



# Evaluation of Phonological Assessment Practices of Children with Suspected Speech Sound Difficulties Conducted By Speech-Language Pathologists in Pakistan

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## ABSTRACT:

### Background:

Speech sound is a phonetically distinct unit of speech. There are twenty four consonant speech sounds in English language and twenty vowel speech sounds (there are 26 letters of the alphabet with 21 consonants and 5 vowels). These sounds are called as phonemes. Each phoneme or speech sound has a symbolic representation. Many children develop speech sounds with the passage of time but those who fail to develop often need the services of SLP's in order to learn correct speech sounds.

### Objective:

To evaluate the phonological assessment practices conducted by speech-language pathologists in Pakistan with the speech sound disorders.

### Methodology:

It was a cross sectional survey study, prospective in nature which included 32 SLPs working with children in special education schools, government or private hospitals and clinical settings of Rawalpindi, Islamabad and Lahore in Pakistan, through convenient sampling technique. Phonological assessment questionnaire with sub-scales A, B, C, and D were used for data collection. Analysis of data was conducted by using version 20.0 of Statistical Package for Social Sciences.

### Results:

The results revealed that the data consisted of 32 total cases. The phonological component sub-scale C included 18 variables having 27 valid cases with a mean of 33.22, the phonological assessment timing sub-scale D included 3 variables with 30 valid cases having 10.06 mean score and the standard tests for phonological assessment.

### Conclusion:

The present study concluded that SLPs do not follow proper assessment guidelines. It was also concluded that SLPs do not conduct comprehensive phonological assessment including standard and non-standard assessment.

### Keywords:

Phonology, phonological assessment, articulation, speech, speech sound disorder

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## INTRODUCTION:

Speech sound is a phonetically distinct unit of speech. There are twenty four consonant speech sounds in English language and twenty vowel speech sounds (there are 26 letters of the alphabet with 21 consonants and 5 vowels). These sounds are called as phonemes. Each phoneme or speech sound has a symbolic representation.<sup>[1]</sup> Many children develop speech sounds with the passage of time but those who fail

to develop often need the services of SLPs in order to learn correct speech sounds. Some speech sound errors can be the result of some physical problems such as genetic syndromes, hearing loss, illness, developmental disorders, and neurological disorders. Frequent ear infection accompanied by hearing loss in young children may also lead to speech sound disorders.<sup>[2]</sup>

Speech sound disorders (SSD) are speech disorder in which some speech sounds (called



phonemes) are either not produced correctly, not produced at all, or are not used correctly in a child's or sometimes adult's native language. Speech sound disorder involves difficulty with and/or delay in the development of a child's speech.<sup>[3]</sup> However speaking with an accent or a dialect is not a speech sound disorder.<sup>[4]</sup> Speech sound disorder is sometimes called 'speech impairment'. Most of the children commit phonological mistakes when they are learning new words. Every speech sound has different age range for acquisition and mastery. By the age of 8 years, children should be able to produce all sounds of English correctly.<sup>[5]</sup> Speech sound disorder occurs when the child past certain age is unable to correctly produce a certain age appropriate speech sound e.g., /s/ sound is produced at 6 years of age.<sup>[6]</sup> The sounds /s/, /l/, /r/ are most commonly mispronounced by children.<sup>[7]</sup>

Intelligibility is defined as the degree to which a speaker's intended message is recovered by a listener.<sup>[8]</sup> A child who is not consistent in his or her speech productions, however, will not be as intelligible. This situation, in fact, has been proposed as one of the properties of a child with a phonological impairment.<sup>[9]</sup> The words produced by a child can be different from one another not only in correctness, but they can also be different in phonological complexity and intelligibility. It may also happen with a specific word which is produced differently from one time to another time. The accuracy rate increases significantly at the age of 3 and 3-1/2 years with the percentage getting better from 68% to 76%.<sup>[10]</sup>

There are typically four categories of errors produced by children with speech sound disorders. Omissions are when any sound is not produced or whole syllable or cluster of syllable may be omitted e.g., 'fi' for fish or 'at' for cat. Additions (or Commissions) are an extra sound or sounds are added to the intended word e.g. espeak for speak. Distortions occur when a typical sound is replaced with non-typical sound e.g.

thoup for soup. One of the most common and difficult sound substitution is with lateral /s/ e.g. lisp. Substitutions occur when one or more sounds are substituted for another; e.g., wabbit for rabbit or tup for cup.<sup>[11]</sup>

The major step in understanding phonological system of a child and planning intervention is to determine any particular type of error in an individual child. Components to phonological analysis are whole-word analysis, word shape analysis (syllables), segmental analysis (matches and substitutions) and phonological analysis. The hierarchical approach to data is reflected in first three components, moving from words to syllables to segments.<sup>[12]</sup>

Acquiring language at a typical rate by the child is usually the first goal of assessment to be determined. If the child has not acquired the language then the child is perceived as the one who lacks age appropriate consonants and vowels. Thus the phonological system of a child is characterized of a set of errors like substitutions or the phonological process. The speech of a child is not like an adult speech because they make typical, systematic child-like 'sound replacements'. These sound replacements are called phonological processes by few researchers and phonological patterns by others.<sup>[13]</sup>

For the assessments of SSD, balance time constraints help the clinician to use best methods to gather and analyze the data collected during assessment in order to guide therapy and to examine the progress. A thorough speech and language assessment can be completed within a 90-minute that includes parent information and explanations for child temperament.<sup>[14]</sup> In a phonological assessment the information is gathered through case history, hearing screening, oral-peripheral examination, language (e.g., syntax, semantics), voice, fluency, and phonological patterns. Speech-language pathologists typically apply assessments that



sample single words, sentences, or connected speech samples in assessing phonological patterns in children with suspected phonological disorders.<sup>[15,16,17,18]</sup> Literature suggests that a single-word task made to some extent to the client's phonological system gives enough and representative information for phonological evaluation. A short sample of conversation remains useful for the examination of prosody, intelligibility, and other aspects of language, and as a check on the representativeness of the single-word sample.<sup>[19]</sup>

To measure the speaking competence of non-native English speakers is another challenge faced by SLPs working with children with SSD.<sup>[20]</sup> Moreover, in order to meet unique needs of these children SLPs should be adequately trained and supported.<sup>[21]</sup> The essential requirements for assessing SSD include obtaining the information on child's phonological stability and weaknesses (inventories as well as phonological deviations), level of severity, stimulability information, guidance for intervention, and measures that document changes/progress following the intervention.<sup>[22]</sup> In order to evaluate a child's phonological system, to select treatment targets and to design intervention, SLPs have number of clinical options available. Most probably all these clinical options are approached eclectically or viewed independently of one another. It is assumed that there exist influential interaction among assessment, selection of target, and intervention.<sup>[23]</sup>

The existing research literature provides little guidance to the clinicians of Pakistan. So the clinicians should make decisions not solely based on existing research but also on clinical reasoning that includes client value, clinical expertise, considerations of service delivery and experimental validation as well as theoretical perspective of clinician.<sup>[24]</sup>

This study will provide information regarding phonological assessment which should be used

by SLPs in Pakistan to improve their phonological assessment practices. This study will also provide practical solution to the problems linked with complete assessment of children suspected of having SSD. SLPs who are working in Pakistan will be able to apply the evaluation procedure described in the present study during the child's intervention program in order to guide progress and to make therapeutic changes as needed.

## METHODOLOGY:

The current study was a cross sectional survey study which was prospective in nature. This study was conducted on speech and language therapist working with children suspected of having speech sound disorder, in government or private hospitals, clinical settings and special education schools of Rawalpindi, Islamabad and Lahore in Pakistan. The present study was completed in six months. The sample size consisted of 32 participants who were speech and language therapists of both genders having a minimal experience of 1 year. In order to collect data, convenient sampling technique was used to conduct the present study.

For the research purpose SSD Assessment Questionnaire was adapted from the study "Speech Language Pathologists' Assessment Practices for Children with Suspected Speech Sound Disorders: Results of a National Survey" by Sarah M. Skahan and Maggie Watson. The questionnaire consisted of five sub-scales. Sub-scale A consisted of demographic information, sub-scale B comprised of non-native English speakers assessment, sub-scale C gave information on phonological assessment components, and phonological assessment timings in sub-scale D.

Each variable of sub-scale A was rated differently on a scale of 1 to 8 with the mean score of 9 variables for 32 participants was 29.5. Similarly the variables of sub-scale B were rated from 1 to 6 with the mean score 15.5 of 6 variables for 32 participants.



The variables of sub-scale C were rated on a 4-point rating scale except two variables which were rated from 1-6 with a mean score 47 of 18 variables for 32 participants. Furthermore, the variables of sub-scale D were rated from 1 to 7 with a mean score 12 of 3 variables for 32 participants.

The data was gathered from 32 SLPs working with children with suspected SSD in government and private hospitals, clinical settings and special education centres of Rawalpindi, Islamabad, and Lahore in Pakistan. The responses of the participants were documented on the questionnaire. Instructions to complete the Phonological Assessment Questionnaire were explained before administration. Researcher ensured the participants that their responses were kept confidential and written informed consent of their participation was also obtained. Participants were informed that they should feel free to leave the study at any time.

## RESULTS:

This chapter deals with the analysis of data collected through Phonological Assessment Questionnaire from SLPs having a minimal experience of 1 year working with children suspected with SSD. Statistical package for social sciences (SPSS) version 20.0 was used for the data analysis.

The results in table 1 given below showed the descriptive statistics of the sub-scales of the phonological assessment. The descriptive statistics of each sub-scale of the phonological assessment included the cases summary, number of variables, mean, variance and standard deviation.

Table 1: Phonological Assessment

Sub-Scales	Cases			No. of Variables	Mean	Std. Deviation
	Total	Valid	Excluded			
A Demographic Information	32	30	2	9	25.3667	4.69397
B Non-Native Speaker	32	8	24	6	14.8750	2.16712
C Components	32	27	5	18	33.2222	6.82379
D Timing	32	30	2	3	10.0667	3.41329

The table number 1 indicated that all the sub-scales of phonological assessment consisted of 32 total cases. The demographic information in sub-scale A of the phonological assessment comprised of 9 variables having 30 valid cases with a mean score of 25.36 which was below the mean score 29.5 for sub-scale A that represented low level of phonological practice and training. The sub-scale B consisted of 6 variables having 8 valid cases with a mean score of 14.87 which were below the mean score 15.5 for sub-scale B that revealed the lower level of practice of SLPs with the children having English as second language, typical assessment of children with English as second language always conducted using standard tests and the development of local norms. The phonological components in sub-scale C included 18 variables having 27 valid cases with a mean of 33.22 which were below the mean score 47 for sub-scale C that represented high levels of phonological components assessment reported as "always". The sub-scale D comprised of the phonological assessment timing included 3 variables with 30 valid cases was 10.06 mean score which was below the mean score 12 for sub-scale D that showed low phonological assessment timings. The bar chart given below in the figure number 1 showed the total mean scores and the percentages of mean scores of the variables of sub-scales A, B, C and D.

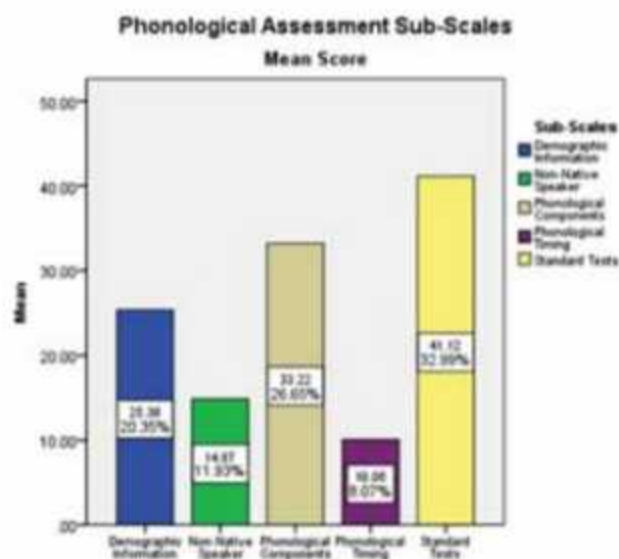


Figure 1: Bar chart of the total mean scores and percentages of mean scores of variables of sub-scales of Phonological Assessment

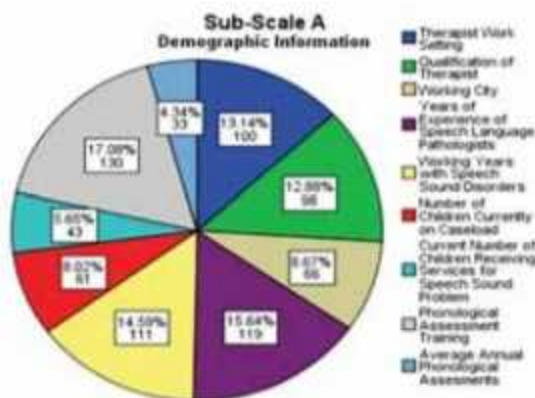


Figure 2: Pie chart of the percentage of variables of demographic information of sub-scale A.

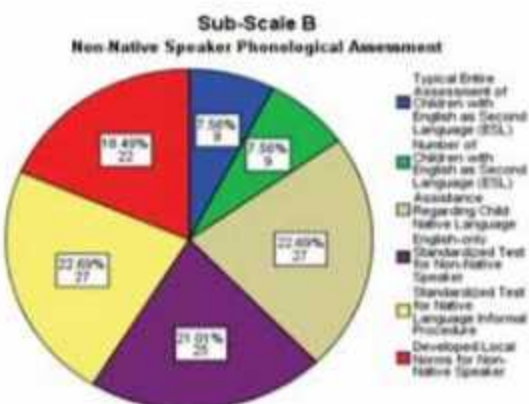


Figure 3: Pie chart of the percentage of variables of demographic information of sub-scale B.

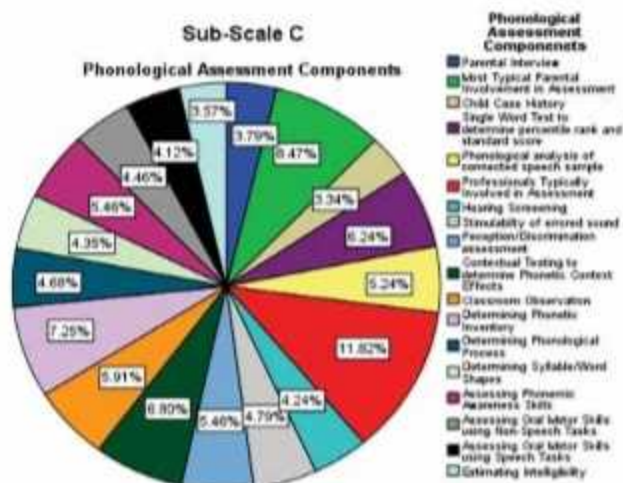


Figure 4: Pie chart of the percentage of variables of demographic information of sub-scale C.

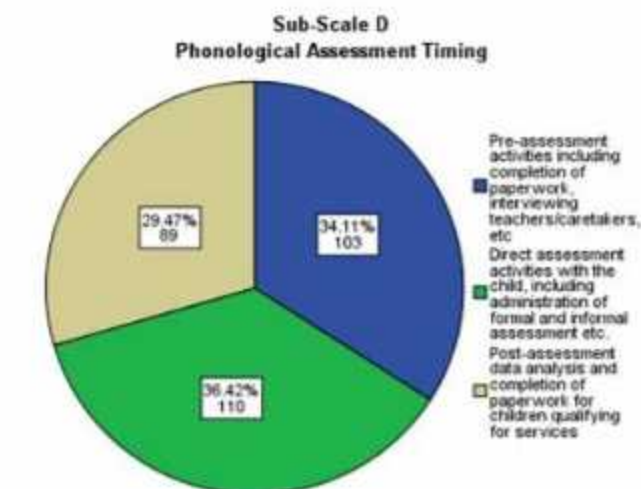


Figure 5: Pie chart of the percentage of variables of demographic information of sub-scale D.

## DISCUSSION:

The descriptive analysis of data revealed that the highest percentage of the qualification of the speech therapist who participated in this study was postgraduate diploma (50% Pgd) working in the settings other (62.5%) than elementary and pre-school, residing in Lahore (56.3%) with a highest percentage of the years working with speech sound disorders along with the total years of experience was more than 5 years of experience (28.1%). The results also revealed that the highest percentage of the number of children currently on the caseload (50%) and receiving services for speech sound problem (78.1%) was 1 to 20 children. Moreover the highest percentage of the phonological assessment training was graduate level course (46.9%) with the missing data of 6.3% of the participants and the highest average annual phonological assessments were up to 50 assessments (87.5%) with the missing data of 3.1% of the participants.

The results shows that the highest percentage of the speech therapists who participated in this study do not conduct typical entire assessment of children with English as second language (62.5%) with the 3.1% of missing data, while the highest percentage of the number of children with English as second language (21.9% ESL) was 1 to 10



children with 75% of the missing data. Furthermore, the highest percentage of the speech therapist who do not assess ESL children was 46.9% with 6.3% missing data. The results in the above table 3 also revealed that the highest percentage of the speech therapists never conducted English-only standardized test for non-native speaker (59.4%), standardized test for native language informal procedure (65.6%) and developed local norms for non-native speaker (53.1%) with 9.4% missing data respectively.

The highest percentage of the speech therapists always conducted parental interview (78.1%) with 50% of the live interview along with the child case history (87.5%) and 3.1% missing data respectively. Similarly the highest percentage of the speech therapists conducting single word test to determine percentile rank and standard score for phonological assessment rated for always (46.9%) with 9.5% of missing data and the highest percentage for the phonological analysis of connected speech sample was rated for sometimes (53.1%) with 12.5% of missing data. The revealed that the highest percentage of the professionals typically involved in assessment was audiologist (31.3%) with a missing data of 3.1% along with the highest percentage of the conduction of hearing screening rated as always (65.5%). Similarly the highest percentage both for the stimulability of errored sounds (53.1%) and perception/discrimination assessment (43.8%) was rated for always. However for the contextual testing to determine phonetic context effects (46.9%), classroom observations (46.9%) and determining phonetic inventory (43.8%), the highest percentage was rated for sometimes. Moreover the results in the table 4 also revealed that the highest percentage of determining phonological process (56.3%), determining syllable/word shapes (65.6%), assessing phonemic awareness skills (46.9%), assessing oral motor skills using non-speech tasks (62.5%), assessing oral motor skills using speech tasks (68.8%) and estimating intelligibility (81.3%) was

rated for always along with 3.1% of missing data respectively.

The highest percentage of timing for the pre-assessment activities was 25% for 11 to 20 minutes, for direct assessment activities was 28.1% for 21 to 30 minutes along with 31 to 40 minutes and for post-assessment data analysis was 37.5% for 21 to 30 minutes with 6.3% of missing data respectively for the phonological assessment timings of pre-assessment activities, direct assessment activities and post-assessment data analysis.

It is now becoming rapidly a standard clinical procedure to conduct phonological assessment of speech disorders in children. It is argued that clinical evaluations and explanations involve an interconnection of the clinical linguistic description of the data of the disorder with the speech pathological description of the processes.<sup>[25]</sup> To measure the speaking competence of non-native English speakers is another challenge faced by SLPs working with children with SSD.<sup>[26]</sup> Moreover, in order to meet unique needs of these children SLPs should be adequately trained and supported.<sup>[27]</sup> It is evident that SSD and RD overlap cognitively and etiologically as well.<sup>[28]</sup> In school setting, the greater number of individuals on clinician caseloads comprise of SSD.<sup>[29]</sup> Informal measures are most often used by practitioners or they assess in English only.<sup>[30]</sup> It is evident that SSD and RD overlap cognitively and etiologically as well.<sup>[31]</sup> In school setting, the greater number of individuals on clinician caseloads comprise of SSD.<sup>[32]</sup> Informal measures are most often used by practitioners or they assess in English only.<sup>[33]</sup> Measuring intelligibility maybe essential, as a child's level of intelligibility often effects the decisions about need for services of assessment, intervention, preferences, and analyzing the success of intervention. There endure a number of methods of measuring intelligibility, and clinician scan select the technique that best meets their needs.<sup>[34]</sup> Examination of oral structures for



functional speech assignments may be important, the validity of administering such an examination for non-speech tasks is questioned, especially when the relationship between non-speech tasks and speech is unproven. Feasibly in an effort to make the best use of time, assessments of non-speech movement should be discontinued.<sup>[39]</sup>

## CONCLUSION:

The present study concluded that SLPs do not follow proper assessment guidelines although they conduct a comprehensive informal phonological assessment. It was concluded from the results of the demographic information in sub-scale A of the phonological assessment that there was a lower level of phonological practice and training. The conclusion from the results of sub-scale B was also that there was a lower level of practice of SLPs with the children having English as second language, typical assessment of children with English as second language always conducted using standard tests and the development of local norms. Only the results of sub-scale C were concluded that there was a high level of phonological components assessment reported as "always". Furthermore it was concluded that sub-scale D showed low phonological assessment timings and lower level of standard phonological assessment, respectively.

## LIMITATIONS:

This study has some limitations, among them one of it was sample size and lack of time which made it difficult to conduct a pre and post analysis of the evaluation of the SLPs phonological assessment practices. Future study with a large sample would likely to give better results along with the pre and post testing of phonological assessment practices.

## RECOMMENDATIONS:

- Speech language pathologists/therapists should "always" conduct phonological

analysis of connected speech sample, contextual testing to determine phonetic context effects, classroom observation, and phonetic inventory, instead of "sometimes".

- Workshops, seminars and conferences along with graduate and undergraduate degree programs should be conducted to educate and for the training of SLPs regarding the informal and formal phonological assessment which will in turn improve the phonological assessment practices.
- Although workshops offer favorable circumstances for SLPs to get information, it is also important that the content administered in those workshops is up to date and should follow the principles of evidence-based practice.
- Further research is required to examine SSD assessment matters, such as typical methods of measuring intelligibility, speech sound analysis procedures that SLPs find most advantageous, types of analysis procedures used over severity levels, along with the types of assessment and analysis procedures that are most commonly attempted after the child is registered in therapy.

It is also recommended to extend this research in two stages: pre-assessment and post-assessment, while considering this study as pre-assessment. The respondents should be trained regarding phonological assessment practices (indirect and direct methods) through workshop and seminars regarding phonological assessments after which their responses regarding phonological assessment practices should be documented again in their post-assessment with the comparison of pre and post-assessment practices.

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