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AUDIOLOGICAL EVALUATION OF PROBLEMS ENCOUNTERED BY INDIVIDUALS WITH HEARING IMPAIRMENT IN HEARING AID USAGE

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ABSTRACT

Introduction: Audiologists and researchers need to comprehend the audiological experiences of individuals with hearing impairments in their use of hearing aids to facilitate the development of support methods that maximize the use of hearing aids because the attitudes and experiences of individuals with hearing impairments toward the use of hearing aids are complicated.

Purpose: The purpose of this study is to examine the audiological problems encountered by individuals with hearing impairment in their use of hearing aids to enable the development of support strategies that optimize the use of hearing aids.

Methodology: A survey research method was used for this study using both scheduled interviews and a self-developed structured questionnaire both comprise two sections A and B (section A comprises the bio-data of the respondents and section B comprises the list of items in questions). A reliability coefficient of 0.82 and 0.50 was achieved for the questionnaire and the scheduled interview respectively. Frequency count, percentage, mean, standard deviation, and document analysis, were used for data analysis.

Results: Audiological problems encountered by individuals with hearing impairment in their use of hearing aids include the output of a high-pitched whistling sound (feedback) which can be distracting and uncomfortable for the hearing aid user, and many more.

Conclusion: There is a need to make individuals with hearing impairment aware of the benefits of audiological examination before the procurement of any hearing aids.

Recommendation: Individuals with hearing impairment and their families should be given thorough information about the advantages, restrictions, and reasonable expectations of hearing aids.

Keywords: Audiological Evaluation, Encountered, Hearing Aid, Hearing Impairment.

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PUBLIC INTEREST STATEMENT

The results of this study can help the manufacturers and audiologists make the required advancements in fitting technology to better tailor hearing aids to the needs of individuals with hearing impairment. School administrators and policymakers can use the results of this study to promote and execute the funds, resources, and training that are required to provide improved support for individuals with hearing impairments.

INTRODUCTION

The ability to hear, and communicate with people and the use of speech is one of the most precious gifts from God to mankind. The hearing system can be used as a continual source of information about the happenings and things within our immediate physical environment. The hearing system also provides warning signals that are important to physical safety. Hence, hearing is very important in man's meaningful life. However, the auditory system may become defective as a result of one disorder or another which may emanate from the prenatal, perinatal, or postnatal stage.

When hearing impairment occurs, hearing care professionals (such as audiologists) play a key role in fostering their client's well-being (Timmer et al, 2023) such as diagnosing their patients and suggesting the use of amplification devices called "hearing aids" where the need arises. Hearing loss is a common disability (Atef et al., 2023; Ghaderi et al., 2023; Shukla et al., 2020) that affects a significant portion of the population, particularly older individuals, and impairs social and communication interaction (Shukla et al., 2020). Hearing aids are usually used to address hearing loss in hearing rehabilitation (Engdahl & Aarhus, 2024) and provide a better hearing experience (Rijke et al., 2022; Mealings et al., 2024). A little electronic gadget worn in or behind the ear is called a hearing aid. To enable a person with hearing loss to hear, converse, and engage more fully in everyday activities, some sounds are amplified (Agyemang et al., 2024).

The obvious functional benefit of improved hearing is provided by hearing aids (Groth et al., 2021). Beechey et al. (2020) investigated the hypothesis that says hearing aid amplification reduces the effort within the conversation for both hearing aid wearers and their communication partners (individuals without hearing impairment) and found that the magnitude of spectral modifications of speech produced by normal-hearing talkers during conversations with aided hearing-impaired individual interlocutors was smaller than the speech modifications observed during conversations between the same pairs of participants in the absence of hearing aid amplification. This implies that the provision of hearing aid amplification minimizes the effort required to maintain communication in adverse conditions which in turn provides benefit to individuals with hearing impairment and also to the conversation partners of individuals with hearing impairment. Despite this advantage of hearing aid amplification, Tamblay et al. (2023) reported that hearing aid usage among individuals with hearing impairment was 16.6% during their study on the prevalence, risk factors, and causes of hearing loss among adults due to the rapid assessment of hearing loss survey.

Wheeler and Tharpe (2020) examined the attitude of young children with normal hearing toward peers wearing hearing aids and found that children used for their study perceived their peers who wore hearing aids as having less physical competence and less peer acceptance than peers without hearing aids thus, their finding serves as an alarm to professionals who work with children that are suffering from hearing loss that additional support and education might be warranted for these children and their peers with normal hearing.

Diehl et al, (2023) present a deep learning-based algorithm that selectively suppresses noise while maintaining speech signals. The algorithm restores speech intelligibility for hearing aid users to the level of control subjects with normal hearing. The system runs in real-

time on a laptop, suggesting that large-scale deployment on hearing aid chips could be achieved within a few years but surprisingly majority of the individuals with hearing impairment still refuse to use hearing aids although Groth et al. (2021) opined that lack of access to affordable interventions for hearing loss is one barrier.

Almost half a billion people worldwide suffer from disabling hearing loss while hearing aids can partially compensate for this, a large proportion of users struggle to understand speech in situations with background noise (Diehl et al, 2023). Timmer et al, (2023) reported that hearing loss not only impairs the ability of individuals with hearing impairment to hear but can also compromise their ability to communicate which in turn negatively impacts both their social and emotional well-being. In the most recent World Hearing Report, the World Health Organization (WHO) estimated that 430 million people have some form of hearing loss at a moderate level or worse (World Health Organization, 2021). Hence, hearing aids become the best generally used device to rehabilitate hearing loss which in turn is capable of improving listening abilities as well as the health-related quality of life of individuals with hearing impairment (Knoetze et al, 2023). The hearing aid will only amplify sounds of certain frequencies. More emphasis is usually given to sounds between 750 and 3000Hz than to frequencies below or above this range (Williams et al., 2024; Wilson & McArdle, 2014).

Bisgaard et al, (2021) found that the majority of individuals with hearing impairment can be helped by prosthetic amplification devices in the form of hearing aids. However, research revealed that majority of the individuals with hearing impairment do not seek help for their hearing problems and do not acquire hearing aids (Orji et al, 2020) as the number of hearing aid uptake has been low with fewer than 11% of individuals with hearing impairment acquiring hearing aids globally (Bisgaard et al, 2021).

Most individuals with hearing impairment were wearing hearing aids without the full knowledge of how it works. They are ignorant of the principle behind the amplification of sounds, the nature of sound, the relationship between the optimum output to a hearing aid, and the fact that the output must be such that is not distorted. This tally with the findings of Agyemang et al. (2024) who found and reported that a small percentage of respondents (15.4%) used for their study claimed to be very knowledgeable about the benefits of wearing hearing aids, a significant proportion of respondents (36.5%) reported being slightly knowledgeable about those benefits, and a large proportion (28.8%) considered themselves to be moderately knowledgeable; remarkably, 19.3% of respondents said they knew nothing at all about the advantages of wearing hearing aids.

Reed et al. (2023) researched the prevalence of hearing loss and hearing aid use among US Medicare beneficiaries aged 71 years and older and reported a weighted estimate of 21.5 million individuals, or 65.3% of adults 71 years of age and older, having at least a light hearing loss (37.0% [95% CI, 34.7%-39.4%], moderate hearing loss (24.1% [95% CI, 21.9%-26.4%], and severe hearing loss (4.2 [95% CI, 3.3%-5.3%]). Age-related increases in the prevalence were observed among White, male, lower-income, and lower education attainment subpopulations, where 96.2% (95% CI, 93.9%-98.6%) of persons 90 years of age and older had hearing loss. Just 29.2% (6.4 million people, weighted estimate) of those with hearing loss utilized hearing aids; estimates were lower for Black and Hispanic people as well as those with low incomes even though using hearing aids seems to have several benefits, including improved social interactions and relationships, less strain and weariness from listening, and usefulness in the workplace (Groth et al., 2021). Newly available data revealed that treating hearing loss in older adults with amplification has significant advantages for preserving mental health and functioning (Sarant et al., 2020; Glick & Sharma, 2020)

Users of hearing aids encounter lots of problems using hearing aids such as the cost of hearing aid, poor access to hearing healthcare, and lack of information (Bisgaard et al, 2021; Orji et al. 2020) as well as the type of noisy environment the individuals with hearing impairment live in and this has caused most of the individuals with hearing impairment to abandon the use of their hearing aid.

Hearing rehabilitation focuses on enhancing communication and safety and improving the overall quality of life and it may provide cognitive benefits (Dawes & Völter, 2023). Hearing aids are commonly utilized in hearing rehabilitation to address hearing loss. The need for hearing aids is influenced by several factors beyond the type and severity of hearing loss. Considerations such as communication needs, lifestyle and activities, emotional and psychological well-being, cognitive function, support network, individual preferences, and financial considerations all play a role in determining the need for rehabilitation with a hearing aid (Helvik et. al., 2024). Hearing rehabilitation may also include the use of assistive hearing devices and aural rehabilitation such as counseling, auditory training, and communication strategies although the evidence in support of aural rehabilitation for older adults with hearing loss has also been questioned (Engdahl & Aarhus, 2024).

Most population studies conclude that hearing aid adoption rates remain low and highlight a substantial unmet need for treatment (Hume, 2024). However, quantifying the unmet need for treatment requires consideration of not only the prevalence of treatment but also the needs and effectiveness of hearing aids. Experiences of and attitudes of individuals with hearing impairment towards the use of hearing aids are complex and it is, therefore, necessary for clinicians and researchers to understand these experiences to enable the development of support strategies that optimize the use of hearing aids (Gregory et al, 2020). This research aims to evaluate the audiological problems encountered by individuals with hearing impairment in their use of hearing aids and suggests some possible support strategies that can optimize the use of hearing aids.

STATEMENT OF THE PROBLEM

Most hearing-impaired individuals were wearing hearing aids without the full knowledge of how it works. They are ignorant of the principle behind the amplification of sounds, the nature of sound and the relationship between the optimum output to a hearing aid, and the fact that the output must be such that is not distorted. Users of hearing aids encounter lots of problems in their use of hearing aids such as the type of noisy environment they live in, parents and teachers speaking loudly into the hearing aid, and lack of concentration on keeping the correct level of sound frequencies which causes most of the individuals with hearing impaired abandon the use of their hearing aid.

PURPOSE OF THE STUDY

The purpose of this study is to:

1. Investigate the audiological problems encountered by individuals with hearing impairment in their use of hearing aids.
2. Investigate how individuals with hearing impairment can properly manage the hearing aid.
3. Investigate the experiences of individuals with hearing impairment in their use of hearing aids to enable the development of support strategies that optimize the use of hearing aids.

RESEARCH QUESTIONS

1. What are the audiological problems encountered by individuals with hearing impairment in their use of hearing aids?
2. How can an individual with a hearing impairment properly manage the hearing aid?
3. What are the experiences of individuals with hearing impairment in their use of hearing aids?

METHODOLOGY

Design

A survey research design was used for this study to elicit responses from the respondents (individuals with hearing impairment and their career such as the teachers, matron, interpreters, audiologist etc.) on the audiological problems encountered by individuals with hearing impairment in their use of hearing aids.

Population and Sample

The population used for this study was limited to all individuals with hearing impairment (HI) who are using hearing aids and their handlers (audiologists, teachers, interpreters, matrons, etc) in the six states in South West, Nigeria which are Oyo, Lagos, Ogun, Ondo, Osun, and Ekiti state respectively. Individuals with hearing impairment were used for the scheduled interview while their handlers were used for the questionnaire. A purposive random sampling technique were used to select one hundred and twenty (120) individuals with hearing impairment using hearing aids and one hundred and twenty (120) handlers making a total of two hundred and forty (240) respondents (120 for HI and 120 for their handlers).

Forty-six (46, 38.5%) of the respondents were teachers; thirty-five (35; 29%) of the respondents were interpreters; twenty-four (24; 20%) of the respondents were Matron; while the remaining fifteen (15, 12.5%) of the respondents fall under other categories of designation. This implies that the respondents used for this study questionnaire section are individuals dealing directly with hearing impairment school students using hearing aid which gives the impression that, they can say a lot about the complaints they have been receiving concerning hearing aid usage.

Instrument for Data Collection

Data was collected from the respondents through self-developed structured questionnaires and scheduled interviews. A self-developed structured questionnaire named "Problem Encountered by Individual with Hearing Impairment on Hearing Aid Usage (PEIHIoHAU) with two sections A and B (section A comprises the bio-data of the respondents and section B comprises the list of items (15) in questions group into two research questions) was used to gather information from the respondents (handlers). Likert Scale ratings of strongly agreed, agreed, disagreed, and strongly disagreed were used to indicate the extent to which the respondents agreed or disagreed with each of the statements. Likert Scale rating was used because it is widely used to measure attitudes and opinions with a greater degree of nuance than a simple "yes/no" question. The scheduled interview comprises ten questions of which part of the questions is open-ended while some of the questions require "yes" or "no" answers and it is designed to be answered by the individuals with hearing impairment.

The instrument used for this study was validated by an expert in the field of special education, measurement, and evaluation. A test-re-test method was used to ascertain the reliability of the instrument. The test-re-test method involve part of the population that was used for this study and a reliability coefficient of 0.82 was obtained for the structured questionnaire and 0.50 for the scheduled interview.

Procedure for Data Collection

To capture data from targeted respondents, the researchers first wrote a letter of notification and requested permission from all the targeted schools within the southwest geo-political zone in Nigeria on their intention of using their school, staff, and students in the research. After the permission had been granted, a consent form (for the staff), and the parent consent form (for the students) were distributed to the respondents to ensure their willingness to participate in the research exercise. Then, the research questionnaire and scheduled interview follow accordingly.

The copies of the questionnaire and the scheduled interview were administered by the researchers personally and were collected back on the spot to avoid ambiguity due to the

nature of the respondents' special needs conditions.

Method of Data Analysis

Frequency count, percentage, mean, standard deviation, and document analysis were used for data analysis. These were considered appropriate based on the nature of the research design (descriptive survey), research questions, and the scheduled interview. The established threshold for the acceptable level of variability of this study is based on a mean value cut-off point of 2.50. Any statement that yields a mean value of 2.50 and above were accepted and any statement that yields a mean value below the cut-off point of 2.50 were rejected accordingly.

RESULTS

Research Question 1: What are the audiological problems encountered by individuals with hearing impairment in their use of hearing aids?

Table 1: Analysis of audiological problems encountered by individuals with hearing impairment in their use of hearing aids

S/N	ITEMS	SA	A	D	SD	$\bar{X}$	σ	Decision
1.	The environmental noise or acoustic conditions level does determine the effectiveness of hearing aids	70	32	8	10	3.35	0.92	Agree
2.	Hearing aids may output a high-pitched whistling sound (feedback) which can be distracting and uncomfortable for the hearing aid user	44	59	8	9	3.15	0.84	Agree
3.	Information heard through the use of a hearing aid may not be clear and cause misinterpretation of the speaker's ideas/messages	56	44	15	5	3.25	0.83	Agree
4.	Distinguishing between the background noise and the speech can be a significant issue for hearing aid users	44	59	8	9	3.15	0.84	Agree
5.	The weather conditions such as dry and rainy seasons do determine the effectiveness of the hearing aids	52	52	12	4	3.26	0.77	Agree
6.	Hearing aid users do experience issues with under-amplification or over-amplification, resulting in sounds being too quiet or too loud, which can be disorienting and uncomfortable.	55	51	8	6	3.29	0.79	Agree
7.	In group settings, some individuals wearing hearing aids may still struggle with speech clarity, making it challenging to understand conversations.	40	59	12	9	3.08	0.85	Agree
8.	Hearing aids can occasionally pick up and amplify external sounds, such as rustling clothing or wind, leading to acoustic feedback that interferes with the user's capability of hearing clearly.	40	42	28	10	2.93	0.94	Agree
9.	Some hearing aids may not provide adequate amplification across the entire frequency range, affecting the perception of certain sounds and music.	48	56	8	8	3.20	0.83	Agree
10.	Hearing aids that block the ear canal can affect the hearing aid wearer's voice perception.	64	32	12	12	3.23	0.98	Agree

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The data in Table 1 revealed that all statement one (1) to ten (10) under research question 1 had their mean values above the cut-off point of 2.50 which implies that the majority of the respondents agreed with statement one (1) to ten (10) showing that the audiological problems encountered by individuals with hearing impairment in their use of hearing aids include all the items on Table 1.

***Research* Question 2:** How can an individual with a hearing impairment properly manage the hearing aid?

Table 2: How individuals with a hearing impairment properly manage the hearing aid

S/N	ITEMS	SA	A	D	SD	$\bar{X}$	σ	Decision
11.	Hearing aid wearer can manage their hearing aid effectively by learning about their specific hearing aid model, including its features, controls, and how to wear it properly.	56	52	4	8	3.30	0.82	Agree
12.	Regular maintenance and repairs are required to ensure that hearing aids continue to function properly.	40	68	4	8	3.16	0.77	Agree
13.	Learning how to replace the battery of hearing aids using a disposable battery is essential to elongate the life of hearing aid effectiveness.	52	40	16	12	3.10	0.97	Agree
14.	Regular cleaning of the hearing aid to remove debris and earwax is essential to maintain the life span of the hearing aid.	44	56	8	12	3.10	0.90	Agree
15.	The use of water or cleaning solutions for cleaning the hearing aid should be avoided unless they are designed for the kind of hearing aid being used.	72	36	4	8	3.43	0.84	Agree

The data in Table 2 revealed that all the statement eleven (11) to fifteen (15) under research question 2 also had their mean values above the cut-off point of 2.50 which implies that the majority of the respondents agreed with statement eleven (11) to fifteen (15) showing that the individual with a hearing impairment properly managed their hearing aid if they can adhere to all the statement in Table 2.

Research Question 3: What are the experiences of individuals with hearing impairment in their use of hearing aids?

Data analysis of discussion of findings for the scheduled interview, which comprises ten (10) items as follows:

Item 1: How long have you been using hearing aids?

Forty-nine (49) individuals with hearing impairment claims that the duration of their hearing aid usage is less than a year, fifty-six (56) individuals with hearing impairment claims that the duration of their hearing aid usage is between one (1) and five (5) years, while fifteen individuals with hearing impairment claims that the duration of their hearing aid usage is six (6) years and above. This implies that the majority of the respondents (49 + 56 = 105) duration of hearing aid usage is just within five (5) years.

Item 2: Can you properly insert your hearing aid without any challenge?

Eighty-seven (87), twenty-one (21), and twelve (12) of the respondents responded yes, no, and undecided respectively. This implies that the majority of the respondents (87) can insert their hearing aid without any challenge as opposed to the minority (21).

Item 3: Can you adjust the volume of your hearing aid to adapt to different listening environments?

Ninety (90), of the respondents agreed that they adjust the volume of their hearing aid to adapt to different listening environments while twenty-seven (27), of the respondents opined that they cannot, and only three (3) of the respondents were undecided.

Item 4: Do you attend regular follow-up appointments with your audiologists to receive necessary adjustments and progress monitoring?

Eighty-seven (87) of the respondents said they do attend regular follow-up appointments with their audiologists to receive necessary adjustments and progress monitoring, while thirty (30) of the respondents claim that they have not been attending any regular follow-up appointments with their audiologists, and three (3) of the respondents cannot even decide either they have been attending regular follow-up appointments with their audiologists or not.

Item 5: Do you pass through any audiological examination before the procurement of your hearing aids?

Sixty-nine (69) of the respondents said they passed through an audiological examination before they procured their hearing aids, while forty-two (42), of the respondents opined that they did not pass through any audiological examination before they procured their hearing aids and nine (9) of the respondents were undecided. This implies that there is a need to make individuals with hearing impairment aware of the benefits of audiological examination before the procurement of any hearing aids.

Item 6: Do you receive any training regarding the use of your hearing aid?

The majority of the respondents (81), said they received training regarding the use of their hearing aids while thirty-three (33), of the respondents, claimed that they did not receive any training regarding the use of their hearing aids and six (6) of the respondents were undecided.

Item 7: Does your hearing aid come with a user manual?

The majority of the respondents (96), agreed that their hearing aids come with a manual that also provides a guide on its usage while a minority (18), of the respondents, said no, and only six (6) of the respondents were undecided.

Item 8: Is the information heard through the use of a hearing aid clear and does not cause misinterpretation of the speaker's ideas/messages?

Eighty-seven (87), of the respondents claim that the information heard through the use of a hearing aid is clear and does not cause misinterpretation of the speaker's ideas/messages as opposed to twenty-seven (27), of the respondents and only six (6) of the respondents were undecided.

Item 9: Do you understand speech when using a hearing aid (auditory comprehension)?

Eighty-four (84), of the respondents, agreed that they understand speech when using a hearing aid (auditory comprehension) while thirty (30), of the respondents, said they do not understand speech when using a hearing aid (auditory comprehension) and six (6) of the respondents were undecided. This implies that understanding speech when using a hearing aid (auditory comprehension) may depend on the kind (model) of hearing aid being used by the user.

Item 10: What other audiological problems do you encounter in the use of your hearing aids?

None of the respondents provided any additional audiological problems encountered in their use of hearing aids.

DISCUSSIONS

In a nutshell, the result revealed that there exist some audiological problems encountered by individuals with hearing impairment in their use of hearing aids despite the prospect of

hearing aids which ranges from output of a high-pitched whistling sound (feedback) that can be distracting and uncomfortable for the hearing aid user. Information heard through the use of a hearing aid may not be clear and cause misinterpretation of the speaker's ideas/messages. Distinguishing between the background noise and the speech can be a significant issue for hearing aid users. The weather conditions such as dry and rainy seasons do determine the effectiveness of the hearing aids. Hearing aid users do experience issues with under-amplification or over-amplification, resulting in sounds being too quiet or too loud, which can be disorienting and uncomfortable. In group settings, some individuals wearing hearing aids may still struggle with speech clarity, making it challenging to understand conversations. Hearing aids can occasionally pick up and amplify external sounds, such as rustling clothing or wind, leading to acoustic feedback that interferes with the user's capability of hearing clearly. Some hearing aids may not provide adequate amplification across the entire frequency range, affecting the perception of certain sounds and music. Hearing aids that block the ear canal can affect the hearing aid wearer's voice perception.

The result tally with the findings of Marcos-Alonso et al. (2023) who found and reported that the most frequent reasons for hearing aid rejection were the lack of perceived benefits or discomfort with the use of the device. The result also in line with the finding of Kim et al. (2023) who found that the speech recognition threshold in quiet conditions and signal-to-noise ratio in noisy conditions were significantly lower in the HA-aided condition. Ng et al. (2015) also identified four audiological determinants including the severity of hearing loss, background noise acceptance, the type of hearing aids, and insertion gain as factors affecting the adoption and use of hearing aids which is in agreement with the result of this study. This implies that there exist audiological problems encountered by individuals with hearing impairment in their use of hearing aids that call for a professional's urgent attention though Groth et al. (2021) contend that the technology in today's hearing aids provides notable advantages in terms of audio features and connectivity, and expands the possibilities to address hearing demands more efficiently than was previously thought possible just a decade ago.

The result also revealed that individuals with hearing impairment can properly manage the hearing aid to maintain the life span of the hearing aid by learning about their specific hearing aid model, including its features, controls, and how to wear it properly (as agreed by 108 respondents). The result of this study also revealed that regular maintenance and repair (as agreed by 108 respondents), and learning how to replace the battery of hearing aids using a disposable battery are essential to elongate the life of hearing aid effectiveness (as agreed by 92 respondents), regular cleaning of the hearing aid to remove debris and earwax (as agreed by 100 respondents), as well as avoidance of water or cleaning solutions to clean the hearing aid unless they are designed for the kind of hearing aid being used.

This result tallies with the submission of Swanepoel et al. (2023) who reported that audiologists, hearing instrument specialists, and other hearing care professionals (HCPs) must provide specialized clinical services that include diagnostic hearing evaluations, patient-centered selection of appropriate hearing aids (HAs), programming and verification of the aids using specialized software, instruction on how to use and maintain the aids, follow-up visits for additional training, adjustment of the acoustic settings, and rehabilitative care. This result is also in line with the submission of Sabin et al. (2020) who submitted that the common practice is to allow the clinician to fit the hearing aid because the clinician is the person who will measure an audiogram and uses it to generate prescriptive gain and output targets and this contradicts the report of Yong et al. (2019) who reported that in the last ten to fifteen years, advancements in digital circuitry and technology have made it possible for hearing aids to be self-fitted

and adjusted to the right audio output levels to prevent hearing impairment.

CONCLUSION

The result of this study revealed that the audiological problems encountered by individuals with hearing impairment in their use of hearing aids include the output of a high-pitched whistling sound (feedback) which can be distracting and uncomfortable for the hearing aid user. Information heard through the use of a hearing aid may not be clear and cause misinterpretation of the speaker's ideas/messages. Distinguishing between the background noise and the speech can be a significant issue for hearing aid users. The weather conditions such as dry and rainy seasons do determine the effectiveness of the hearing aids, and hearing aid users do experience issues with under-amplification or over-amplification, resulting in sounds being too quiet or too loud, which can be disorienting and uncomfortable, and many more.

In a nutshell, there is a need to make individuals with hearing impairment aware of the benefits of audiological examination before the procurement of any hearing aids. Individuals with hearing impairment and their families should be given thorough information about the advantages, restrictions, and reasonable expectations of hearing aids.

RECOMMENDATIONS

Healthcare professionals, audiologists, and hearing care providers can maximize the use and results of hearing aids, boost communication skills, and improve the general quality of life for individuals with hearing impairments by putting the below recommendations into practice:

1. Conduction of a detailed audiological evaluation to assess the individual's hearing loss profile accurately, including type, degree, and configuration which will serve as the foundation for selecting appropriate hearing aid technology and programming.
2. Adapt the fitting and programming of hearing aids to the specific hearing requirements, lifestyle, and preferences of each individual. To guarantee ideal amplification and sound quality catered to the individual's ear architecture and hearing thresholds, use real-ear measuring techniques.
3. Give individual with hearing impairment and their family thorough information about the advantages, restrictions, and reasonable expectations of hearing aids. Dispel the myths, anxieties, and stigma surrounding hearing loss to encourage acceptance and self-determination.
4. Help people become accustomed to wearing hearing aids and adjusting to new auditory experiences by facilitating a gradual acclimatization process. To enhance speech recognition, localization, and auditory processing abilities over time, provide rehabilitation programs and auditory training activities.
5. Individual with hearing impairment should create a systematic follow-up plan to track the performance, satisfaction, and use of their hearing aids.
6. Individual with hearing impairment should be informed on how to take care of their hearing aids, including cleaning, changing the batteries, and storing them. Assure the longevity and dependability of hearing aid equipment by offering information and advice on resolving common problems.
7. Examine how assistive technologies, like telecoil systems, Bluetooth connectivity, and smartphone apps, can be integrated to improve the usability and functionality of hearing aids in a variety of listening contexts. For increased accessibility and convenience, provide seamless connectivity with assistive listening devices, communication systems, and audio devices.

Conflict of Interest

The authors declare no conflict of interests

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Disclaimer Statement

We the undersigned declare that this manuscript is original, has not been published before, and is not currently being considered for publication elsewhere. We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

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Authorship and Level of Contributions

Enitan Olabisi ADEBAYO: Introduction, Literature Review, Instrumentation, Data Collection, Data Collation, Methodology, Analysis, Supervision, Writing - original draft, Review & Editing.

Jelili Olalekan AMOO: Literature Review, Instrumentation, Data Collection, Data Collation, Review, Supervision.

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