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ASSESSING THE PARENTS' EXPERIENCE REGARDING THE DIAGNOSIS PROCESS OF COCHLEAR IMPLANT TECHNOLOGY FOR THEIR CHILDREN IN NAIROBI CITY COUNTY, KENYA

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Abstract:
This study examined parents' experiences of the diagnostic process leading to cochlear implantation for their children in Nairobi City County, Kenya. Guided by Bronfenbrenner's Ecological Systems Theory, the study employed a descriptive research design to explore how family, healthcare, and societal systems shape parental experiences. The target population comprised 100 parents of children undergoing speech therapy services, selected through purposive and snowball sampling techniques. Data were collected using questionnaires, interviews, and observation checklists, and analyzed using both descriptive statistics and qualitative content analysis. Findings indicated that parental suspicion of hearing loss most frequently emerged between ages 1 and 2 years (50.6%), followed by ages 2 to 3 years (35.6%). Only 11.5% of parents identified concerns within the first year of life, suggesting gaps in early detection. Although cochlear implantation was perceived to improve children's quality of life, parents reported significant challenges during the diagnostic and implantation process, including delays in professional diagnosis, financial constraints, and societal stigma. The findings underscore the need for strengthened early hearing detection and intervention programs, routine screening services, and coordinated post-operative rehabilitation systems to improve parental experiences and optimize developmental outcomes for children with cochlear implants.

Keywords: cochlear implants, parental experience, diagnosis process, early hearing detection

1. Introduction

Hearing impairment is the most prevalent sensory disability worldwide, affecting more than 466 million people (World Health Organization [WHO], 2019). Projections indicate that by 2050, over 900 million individuals, approximately one in ten people, will experience some hearing loss. WHO also estimates that 32 million children globally live with disabling hearing loss (WHO, 2021). The growing burden of childhood hearing loss underscores the need for early identification, timely intervention, and sustained family-centered support systems.

Cochlear implants (CIs) have transformed the management of severe to profound sensorineural hearing loss (SNHL), particularly in children. By bypassing damaged portions of the inner ear and directly stimulating the auditory nerve, cochlear implants enable access to sound and spoken language development. Regarded as one of the most advanced neural prosthetic devices, cochlear implantation is considered a safe and effective intervention for pediatric SNHL globally (Athanasopoulos *et al.*, 2024). The device consists of external components, including a microphone, speech processor, and transmitting coil, and internal components surgically implanted in the cochlea (Deep *et al.*, 2019). Although the surgical procedure typically lasts two to four hours, the long-term success of implantation depends heavily on consistent post-operative rehabilitation, including intensive auditory-verbal therapy over several years.

While cochlear implantation is a medical intervention, its outcomes are shaped by many interacting systems beyond the hospital setting. Bronfenbrenner's Ecological Systems Theory provides a useful framework for understanding these influences. The theory presupposes that a child's development is shaped by interactions within her environmental systems: the microsystem (family and immediate caregivers), mesosystem (interactions between family, school, and healthcare providers), exosystem (broader institutional and policy environments), macrosystem (cultural beliefs and societal attitudes), and chronosystem (changes over time). In the context of cochlear implantation, parental perceptions, family support structures, healthcare accessibility, rehabilitation services, educational placements, cultural beliefs, and socioeconomic conditions interact to influence both the diagnostic process and subsequent language outcomes.

Research from high-income countries demonstrates that parental engagement within the child's microsystem plays a critical role in rehabilitation outcomes. Parents frequently perceive cochlear implants as a pathway to improved communication and quality of life, though concerns regarding surgical risks, long-term effectiveness, and financial burden remain (Tobey *et al.*, 2022). Lyxell *et al.* (2021) reported high parental satisfaction in Sweden, particularly when early intervention services were coordinated and accessible, illustrating strong mesosystem collaboration between families and professionals. Similarly, Archbold *et al.* (2020) emphasized that parental involvement in rehabilitation programs in the United Kingdom significantly influences children's access to auditory-verbal therapy and educational opportunities.

In low- and middle-income countries (LMICs), however, ecological influences at the exosystem and macrosystem levels often constrain parental experiences. In Nigeria, financial limitations and infrastructural challenges restrict access to cochlear implant technology despite increasing awareness (Adeyemo *et al.*, 2023). In South Africa, disparities between urban and rural settings affect service availability, with wealthier families more likely to pursue implantation (Mahomed-Asmail *et al.*, 2020). Egyptian studies highlight the role of cultural and religious beliefs in shaping parental acceptance of Western medical interventions (El-Anwar *et al.*, 2021). These findings illustrate how societal norms, economic structures, and healthcare policies interact with family-level factors to shape decisions and outcomes.

Within East Africa, limited research has examined parental perceptions of cochlear implant technology through an ecological lens. Studies in Uganda and Tanzania identify low awareness, stigma, misinformation, and inadequate early intervention services as significant barriers (Ndyomugenyi *et al.*, 2022; Mwacha *et al.*, 2023). In Kenya, disparities in access persist despite improvements in healthcare infrastructure, and misconceptions about cochlear implantation are influenced by socioeconomic status and cultural attitudes (Otieno *et al.*, 2021). These systemic influences highlight the interconnectedness of family experiences with broader healthcare, educational, and cultural systems.

Although global literature underscores the importance of parental engagement in cochlear implant outcomes, there is limited research exploring how multiple ecological systems shape parents' experiences of the diagnostic and implantation process in Nairobi City County, Kenya. Much of the existing research in East Africa focuses primarily on access barriers or clinical outcomes, with insufficient attention to how parents navigate interactions across family, healthcare, educational, and sociocultural contexts. Applying Bronfenbrenner's Ecological Systems Theory allows for a comprehensive examination of these interconnected influences, thereby informing contextually responsive interventions that strengthen early diagnosis, improve family-centered care, and enhance language development outcomes for children with cochlear implants.

2. Statement of the Problem

Childhood hearing loss remains a significant global public health concern, and cochlear implantation has transformed the management of profound hearing impairment. In Nairobi City County, Kenya, approximately 300 children have received cochlear implants over the past twelve years, reflecting increasing adoption of this technology. Although cochlear implantation has the potential to significantly enhance auditory access and spoken language development, little is known about how parents in this context experience the diagnostic and early implantation process.

Existing literature consistently demonstrates that parental attitudes, beliefs, and engagement play a critical role in the success of cochlear implant interventions. Studies from high-income countries indicate that parents often view cochlear implants as essential for improving their children's communication abilities and overall quality of life. However, concerns regarding surgical risks, long-term outcomes, financial burden, and access to rehabilitation services persist. In Sub-Saharan Africa, including countries such as Nigeria and South Africa, financial constraints, limited infrastructure, and sociocultural factors have been shown to restrict access to cochlear implant services and shape parental perceptions.

In Kenya, despite gradual improvements in healthcare infrastructure, disparities in access and understanding of cochlear implant technology remain evident. Current research in the region largely focuses on clinical outcomes and service availability, with limited attention to parents' lived experiences during the diagnostic and decision-making process. The absence of context-specific evidence on how parents navigate medical systems, interpret hearing loss diagnoses, and manage early implantation challenges represents a critical knowledge gap.

Understanding parental experiences is essential for strengthening early hearing detection systems, improving family-centered care, and enhancing language development outcomes. Without such insight, policy interventions and rehabilitation programs may fail to address the systemic, cultural, and socioeconomic factors influencing families during the diagnostic journey. This study, therefore, seeks to bridge this gap by examining parents' experiences of the cochlear implant diagnostic process in Nairobi City County.

2.1 Purpose of the Study

The purpose of this study was to assess parents' experiences of the diagnostic process leading to cochlear implantation for their children in Nairobi City County, Kenya.

3. Conceptual Framework

This study was guided by Bronfenbrenner's Ecological Systems Theory, which posits that child development is influenced by interactions within multiple, nested environmental systems. In this study, parental experiences of the cochlear implant diagnostic process were conceptualized as being shaped by interconnected ecological levels.

At the microsystem level, parental knowledge, beliefs, emotional responses, and family support structures influence decision-making and engagement with services. The mesosystem reflects interactions between families and healthcare providers, audiologists, speech-language therapists, and educational institutions. The exosystem includes broader institutional and structural factors such as healthcare policies, availability of implant programs, and insurance or financial support mechanisms. The macrosystem encompasses cultural beliefs, societal attitudes toward disability, and stigma related to hearing impairment. Finally, the chronosystem captures changes over time, including evolving parental understanding, technological advancements, and long-term adaptation following diagnosis and implantation.

Figure 1.1 illustrates the interrelationships between these ecological systems (independent variables) and parental experiences of the diagnostic process (dependent variable), demonstrating how multilevel environmental influences shape decision-making, satisfaction, and early rehabilitation engagement.

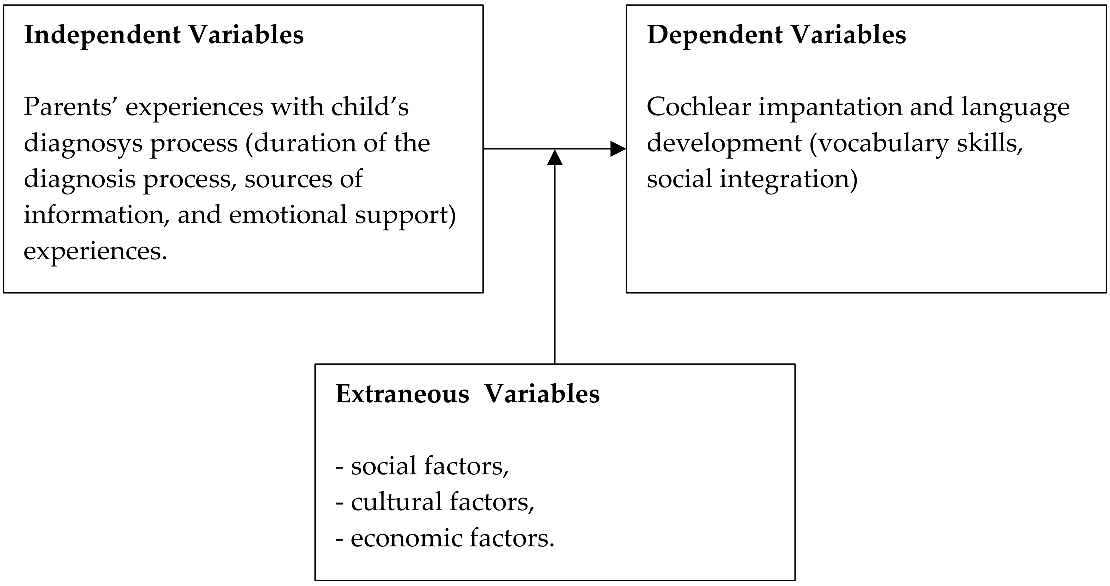

Figure 1.1: Conceptual Framework

4. Literature Review

4.1 Theoretical Framework

This study was grounded in Bronfenbrenner's (1979) Ecological Systems Theory, which conceptualizes child development as occurring within interconnected environmental systems. The theory posits that children and their families exist within multilayered contexts that shape developmental outcomes through dynamic interactions between individuals and their environments.

In the context of cochlear implantation, the **microsystem** includes the child's immediate environment, such as family members, caregivers, and daily rehabilitation interactions. Parental beliefs, emotional responses to diagnosis, and engagement in therapy directly influence auditory and language development. Interactions with healthcare professionals, including audiologists, surgeons, and speech-language therapists, also form part of this system and may affect parental satisfaction and rehabilitation adherence.

The **mesosystem** refers to linkages between microsystems, including relationships among families, healthcare providers, educational institutions, and community support networks. Effective coordination among these systems may enhance early intervention outcomes and parental experiences.

The **exosystem** encompasses broader institutional structures that indirectly influence families, such as healthcare infrastructure, insurance systems, and government policies. Resource limitations or high treatment costs may shape access to cochlear implantation services.

The **macrosystem** includes cultural beliefs, societal attitudes toward disability, and socioeconomic conditions. In Nairobi City County, cultural perceptions of hearing impairment and financial disparities may influence parental acceptance of cochlear implant technology.

Finally, the **chronosystem** reflects change over time, including technological advancements, evolving parental understanding, and the child's developmental progression. This ecological framework provided a comprehensive lens for examining parental experiences within interacting social systems.

4.2 Parental Perceptions of Cochlear Implants

Globally, approximately 466 million individuals live with disabling hearing loss, and projections indicate that this number may exceed 900 million by 2050 (World Health Organization [WHO], 2021). Although country-specific prevalence estimates for Kenya are limited, hearing loss remains a significant public health concern in low- and middle-income countries due to restricted access to early detection and intervention services (WHO, 2021). Mugambi *et al.* (2019) reported that 5.3% of primary school children in Kenya experienced hearing impairment, highlighting the need for early identification and intervention.

Research indicates that parental perceptions significantly influence the adoption and success of cochlear implantation. Parents often perceive cochlear implants as essential tools for improving communication and quality of life. However, concerns regarding surgical risk, device longevity, cost, and rehabilitation demands remain prevalent

4.3 Parents' Experiences with Cochlear Implant Adoption

Young *et al.* (2021) found that parents in the United States reported difficulty navigating healthcare systems and making informed decisions about cochlear implantation. Many described feeling overwhelmed and expressed the need for enhanced professional guidance.

In Sub-Saharan Africa, structural and sociocultural barriers influence parental experiences. Adedeji *et al.* (2020) reported that Nigerian parents encountered financial constraints, limited specialist services, and stigma associated with hearing loss. Similarly, Mutua *et al.* (2023) found that Kenyan parents experienced prolonged wait times, inadequate information from healthcare professionals, and financial hardship. Despite these challenges, parents recognized the potential benefits of cochlear implants for language and social development. Kamau *et al.* (2022) further reported limited awareness and persistent misconceptions regarding cochlear implantation among Kenyan parents.

Existing Kenyan research has primarily focused on awareness and access barriers, with limited attention to parental experiences during the diagnostic and decision-making process. This gap underscores the need for context-specific research informed by an ecological framework.

5. Method

5.1 Study Design

The study employed a descriptive mixed-methods design. This approach enabled the integration of quantitative and qualitative data to provide a comprehensive understanding of parental experiences (Creswell, 2014). Quantitative data identified patterns and trends, whereas qualitative data provided in-depth insight into lived experiences.

5.2 Setting

The study was conducted in Nairobi City County, Kenya. Nairobi serves as the country's primary economic and healthcare hub and hosts most cochlear implant centers and rehabilitation services. Its concentration of specialized services made it an appropriate site for examining parental experiences.

5.3 Participants

The target population comprised 100 parents of children receiving speech therapy services in Nairobi City County. Participants were selected using purposive sampling to identify parents with direct experience of cochlear implantation. Snowball sampling was subsequently used to recruit additional eligible participants.

Although the sample may not represent all parents of children with cochlear implants in Nairobi, it provided sufficient variability to generate meaningful descriptive and thematic findings.

5.4 Instruments

Data were collected using three instruments:

1) A structured questionnaire assessing demographic characteristics and parental experiences.
2) A semi-structured interview guide exploring decision-making processes and perceptions.
3) An observation checklist documenting parent–child interactions and rehabilitation engagement.

The use of multiple instruments facilitated methodological triangulation.

5.5 Pilot Study

A pilot study was conducted with a small group of parents of children with cochlear implants in Nairobi City County. Questionnaire items were revised based on participant feedback to improve clarity and relevance. Interview questions were refined to enhance depth and flow. Revisions were made iteratively until acceptable clarity and reliability were achieved.

5.6 Validity and Reliability

Content validity was established through expert review by specialists in cochlear implantation, language development, and research methodology. Their feedback ensured alignment between the instruments and study objectives.

Internal consistency reliability of the questionnaire was assessed using Cronbach’s alpha, which yielded $\alpha = .78$, indicating acceptable reliability. Test–retest reliability procedures were also conducted to assess stability over time.

5.7 Procedure

Ethical approval was obtained prior to data collection. Informed consent was secured from all participants. Questionnaires were administered in person, by telephone, or online based on participant preference. Individual interviews were conducted either face-to-face or via video conferencing platforms. Observations were conducted in home and therapy settings with participant consent.

5.8 Data Analysis

Quantitative data were analyzed using descriptive statistics, including means (M), standard deviations (SD), frequencies, and percentages. Where appropriate, independent-samples *t* tests were conducted to compare subgroup differences.

Qualitative data were analyzed using thematic analysis. Transcripts were coded, organized into categories, and refined into themes through iterative review. Findings were presented using narrative descriptions and supporting tables.

6. Results

6.1 Sample Characteristics

A total of 87 parents completed the demographic section of the questionnaire. Table 1 presents the general characteristics of the sample.

Female respondents constituted the majority of participants (n = 53, 60.9%), compared to males (n = 34, 39.1%), suggesting greater maternal involvement in cochlear implantation and rehabilitation processes. Most parents were aged 26–35 years (n = 42, 48.3%), followed by those older than 45 years (n = 19, 21.9%). Only 9 participants (10.3%) were aged 20–25 years.

Regarding marital status, over half of the respondents were married (n = 48, 55.2%), while 22 (25.3%) were single. Divorced (5.7%), separated (6.9%), and widowed (6.9%) parents comprised smaller proportions. The predominance of married parents may indicate the presence of dual-parent support during rehabilitation.

Educational attainment was relatively high. Nearly half of the parents held a university degree (n = 39, 44.8%), while 12 (13.8%) had postgraduate qualifications. Only 4 participants (4.6%) had completed primary education. Higher educational levels may influence parents’ ability to access and interpret medical information.

In terms of occupation, 33.3% (n = 29) were employed in the civil service, 24.1% (n = 21) in the private sector, and 20.7% (n = 18) reported other forms of employment. Employment commitments may affect parents' ability to attend therapy sessions consistently.

Table 1: Parent Demographics

Demographic Information		**Frequency**	**Percentage (%)**
1. Gender	Male	34	39.1
	Female	53	60.9
2. Age	20-25 years	9	10.3
	26-35 years	42	48.3
	36-45 years	17	19.5
	> 45 years	19	21.9
3. Marital status	Single	22	25.3
	Married	48	55.2
	Divorced	5	5.7
	Separated	6	6.9
	Widowed	6	6.9
4. Level of education	Primary school	4	4.6
	Secondary school	11	12.6
	College or technical school	21	24.1
	Degree	39	44.8
	Post graduate	12	13.8
5. Occupation	Business person	11	12.6
	Farmer	8	9.2
	Civil Service employment	29	33.3
	Private Sector employment	21	24.1
	Others	18	20.7

6.2 Child Characteristics

Thirty children receiving speech therapy services were profiled (Table 2). Males constituted 60% (n = 18) of the sample. The largest age group was 3–5 years (n = 8, 27%), while only 7% (n = 2) were below one year of age, suggesting that intervention frequently begins at preschool age rather than during infancy.

Unilateral cochlear implantation was most common (n = 16, 53%), followed by bilateral implantation (n = 9, 30%). Five children (17%) used a cochlear implant and hearing aid combination. Financial considerations and availability may explain the higher prevalence of unilateral implantation.

Table 2 indicates that males constituted the majority at 18 (60%), whereas females accounted for 12 (40%). The elevated proportion of males receiving speech therapy corresponds with the gender imbalance noted among cochlear implant recipients. The majority of children in therapy were aged 3-5 years, comprising 8participants (27%), while the minority were aged 0-1 year, totalling 2participants (7%). The prevalence of the 3-5 age group in therapy indicates that early intervention occurs at the preschool level; however, greater awareness is required for earlier detection and intervention. Unilateral cochlear implants (CIs) were the most prevalent, accounting for 16 cases (53%), while the combination of cochlear implants and hearing aids (CI&HA) was the least utilised, with 5 cases (17%). The inclination toward unilateral implantation may stem from financial considerations or availability, indicating a necessity for enhanced support for bilateral implantation where advantageous.

Table 2: Personal Data for the Children Undergoing Speech Therapy in Nairobi City Frequency

Personal Information	Frequency	Percentage (%)
Gender Distribution		
Male	18	60.0
Female	12	40.0
Total	**30**	**100.0**
Age Distribution		
0-1 year	2	7.0
1-2 years	4	13.0
2-3 years	6	20.0
3-5 years	8	27.0
5-8 years	6	20.0
More than 8 years	4	13.0
Total	**30**	**100.0**
Type of Cochlear Implantation Used		
Unilateral	16	53.0
Bilateral	9	30.0
CI and HA (Cochlear Implant and Hearing Aid Combination)	5	17.0
Total	**30**	**100.0**
Brand of Cochlear Implant Worn		
Medel	18	60.0
Cochlea	9	30.0
Combination of two brands	2	7.0
Other (unspecified)	1	3.0
Total	**30**	**100.0**

6.3 Parental Perspectives on the Diagnostic Process

6.3.1 Initial Identification of Hearing Difficulties

Parents most frequently reported identifying hearing concerns through observation of behavioral indicators. Over half indicated that their child failed to respond to sound (n = 45, 51.8%) or turn when called (n = 45, 51.8%). Family members or friends contributed to suspicion in 55.4% of cases (n = 48).

Only 37 parents (42.9%) reported that hearing impairment was initially identified through professional medical diagnosis, suggesting delays in formal screening pathways. These findings indicate that detection often relies on parental and social observation rather than systematic newborn screening.

Table 3: How Parents Discovered their Children's Hearing Challenges

		Frequency	**Percentage (%)**
Routine screening at birth	Yes	3	55.4
	No	84	44.6
	Total	**87**	**100.0**
Observing a lack of response to sound	Yes	45	51.8
	No	42	48.2
	Total	**87**	**100.0**
The child stopped babbling	Yes	44	50.0
	No	43	50.0
	Total	**87**	**100.0**
The child could not follow spoken commands	Yes	40	46.4
	No	47	53.6
	Total	**87**	**100.0**
The child failed to wake up to loud noises	Yes	36	41.1
	No	51	58.9
	Total	**87**	**100.0**
The child could not turn the head when called out	Yes	45	51.8
	No	42	48.2
	Total	**87**	**100.0**
Medical professional diagnosis	Yes	37	42.9
	No	50	57.1
	Total	**87**	**100.0**
You may make multiple selections)/ Family member or friend observation	Yes	48	55.4
	No	39	44.6
	Total	**87**	**100.0**
You may make multiple selections)/ Other (please specify)	Yes	9	10.7
	No	78	89.3
	Total	**87**	**100.0**

6.3.2 Age of Suspicion, Diagnosis, and Implantation

Most parents suspected hearing impairment between ages 1–2 years (n = 39, 44.8%), followed by 2–3 years (n = 31, 35.5%). Only 10.2% (n = 9) suspected hearing loss within the first year of life.

Diagnosis most commonly occurred between ages 3–5 years (n = 27, 31.0%). Cochlear implantation was also most frequently performed between ages 3–5 years (n = 39, 44.9%). Only 6 children (6.8%) received implantation before one year of age.

These findings suggest substantial delays between suspicion, diagnosis, and implantation, potentially limiting the benefits of early auditory stimulation.

Table 4: Age of Suspected Hearing Impairment and Diagnosis

Variable		**Frequency**	**Percentage (%)**
Age suspected that your child had a hearing impairment	Between 0-1 year	9	10.2
	Between 1-2 years	39	44.8
	Between 2-3 years	31	35.5
	Above 3 years	8	9.1
	Total	**87**	**100.0**
Child's age at the time of diagnosis with hearing impairment	Between 0-1 year	10	11.5
	Between 1-2 years	22	25.2
	Between 2-3 years	23	26.4
	Between 3-5 years	27	31
	Above 5 years	5	5.7
	Total	**87**	**100.0**
Child's age at the time of cochlear implant	Between 0-1 year	6	6.8
	Between 1-2 years	12	13.6
	Between 2-3 years	21	24
	Between 3-5 years	39	44.9
	Above 5 years	9	10.2
	Total	**87**	**100.0**

Table 4 indicates that 39 (44.8%) parents identified hearing impairment in their kid at ages 1–2 years, whereas 31 (35.5%) suspected it at ages 2–3 years. Only 9 individuals (10.2%) identified the issue in the first year, while 8 individuals (9.1%) expressed concerns about impairment after 3 years. Suspicions of hearing loss frequently emerge later than during infancy. The majority of children, 27 (31.0%), received their diagnosis between the ages of 3 and 5 years, while 23 (26.4%) were diagnosed between 2 and 3 years. Only 10 individuals (11.5%) received a diagnosis in the first year, whereas 22 individuals (25.2%) were diagnosed between one and two years.

Notably, 5 (5.7%) of children had a diagnosis post age 5, indicating a postponement in professional action. The majority of children, 39 (44.9%), received cochlear implants between the ages of 3 and 5 years, followed by 21 (24.0%) between 2 and 3 years, and 12 (13.6%) between 1 and 2 years. Only 6 (6.8%) had implantation before their first birthday, and 9 (10.2%) had it after they turned 5. The findings suggest that cochlear implantation is typically postponed until preschool or later, despite a diagnosis occurring between the ages of 2 and 5 years. Such delays may restrict the advantages of early auditory stimulation and highlight the necessity for improved neonatal hearing screening and intervention referrals. Mutua *et al.* (2023) demonstrated that delays in diagnosis and intervention are prevalent in Kenya due to limited access to specialised healthcare services. They also endorse Adedeji *et al.* (2020), who identified financial constraints and limited awareness as obstacles to early diagnosis in Nigeria. These findings contradict the National Institute on Deafness and Other Communication Disorders (NIDCD, 2021), which emphasizes the value of cochlear implantation in high-income nations.

6.3.3 Location of Implantation and Access to Services

Table 5: Location of Implantation and Access to Service

Item		Frequency	Percentage
Location of implantation	Within the Country (Kenya)	60	69%
	Outside the Country	27	31%
	Total	**87**	**100.0%**
Specific country	India	18	66.7%
	USA	4	14.8%
	South Africa	3	13.3%
	Germany	2	7.4%
	Total	**27**	**100.0%**
Source of CI services like support and repair services in case of failure and breakage	Locally through CI programs and networks	55	63.1%
	From outside the Country	31	35.1%
	Other (not mentioned)	1	1.8%
	Total	**87**	**100.0%**
Duration the child has been using a cochlear implant	Less than 1 year	11	12.5%
	1-2 years	23	25.8%
	2-5 years	28	32.1%
	More than 5 years	25	28.6%
	Total	**87**	**100.0%**

Most implant surgeries were conducted within Kenya (n = 60, 69%), while 31% (n = 27) sought services abroad, primarily in India. Maintenance and support services were accessed locally by 63.1% of parents (n = 55).

The duration of implant use varied, with 32.1% (n = 28) reporting 2–5 years of use and 28.6% (n = 25) reporting more than five years, indicating sustained reliance on cochlear implant technology.

6.4 Decision-Making Factors

Table 6: Factors for Parent's Decision to Opt for Cochlear Implantation for Their Child

Factor		Frequency	Percentage (%)
Medical advice	Yes	56	64.4
	No	31	35.6
	Total	**87**	**100.0**
Personal research	Yes	54	62.1
	No	33	37.9
	Total	**87**	**100.0**
Recommendations from other parents	Yes	58	66.7
	No	29	33.3
	Total	**87**	**100.0**

Medical advice influenced 64.4% of parents (n = 56), while recommendations from other parents influenced 66.7% (n = 58). Personal research was reported by 62.1% (n = 54). These findings suggest that both professional and peer networks significantly shape decision-making.

6.5 Satisfaction with Information and Support

Table 6: Parental Satisfaction Levels

Item		Frequency	Percentage (%)
How satisfied were you with the information provided to you about CIs before the procedure?	Very satisfied	19	21.8
	Satisfied	17	19.5
	Neutral	22	25.3
	Dissatisfied	17	19.5
	Very dissatisfied	12	13.9
	Total	**87**	**100.0**
How satisfied are you with the support provided by healthcare professionals during the cochlear implantation process?	Very satisfied	16	18.4
	Satisfied	16	18.4
	Neutral	16	18.4
	Dissatisfied	17	19.5
	Very dissatisfied	22	25.3
	Total	**87**	**100.0**

Parental satisfaction levels were mixed. Approximately 41.3% reported being satisfied or very satisfied with pre-procedure information, whereas 33.4% reported dissatisfaction.

Support from healthcare professionals received lower ratings, with 44.8% indicating dissatisfaction or strong dissatisfaction. These findings highlight areas for improvement in counseling and family-centered care.

6.6 Challenges during the Implantation Process

Forty-one percent (n = 36) reported encountering challenges. Among these, financial constraints were the most frequently cited barrier (approximately 70% of those reporting challenges). Additional concerns included limited access to speech therapy, inadequate insurance coverage, and prolonged approval processes.

More than half of the parents (51.8%) reported experiencing societal stigma or discrimination related to their child’s cochlear implant.

Despite challenges, 55.3% rated their overall experience as good or excellent.

Table 7: Reported Challenges During the Implantation Process

		Frequency	Percentage (%)
Whether encountering any challenges during the process of obtaining a cochlear implant for your child	No	51	58.9
	Yes	36	41.1
	Total	**87**	**100.0**
Specific challenge	Psychological challenge	0	0.0
	Inadequate insurance cover	2	5.0
	Longer waiting period for approval	2	5.0
	Poor access to speech therapy and post-surgery care	5	15.0
	Little information	2	5.0
	Lack or inadequate funds	25	70.0
	Total	**36**	**100.0**
Rating of the overall experience with the adoption of cochlear implant technology for your child	Excellent	19	19.6
	Good	31	35.7
	Fair	28	32.1
	Poor	9	12.5
	Total	**87**	**100.0**
Faced any societal stigma or discrimination due to your child's cochlear implant?	No	42	48.2
	Yes	45	51.8
	Total	**87**	**100.0**

6.7 Impact on Quality of Life

Nearly half of parents rated the impact of cochlear implantation as positive or very positive (44.6%). However, 25% reported neutral experiences, and approximately 30% reported negative perceptions, suggesting variability in outcomes.

Table 8: Quality of Life

		Frequency	Percentage (%)
How would you rate the impact of cochlear implantation on your child's quality of life?	Very positive	19	21.4
	Positive	20	23.2
	Neutral	22	25.0
	Negative	12	14.3
	Very positive	14	16.1
	Total	**87**	**100.0**
To what extent do you feel confident in managing your child's cochlear implant?	Extremely confident	19	21.4
	Confident	26	30.4
	Somewhat confident	31	35.7
	Not confident	11	12.5
	Total	**87**	**100.0**

Regarding confidence in managing the device, 51.8% reported feeling confident or extremely confident, while 12.5% reported low confidence. These findings underscore the importance of continued parental training and post-implantation support.

Table 10: Improvements Suggested by Parents in the Cochlear Implantation Process

Suggested Improvement	**Frequency**	**Percentage (%)**
Improved Access to Information and Counseling	19	21.4
Enhanced Post-Implant Therapy and Support Services	17	19.6
Financial and Insurance Support	16	17.9
Technology Enhancements	16	17.9
Peer and Parental Support Networks	11	12.5
Reduced Waiting Times and Bureaucracy	9	10.7
Total	**87**	**100.0**

Table 10 identifies key areas requiring improvement in cochlear implantation services. Nineteen parents (21.8%) reported a need for enhanced pre-implantation education and counseling, particularly regarding realistic expectations, emotional preparedness, and financial planning. Seventeen respondents (19.5%) emphasized the importance of structured rehabilitation programs, including consistent speech therapy and long-term follow-up care to optimize implant outcomes.

Sixteen parents (18.4%) expressed the need for expanded financial assistance programs beyond insurance coverage to improve access to cochlear implant (CI) services. An equal proportion (n = 16, 18.4%) highlighted the importance of technological advancements, including extended battery life, improved background noise reduction, and better synchronization with hearing aids to enhance user experience.

Additionally, 11 parents (12.6%) underscored the value of peer and parent support networks, noting that engagement with families who have undergone similar experiences could reduce emotional distress and provide practical guidance. Finally, nine respondents (10.3%) advocated for reduced waiting times and fewer regulatory barriers to facilitate timely access to implantation services.

This study also presents thematic findings derived from qualitative interviews with parents of children with cochlear implants in Nairobi City County. The results are organized according to major themes, participants' narratives in chronological context, and the broader implications of these experiences. The qualitative findings aim to illuminate both the challenges and successes encountered by families as they navigate diagnosis, implantation, and post-implant rehabilitation within their sociocultural environment.

6.8 Qualitative Findings

Theme 1: Emotional Reactions to Diagnosis

Parents described intense emotional responses following diagnosis, including shock, denial, and uncertainty about their child's future. These reactions often delayed immediate decision-making and highlighted the need for structured psychological counseling at the point of diagnosis.

A mother of a three-year-old child recalled,

> *"I felt confused when the doctor verified my child had severe hearing loss. I had no idea about his future."* (Female participant 1, aged 45 years in Embakasi East Sub-County).

Based on the above subject, another parent expressed,

> "*My initial reaction was one of denial. I reasoned perhaps there had been an error. We also asked for a second view*." (Male participant 2, aged 48 years, Mathare sub-county).

In another response supporting the above sentiment, a participant said,

> *"For months, I kept expecting that my child would start speaking. When it did not happen, it was devastating."* (Female participant 2, aged 31 years in Langata Sub-County).

The above findings show that, at the point of diagnosis, parents go through major emotional conflict. Often delaying proactive actions in search of treatments, the shock and suffering point to a significant need for organized counselling and emotional support programs at the first diagnosis stage.

Theme 2: Limited Awareness and Information Gaps

Many parents reported limited prior knowledge of cochlear implants. Informal peer networks frequently served as primary sources of reassurance and information.

Participants emphasized the need for improved counseling, accessible educational materials, and structured guidance throughout the diagnostic process.

> "*I had never heard of CIs before. I had to consult other parents*." (Male participant 3, aged 44 years, Kasarani Sub-County).

Grace (not real name), who has also experienced difficulties, stated,

> "*The doctors explained the options well, but I still needed to talk to other parents for reassurance*." (Female participant 4, aged 29 years, Ruaraka Sub-County).

The findings of this study reinforce existing evidence that limited awareness and inadequate information significantly influence parental decision-making regarding cochlear implantation. A substantial proportion of parents in Nairobi City County reported relying on personal observations, family members, and other parents—rather than structured medical pathways—for initial information about their child's hearing loss and cochlear implant options. Additionally, notable dissatisfaction with pre-implant counseling and professional support suggests persistent informational gaps within the healthcare system. These findings align with those of Kamau *et al.* (2022), who observed that many Kenyan parents depended on informal parent networks due to limited formal guidance. Similarly, Mutua *et al.* (2023) reported that insufficient knowledge contributed to hesitation and misconceptions about cochlear implants, while Young *et al.* (2021) demonstrated that unclear communication delayed treatment decisions.

In the present study, delayed suspicion, diagnosis, and implantation further illustrate how informational deficiencies can prolong intervention timelines, potentially affecting language development outcomes. Together, these findings highlight the urgent need for structured pre-implant counseling, accessible educational materials, and community-based awareness initiatives. Strengthening communication pathways between healthcare providers and families may reduce uncertainty, promote earlier decision-making, and improve both parental confidence and long-term rehabilitation outcomes.

7. Conclusion

Although cochlear implantation has improved communication and quality of life for many children in Nairobi City County, significant systemic and contextual challenges persist. Delays in diagnosis and implantation remain common, often due to limited screening systems, financial barriers, and inadequate professional support. Societal stigma further complicates parental experiences.

Strengthening early hearing detection programs, expanding financial assistance mechanisms, and implementing structured family-centered counseling services may enhance parental satisfaction and improve long-term developmental outcomes for children with cochlear implants.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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