

Intervention Approaches used for Speech Sound Disorders in Children in Tertiary Care Hospitals, Karachi

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Abstract: Objective: The aim of the study was to determine the most common intervention approach used by speech, language therapists to remediate speech sound disorders in children, working in tertiary care hospitals of Karachi. In addition the study examined responses commonly provided by the clinician as contingency responses for the correct and incorrect production of a sound.

Methods: Cross sectional study was conducted with speech language therapists working with children who are presenting with the concerns of speech sound disorders. Questionnaire containing multiple choice questions was designed and shared online with speech, language therapists working in tertiary care hospitals. Simple random sampling technique was used and 43 responses were recorded and stored in a Google sheet.

Results: IBM SPSS statistics was used for qualitative data analysis, findings revealed that more than half of the total participants use aspects of traditional motor approaches in the selecting the target production of a sound, level at which the sound is to be targeted, elicitation techniques used to elicit desired production of a sound and in making decisions to move towards next step of therapy plan. 55.8% of the total participants reported to use verbal, tactile and kinesthetic cues and prompts as the common contingency responses.

Conclusion: These findings contribute to the existing state of knowledge about the treatment approaches used by speech, language pathologists for children presenting with speech sound

disorders. The application of traditional motor approach with combined elements of other intervention approaches i.e. sensory perceptual approach and cyclic approach to intervention was seen to be more common.

Keywords: Speech Sound disorders, Intervention approaches, Traditional motor approach, Linguistic based approaches, Tertiary care hospitals, Evidence based practice.

Introduction

Speech Sound Disorders (SSDs) are one of the most prevalent communication disorders (Schools survey report, 2018) and is among the commonest treated developmental disorders (De Anda, 2022) in pre-school children (Campbell, 2003). In children there has been significant diversity in the occurrence of Speech Sound Disorders (Bauman-Waengler, 2018). Furthermore, children with speech sound disorders present as a heterogeneous group in terms of their number and types of errors influence on overall intelligibility of speech or response to intervention. They may present with articulation errors, phonological errors, or both (Dodd, 2018). If proper type and intensity of facilitation during the years before a child gets enrolled in school is not provided, children with speech sound disorders are at risk of developing educational and socio-emotional difficulties (Lewis, 2016). It leads to problem in literacy acquisition (Overby, 2012) often associated with dyslexia and spelling disorders (Kim, 2019; Siemons-Lühning, 2021) later in life it reduces employment opportunities (Kim, 2019). Traditional articulation therapy has historically been the most common intervention approach (Hardin-Jones, 2020) for eliminating compensatory and obligatory speech sound errors (Diepeveen, 2020). It is constantly used in a hierarchy according to performance (Mendoza Ramos, 2021). Even in the presence of evidence-based phonological interventions approaches, there is lack of accurate researches that can guide speech language therapists to make decisions between intervention approaches (Rvachew, 2021). Speech language therapists' current interventions practices for phonological impairment in children (Hegarty, 2021) revealed that speech language therapists are not completely aware of all evidence-based treatment approaches that can be used as alternatives (Chung, 2022). Speech language therapists only tend to consider these approaches if the child does not respond to their typical intervention plan (Hegarty, 2021). Speech language therapists tend to use known often combined approaches to treat phonological disorders (Hegarty, 2021). Phonological interventions or linguistic-based approaches are the largest group of interventions available for children with phonological impairment (Baker, 2011). It is based on distinctive features theory Morsette. "Utilizing motor based approaches (e.g., traditional articulation approach), sound approximations, and non-speech oral motor exercises for phonological disorders are contraindicated unless the individual has comorbid articulation and phonological disorders" (Randolph, 2017). A study noted an improvement in intelligibility which was more significant in participants who received phonological disorders treatment than those that received articulation/traditional approach (Jesus, 2019). A study was conducted in 2018, to investigate the clinical management of

phonological impairment by speech and language therapists (SLTs) in the United Kingdom (UK) (Hegarty, 2018). Study highlighted that half the participants of the study always/often used traditional articulation therapy to remediate phonological impairment, although this approach has been found to be less effective (Oliveira, 2015). It is important to collect quantitative data to explore the therapeutic intervention approaches used by speech, language therapists without consideration of why and how these processes are implemented within clinical settings. Identification of highlighted error patterns is significant to make effective intervention plan and to follow intervention approaches that can maximize speech production.

Methods

A cross-sectional study of speech therapists working in a tertiary care hospital in Karachi was conducted. A self-designed survey questionnaire was written in English and contained 12 questions grouped into components containing demographic information and intervention techniques used by speech and language therapists to address language disorders. A pilot study was conducted with 5 speech therapists. Multiple-choice questionnaires were created online using the Google Forms platform. The sampling method was simple random sampling. An online link was shared with the speech therapist, along with a description of the purpose of the study, who invited them to participate in the study. 43 responses were received and was automatically collected by the system and stored in a Google sheet.

Results

Participant's demographics

A total of 43 responses were obtained and information related to their working experience in tertiary care hospitals including others settings was analyzed. Findings revealed that 90.7% of total participants work in other settings including tertiary care hospitals, 41.9% of total participants have working experience of more than 4 years and 16.3% of the total participants have working experience of less than one year.

Statistical analysis

IBM SPSS statistics was used for statistical analysis. The significance level was set at $p \leq 0.05$. According to finding there is no significant correlation between years of working experiences and selection of targets for intervention as demonstrated in Table 1 stimulability of a sound is found to be the most common variable that is being considered in selecting the target sound.

Table 1: Criteria of selection of target sounds

Selection of target sounds	Always	Frequently	Sometimes	Never	P value
Stimulability	27	15	1	0	0.942

Sounds in functional words	7	16	19	1	0.142
Effect on overall intelligibility	23	18	2	0	0.464
Accurate production in facilitative context	14	20	9	0	0.09

Table 1 shows that majority of the participants 27 always consider the stimulability of the sound for targeting the correct production of the target sounds, 23 of the total participants always consider sound production that impacts the overall speech intelligibility, 14 participants always target the sound that can be produced in some facilitative context while 7 of the total participants reported to target the sound that occurs in functional words.

Table 2 shows the frequency of targeting sensory perceptual training as a goal of intervention. Data revealed that 27.9% of the total participants always include sensory perceptual training as a part of the intervention that is one element of traditional motor approach, 51.2% of total participants reported to target sensory perceptual training frequently while 20.9% of the total participants reported to target auditory discrimination of the target sound sometimes. Data gathered about the levels at which sensory perceptual training is targeted revealed that more than half of the total participants' i.e. 29 out of total participants reported to target the discrimination between sounds at isolation level, 1 out of the total participants target auditory discrimination in nonsense syllables, 10 out of total participants use minimal pairs while 3 out of total participants target discrimination at maximal pairs and there is no significant correlation observed i.e. $p=0.852$.

Table 2: Targeting auditory discrimination of target sound as a goal of intervention.

Always	Frequently	Sometimes
12	22	9
27.9%	51.2%	20.9%

More than half of the participants 72.1% reported to use phonetic placement and shaping as a technique for the elicitation of correct production of a sound, 27.9% of the total participants reported to use stimulation cues and prompts, while none of them reported to employ facilitative contexts, grapheme and phonetic symbol as a strategy to prompt the correct production of a sound. When data gathered about the level at which the production of a sound is targeted it was found that 79.1% of the total participants target production of a sound at isolation. While in targeting the production of a sound more than half of the total participants target one sound or error pattern only. There is a significant correlation between years of experiences and selection of target sounds ($p=0.027$) (Table 3).

Table 3: Production of a target sound

Elicitation technique		
Phonetic placement and shaping	31	72.1%
Auditory, tactile and visual stimulation cues and prompts	12	27.9%

17 out of 43 participants consider the correct production of a sound in natural environment before targeting the correct production of other sound as a treatment objective. 15 out of 43 participants reported to consider the correct production of sound at word level with 100% of accuracy in structured contexts, while 11 out of 43 participants reported to consider the correct production of a target sound in facilitative contexts.

Table 4 shows the commonly used models, contingencies and input mostly used by speech language therapists in response to production of a sound. More than half of the participants use cues and prompts in response to production of an incorrect sound and there is no significant correlation i.e. ($p=0.14$) found with years of working experiences.

Table 4: The commonly used models, contingencies and inputs

		What model, input and contingencies you mostly use in your sessions?				Total
		Verbal, tactile and kinesthetic cues and prompts	Providing corrective feedback	General praise for effort and participation	Token reinforcement	
Since how long have you been practicing speech therapy?	Less than 1 year	3	4	0	0	7
	1-2 years	5	5	0	1	11
	3-4 years	5	0	2	0	7
	More than 4 years	11	6	1	0	18
Total		24	15	3	1	43

Discussion

Even in the presence of current knowledge of articulation-based error types and phonologically-based error types, clinician must be aware about individual variation and treatment requirement (Sandbank, 2011). There are numerous barriers to implementing other intervention approaches including lack of familiarity (Storkel, 2018) and knowledge about evidence base supporting approaches that consequently limits speech sound production in children receiving speech therapy services. Speech language therapists can plan an effective intervention approach by understanding the importance of evidence-based intervention approaches, highlighting the goals

of treatment, and self-awareness of clinical skills, to maximize outcomes for each individual (Cabbage, 2020). The study was conducted with the purpose to inquire about the intervention approach that is commonly followed by SLPs working in tertiary care hospitals. The findings of the study show that SLPs prioritize elements of traditional motor approach in the management of SSDs. It is consistent with the findings of a national survey conducted, where speech-language pathologists were asked about therapeutic services of severe sound disorders between the ages of 3 to 6 years. Traditional articulation technique is more common than other types of intervention some SLPs reported. However; SLPs reported to use aspects of phonological interventions including the acknowledgement of the phonological awareness training (Oliveira, 2015). A study conducted was conducted in 2021 with the purpose to explore the treatment processes used by speech-language pathologists (SLPs) to remediate speech sound disorders (SSDs revealed that SLPs often combine aspects of four therapies: the Minimal Pairs Approach, Traditional Articulatory Approaches, Auditory Discrimination, and Cued Articulation) (Strand, 2020).

Additionally it was acknowledged that researches are required to enhance the knowledge through studies (Ahmadi, 2019). This knowledge will provide an information base on which approach or combination of approaches will be most effective for the client group with specific presentations" (Hegarty, 2021). It is considered the standard of clinical care within the professions (Tessel, 2021). Another study conducted by Carol A. Tessela and Jenna Silver Luque in 2019 with an objective to compare the effectiveness of a phonologically based accent modification treatment to an articulation/motor based treatment with Spanish-speaking adult learners of English using a small group model. One of the major finding of this study is that an articulation based approach may be more effective for treating vowels, with Spanish speaking learners of English in the early stages of English fluency (Hitchcock, 2015). Further research can be conducted with an objective to focus on comparing different treatment settings, such as individual vs. group therapy, effectiveness of extensive vs. intensive therapy (Duffy, 2019).

Conclusion

Speech sounds errors can negatively impact an individual's speech intelligibility or social functioning which may negatively affect their lives, thus making effective intervention essential. The study revealed that the most common intervention approaches used in Speech sound disorders are the use of articulatory based interventions i.e. traditional motor approach.

Conflict of Interests

The authors declare no conflict of interest.

Authors Contribution

All authors contributed equally in this research study

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