a way by means of the therapy, music has been observed as a good intervention strategy with the persons with communication difficulty (Abiodun & Oluokun, 2007). Hence, this study evolved to rehabilitate the non-fluent aphasias attending special educational classroom setting with melodic intonation therapy. The study sought to evaluate the effects of MIT on the overall communication ability of the non-fluent aphasias. Also, the study helped to determine the capability and efficacy of MIT in alleviating the difficulties associated with non-fluent aphasias in the classroom setting.

Objectives of the Study

In order to effectively carry out this study, the following objectives were drawn.

1. To determine the impact of Melodic intonation therapy on the overall communication of the aphasias attending special schools.
2. To ascertain the effectiveness and capability of MIT as a rehabilitative technique towards acquisition of verbal communication skills.
3. To survey the acceptability of MIT as a speech rehabilitative model by the patients and therapists alike.
4. To ensure the capability of MIT in alleviating the psycho-social difficulties associated with non-fluent aphasias in the classroom setting.

Significance of the Study

This study would be of importance to Speech Therapists who work to rehabilitate persons with communication difficulties. It would help to equip the therapists with essential skills and information on how to methodologically use Melodic Intonation Therapy in rehabilitating persons with language difficulties. The use of MIT as demonstrated in the study would help the therapists to select appropriate intoned phrases and words to use. The step by step approach of the MIT explained in the study would benefit the parents of children with speech problems in taking care of them at home. More importantly, this study would serve as demonstrable evidence towards the use of musical therapy to rehabilitate aphasics. This study would also contribute immensely to facilitating interest in rehabilitating patients with any type of aphasia.

Hypotheses

For the purpose of this study the following hypotheses were raised and tested at 0.05 level of significance.

H₀₁: There is no significant difference in the performance of the pupils with non-fluent aphasia exposed to melodic intonation therapy and the control.

H₀₂: There is no significant difference in the pre and post-performance of the non-fluent aphasias exposed to MIT.

Method

Twelve (12) male non-fluent aphasias were involved in the study. The subjects were purposively selected from the Speech/Language Rehabilitation Clinic, here in Ibadan, Nigeria. The subjects were within the age range of 15-25 years, with evidence of diagnosed and classified non-fluent aphasias. Prior to the commencement of the study in order to rule-out

the possibility of influence of intellectual retardation on the subjects' performance. The subjects were subjected to Slosson Intelligence Scale (SIT- R3, 2006), so as to measure each subject's level of intelligence. The result was above average, and it confirmed their eligibility for the study. Thereafter, the subjects were evaluated based on the pre-test assessment.

After the pre-test evaluation, the subjects were grouped into two groups, with varied types of rehabilitative programmes. Group A was used as the experimental group. The patients under group A were rehabilitated using Melodic Intonation Therapy (MIT), while the second group, which was categorized as group B, was used as the control, and they were given normal speech therapy, throughout the period of training. Both the experimental and control groups were given 18 hours of training sessions per week, which spanned for 3 months (12 weeks). During the course of training the group B, went through normal systematic speech developmental therapies. But, the experimental group was made to undergo series of melodic intonation training exercises. Group A kind of training was progressive coughing exercise, and step by step singing exercises, starting with humming while continuous beats and drumming were on. The therapists continually exposed them to singing out the intoned words and phrases of their needs and wants such as "I want to eat; give me rice to eat, I want to drink; give me water to drink." Also, in the course of the training, the therapists developed the subjects through the singing of intoned phrases such as "Ade give me my bag; take your bag. Teacher, I want to go to toilet; to do what? To wee wee". These phrases are uttered in a monotonous cadence or rhythm as in chanting to make their requests and responses to questions. This step helped them to progress via step by step arrangement to singing out sentences, as they repeat the intoned questions and answers in a designated period of time within the training sessions.

The study also utilized live and recorded singing speeches of the speech/language therapists, and some phonetically balanced words and nursery rhymes on DVD. Examples of the test materials are CID W-22 test list developed to improve the phonetically balanced characteristics or speech recognition test; and composed rhymes for melody and elicitation of response such as "London bridge is falling down, falling down, falling down, London bridge is falling, my fair lady".

After the twelve weeks of the training exercises, the performance of both the groups were evaluated and rated so as to determine the relative effects of the treatment package on the experimental group, in comparison to that of the control group. The same ten (10) short phrases and sentences, which were used for the Pre-test evaluation, were equally used for the post-test evaluation. Those items were taken from Peabody Picture Vocabulary Test (PPVT-4) with correlation coefficient of .93. For easy computation, the ratings were grouped in terms of constructs involved, such as differences in time of data collection and types of rehabilitative strategies employed. Thereafter, an independent t-test statistical method with 0.05 level of significance was used to compare the means of the construct for differences.

Presentation of Results

Table 1: The Performance of the two Groups after Treatment.

Group 1 Melodic Intonation Therapy		Group 2 Normal Speech Exercise	
Aphasic Patient	Score	Aphasic Patient	Score
1	12	1	08
2	13	2	05
3	10	3	08
4	15	4	08
5	12	5	09
6	14	6	06
Total	76	Total	44

Summation of the marks obtained by the aphasic exposed to melodic intonation therapy was 76, while those rehabilitated through the normal speech exercises had a total of 44 marks.

Table 2: Pre- and Post Scores of the Aphasics

Aphasic Patient	Pre- Test	Post- Test
1	05	12
2	07	13
3	04	10
4	08	15
5	05	12
6	06	14
Total	35	76

The aphasics exposed to MIT had a total score of 76 after being rehabilitated through MIT, as against 35 marks obtained before the treatment.

Testing the Hypotheses

Hypothesis I

There is no significant difference in the performance of the pupils with non-fluent aphasia exposed to Melodic Intonation Therapy and the control.

Table 3: Comparison of the Performance of the 2 groups after Treatment

Groups	N	Σx	\bar{x}	SD	Df	Cal.t	Crit.t	P
Melodic intonation Therapy	6	76	12.7	1.69				
Normal speech Exercises	6	44	7.3	1.04	10	8.06	1.18	0.05

* Significant at $P < .05$

Table 3 above shows the comparison of the performance of the non-fluent aphasias exposed to MIT and that of the control. The computed t-value of 8.06 when compared to the table value of 1.18 shows a significant difference in the performance of the two groups. With the mean value of 12.7 of the MIT group as against 7.3 of the control group reveals that melodic intonation therapy influenced better and positive communication changes faster than the

normal speech therapy with non-fluent aphasias. Therefore, the Null hypothesis is hereby rejected.

Hypothesis 2

There is no significant difference in the Pre- and post-performance of the non-fluent aphasias exposed to melodic intonation Therapy.

Table 4: Analysis of Pre-and Post-Performance of the Non-Fluent Aphasics.

Time of Evaluation	N	Σx	\bar{x}	SD	Df	Cal.t	Crit.t	P
Post-test Score	6	76	12.7	1.69				
Pre-test score	6	35	5.8	0.69	10	10.95	1.18	0.05

* Significant at $P < 0.05$

The above table shows that there is significant difference in the pre-and post evaluation finding on the performance of the non-fluent aphasias. This result (cal. $t = 10.95$; Crit. $t = 1.18$, $df = 10$, $P < 0.05$) indicates that MIT as a treatment package brought about a significant improvement of communicative abilities of the pupils exposed.

Discussion

The findings of this study revealed that the non-fluent aphasias exposed to Melodic Intonation Therapy (MIT) performed better after the training sessions. In comparison, the non-fluent aphasias exposed developed better communication skills, which reflected in their verbal-expressive and auditory comprehension abilities, than their counterpart in the control group. This was due to the fact that MIT enhanced better and fast communication developmental skills (Berlin et al, 1996; Carrol, 1996). With the evaluation findings, it became apparent that the treatment contributed positively to effect a desirable changes on the psycho-social life of the patients. In fact, this study corroborated the position of earlier studies on the non-fluent aphasias, which indicated that the use of MIT proved to be very effective in managing non-fluent difficulties, as well capable of increasing the role of hemisphere in inter-hemispheric control of language (Wikipedia, 2009).

In this present study, MIT was found to be effective in the management of non-fluent aphasias. Based on the evaluation finding (Cal.t =8.06, Crit. t=1.18, df=10, $P < 0.05$), the effectiveness of MIT was confirmed over the normal speech therapeutic programme. Therefore, MIT, with a model of singing called melodic intonation remains a better therapy to stimulate activity in the right hemisphere of the brain in order to assist in speech production (Carroll, 1996). This treatment package as in advanced model of music therapy has the required capacity to help patients with non-fluent communication difficulty within a short period of time.

After thorough rehabilitative sessions, which lasted for twelve weeks of intensive 18 hours of training per week, this study established a significant difference in the pre-and post-evaluation findings. It was observed that the patients performed significantly better as result of the

treatment package used. This study also discovered that during and after the treatment, the patients became livelier, friendly and socio-emotionally interested in the issues around them. The finding was in line with the assertion of Grob, Linden and Ostermann (2010) that music therapy can be beneficial in activating and supporting mental and psycho-physical recovery. Melodic intonation therapy as a package of improvement, helped tremendously in the study of Grob, Linden and Osterman (2010) to develop better social concession and verbalization among the exposed non-fluent aphasias. It increased the social consciousness and awareness as well as cooperation spirit in them. This was in line with the finding of Abiodun and Oluokun (2007), which says that musical intervention provides help for children to enhance their communication abilities via group discussion and self disclosure.

More importantly, melodic intonation therapy provided a level play-ground for interaction and interpersonal relationship among the children of the rehabilitation centre with varied kinds of speech/language development disorder even after the treatment sessions.

Conclusion

Speech development remains one of the essential needs of all the categories of patients with communication disorders, most especially, those patients with non-fluent speech difficulty. Patients with non-fluent aphasias suffer greatly in the area of speech development due to the nature and the site of the affliction which is the language dominance unit of the brain. Consequently, their ability to acquire good speech profile becomes affected greatly, in the area of cognitive thinking, psycho-social feelings and relationship, educational development as well as overall communication enjoyment. In most cases, some of them exhibit social withdrawal syndrome, lack of interest and unfriendly attitude. In fact, they find it difficult always to perform or work correctly on the given task, due to their inability to produce volitional speech sounds (Osisanya and Oyebola, 1998). According to Byng (1992) some of the non-fluent patients demonstrated isolation syndrome, poor verbal recovery or severely restricted verbal output and poor articulated speech. Therefore, to effectively manage the non-fluent aphasias, requires a concerted effort and a kind of treatment package that will help ameliorate their difficulty in the area of speech development and social withdrawal syndrome.

Once, the communication skill becomes developed and reinforced thoroughly, all other cues and skills will become developed in turns. In fact, with better and perfect speech development profile, the non-fluent aphasias hitherto, will overcome their psycho-social complexities, territory deficits better. They will be privileged to re-integrate themselves back to the society for positive contributions, worthy living standard and attitude.

Based on the findings of this study ($cal.t= 10.95$; $crit.t= 1.18$, $df= 10$, $p<0.05$), it has been significantly established that melodic intonation therapy would be of utmost help to develop verbal-expressive and auditory comprehensible communication skills in patients with non-fluent aphasias.

This therapeutic package (CID W-22 test list and composed rhymes for the pre-nursery pupils) with the step by step intoned words development, via singing, has the required capacity and skill to develop good communication abilities and empowerment in the patients, if utilized well.

Recommendations

Melodic Intonation Therapy has been noticed, having the capacity to be very effective in the management of patients with speech difficulties such as Down syndrome, Aphasia, Cerebral Palsy and Autism etc.

In using the package, the three (3) therapeutic programme structure and techniques developed by Helfrich-Miller (Roper, 2003) must be followed. The programme involves keeping the same melodic line as the intoned sentences with constant pitch of the intoned words are being produced. This methodological profile is helpful in helping the non-fluent patients develop good communication and psycho-social skills, if adopted and utilized in the rehabilitative parlance. Also, the step by step approach that could help patients to record smooth transition must be adhered to. This will help separate the treatment patterns of children from that of adult.

With MIT, as the patient progresses on the therapy, the work of the therapist decreases. In the sense that once a patient masters the intoned words, the singing will fade-out gradually and normal speech becomes developed.

For a better result, the therapist must design the treatment exercise in such a way to stimulate and reinforce the patients well. The treatment must be accompanied with some musical instruments such as drum, rattles and tambourine as well as hand clapping to elicit cooperation and help arouse the interest of the patient right from the beginning.

The therapist should make use of some of fluent or normal speech individual, which the patients would tolerate, to join in facilitating and help develop good interpersonal relationship in them. The co-opted individual could be of immense help in continued speech and psycho-social development outside the school environment.

The patients' family should be encouraged to reinforce (in compensatory model) the effort of the patients by singing songs to them at home, especially at the beginning of the rehabilitation.

The patients must be placed on recorded intoned singing phrases and words during their leisure time. This could be done via using of VCD/DVD or cassette players.

The therapist and the family members involved must help the patients to select appropriate intoned phrases and words at the beginning, of the therapeutic programmes. This will help the aphasics to develop confidence and metaphorical ways to better express themselves. Furthermore, melodic intonation therapy can be of help in providing pleasurable atmosphere to learn and relax at will for all categories of patients with speech/language difficulty.

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