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Original Article

Barriers for Audiology, Speech, and Language Therapy Services to Cochlear Implant Recipients

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ABSTRACT

Background: With the rise in cochlear implant use among children with hearing impairments, understanding the challenges in providing effective audiology, speech, and language therapy services is crucial. These services are vital for the successful integration of cochlear implant recipients into mainstream society, particularly in terms of language acquisition and social-educational outcomes.

Objective: This study aimed to find out Barriers of audiology, speech, and language therapy services to cochlear implant.

Methods: A cross-sectional survey design was employed, involving 74 participants selected through non-probability convenience sampling. The study utilized a structured questionnaire covering demographics, availability of audiology, speech, and language therapy services, and specific issues related to cochlear implant use. Data were analysed using the Statistical Package for the Social Sciences (SPSS) software, version 20.0.

Results: Among participants, 58.1% were aged 25-35 years; 67.6% were female. Educational levels varied, with 33.8% holding graduate degrees. Key barriers identified included distance to services, cost, and scheduling difficulties. 66.2% agreed that health insurance was a significant challenge, and 52.7% faced difficulties due to the unavailability of nearby speech therapists.

Conclusion: The study highlights the critical need for accessible and tailored speech and language therapy services for cochlear implant recipients, especially in rural areas. Addressing these barriers requires concerted efforts from healthcare providers, policymakers, and community leaders to enhance the rehabilitation outcomes for cochlear implant recipients.

Keywords: Cochlear Implants, Rehabilitation Services, Audiology, Speech Therapy, Accessibility, Rural Healthcare.

INTRODUCTION

Audiology, a critical field in healthcare, focuses on the assessment, diagnosis, treatment, rehabilitation, and prevention of hearing and balance disorders (1, 2). The global audiology market has witnessed significant growth, primarily due to the increasing prevalence of age-related hearing loss. Audiologists play a vital role in this domain, conducting hearing evaluations (3), fitting various hearing devices, and participating in the management of hearing loss (4, 5). A crucial aspect of their work involves newborn hearing screening (NNHS) programs. These government-led initiatives aim to detect deafness in infants from birth to one month old, ensuring early intervention by six months. This early intervention is vital for normal speech and language development, educational achievements, and overall quality of life (2, 6, 7).

In countries like Pakistan, where there is a substantial population but a notable absence of NNHS programs, hearing loss often remains undetected until later in life. Pakistan's healthcare spending, at 2.4% of its GDP, falls short of the 4-5% global standard required for basic healthcare. This lack of resources, coupled with cultural barriers and a limited healthcare workforce, poses significant challenges in implementing effective NNHS programs (8, 9). It is hoped that highlighting these issues will spark interest and action towards establishing NNHS in Pakistan (10). Treatment options for the hearing impaired include assistive devices and

cochlear implants. Cochlear implants, in particular, are surgically implanted neuroprostheses that provide a modified sense of sound to those with sensorineural hearing loss, requiring intensive auditory training for effective use (8, 9).

Barriers delaying treatment for hearing-impaired children can have profound impacts on cognitive, language, and auditory development (9, 11). These include late detection of hearing loss, which can be mitigated through universal hearing screening and identification of high-risk groups like those with congenital cytomegalovirus (CCMV) (12). Additional obstacles include limited access to speech pathologists, especially in rural areas, high travel costs, lack of public transportation, low awareness of speech pathology services, and treatment delays due to long waiting lists (13, 14).

Research indicates that the denial of hearing loss and the refusal to seek help is often rooted in socio-psychological issues. Many individuals with mild to moderate hearing loss fail to recognize their condition, attributing stress at work or other factors to their impaired hearing. This denial is particularly prevalent in those who manage to hear adequately in most situations (13)

Socioeconomic factors play a significant role in access to hearing healthcare, especially for deaf and hard-of-hearing (D/HH) children. Factors such as rural residency, low parental education, low socioeconomic status, and reliance on public insurance create barriers to adequate care (11).

The role of parents in the rehabilitation of DHH children is pivotal, with family income and education level significantly influencing a child's language development. Concerns are particularly acute for low-income parents who may lack the necessary communication skills to navigate complex healthcare systems effectively (15).

The scarcity of healthcare services in rural areas further exacerbates these challenges. Delays in diagnosing hearing loss are often attributed to a lack of audiological services, particularly in remote areas. Additionally, insurance coverage plays a critical role in the referral patterns for cochlear implants, influencing access to hearing rehabilitation therapies (16).

Further studies have identified a range of impediments to effective hearing loss management. These include cost, location, availability of qualified specialists, acceptance of hearing loss, language and cultural barriers, secondary disabilities, and mental health issues. The impact of these barriers varies based on age, language, and location (urban vs. rural), affecting timely testing, device provision, and access to auditory, speech, and language therapy (17). These challenges also complicate the acceptance of hearing loss and the use of assistive devices (17).

The primary objective of this study is to comprehensively analyze and address the multifaceted barriers impeding effective hearing loss management in Pakistan, particularly focusing on the challenges faced in the implementation of Newborn Hearing Screening (NNHS) programs. This analysis aims to underscore the socio-economic, cultural, and infrastructural obstacles that delay the detection and treatment of hearing impairments, especially in newborns and children. By identifying these challenges, the study seeks to inform and catalyze the development of targeted strategies and policies that can improve early detection and intervention, ultimately enhancing the quality of life and developmental prospects for individuals with hearing loss.

MATERIAL AND METHODS

The study employed a cross-sectional survey design and was conducted over a six-month period. There was utilized a non-probability convenience sampling technique to gather the required data. The sample size, determined to be 74, was calculated using the RAO sample size calculator, ensuring sufficient statistical power for the analysis (18).

The research focused on a specific target population: parents or guardians of children with congenital hearing impairment who had received a cochlear implant (CI) (19). The inclusion criteria were set to encompass parents and guardians of children with a hearing age of at least one year and an actual age range of 1 to 8 years. However, the study excluded children who were older than 5 years at the time of their CI implantation (20). Additionally, those with associated syndromes, mental impairments as determined by psychological assessments, or children whose parents had diagnosed mental disorders were also excluded from the study.

Data collection took place at two primary sites: Alam Clinic Shadman and the Hamza Foundation Deaf Academy in Lahore. These locations were chosen due to their relevance and accessibility to the target demographic. The primary instrument for data collection was a specifically designed questionnaire for parents of cochlear implant recipients. This questionnaire was formulated to gather detailed information pertinent to the study's objectives (21).

To ensure thoroughness and accuracy in data analysis, the collected data was processed using the Statistical Package for the Social Sciences (SPSS) software, version 20.0. This software facilitated a comprehensive statistical examination of the data, allowing for a robust interpretation of the findings (22).

In conducting this study, the researchers adhered to ethical considerations, including obtaining informed consent from all participants and ensuring the confidentiality of the data collected

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RESULTS

The table 1 shows the demographic data of the participants: 74 participants (58.1%) were in the age between 25-35, (35.1%) between ages 35-45, participants (6.8%) were in the age between 45-65. 74 participants of the respondents were male, and (50) were female. Participant were having matric, (8.1%) participant were having intermediate education (29.7%), participant were having graduation education (33.8%), and participant were having master education (28.4%). In this study, participants having nuclear family were (45.9%) while participants having joint family (54.1%). Participants were single (9.5%) of the people were married, (79.7%), people were separated (1.4%), people were widow (6.8%), people were divorced (2.7%).

Table 1 Demographics

Variable	Category	Frequency (Percentage)	Variable	Category	Frequency (Percentage)
Age	25 to 35 years	43 (58.1%)	Marital Status	Married	59 (79.7%)
	35 to 45 years	26 (35.1%)		Single	7 (9.5%)
	45 to 60 years	5 (6.8%)		Widow	5 (6.8%)
Gender	Male	24 (32.4%)		Divorce	2 (2.7%)
	Female	50 (67.6%)		Separated	1 (1.4%)
Educational Status	Matric	6 (8.1%)	Monthly Income	10,000	1 (1.4%)
	Intermediate	22 (29.7%)		20,000	7 (9.5%)
	Graduate Degree	25 (33.8%)		30,000	16 (21.6%)
	Master	21 (28.4%)		30,000-60,000	24 (32.4%)
Family System	Nuclear	34 (45.9%)		60,000+	26 (35.1%)
	Joint	40 (54.1%)			

Table 2 shows the barriers regarding to audiological and speech therapy services to Cochlear implant recipients "About child's health insurance as a difficulty, 10.8% of parents responded as strongly, 10.8% Disagree, 8.1% Undecided, 66.2% Agree and 4.1% strongly agree. About distance to the audiologist as a difficulty 27.7% of the parents responded as strongly disagree, 00.0% Disagree 00.0% Undecided 51.4% Agree 21.6% Strongly Agree. About distance to the ENT clinic as a difficulty 20.3% of parents responded as strongly disagree, 00.0% Disagree, 2.7% Undecided, 71.6% Agree, 5.4% Strongly Agree. About difficulty for scheduling appointments of audiological services 21.4% of parents responded as strongly disagree, 14.9% Disagree, 9.5% Undecided, 48.6% Agree, 5.4% Strongly Agree. About child's attitude towards use of implant as a difficulty, 18.9% of parents responded as strongly disagree, 12.2% Disagree, 4.1% Undecided, 55.4% Agree, 9.5% Strongly Agree. About Child's other health problems as difficulty 4.1% of the parents responded as strongly disagree, 52.7% Disagree, 5.4% Undecided, 33.8% Agree, 4.1% Strongly Agree. Asking about availability of speech therapist/rehabilitation professionals nearby, 32.4%, of parents responded as strongly, Disagree 4.1% Undecided 4.1% Agree 52.7% Strongly Agree 6.8%.The cost of traveling to appointments is a difficulty of parents responded as strongly 20.3%, Disagree 2.7% Undecided 5.4% Agree 51.4% Strongly Agree 20.3%.

Table 2 Responses about Issues related to the post CI services

		Strongly	Disagree	Undecided	Agree	Strongly Agree
My child's health insurance is a difficulty	Count	8	8	6	49	3
	Row N %	10.8%	10.8%	8.1%	66.2%	4.1%
The distance to the audiologist is a difficulty	Count	20	0	0	38	16
	Row N %	27.0%	0.0%	0.0%	51.4%	21.6%
The distance to the ENT clinic is a difficulty	Count	15	0	2	53	4
	Row N %	20.3%	0.0%	2.7%	71.6%	5.4%
Scheduling appointments for audiological services are difficulty	Count	16	11	7	36	4
	Row N %	21.6%	14.9%	9.5%	48.6%	5.4%
My child's attitude towards the implant is a difficulty	Count	14	9	3	41	7
	Row N %	18.9%	12.2%	4.1%	55.4%	9.5%
Child's other health problems are difficult	Count	3	39	4	25	3
	Row N %	4.1%	52.7%	5.4%	33.8%	4.1%

There are no speech therapist/rehabilitation professionals near me	Count	24	3	3	39	5
	Row N %	32.4%	4.1%	4.1%	52.7%	6.8%
The cost of traveling to appointments is a difficulty	Count	15	2	4	38	15
	Row N %	20.3%	2.7%	5.4%	51.4%	20.3%

DISCUSSION

The current research delved into the complexities of providing effective audiology, speech, and language therapy services to individuals with cochlear implants, a demographic that has shown significant gains in language acquisition and social-educational integration when supported appropriately. This study was particularly focused on identifying the barriers to rehabilitation services and care access, especially in rural contexts where such challenges are often amplified (9, 17).

Consistent with existing literature, this study reinforces the notion that family involvement and an understanding of the family's socio-cultural background are crucial in the successful rehabilitation of children with cochlear implants. Previous studies have emphasized the significant role of parental education in understanding and navigating the rehabilitation process. In line with these findings, the current research observed a notable proportion of graduate-level educated parents among the participants, yet challenges in accessing and utilizing speech and language therapy services persisted (13)

A notable finding of the study was the correlation between the scarcity of speech therapists in certain regions and the parental educational level (11) This scarcity was found to contribute to a reduced frequency of speech service usage, a finding that aligns with prior research indicating that lower parental education and socioeconomic status can negatively impact language development in children. Furthermore, cultural factors were also found to influence engagement in healthcare, affecting the rehabilitation outcomes post cochlear implantation, particularly in households with lower socioeconomic and educational status (15). The study also sheds light on the integration of cochlear implant recipients into regular educational settings. While urban children typically have better access to speech therapy services, a stark contrast was observed in rural areas (16).

Here, schools often serve as the sole provider of such services, highlighting a significant urban-rural disparity. This discrepancy underscores the need for specialized speech therapy services tailored to the needs of young CI recipients, especially in rural schools where resources and specialized expertise might be lacking (17). The research encountered specific challenges in engaging with lower socioeconomic and rural populations, such as issues with phone connectivity and transient housing. These factors necessitated the adoption of a cross-sectional study design, which, while effective in evaluating the functional use of CIs, did not allow for an independent and detailed assessment of the quality of rehabilitation services provided.

CONCLUSION

The study conclusively identified several key barriers to speech and language therapy services for cochlear implant recipients. These included logistical challenges like time, distance, and cost, along with systemic issues such as socioeconomic status, educational background, and a lack of available therapists, particularly in rural areas. These findings not only highlight the need for more accessible and tailored services but also call for a deeper exploration into the long-term benefits of speech-language pathology services for children with cochlear implants. The insights from this study are crucial in guiding future research and in developing more effective strategies to overcome the identified barriers, ultimately enhancing the rehabilitation outcomes for cochlear implant recipients.

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