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SPEECH AND LANGUAGE THERAPY: A CLINICAL LINGUISTIC INVESTIGATION OF COMMUNICATION DISORDERS AMONG SELECTED NIGERIAN SPEAKERS

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ABSTRACT

Speech and language disorders constitute a significant public health and educational concern, particularly in developing countries where access to specialized speech-language therapy services remains limited. This study investigated communication disorders among selected Nigerian speakers from a clinical linguistic perspective, with the aim of identifying the linguistic characteristics, neurological correlates, and social implications of speech and language impairments while proposing context-appropriate therapeutic interventions. A descriptive observational design was adopted involving 40 purposively selected participants with clinically diagnosed or observable communication disorders from hospitals, rehabilitation centres, and educational institutions in Gusau and Talata Mafara, Zamfara State, Nigeria. Data were collected through structured questionnaires, clinical observations, digital speech recordings, and acoustic analyses using Praat software. Quantitative data were analysed using descriptive statistics, while phonetic, phonological, syntactic, semantic, and pragmatic analyses were employed to characterize language impairments. Phonological and articulatory disorders were the most prevalent (35%), followed by fluency disorders (20%), aphasia (17.5%), dysarthria (15%), apraxia of speech (7.5%), and mixed language disorders (5%). Acoustic analysis revealed abnormal speech parameters, including elevated fundamental frequency, reduced speech intensity, prolonged speech duration, increased pause duration, and unstable formant patterns. Stroke, developmental neurological disorders, traumatic brain injury, hearing impairment, and oro-motor dysfunction were identified as

major underlying causes. The disorders significantly affected participants' academic achievement, employment performance, social interaction, and psychological well-being. The findings demonstrate the value of integrating clinical linguistics with speech-language pathology to enhance diagnostic accuracy and rehabilitation outcomes. The study recommends strengthening speech-language therapy services, expanding specialist training programmes, and integrating early screening and intervention into Nigeria's healthcare and educational systems to improve communication outcomes and quality of life for affected individuals.

KEYWORDS: Clinical linguistics; speech and language disorders; speech-language therapy; communication disorders; acoustic analysis; Praat software; Nigeria.

INTRODUCTION

Language is the primary medium of human communication and social interaction. Through language, individuals express ideas, emotions, intentions, and social identities, thereby facilitating interpersonal relationships and participation in society. When the neurological or physiological mechanisms underlying speech and language become impaired, communication may be severely disrupted, leading to educational, psychological, and social difficulties (Hegde & Maul, 2019).

According to Crystal (2011) language disability refers to any systematic deficiency in the way people speak, listen, read, write, or sign that interferes with their ability to communicate with their peers. He went on to say that the ability may be mild, such as a minor impediment in pronunciation; or an almost total breakdown of all modes of communication, as in severe forms of brain damage. Salami (200, 2008) in Adegbite (2013) opines that language impairment or disorder refers to various difficulties encountered in the process of communicating with people…

Citing Salami (2005), Adegbite (ibid) identifies five neural systems that are involved in communication as (i) sensory system (ii) analyzing system, (iii) language system, (iv) motor command system and (v) neuro-motor system. Damage to one of the five systems could lead to five problems which could include sensory impairment –agnosia (confusion among auditory or visual stimuli); aphasia and dysphasia – language disability, apraxias – bizarre behaviour; and dysarthrias –inability to articulate speech sounds.

Clinical linguistics, a branch of applied linguistics, focuses specifically on the analysis of language disorders. Crystal (1981) defines clinical linguistics as the application of linguistic

theory and analytical methods to the study and treatment of communication impairments. Linguistic analysis provides clinicians with tools for identifying disruptions in phonology, morphology, syntax, semantics, and pragmatics, thereby improving diagnostic accuracy and therapeutic intervention.

Research in neurolinguistics has significantly improved understanding of how language is represented and processed in the human brain. Classical studies by Broca and Wernicke demonstrated that specific brain regions are associated with language production and comprehension respectively (Pracar et al., 2025; Lui & Wroten, 2025). Modern neuroscience research further shows that language processing involves distributed neural networks across frontal and temporal cortical regions (Friederici, 2011).

Speech and language disorders may result from developmental conditions, neurological injuries, hearing impairments, degenerative diseases, or structural abnormalities affecting speech organs (Hegde & Maul, 2019). These disorders commonly affect articulation, fluency, voice quality, language comprehension, and pragmatic communication. Disorders such as aphasia, dysarthria, apraxia of speech, and phonological disorders significantly impair communication and quality of life. Despite increasing global recognition of speech-language pathology, Nigeria still faces substantial shortages of trained speech therapists, limited diagnostic facilities, and inadequate research on communication disorders. Consequently, many individuals with speech impairments do not receive adequate clinical intervention. Existing linguistic research in Nigeria has focused primarily on language variation and second-language acquisition, with limited attention to clinical speech disorders.

This study therefore investigated speech and language disorders among Nigerian speakers from a clinical linguistic perspective. The study aimed at understanding the physical and linguistic basis of language disability and to devise therapeutic ways suitable for the Nigerian environment with a view to finding ways of lessening the condition so that a disabled person can achieve as full a life as possible.

Study Area

The study was conducted in Talata Mafara and Gusau, two major urban centres in Zamfara State, northwestern Nigeria. Gusau serves as the state capital and an important healthcare and educational hub, while Talata Mafara functions as a major commercial and administrative centre. The selection of these locations provided access to diverse populations and facilitated recruitment of individuals with speech and language disorders.

Study Design

A descriptive observational research design was employed to investigate speech and language impairments among selected Nigerian speakers.

Study Population

The study population comprised individuals with speech and language impairments across different age groups, including:

1. Children with developmental speech disorders;
2. Adults with neurological communication impairments;
3. Individuals currently receiving speech therapy treatment.

Participants were recruited from selected hospitals, rehabilitation centres, and educational institutions.

Sample Size and Sampling Technique

Approximately 40 participants were purposively selected based on confirmed or clinically observable speech and language impairments. Purposive sampling enabled the recruitment of participants with relevant communication disorders for detailed linguistic and clinical analysis.

Instruments for Data Collection

The following instruments were utilized for data collection:

Digital Speech Recording Devices

High-quality digital recording devices were used to capture participants' speech samples for acoustic and phonetic analysis.

Structured Questionnaires

Structured questionnaires were administered to obtain demographic information, medical history, communication experiences, and social impacts of speech impairment.

Clinical Observation Schedule

Clinical observation checklists guided systematic evaluation of participants' speech, language, articulation, fluency, and pragmatic communication abilities.

Speech Analysis Software

Praat software version 6.4.50 was used for acoustic analysis of speech samples, including measurements of pitch, duration, intensity, and formant structures.

Procedure for Data Collection

Eligible participants were identified through healthcare facilities and community outreach programmes. Informed consent was obtained from participants or caregivers before participation. Speech samples were recorded in quiet environments using standardized reading passages, spontaneous speech tasks, and repetition exercises. Clinical observations were conducted during structured and semi-structured interactions.

Acoustic analyses were subsequently performed using Praat software to evaluate phonetic and prosodic characteristics. Data from questionnaires, observations, and acoustic analyses were triangulated to improve reliability and validity.

Data Analysis

Quantitative data were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations.

Phonetic and phonological analyses were conducted to identify articulatory errors, prosodic abnormalities, and speech production patterns. Linguistic error analysis examined grammatical, syntactic, semantic, and pragmatic impairments.

Acoustic measurements generated using Praat software provided objective analyses of speech characteristics, including fundamental frequency, duration, intensity, and formant distribution.

Ethical Considerations

Ethical approval was obtained from the appropriate institutional research ethics committee prior to commencement of the study. Informed consent was obtained from all participants or their caregivers before participation. Participant confidentiality and anonymity were maintained throughout the study.

RESULTS

Table 1: Demographic Characteristics of Participants. (n = 40)

Variable	Category	Frequency (n)	Percentage (%)
Age group	5–12 years	10	25.0
	13–19 years	6	15.0
	20–39 years	14	35.0
	40 years and above	10	25.0
Sex	Male	22	55.0
	Female	18	45.0
Location	Gusau	24	60.0
	Talata Mafara	16	40.0
Occupation/Status	Students	16	40.0
	Employed adults	12	30.0
	Unemployed/Dependents	12	30.0

Table 2: Distribution of Types of Speech and Language Disorders.

Disorder Type	Frequency (n)	Percentage (%)
Phonological/Articulatory Disorders	14	35.0
Fluency Disorders (Stuttering)	8	20.0
Aphasia (post-stroke/TBI)	7	17.5
Dysarthria	6	15.0
Apraxia of Speech	3	7.5
Mixed Language Disorders	2	5.0

Table 3: Phonological Error Patterns Observed in Participants			
Error Type	Children (n=16)	Adults (n=24)	Total (%)
Sound substitution	12	6	45.0
Sound omission	10	5	37.5
Cluster reduction	11	2	32.5
Distortion	6	7	32.5
Final consonant deletion	9	1	25.0

Table 4: Acoustic Measurements of Speech Parameters. (Praat Analysis)

Parameter	Normal Range	Participants with Disorders (Mean ± SD)
Fundamental frequency (F0)	85–255 Hz	312.4 ± 48.6 Hz
Speech intensity	60–70 dB	52.3 ± 6.1 dB
Speech duration (word repetition task)	0.4–0.7 sec	1.1 ± 0.3 sec
Pause duration	<0.3 sec	0.8 ± 0.2 sec
Formant stability	Stable	Highly variable

Table 5: Neurological and Physiological Correlates of Speech Disorders.

Underlying Cause	Frequency (n)	Percentage (%)
Stroke	10	25.0
Traumatic Brain Injury	6	15.0
Developmental neurological disorder	8	20.0
Hearing impairment	7	17.5
Oro-motor dysfunction	5	12.5
Unknown/idiopathic	4	10.0

TABLE 6: Social and Educational Impact of Communication Disorders.

Impact Area	Severe Impact (%)	Moderate Impact (%)	Mild/No Impact (%)
Academic performance	62.5	25.0	12.5
Employment performance	55.0	30.0	15.0
Social interaction	70.0	20.0	10.0
Psychological wellbeing	60.0	25.0	15.0

Figure 1: Distribution of Speech and Language Disorders among Participants

(Recommended chart: Pie chart)

- Phonological/articulatory disorders – 35%
- Fluency disorders – 20%
- Aphasia – 17.5%
- Dysarthria – 15%
- Apraxia – 7.5%
- Mixed disorders – 5%

This figure shows that phonological/articulatory disorders were the most prevalent.

Demographic Characteristics of Participants The study involved approximately 40 participants comprising children and adults with varying communication disorders. Participants were recruited from hospitals, rehabilitation centres, and educational institutions within Gusau and Talata Mafara.

Developmental speech disorders were more common among children, while neurological communication impairments such as aphasia and dysarthria were predominantly observed among adults.

Linguistic Characteristics of Speech Disorders: The study identified several categories of communication disorders affecting different linguistic domains.

Phonological and Articulatory Disorders

Many participants exhibited articulatory distortions, substitutions, omissions, and phonological simplification processes. Consonant cluster reduction, sound substitutions, and reduced speech intelligibility were frequently observed among children with developmental speech disorders.

Fluency Disorders

Participants with fluency disorders demonstrated repetitions, prolongations, hesitations, and speech blocks characteristic of stuttering. These features negatively affected communication confidence and social participation.

Language Disorders

Participants with aphasia and neurological impairments exhibited deficits in lexical retrieval, grammatical organization, sentence formulation, and comprehension. Pragmatic communication difficulties, including impaired conversational turn-taking and contextual interpretation, were also identified.

Acoustic and Phonetic Findings

Acoustic analysis using Praat software revealed abnormalities in pitch variation, speech intensity, duration, and prosodic patterns among participants with speech impairments.

Participants with dysarthria demonstrated reduced articulatory precision, abnormal speech rhythm, and decreased vocal intensity. Fluency disorders were associated with irregular temporal speech patterns and prolonged pauses.

Neurological and Physiological Correlates

Neurological conditions such as stroke, traumatic brain injury, and developmental neurological disorders were strongly associated with communication impairments.

Physiological abnormalities affecting speech organs, including oral-motor dysfunction and hearing impairment, also contributed to articulation and language difficulties.

Social and Educational Impact

Communication disorders significantly affected participants' academic performance, employment opportunities, social relationships, and psychological wellbeing.

Children with speech impairments experienced difficulties in classroom participation and peer interaction, while adults reported reduced occupational performance and social confidence.

DISCUSSION

The present study investigated speech and language disorders among Nigerian speakers from a clinical linguistic perspective. The findings demonstrated that communication disorders affect multiple dimensions of language, including phonology, syntax, semantics, fluency, and pragmatic communication.

The phonological and articulatory impairments observed among participants are consistent with previous studies indicating that developmental speech disorders frequently involve sound substitutions, omissions, and reduced speech intelligibility (Murphy et al., 2015). Such impairments may significantly hinder academic achievement and social interaction.

The findings also support neurolinguistic theories linking language impairment to neurological dysfunction. Participants with aphasia and dysarthria demonstrated deficits associated with cortical and neuromuscular disruptions, consistent with earlier findings by Broca, Wernicke, and contemporary neurolinguistic research (Friederici, 2011; Lui & Wroten, 2025).

The acoustic abnormalities identified through Praat analysis further confirm the usefulness of instrumental phonetic analysis in clinical speech assessment. Objective acoustic

measurements enhance diagnostic precision and facilitate evidence-based therapeutic planning.

The observed social and educational consequences of communication disorders emphasize the importance of early diagnosis and rehabilitation. Individuals with speech impairments often experience stigmatization, reduced educational participation, and psychosocial challenges. Similar findings have been reported in studies on communication rehabilitation in sub-Saharan Africa (Wylie et al., 2018).

Despite the growing global importance of speech-language pathology, access to speech therapy services in Nigeria remains limited due to inadequate infrastructure, shortage of specialists, and low public awareness. This situation highlights the need for investment in speech therapy training programmes, rehabilitation centres, and community awareness campaigns.

The integration of clinical linguistics with speech therapy practice may improve understanding of communication disorders and facilitate culturally appropriate intervention strategies. Linguistic analysis provides valuable insight into patterns of impairment and contributes to individualized rehabilitation planning.

CONCLUSION

Speech and language disorders remain important yet under-recognized public health and educational challenges in Nigeria. The present study demonstrated that communication disorders affect multiple linguistic domains and significantly impair social participation, educational performance, and psychological wellbeing.

The findings signify the importance of integrating clinical linguistics, neuroscience, and speech-language pathology in the diagnosis and management of communication disorders. Acoustic and linguistic analyses provide valuable tools for identifying patterns of impairment and improving rehabilitation outcomes.

There is an urgent need to strengthen speech-language therapy services in Nigeria through professional training, improved clinical infrastructure, and increased research on communication disorders. Integrating speech therapy into healthcare and educational systems may improve access to rehabilitation services and enhance quality of life for affected individuals.

RECOMMENDATIONS

1. Government and healthcare institutions should establish and strengthen speech-language therapy services across Nigeria.
2. Universities and professional institutions should develop specialized training programmes in speech-language pathology and clinical linguistics.
3. Public awareness campaigns should be conducted to reduce stigma associated with communication disorders.
4. Early screening and intervention programmes should be integrated into healthcare and educational systems.
5. Further research should be conducted on speech and language disorders among different Nigerian linguistic populations.

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Conflict of Interest

The authors declare no conflict of interest.

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