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To Assess the Efficacy of Speech Elicitation Programme (SEP©) in Children with Speech Sound Disorders: A Qualitative Study

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ABSTRACT:
Verbal communication is the most vital tool bestowed upon humanity. Inability to use this tool incapacitates the person from interacting with the social world around them thereby curbing their enthusiasm, curiosity, and eventually their expressive drive and ability. SEP© (Speech Elicitation Programme) is an innovative method to elicit speech sounds and assist in eliciting words and sentences in children with speech delay or speech sound disorder. SEP© derives its principles from the fields of Occupational Therapy, Sanskrit texts, and from the science of music and instruments. Thus, this study aims to assess the efficacy of Speech Elicitation Programme in eliciting words and sentences thereby impacting children's freedom and development. An exploratory descriptive qualitative approach will be used. Semi-structured interviews will be completed with 20 families of children with speech difficulties. Reflexive thematic analysis will be employed to analyse the data gathered.
The qualitative analysis of the study from 20 parents were analysed on all 10 questions. An attempt was made to understand and describe each question for the theme it created. The findings from this study indicates that many parents affirmed the SEP© protocol and did not expect to hear words during elicitation. 18 participants were successfully assisted in eliciting words; however, 2 of the participants could not elicit words. Parents expressed optimism that this approach will assist children in learning meaningful words.
The findings of this study will help in understanding the deeper impact of speech and use of morphemes in the treatment process. Additionally, the findings may identify approaches for leveraging what makes OT distinct and for structuring the programme to address the key issues in the development of speech.

Keywords: Speech Delay, Occupational Therapy, Speech Elicitation.

INTRODUCTION:

Speech is the ability to use words for communication which helps convey needs, sharing ideas, beliefs and opinions. Speech is among the most intricate abilities that individuals acquire. It necessitates the use of motor, sensory, perceptual, praxis, and cognitive functions, as well as the combination of these capabilities. Given the complicated nature of this skill, it is not surprising that numerous children face

challenges in achieving proficiency in this domain.Speech Sound Disorders generally describe a range of difficulties in producing speech sounds in children(Namasivayam et al., 2020). Classifying SSD has been attempted in literature but it is complicated by the complex interplay between the aetiology, processing deficits, and the behavioural levels (speech symptoms) and is under-specified in the literature (Namasivayam et al., 2020).

These disorders are categorised into four subtypes(Rasmussen et al., 2018). Motor Speech Disorders (MSD), namely, Childhood Dysarthria; Childhood Apraxia of Speech (CAS); Speech Motor Delay (SMD); Concurrent Childhood Dysarthria and CAS.

Various conditions can cause Speech Delay such as cerebral palsy, Autism, HIE, Genetic Disorders, Global Developmental Delay, Etc (Kanhere & Sunderajan, 2019). Many forms of developmental speech sound disorder are due to structural, sensory or neurophysiological causes, but more often the cause of the problem is unknown(Waring & Knight, 2012). Prevalence of children with speech issues is on the rise and a cause for concern. In 2021, an estimated 61.8 million people (1 in 127) were on the autism spectrum(Santomauro et al., 2024). According to this study, it is very difficult to provide a global estimate due to lack of standardised methods of diagnosis, lack of knowledge about these developmental conditions in less educated sections of society (Santomauro et al., 2024).

General advocacy of nonverbal communication in the form of gestures and sign language is a taxing affair, and more so for special children. Such issues can result in long-term difficulties in mental health, social well-being and academic outcomes (Langbecker et al., 2020; Law et al., 2003).Current treatment methods available to manage this rising challenge are with Occupational Therapist and Speech Therapist. (Garcia et al., 2020; Ryan et al., 2024). The primary goal of interprofessional collaboration is for professionals to share their expertise, information, clinical decision-making, and support goals to work in a comprehensive way and offer patients and families high-quality assistance (Ikeda & Sasada, 2022).Speech therapy for children often involves many techniques like play-based methods, such as Sequencing Activities or Language-Centred Board Games, Rapid Syllable Transitions, Visual Aids, Drills, Phonetic Placement Techniques, and Auditory-Verbal Therapy (AVT) (Habibah et al., 2025; McCabe et al., 2020).More structured protocols like PROMPT and DTTC are also used with traditional speech therapy technique(Donadio et al., 2023),(Kelly, 1987). PROMPT (Prompts for Restructuring Oral Muscular Phonetic Targets) is a tactile-kinaesthetic technique for providing physical guidance to articulators, while DTTC (Dynamic Temporal and Tactile Cueing) is a cueing hierarchy that incorporates temporal (timing) and other cues to facilitate motor planning and practice.

Occupational Therapists work in a multidisciplinary team to help children with speech delay by addressing issues with physical and sensory components that impact communication, such as poor muscle control, attention; they also work on enhancing breath control, muscle strength and coordination required for clear articulation through fine and gross motor skills (Reilly et al., 1983), improving coordination, and auditory processing, thus creating a stronger foundation for speech development. Both classical and contemporary studies emphasize relations between speech and executive functions (Zakharova & Агрис, 2023). Studies demonstrate that Occupational Therapist's interventions can lead to significant improvements in executive skills (Cramm et al., 2013). Speech impairment and motor impairment are concurrently present in children, and are treated by Occupational Therapists (Rechetnikov & Maitra, 2009). Nonspeech Oral Motor Treatments (NSOMTs) which are frequently used as a preparatory step in facilitating participation of the child in speech sessions is inconclusive (Ruscello, 2008). Sensory Integration has been the most common treatment modality affecting speech development (Kelly, 1987; Mauer, 1999),

Currently there is no standardised protocol available in the literature that ensures smooth transition and sequential analysis of the issue at hand. SEP© is an attempt and a novel technique aimed at addressing this issue. SEP© can be utilized to stimulate speech in various conditions like Neuro-Developmental Disorders, Neurological Conditions, and Genetic Disorders. SEP© derives its treatment principles from the rich literature in the field of Occupational Therapy, Sanskrit and musical instruments. SEP© uses sound progression based on Sanskrit phonetic framework (*sthāna* – place of articulation, *prayatna* – manner of articulation) as a scientific-cultural model of speech production. SEP© uses music cognition literature, highlighting the symbiosis between musician and musical instrument.

METHODOLOGY:

Participants

This study involved a one-time interaction with the client, incorporating a brief assessment and a trial of the SEP© protocol. After approval from the institutional review board, twenty incoming parents with children with special needs presenting with speech difficulties (delay or developmental speech disorders) and SSD (speech sound disorder) were recruited using convenience sampling from a private rehabilitation centre in the vicinity of the institution. They were handed the study information and explained in detail about the study protocol. Participation was voluntary.

Process and Measure

Upon visiting the centre, participants first completed the informed consent. Then, they were asked sociodemographic questions about themselves. Next, they were given the SEP© information sheet. A baseline Occupational Therapy assessment was done, and the child was taken up for an Occupational Therapy session involving SEP©; word elicitation was then attempted. Parents had to select 10 words from a list (probe word list) of 120 words (40 English, 40 Marathi, 40 Hindi) for elicitation. If the child was compliant and not distressed, 2 sentences from the sentence list were attempted. If the sound was blocked, the therapist would slightly block nostrils to elicit sounds.

The participants were then asked the open-ended questions from the questionnaire designed to assess the efficacy of SEP© for this study.

Analysis

We first analysed sociodemographic data using descriptive statistics. We then analysed the qualitative data about the feedback and experience of the parents or guardians on SEP© protocol (Braun & Clarke, 2006). To do so, all the authors independently coded participants' responses to the question. While doing so, we each assigned interpretive codes to the responses. Next, we came together to discuss and compare our codes – consulting and challenging each other about meaning and interpretation of codes. Once we achieved consensus on code meaning and definitions, we worked together to group codes with shared meaning into themes. We then conducted a final review of themes, coming to consensus. To promote unbiased interpretation, during the coding process we were purposely reflexive, challenging each other to acknowledge how personal biases and preconceived ideas might be influencing sections of narratives attended to while ignoring others. We also had prolonged engagement with the data, while critically reflecting on how our personal knowledge and experience may have influenced our interpretation of the data. Our discussions in the consensus meetings also helped with this, as did returning to the text.

Researcher Positionality

Multiple approaches were used by the researchers to address concerns that can arise when performing and reporting qualitative research. One method which all 3 researchers used was attending to our own

positionality as it might influence our interpretations of participant responses to the research question. One benefit was that one researcher is an OT with decades of clinical experience; a second researcher was a speech therapist with rich experience in addressing speech needs and our third researcher was a professional from Ayurveda, not directly related with rehabilitation, which helped us with a different perspective on analysing the response. These perspectives created multiple sessions of rich dialogue during analysis that served to inform the interpretive authority of the final theme development.

RESULTS:

The average age of participants was 5.8 years old (see Table 1). The majority of participants were diagnosed with ASD (60%), GDD (25%), ID (5%), DS (5%) and ASD with ID (5%). About 85% were males and 15% were female participants. The majority of participants presented with CAS (60%) and SMD (40%) respectively. When compared on verbal status, 85% presented as nonverbal and 15% as semi-verbal.

Characteristics		n	%
Diagnosis	No. of ASD	12	60
	No. of GDD	5	25
	No. of ID	1	5
	No. of Downs syndrome	1	5
	No. of ASD ID	1	5
Gender	No. of F	3	15
	No. of M	17	85
Type of SSD	No. of CAS	12	60
	No. of SMD	8	40
Speech status	No. of NV	17	85
	No. of SV	3	15
Speech Elicitation status	Could elicit	18	90
	Could not elicit	2	10

An attempt was made to identify common themes from all 10 questions asked to 20 parents.

Question1: What are your top 3 priorities in your child's development?

Most of the parents mentioned the ability to speak and write, and appropriate social behaviour as their priorities in their child's development. Few other terms were also repeated like independent selfcare and toilet training.

Question2: Since what duration are you working over your child's speech development?

A phrase commonly used was "For long", parents perceived their efforts to be of long duration, regardless of the child's age. Though the age of the children in the study varied and parental years dedicated to work on speech varied, general phrases frequently used were "for long" and "since the child was 1.5 to 2 years old".

Question3: How has your past experience with speech-related therapies been?

Parents mentioned terms such as "Repetitive", "same" and "tiring"

Question4: What methods of treatment have you seen your speech therapist or Occupational therapist use for speech in your child?

Parents mentioned "flash cards", "blowing exercises" and "Oro-motor exercises" as the commonly used

treatment methods by speech therapists whereas "Imitation", "motor planning exercises like gross and fine motor activity" and "sequencing" by an occupational therapist. P [15] mentioned that their occupational therapist uses primitive reflexes integration exercises in OT sessions.

Question5: What treatment strategies have you been using currently in your home programme?

Parents mentioned Blowing, imitation, flash cards and teaching methods for speaking words as the most frequently used home programme to facilitate speech

Question6: How was your experience with words you heard during SEP?

Parents mentioned their experience in affirmative light. "Good," "surprising," and "heard for the first time" were the phrases which were reported by parents. Of 2 children P[9], P[20] who could not elicit words, their parents showed keen interest in learning the technique and preparing the kids for elicitation session.

Question7: How was the clarity of sounds that you heard?

Parents stated that they "Understood words", and that words were "somewhat clear". P[2] also mentioned that for them clarity is secondary and they were glad to have heard words from the child.

Question8: How did the child respond to the handling?

Parents reported that they felt the child "Was apprehensive", "not cooperative" and "no issues with handling". P [10] mentioned though the child appeared a little uncomfortable, it was a small price to pay for learning speech.

Question9: What was the success rate of eliciting words?

"Good", "heard most of the words" were mentioned as the parents' response.

Question10: Will your child be helped with this approach?

"Yes" and "Maybe yes" was reported by the parents. Even for children who could not elicit words, their parents mentioned willingness to try this approach to elicit them.

Discussion:

This study explored the efficacy of the assisted speech elicitation method and parents' perceptions of treatment methods for speech development. Analysis across participants showed a striking similarity in parents' opinions regarding treatment, home programmes, and the SEP© protocol.

Parents of children with special needs have important intervention priorities. By understanding these and incorporating them into treatment and support programs, it is likely to increase parental acceptance, participation, and satisfaction, all of which are likely to improve children's outcomes. our survey identified Speech, writing, and social conduct as the sample's top three priorities. These findings align with a study conducted by (Ghanadzade et al., 2018). The results indicated that building social communication skills and challenging behaviours in children was the highest intervention priority for parents. (Ghanadzade et al., 2018)

Another study by (Đorđević et al., 2023) showed that parents ranked the highest priorities in the areas of Communication Skills, Community Living, and Social Relationships. (27)(28)(Đorđević et al., 2023)Studies demonstrate that parents of children with special needs have more emotional, financial, and social challenges than parents of neurotypical children in a variety of circumstances. Parents, who undertake the majority of caregiving obligations, are most affected by the emotional toll, which frequently shows up as carer burnout, chronic stress, and psychological anguish(Tang et al., 2025). This can explain the use of words like "for long"; parents often feel exhausted when they are unable to connect with their child. Speech is hence viewed as a means of connection and as a mode of expression(Agyekum, 2018).

Parents mentioned terms like “Repetitive”, “same,” and “tiring” in our survey. Previous literature on parents’ perception of speech-related services has shown a strong need for empowerment and a desire to understand the process(Roulstone et al., 2015). The study conducted by (Auert et al., 2012) mentions an intricate interplay of elements such as parents’ access to information, their participation in therapy, and their feelings of empowerment. The parents involved in this study showed a strong preference for evidence-based practice (EBP).(Auert et al., 2012). Another study concludes that there is a need for the SLP services to clarify and educate the parents about their roles and expectations, thereby enabling them to set realistic ones(Skeat & Roddam, 2019).

Parents mentioned “flash cards”, “blowing exercises”, and “Oro-motor exercises” as the commonly used treatment methods by speech therapists consistent with findings by (Habibah et al., 2025), which recommended strengthening the speech organs through massage, brushing, and breath exercises, and repetitive verbal training using visual aids as a frequently used strategy by speech therapists. This paper also mentions interventions like imitation, which is used frequently by Occupational Therapists as well.(Habibah et al., 2025)

From an Occupational Therapist's perspective, parents mentioned “Imitation”, “motor planning exercises like gross and fine motor activity” and “sequencing” as commonly used treatment strategies. The use of gross and fine motor activity and motor planning have been a cornerstone of OT intervention for speech development(Ayres & Mailloux, 1981). One of the parents mentioned their therapist emphasised working on primitive reflexes for speech. The association between primitive reflexes and speech is well documented.(Orabi et al., 2025)

Parents were taught the types of tasks that required repetition and mass practice, like blowing, imitation, flash cards, and using teach and perform' method, required for facilitating speech. Additionally, the findings across the sample of 20 did not mention any individualised treatment approach followed for their child, which demonstrated that neither the therapy centre's treatment plan nor their at-home program included child specific or any phoneme-related programme.

Since this study sample consisted of a homogeneous population of nonverbal or semi-verbal (minimally verbal) children, these children did not speak any words. Defining nonverbal or minimally verbal, there is a great deal of variation and gross inconsistency across studies in the number of words spoken by children described as nonverbal or minimally verbal. (Koegel et al., 2020). In our study non-verbal is defined as using no words and minimally verbal as a few unpredictable words used by the child. According to studies, language acquisition age is a significant predictor of social functioning and a favourable prognosis.(Mayo et al., 2012)

Hence, when children were assisted to speak morphemes, parents were surprised and expressed motivation to work further with the child. The parents of children who could not elicit sounds during the elicitation session still expressed willingness to prepare their children for elicitation sessions.

According to the survey, parents’ mentioned that the clarity was good. Since the child was taken up for speaking for the first time, the volume of the voice was low, but could be articulated into words. The vocalis is a specialised, intrinsic skeletal muscle located within the vocal folds (true vocal cords) that acts to tense, relax, and shorten them to modulate pitch and tone. Recent studies described the discovery of a unique neuromuscular functional unit within the human vocalis muscle, termed "myolaryngovocalis'. This muscle has been found to show the properties of a unique type of striated muscle fibres with features distinct from skeletal and cardiac muscles, broad distribution of synapses in the thyroarytenoid (TA) muscle, with multiple ultrastructural types suggesting both motor and sensory roles; neuronal bodies

suggesting a sensory role in a local neuronal network were also identified. Spindle-like structures were found in the vocalis muscle, though their presence remains controversial. These findings provide new insights into the specialised structure and function of the vocalis muscle, which plays a central role in human vocalisation. (Tracicaru et al., 2024)

The properties of skeletal muscles demand progressive muscle activity and resistance training(Fokter, 2012). Speaking consonant sounds is a technique used in vocal training, which can contribute to vocalis muscle activity(Kapsner-Smith et al., 2015; McGlashan et al., 2025).

Other techniques used for achieving clarity of sounds focus on shaping existing sounds as in DTTC (Grigos et al., 2024) and PROMPT (Grigos et al., 2010). SEP© aims to elicit words from children who cannot initiate or produce sounds.

Since it was the first exposure to speech elicitation, the child could see the preparation in the form of the therapist wearing gloves, mask and preparing the treatment couch. Such preparation can provoke anxiety in CWSN. As the SEP© protocol involves manipulating the airstream in the larynx and manipulating articulators to elicit morphemes, children can experience uncertainty and anxiety. The experience of producing sound and vibrations felt on the throat can be overwhelming for the child, leading to noncompliance in the initial phase of handling. Some parents reported that handling was not a problem as their child cooperated well.

Parents said that there was a high success rate in extracting words from the PWL (probe word list). Ten Words were selected by parents from a list of 120 words (40 English, 40 Marathi, 40 Hindi) for elicitation. The PWL used in this study is structured and is based on the classification of the alphabet used in the Sanskrit language (Devale, S. D. 2020).

This response increases the likelihood that the children will become more involved and interested in making better use of their speech apparatus, thus increasing the probability of using language for communication.

Gestalt psychology in learning emphasises that students understand concepts as organised, meaningful wholes rather than isolated parts, with learning occurring through insight, pattern recognition, and understanding relationships. It rejects rote memorisation in favour of active, holistic perception, where learners mentally reorganise information to gain a sudden understanding of a problem. (Pineda, 2025). The Gestalt method of learning is aligned with a top-down approach to treatment or learning, which is frequently used by occupational therapists(Haumann, 2015; Vattanaphan et al., 2023). Attempting morpheme over phoneme is based on these principles of Gestalt learning and top-down approach to learning.

The study mentions that the age of early language milestones predicts of particular language abilities and adaptive communication skills. The earlier the age, the better the developmental outcome. Hence, any attempt to increase verbal skills will lead to better developmental outcomes.(Kenworthy et al., 2012)

The affirmative response to this approach is an encouragement to further refine and elaborate on this approach. This protocol is the very first of its kind where a nonverbal child is assisted to use his speech apparatus using guided tactile kinaesthetic cues and prompting to produce morphemes.

Limitations:

Since this is a one-time interaction and one-time exposure study, its long-term effect needs to be studied. The practitioner will need training and education before attempting an elicitation session. As this is a pilot

project, another study with a larger sample size will give more insights into this approach. Potential effects of researcher subjectivity and Researcher Bias cannot be ruled out.

Conclusion:

The review of the literature indicates that there are very few structured protocols for eliciting phonemes and morphemes or even phrases in children experiencing difficulties using their speech apparatus. SEP© is an attempt to address this gap. SEP© is a structured protocol to elicit speech. This study is an attempt to investigate the efficacy of this programme as experienced by parents. The results indicated that parents have a strong urgency to help their child develop speech skills. The experience of hearing words was welcomed by the parents, and an affirmative response regarding engaging in future sessions gives a further boost to the author to expand on the work.

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