Implementation of Phonetic Placement Method in Down Syndrome Client Articulation Disorder: A Sing Case Study

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Abstract

Background: down syndrome is the most common chromosomal disorder that causes intellectual disability. Articulation disorder is one of the symptoms found in down syndrome. The condition is affected by macroglossia, muscle hypotonia, lack of control over lips and tongue and motor deficiency.

Objective: The need for early intervention through speech therapy, physiotherapy and occupational therapy as well as medical attention for various health problems that occur.

Method: using Single Subject Research, with one group pretest-posttest design. The participant was a female aged 8:5 years with articulation disorder on /p/ at the start of a word and had never received speech therapy. Data collection was done through interviews with the client's parents, direct observation of the client, tests, and document studies. Speech therapy was conducted for 10 sessions with an emphasis on bilabial phonetic placement exercises. Perceptual assessment by comparing the ability to produce /p/ at the start of a word before and after therapy.

Results: in the post speech therapy assessment, there was an increase of 60%.

Conclusion: Interventions given to clients to help articulation skills through the phonetic placement method. After the intervention was carried out for 10 sessions, a post test was carried out on the client and there were changes in the client's articulation ability in this case.

Keywords: articulation, intellectual disability, phonetic placement method.

INTRODUCTION

Down syndrome is a chromosomal disorder condition that is widely diagnosed in newborns. In Down syndrome conditions found macroglossia conditions, palate structure, tongue size, temporomandibular joint dysfunction and muscle hypotonia that can affect articulation (1). Down syndrome is called syndrome because it affects various organ systems of the body, the effects of Down syndrome effect on the physical with its symptoms, including heart defects, congenital conditions affecting muscles and bones, digestion, and immunity, as well as intellectual impairment (2). Down syndrome is a congenital abnormality on chromosome 21. This disorder will affect almost all body systems, with diverse characteristics. Including intellectual disorders, posture, having a longer tongue than other children and others (3). Trisomy disorder 21 occurs in between 1 in 319 and 1 in 1000 births (4).

Articulation disorders are a form of error in the production of speech in a person (5). In a study explained that children with Down syndrome have problems in articulation production. Speech production deficits and reduced clarity are consistently associated with any combination of phonological, structural (longer tongue size), and/or reduced ability motor control (6). In order for Down syndrome children to optimize their articulation abilities, speech therapy interventions are needed. One method that can be applied in conducting articulation interventions is phonetic placement. Phonetic placement is one of the stages in the traditional approach, phonetic placement is done after the client has an auditory sensory modality (7). The phonetic placement method helps children position articulator correctly to produce the desired sound target (8)(9) According to Brosseau-Lapré and Rvachew phonetic placement. is a therapeutic method that helps clients place articulators according to the sound they want to produce, this can also be assisted by therapists (10).

RESEARCH METHODS

The type of research is epidemiological intervention with one group design method. This means conducting research on someone suspected of suffering from a disease by providing intervention

(treatment). This approach is preceded by a pretest, after which an intervention (a treatment that is systematized and can be measured success rate) based on the results of the initial assessment, Then the subjects were post-tested to measure the success of the intervention (11). Kazdin and Tuma in Prahmana define Single Subject Research (SSR) as an experimental research methodology used to evaluate an intervention performed on a subject or a single individual (12).

The advantage of the Single Subject Research method is that it can see the effects of an intervention and see its effectiveness as well. In addition, this method can observe changes in client abilities from day to day. 12) The single subject in this study was an eight-year-five-month-old girl client living in Jelambar Baru Village, Grogol Petamburan District, West Jakarta. The assessment was carried out at Harapan Kita Hospital. Assessment is carried out through interviews, observations, tests and documentation studies.

If depicted flow chart one group design:

Diagram 1. Flow chart one group design

Basically, research is a measurement effort, then measuring instruments in research are called research instruments (14). Research instruments according to Ibn Hadjar in (15) are measuring instruments used to collect quantitative data / information about variations in the characteristics of research variables objective. Data collection techniques used in this study were interviews with clients' parents, observation of clients' speech, motor, and sensory language skills, various tests and document study. Data collection techniques can be seen in table 1 below:

Table 1. Techniques, Respondent Instruments and Research Indicators

No	Collection Techniques Data	Instruments	Respond	Indicator
1	Interview	Form, Interview and Inform Consent	Client's parents	Obtain data on: client identity, causal factors, medical history before and after illness, family history.
2	Observation	Observation	Client	Knowing: physical condition, speech

		Form		language skills, motor skills, sensory abilities.
3	Speech Tool Inspection (PAW)	PAW Form	Client	Knowing: the structure and function of the speech organs, and the presence or absence of damage to the client's speech organs both anatomically and functionally.
4	Articulation Tests	Articulation Test Form	Client	Knowing: articulation ability at the word level, and to assess the presence or absence of articulation errors of substitution, omission, distortion, and addition (SODA).
5	Auditory Language Comprehension Test (PBSA)	PBSA test form	Client	Knowing: the client's language comprehension ability at the level of words, phrases and sentences through auditory stimuli
6	Document Study	Results of the doctor's examination	Doctor	Supporting data needed by researchers in strengthening the data obtained
7	Initial Test and Final Test	Initial Test Form and Final Test	Client	Knowing the success of therapy achieved

After the assessment, the data obtained will be analyzed in order to determine the right diagnosis. Data analysis is the last stage before drawing conclusions (16). Data analysis will provide an overview of the abilities, obstacles or needs of the client so that it will be able to formulate a therapy program that suits the client.

Case Description

An eight-year-five-month-old client with Down syndrome. The second of two children. The client has been verbal but for the client's ability to articulate it is still experiencing obstacles. The client is already verbal with the client's expressive language skills still at the word level, late receptive language comprehension being at the age of 2.5 - 3 years. Client attention is easily distracted. The client is able to walk on his own without assistance. The client attended Special education school (SLB N) in Jakarta.

Therapeutic Goals

The specific goal of therapy is for the client to be able to produce articulations in the consonant /p/ at the beginning of words with a combination of vowel /a/ without word-level omission by imitating as many as 5 word items [spikes], [hammer], [morning], [thigh], [rice].

Therapy Methods

Phonetic placement is a method for treating articulation disorders that involves various techniques in helping clients position and move the articulator correctly according to the sound or desired phonemes. These techniques can include verbal instructions, imitation, help manipulating articulator movements which are then feedback related to the articulator's position (10). When the client is unable to imitate the target sound, the Speech Therapist begins to give cues or instructions regarding the correct placement of the articulator, this type of instruction is called phonetic placement (9).

When the client is unable to mimic the target's voice, the Speech Therapist usually begins to cue or instruct the client for the correct and appropriate placement of the articulator. This type of instruction is called phonetic placement (9).

1) Instruct the client to place an articulator to produce certain speech sounds that correspond to (Manner of Articulation/MoA) and (Place of Articulation/PoA).
2) Provide visual and tactile assistance so that the client can do so (for example the /l/ sound, give a visual example of the tongue being moved to the tip of the next upper tooth when the client is still unable provide tactile assistance).
3) Stage two will be able to help the client, to analyze and explain the difference between fault production and target production, depending on the maturity level of its articulator. Sometimes a speech therapist may use pictures or photographs to help with instruction.

Therapy Materials

The therapy material is adjusted from the results of the analysis of the assessment data obtained. From the results of the articulation test, there is one group of sounds that has not been consistently mastered. The client's ability to produce /p/ is still inconsistent, with the omission of the consonant

/p/ at the beginning and /p/ at the end of the word. Based on these data , consonant therapy material /p/ is taken at the beginning of the word that is still inconsistently transmitted. The /p/ sound belongs to the category of bilabial sounds in PoA (place of articulation).

Bilabial involves two lips. When producing sound, use only both lips. So, both lips help produce bilabial sounds. The sounds /p/, /b/, and /m/, /w/ are bilabial sounds. Examples: mama /m/, papa /p/, aunt /b/, time /w/ (17). While in MoA (manner of articulation) the sound /p/ is included in the category of plosive sounds. Plosive sounds are made by forming a total resistance to the flow of air through the mouth and nose. The first stage is closure. Then the airflow builds up and finally the closure is released, creating a blast of air that causes a crisp sound. The inner plosives are: /p/, /b/, /t/, /d/, /k/, /g/, /?/ (18). The therapeutic material used is as follows:

Table 2. Therapy Materials

No.	Therapy Materials
1.	[nail]
2.	[hammer]
3.	[morning]
4.	[evil]
5.	[rice]

Judging Criteria

The following are the assessment criteria given:

a. Response criteria

1) Value 1: client is able to imitate the consonant /p/ at the beginning of a word with a vowel combination /a/ without omission.

2) Value 1/2: client is able to imitate the consonant /p/ at the beginning of a word with a vowel combination /a/ without omission but hesitation or more than 5 seconds.

3) Rated 0: the client is unable to correctly imitate the consonant /p/ at the beginning of a word with the vowel combination /a/ without omission

b. Success criteria

1) Success: the client gets a value of 4-5 points.

2) Quite successful: the client gets a value of 2-3 points.

3) It didn't work: the client got a value of 0-1 point.

RESULTS AND DISCUSSION

Based on information from parents, it is known that the doctor stated that the client had Down syndrome. According to Raymond D. Kent, the cause of Down syndrome is a genetic disorder that most often occurs in children. A genotype involving an extra double of the short arm of chromosome 21, can occur as trisomy (95% of cases), translocation or mosaic (19). Down syndrome It is one of the most common gene disorders in cases of intellectual impairment caused by abnormalities in chromosome 21 (20). Based on the results of the articulation test examination, data were obtained that the client experienced articulation errors in the form of substitutions and emissions.

Based on the articulation format of 69 test items, data were obtained that from 69 items, the client experienced a substitution of 1 item in the consonant /f/ at the beginning of the word to /p/ in the middle of the word For example, in the word /shroud/, the omission of 46 items consists of /p/ at the beginning of the word, /-p/, /b-/, /m-/, /-m-/, /-m/, /-t/, /d-/, /n-/, /-n/, /l-/, /-l/, /k-/, /-k/, /g-/, /-g/, /-ŋ-/, /-ŋ/, /tʃ-/, /-dʒ-/, /ń/, /-ń-/, /f-/, /-f/, /v-/, /s-/, /-s/, /r-/, /-r-/, /-r/, /w-/, /-w-/, /-w/, /ĵ-/, /-ĵ/, /br-/, /dw-/, /fr-/, /gr-/, /kl-/, /pr-/, /sk-/, /sp-/, /st-/, /sw-/ and normal as many as 22 items. In Down syndrome conditions consonant deletion occurs (omission) being the most common type of error (21). Down syndrome has the characteristic of late consonant deletion (omission), cluster removal, lateral sound disturbances, vocal stop and fricative disturbances (6).

Several studies prove that clarity of speech is a serious problem in individuals with Down syndrome, that it continues throughout life for many people, and that this is possible has a negative effect on social activities (22) Very few of these studies reported detailed analyses of the underlying factors for reduced clarity, although they could It is assumed that disturbances in voice, articulation, resonance, eloquence, and prosody all contribute to this problem. It is not known how difficulties in

each of these areas contribute to the overall clarity deficit. It is also unclear whether any articulation errors or unusual or unusual phonology increase the risk of impaired clarity (22).

Based on the results of interviews with the client's mother, the stages of development of the client's speech language are as follows: Client's vocalization reflex at the age of 0 months, babbling 8 months, lalling 16 months, echolalia The client's mother forgot and the client's true speech at the age of 36 months. The client's ability in the development of articulated sounds is at the age of 3 years. When compared to the client's current chronological age of 8 years and 5 months, the client experiences delays for abilities that should be mastered. Children with Down syndrome experience neurodevelopmental disorders that affect their language disorders (23). Based on the results of the auditory language comprehension test (PBSA) of the 101 stimulus items that have been given, the client was only able to correctly answer 43 items of commands, 58 items of error. When viewed from the PBSA test results, the client's ability is under the age of 3 years. Delayed language development as one of the characteristics that exist in Down syndrome conditions (24).

Based on the Speech Tool Examination (PAW) test, results were obtained for the structure and function of the client's speech apparatus such as the client's eyes narrow, swollen and red eyelids, the client's nose was visible Small or pug, small mouth and sometimes hanging open, tongue seems wide. Based on the results of the examination, when the client was asked to inflate his cheeks and hold his breath for a moment, the client was unable to do so. There is an expulsion of air through the client's nose (nasal emission). Based on the results of the examination, the client's teeth looked toothless on the right and left molars, the client's teeth were loose and for the client's dental hygiene there was a pile of tartar.

Based on the results of the examination, the client was unable to stick his tongue up. Based on the results of the examination, when the client is asked to pronounce the vowel sound /a/ the client tends to shout by removing the phonation /a/ for 4 seconds. Based on the results of psychological examination, data were obtained that the client's ability at the stage was able to train (25). At the stage of being able to train based on classification according to (26) falls into the category of moderate

mental retardation level with IQ levels of 35-40 to 50-55. The following are the results of the implementation of therapy that has been implemented:

Table 3. Implementation of Therapy

Meeting	Stimulus	Responds
1 and 2	a. The client is asked to produce /p/ and explain to the client when producing /p/ the position of the two closed lips touching each other b. Both see in the mirror the movement of the two lips closing each other production / p/ c. The client is asked to imitate the initial syllable /pa/ d. Manipulating the client's lips to open and close using a spatel e. The client is asked to imitate the initial syllable [papa] f. The client is asked to repeat the /p/ production at the beginning of the word in the word [nail] 5 times g. The client is asked to mimic the initial syllable /pa/ on the stimulus [spike] h. The client is asked to imitate the initial syllable and the subsequent syllable [cuneiform] i. The client is asked to repeat the /p/ production at the beginning of the word in the word [nail] 5 times j. The client is asked to imitate the initial syllable [papa] k. The client is asked to repeat the /p/ production at the beginning of the word in the word [hammer] 5 times	a. The client is able to mimic / p/ but the closure of both lips is inadequate b. The client tries to imitate the movement through the mirror but the client still seems to struggle and suffers from distortion c. The client follows directions, wants to open and close the lips with the help of using a spatula but is still less strong in lip closure d. The client is able to mimic the initial syllable [papa] on a given stimulus e. The client is able to imitate speech but there is an omission [nail] becomes /ku/ f. The client is able to imitate the initial syllable /pa/ in the word [nail] according to the stimulus given g. Client able to follow word [nail] h. The client is able to repeat the production of /p/ at the beginning of the word in the word [nail] 5 times i. The client is able to mimic the initial syllable [papa] on a given stimulus j. The client imitates speech by saying [hammer] but there is an omission to [pa u] 5 times
3 and 4	a. The evaluation of the 1st &; 2nd meeting asked the client to imitate the word [hammer] 5 times b. The client is asked to produce /p/ and explain to the client when producing /p/ the position of the two closed lips touching each other c. Both see in the mirror the movement of the two lips closing each other	a. The client is able to pronounce the word [hammer] into [pa u] 5 times b. The client is able to emulate / p/ c. The client is still inconsistent in mimicking the movement through the mirror d. The client is able to imitate

Meeting	Stimulus	Responds
	production / p/ d. The client is asked to imitate the initial syllable /pa/ e. Manipulating the client's lips to open and close using a spatula f. The client is asked to imitate the initial syllable [papa] g. The client is asked to repeat the /p/ production at the beginning of the word in the word [nail] and /hammer 5 times h. The client is asked to mimic the initial syllable /pa/ on the stimulus [nail] and [hammer] i. The client is asked to imitate the initial syllable and subsequent syllables [nail] and [hammer] j. The client is asked to repeat the /p/ production at the beginning of the word in the word [morning] 5 times k. The client is asked to mimic the initial syllable /pa/ on the [morning] stimulus l. The client is asked to imitate the initial syllable and the next syllable [morning]	and chase /pa/ e. The client is able to open and close the lips with the help of using a spatula f. The client is able to mimic the initial syllable [papa] on a given stimulus g. The client was able to teach [nail] to [pa u] and [hammer] to [pa u] 5 times by imitating h. The client is able to say [morning] 5 times i. The client is able to follow the initial syllable /pa/ on the stimulus [morning] j. The client is able to repeat the production of /p/ at the beginning of the word in the word [morning] 5 times
5 and 6	a. The evaluation of the 3rd & 4th meeting asked the client to imitate the word [morning] 5 times b. The client is asked to produce /p/ and explain to the client when producing /p/ the position of the two closed lips touching each other c. Both see in the mirror the movement of the two lips closing each other production / p/ d. The client is asked to imitate the initial syllable /pa/ e. Manipulating the client's lips to open and close using a spatula f. The client is asked to imitate the initial syllable [papa] g. The client is asked to repeat the /p/ production at the beginning of the words [thigh] and [rice] 5 times h. The client is asked to mimic the initial syllable /pa/ on the stimuli [thigh] and [rice] i. The client is asked to imitate the initial syllable and subsequent	a. The client is able to say the word [morning] 5 times b. The client still looks troubled and distorted when imitating movement through the mirror c. The client is able to teach /pa/ to [papa] by imitating d. The client wants to open and close the lips with the help of using a spatula but the client is less strong in lip closure e. The client is able to mimic the initial syllable [papa] on a given stimulus f. The client is able to follow the teaching of [thigh] to /pa a/ and [paddy] but it is still inconsistent and there is an omission to /di/ g. The client is able to repeat producing /p/ at the beginning of the word in the word [thigh]

Meeting	Stimulus	Responds
	syllables [thigh] and [rice] j. The client is asked to repeat the /p/ production at the beginning of the words [thigh] and [rice] 5 times k. Clients are asked to mimic the initial syllable /pa/ on stimuli [morning], [thigh] and [rice] l. The client is asked to repeat the /p/ production at the beginning of the word [morning], [thigh] and [rice] 5 times	to /pa a/ and [rice] 5 times h. The client is able to teach [morning], [thigh] and [rice] 5 times by imitating i. The client is still inconsistent and has omission in the word [thigh] to /a/
7 and 8	a. The evaluation of the 5th & 6th meeting asked the client to imitate the words [morning], [thigh] and [rice] 5 times b. The client is required to produce /p/ and explain to the client at the time of producing /p/ the position of the two closed lips touching each other c. Both see in the mirror the movement of the two lips closing each other production / p/ d. The client is asked to mimic / p/ using a tissue in front of the lips where air comes out e. Manipulating the client's lips to open and close using a spatula f. The client is asked to imitate combining the initial syllable [papa] g. The client repeats itself producing /p/ at the beginning of the words in the words [nail] and [hammer] 5 times h. The client is asked to mimic the initial syllable /pa/ on the stimulus [nail] and [hammer] i. Clients are asked to mimic the initial syllable /pa/ on stimuli [morning], [thigh] and [rice]	a. The client is able to pronounce the word [morning], [thigh] is transmitted to /aa/ and [rice] 5 times b. The client is able to teach / p/ by imitating but the strength of the lips in closing is still not strong c. The client is able to pass / p/ in front of the lips using a tissue in a mimicking way but the pop is not right d. The client is willing to open and close the lips with the help of using a spatula e. The client is able to mimic the initial syllable [papa] on a given stimulus f. The client was able to teach [nail] but was still inconsistent and substituted into [patu], [papa] and imitated [hammer] 5 times g. The client experiences omission when teaching [nail] and [hammer] into [pa u] h. The client is able to imitate the movement through the mirror to close the lips i. The client experienced omission and substitution in teaching [morning], [thigh] to [pa a] and [rice] 5 times j. The client is able to repeat producing /p/ at the beginning of the word in the word

Meeting	Stimulus	Responds
		[morning], [thigh] but there is an omission to /aa/ and [rice] 5 times
9 and 10	a. The 7th &; 8th meeting evaluation asked the client to imitate the words [nail] and [hammer] 5 times b. The client is asked to produce /p/ and explain to the client at the time of producing /p/ the position of the two lips closing so that they touch each other c. Both see in the mirror the movement of the two lips closing each other production / p/ d. The client is asked to mimic / p/ using a tissue in front of the lips where air comes out e. Manipulating the client's lips to open and close using a spatula f. The client is asked to imitate the initial syllable [papa] g. The client is asked to repeat himself producing /p/ at the beginning of the word in the words [morning], [thigh] and [rice] 5 times h. The client is asked to mimic the initial syllable /pa/ in the stimulus [morning], [thigh] and [rice] i. The client is asked to imitate the initial syllable and subsequent syllables [morning], [thigh] and [rice] j. The client is asked to imitate the initial syllable [papa] k. The client is asked to repeat the /p/ production at the beginning of the words [nail] and [hammer] 5 times l. The client is asked to imitate the initial syllable and subsequent syllables [nail] and [hammer]	a. The client is able to say the word [morning], [thigh] there is an omission to /aa/ and [rice] 5 times b. The client still seems to struggle and experience distortion when imitating movement through the mirror c. The client is able to imitate teaching / p/ using a tissue in front of the lips but the lip pop is still not strong d. The client is willing to open and close the lips with the help of using a spatula e. The client is able to imitate the initial syllable [papa] according to the stimulus given f. The client was able to imitate teaching [nail] into [pa u] and [hammer] into [pa u] 5 times g. The client is able to imitate the teaching of [nail] and [hammer] but there is an omission of being /au/ h. The client is able to follow the initial syllable /pa/ on the stimulus [morning], [thigh] becomes [pa a] and [rice] according to the stimulus given
11	Evaluation: Evaluate the handling that has been done during 10 meetings by imitating: [nail], [hammer], [morning], [thigh], and [rice]	The client is able to imitate: [nail], [hammer], [morning], [thigh], and [rice].

Interventions have been carried out to clients as many as 10 sessions. Then a final test is carried out with the results of the comparison of the initial and final tests as follows:

Table 4. Comparison of Initial Test Results and Final Test

No	Test Materials	Initial Test Response	Value	Final Test Response	Value
1	Nail	/ku/	0	/ku/	0
2	Hammer	/Read/	0	Tidak Reply	0
3	Morning	/give/	0	[pagit]	1
4	Bad	/Has/	0	[pa a]	1
5	Rice	/of/	0	[pagik]	1
		Sum	0	Sum	3

Table 5. Pre-Post Test Results

	Mean	N	SD	df	p-value
Pre test	.00	5	.000	4	.070
Post test	.60	5	.548		

After the client was given 10 sessions of intervention, there was 60% improvement. The material provided considers the capabilities and modalities that the client has. From the results of the articulation test there is an inconsistent omission, namely on the consonant /p/. Evaluate the handling that has been carried out as many as 10 sessions by imitating: [nail], [hammer], [morning], [thigh], and [rice]. From the results of the final test, changes were obtained in the ability to teach several words, the client was able to imitate: [nail], [hammer], [morning], [thigh], and [rice]. From the results of the study, according to Korah, the phonetic placement method is effective for the articulation ability of children with impaired speech organ structures (27).

CONCLUSION

Based on preliminary studies that have been carried out interventions on a client girl aged eight years and five months. Interventions are given to clients to help articulation skills through the phonetic placement method. After intervening for 10 sessions, a post test was carried out on the client and there was a change in the client's articulation ability. It is proven that the phonetic placement method is effective for clients with Down syndrome cases in this case.

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