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HEARING AID UTILIZATION, ACADEMIC ACHIEVEMENT, AND PSYCHOSOCIAL EXPERIENCES AMONG SECONDARY SCHOOL STUDENTS WITH HEARING IMPAIRMENT

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Abstract

This study examined the association between hearing aid utilization, academic achievement, and gender among secondary school students with hearing impairment. A descriptive survey with an ex-post facto design was employed, involving 100 students recruited from two inclusive secondary schools. Academic performance was assessed using a structured Academic Achievement Test (AAT), while students' academic and psychosocial experiences related to hearing aid use were measured using the Hearing Aid and Academic Performance Scale (HAAPS). Data were analyzed using Pearson correlation and independent samples t-tests. Results revealed a significant positive relationship between hearing aid utilization and academic achievement ($r = .54$, $p < .05$). Students who used hearing aids achieved significantly higher AAT scores ($M = 13.84$, $SD = 2.91$) than those who did not use hearing aids ($M = 9.21$, $SD = 2.64$), $t(98) = 6.57$, $p < .05$. A significant gender difference in academic achievement was also observed, with female students ($M = 13.92$, $SD = 2.87$) outperforming male students ($M = 10.71$, $SD = 3.02$), $t(98) = -10.32$, $p < .05$. Descriptive findings from the HAAPS indicated that, despite improved academic performance, many students continued to experience high listening effort and challenges with social integration. The study concludes that hearing aid utilization is significantly associated with improved academic achievement among secondary school students with hearing impairment; however, amplification alone does not fully address the cognitive and psychosocial demands of learning in inclusive educational settings. These findings highlight the need for holistic educational interventions that combine auditory amplification with classroom, instructional, and psychosocial support.

Keywords: Hearing impairment, Hearing aids; Academic achievement, Gender differences, Psychosocial experiences and Adolescents

Introduction

Hearing impairment remains one of the most common sensory disabilities globally, with significant implications for educational participation and developmental outcomes across the lifespan. During childhood and adolescence, hearing plays a central role in language development, classroom learning, and social engagement, domains that collectively shape academic achievement and psychosocial well-being. When access to auditory input is limited, students with hearing impairment are often placed at an educational disadvantage, particularly in mainstream or inclusive school environments where instruction is predominantly auditory. Adolescence represents a particularly sensitive period for students with hearing impairment. Beyond the increasing academic demands associated with secondary education, this developmental stage is marked by identity formation, heightened social awareness, and the need for peer acceptance. Difficulties in hearing and communication during this period may therefore extend beyond academic performance to affect social integration and emotional well-being. Walker (2025) notes that adolescents with hearing impairment often face compounded challenges in educational settings, where reduced access to spoken instruction intersects with developmental pressures related to autonomy and self-concept.

In school contexts, the impact of hearing impairment is not limited to reduced audibility alone. Students frequently experience delays in language development, restricted vocabulary growth, and challenges with higher-order language skills, all of which are essential for academic learning. These academic challenges are often accompanied by psychosocial difficulties, including social withdrawal, reduced confidence, and strained peer relationships. Although the use of hearing aids has been associated with improved access to communication and greater social participation, evidence suggests that gaps in pragmatic language skills and peer interaction frequently persist, even among adolescents who use amplification consistently (Haukedal et al., 2022). Hearing aids remain the most commonly prescribed intervention for improving auditory access among adolescents with hearing impairment. Consistent use of hearing aids has been shown to enhance speech perception in classroom environments, particularly in noisy settings, thereby supporting engagement with instruction and learning activities. Walker (2025) demonstrated that regular hearing aid use is positively associated with improved speech perception in educational contexts, a factor closely linked to academic engagement. Improved auditory access has also been associated with better language and reading outcomes, which form the foundation for academic success across subject areas (Haukedal et al., 2022).

However, amplification alone does not fully address the educational challenges faced by adolescents with hearing impairment. Even with hearing aid use, many students continue to experience elevated listening effort, requiring greater cognitive resources to process spoken information. This increased cognitive demand may result in mental fatigue, reduced attention, and

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diminished learning efficiency. Research indicates that although hearing aids reduce listening effort, the cognitive load experienced by adolescents with hearing impairment often remains higher than that of their peers with normal hearing (Haukedal et al., 2022). Over time, sustained listening effort may influence motivation, classroom participation, and academic confidence. Emerging evidence suggests that psychosocial factors play a critical role in shaping academic outcomes for adolescents with hearing impairment. Social support, psychological resilience, and perceptions of self-efficacy have been identified as important predictors of academic engagement and performance (Chen, 2025; Xu, 2023). In this context, hearing aids may serve not only as tools for auditory access but also as facilitators of social interaction and classroom inclusion, indirectly supporting academic functioning. Nonetheless, variability in outcomes persists, highlighting the need to better understand how hearing aid utilization interacts with cognitive and psychosocial experiences to influence academic achievement. Together, these considerations point to the importance of examining academic outcomes among adolescents with hearing impairment using objective measures, while also attending to the classroom and psychosocial conditions under which learning occurs.

Statement of the Problem

Despite advances in hearing aid technology, academic underachievement remains a persistent challenge among adolescents with hearing impairment. Although hearing aids improve access to auditory information, students with hearing loss often experience increased listening effort and cognitive fatigue, which may negatively affect classroom engagement and learning outcomes (Haukedal et al., 2022). Consequently, improved audibility does not always translate into optimal academic performance, particularly in acoustically demanding school environments. There is also ongoing debate regarding the educational effectiveness of hearing aids compared with alternative modes of communication, such as sign language or total communication approaches. While some scholars question the utility of hearing aids in poor classroom acoustic conditions, others emphasize their role in facilitating access to spoken instruction and mainstream curricula. In addition to these instructional challenges, adolescents with hearing impairment are at increased risk of psychosocial difficulties, including social anxiety, which may further interfere with academic participation; however, strong social support has been shown to mitigate these challenges (Yuan et al., 2022). Furthermore, evidence on gender differences in academic outcomes among students with hearing impairment remains inconsistent. While general education research often reports higher academic performance among females, findings within the hearing-impaired population are mixed, leaving uncertainty as to whether the academic benefits associated with hearing aid use are experienced uniformly across gender. This study therefore seeks to examine the relationship between hearing aid utilization and academic performance, and to determine whether gender influences this relationship.

Objectives of the Study

The primary objective of this study is to evaluate the impact of hearing aid usage on the academic performance of secondary school students with hearing impairment. Specifically, the study seeks to:

1. Assess students' perceptions regarding the user-friendliness and social efficacy of hearing aids.
2. Determine the relationship between hearing loss (managed by hearing aids) and academic performance.
3. Compare the academic performance of students who use hearing aids with those who do not.
4. Investigate the influence of gender on the academic performance of students with hearing impairment.

Hypotheses

To guide the investigation, the following null hypotheses were formulated:

Hypothesis 1: There is no significant relationship between hearing loss and academic performance of students with hearing loss who use hearing aids.

Hypothesis 2: There is no significant effect of hearing aids usage on academic performance of students with hearing loss.

Hypothesis 3: There is no significant main effect of gender on academic performance among students with hearing impairment.

Methodology

This study utilized a combination of descriptive survey research and ex-post facto design. The descriptive survey aspect was employed to gather demographic data and students' self-reported perceptions regarding the impact of hearing aids on their social and academic lives. The ex-post facto component was used to analyze the relationship between the independent variables (hearing aid usage, gender) and the dependent variable (academic performance) without direct manipulation of the variables by the researcher. A total of 100 students with hearing impairment participated in the study. The participants were drawn from two secondary schools known for inclusive education or special units for the deaf: Andrew Foster Memorial College and Methodist Grammar School. A stratified sampling technique was used to ensure equal representation from both institutions (50 students from each school). The sample consisted of 59 (59.0%) males and 41 (41.0%) females. The participants ranged across various secondary school levels, including Junior Secondary School (JSS 1-3) and Senior Secondary School (SSS 1-3), allowing for a broad analysis of academic performance across different developmental stages.

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The age distribution ranged from 11 years to over 17 years, with the largest segments being 15-16 years (35.0%) and 17 years and above (35.0%).

Data were collected using two instruments: (1) a structured Academic Assessment Booklet and (2) the Hearing Aid and Academic Performance Scale (HAAPS). These instruments were designed to capture participants' background characteristics, objectively assess academic achievement, and document students' experiences related to hearing aid use in academic and social contexts. The Academic Assessment Booklet is a researcher-designed instrument administered to all participants during the data collection period. It comprised two distinct sections, each serving a specific purpose within the study.

Section A collected essential background information about the participants. This section included items on age, gender, current class level (Junior Secondary School or Senior Secondary School), and school of attendance. The demographic information provided contextual details necessary for describing the study sample and understanding participant characteristics across the two participating schools. Section B consisted of a structured Academic Achievement Test (AAT) developed to assess students' academic competence in selected core subjects. The test consisted of 24 multiple-choice items drawn from English Language, Mathematics, and Integrated Science, subjects that represent foundational academic skills across secondary school curricula. Each item had one correct response, with one mark awarded per correct answer, resulting in a maximum obtainable score of 24. The Academic Achievement Test was administered in written form under standardized classroom conditions to ensure uniformity across participants. To support accessibility and comprehension, sign language interpretation was provided where necessary, particularly for clarifying test instructions, without modifying the content or structure of the test items. The instrument demonstrated acceptable internal consistency reliability, with a Cronbach's alpha coefficient of .82, indicating that it was suitable for assessing academic achievement in this population.

Section C: Hearing Aid and Academic Performance Scale (HAAPS) section employed a researcher-developed instrument titled the Hearing Aid and Academic Performance Scale (HAAPS). The HAAPS is a 20-item self-report scale designed to assess students' perceptions of hearing aid use and its influence on their academic and social experiences. Items were rated on a four-point Likert scale ranging from *Strongly Disagree (1)* to *Strongly Agree (4)*. Negatively worded items were reverse-scored to ensure consistent interpretation of higher scores as indicating more positive perceptions of hearing aid use. The HAAPS is structured into four sub-dimensions, each comprising five items and reflecting a distinct aspect of students' experiences with hearing aids in educational contexts.

Before data collection, ethical approval was sought and obtained from the relevant educational authorities. The researchers visited the selected schools and briefed the principals and teachers on the purpose of the study. Informed consent was obtained from the students and their guardians. The questionnaires were administered to the students during school hours in a quiet environment to minimize distractions. For students with severe communication difficulties, the services of sign language interpreters provided by the schools were utilized to ensure comprehension of the questionnaire items. The administration process took approximately two weeks. Data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics (means, standard deviations, frequencies, and percentages) were used to summarize participant characteristics and study variables. Pearson Product–Moment Correlation was used to examine the relationship between hearing aid utilization and Academic Achievement Test scores. Independent samples t-tests were conducted to compare AAT scores between hearing aid users and non-users, and between male and female students. Statistical significance was set at $p < .05$.

Results

Demographic Information

Table 4.1: Distribution of Respondent based on Socio-Demographic

Category	Variable	Frequency	Percent
School	Andrew Foster Memorial College	50	50.0
	Methodist Grammar School	50	50.0
Sex	Male	59	59.0
	Female	41	41.0
Class	JSS1	21	21.0

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Category	Variable	Frequency	Percent
	JSS2	8	8.0
	JSS3	20	20.0
	SSS1	7	7.0
	SSS2	18	18.0
	SSS3	26	26.0
Age	11-12 Years	11	11.0
	13-14 Years	19	19.0
	15-16 Years	35	35.0
	17 Years Above	35	35.0

Table 4.1 presents the socio-demographic distribution of the 100 respondents. The data indicates an equitable distribution between the two participating schools, with 50.0% from Andrew Foster Memorial College and 50.0% from Methodist Grammar School. Regarding gender, males constituted the majority (59.0%) compared to females (41.0%). In terms of class level, the highest representation was in Senior Secondary School 3 (26.0%), followed by Junior Secondary School 1 (21.0%) and JSS 3 (20.0%). This suggests a substantial number of students in their final examination years. The age distribution showed that 35.0% of the respondents were aged 15-16 years, and another 35.0% were 17 years or older, indicating a predominantly adolescent sample. This section presents an assessment of students' perceptions regarding the effectiveness of hearing aids in the context of their academic performance. The analysis is categorized into four sub-dimensions: Teacher-Student Interaction, Social Integration, User-Friendliness, and Cognitive Load. The perception concerning classroom engagement and instructional efficacy revealed a generally positive assessment of the hearing aid's role in academic instruction. A majority of the respondents (44% Strongly Agree; 36% Agree) indicated a distinct preference for using hearing aids, perceiving them as critical for effective teacher-student interaction. Furthermore, 39% strongly agreed and 33% agreed that the devices promote individualization, which they assessed as directly enhancing academic performance and compensating for learner deficits. Regarding comparative effectiveness, 35% of respondents strongly agreed that students using hearing aid devices tend to perform better academically than those relying on alternative means of communication. Additionally, 34% agreed that the hearing aid is an effective and indispensable therapeutic tool for their education. However, skepticism regarding the device's absolute effectiveness remains, as 36% strongly agreed that "the academic performances of students who wear hearing aids are no better than students who are being taught with alternative means of communication." This highlights a complexity in how students assess the direct link between the device and their actual grades.

Hypothesis Testing

Hypothesis 1: Relationship Between Hearing Aid Utilization and Academic Achievement

Table 4.2: Pearson correlation showing relationship between hearing aid usage and academic performance

Variable	N	M	SD	r	$Sig.$
Hearing Aid Utilization	65	69.17	5.28	.54**	.001
Academic Achievement	65	12.06	3.12		

*Note. *$Significant\ at\ p < .05$*

Pearson Product–Moment Correlation analysis revealed a significant positive relationship between hearing aid utilization and AAT scores, r = .54, p = .001. The null hypothesis was therefore rejected, indicating that greater hearing aid utilization was associated with higher academic achievement.

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Hypothesis 2: Difference in Academic Achievement Between Hearing Aid Users and Non-Users

Table 4.3: t-test for repeated independence showing the difference between student with hearing aids and student without hearing aids

Group	N	M	SD	t	df	$Sig.$
With hearing aid	65	13.84	2.91	6.57	98	.001
Without hearing aids	35	9.21	2.64			

*Note. *Significant at* $p < .05$

An independent samples t-test showed a significant difference in AAT scores between students who used hearing aids (M = 13.84, SD = 2.91) and those who did not (M = 9.21, SD = 2.64), t(98) = 6.57, p = .001. The null hypothesis was rejected, indicating that hearing aid use was associated with higher academic achievement.

Hypothesis 3: Gender Differences in Academic Achievement

Table 4.4: t-test for independence showing the difference between male and female academic performance

Gender	***N***	***M***	***SD***	***t***	***df***	***Sig.* (2-tailed)**
Male	59	10.71	3.02			
				-10.32	98	.000
Female	41	13.92	2.87			

*Note. *Significant at* $p < .05$

A statistically significant gender difference was observed in AAT scores. Female students (M = 13.92, SD = 2.87) scored significantly higher than male students (M = 10.71, SD = 3.02), t(98) = −10.32, p < .001. The null hypothesis was rejected, indicating that gender significantly influenced academic achievement within the sample.

Discussion of the Findings

This study examined the relationship between hearing aid utilization, academic achievement, and gender among secondary school students with hearing impairment findings provide clear evidence that hearing aid use is positively associated with academic achievement, while also highlighting persistent cognitive and psychosocial challenges that are not fully resolved through amplification alone. Look at the perception of hearing aids among its users Many respondents expressed a preference for hearing aids during classroom instruction, a substantial proportion also indicated that alternative communication methods were perceived as more effective in certain contexts. This suggests that while hearing aids improve academic outcomes, they may not fully meet students' communicative needs, particularly in socially complex or linguistically demanding situations. Similar observations have been reported by Richardson et al. (2009), who noted that although hearing aids provide educational benefits, students with hearing impairment often continue to experience residual communication barriers that may affect broader academic and social participation.

However. a large proportion of students reported expending greater mental effort to understand spoken instruction and experiencing withdrawal during oral classroom activities. These findings are consistent with the Effortfulness Hypothesis, which posits that increased listening effort reduces the cognitive resources available for memory, comprehension, and learning. Although hearing aids appear to mitigate some aspects of listening effort, the persistence of high cognitive load among users suggests that amplification alone does not fully normalize the listening experience. This aligns with previous research indicating that adolescents with hearing impairment continue to experience elevated listening effort and fatigue even when using hearing aids (Haukedal et al., 2022). It also supports earlier observations by the American Speech-Language-Hearing Association (2000) that background noise and poor classroom acoustics disproportionately affect students with hearing loss.

Consistent with Hypothesis 1, a significant positive relationship was observed between hearing aid utilization and academic achievement. Students who used hearing aids demonstrated higher scores on the Academic Achievement Test than those who did not, supporting the view that amplification plays an active role in facilitating access to curriculum content. This finding aligns with earlier work by Anita et al. (2009), which showed that students with well-managed hearing loss perform better academically than those with unmanaged hearing difficulties. The study also reinforces the importance of early and consistent hearing aid use, as emphasized by Itano et al. (2009), and highlights the role of family and environmental factors in shaping educational outcomes (Walker, 2025). More recent evidence similarly indicates that consistent hearing aid use improves

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speech perception in noisy classroom environments, a critical factor for academic engagement (Walker, 2025). Improved access to spoken instruction likely supports more effective encoding of information, thereby enhancing learning outcomes.

The second hypothesis demonstrated that there is significant difference in academic achievement between hearing aid users and non-users further reinforces the functional importance of amplification in inclusive educational settings. Students who used hearing aids achieved higher AAT scores than their peers without amplification, suggesting that hearing aids contribute meaningfully to academic performance by reducing barriers to instructional access. This finding is consistent with research demonstrating associations between improved auditory access and gains in language and reading skills, which underpin broader academic achievement (Haukedal et al., 2022). From a cognitive perspective, amplification may reduce reliance on compensatory strategies such as lip-reading or inferential guessing, thereby freeing cognitive resources for comprehension and learning (Bess et al., 1998).

The finding that female students outperformed male students on the Academic Achievement Test supports Hypothesis 3 and contributes to ongoing debate regarding gender differences in academic outcomes among students with hearing impairment. While some earlier studies have reported better academic performance among males in this population (Ademokoya & Shittu, 2010), the present findings align more closely with broader educational literature showing female advantages in language-related academic domains. Several explanations are plausible. Female students may demonstrate greater consistency in hearing aid use, higher academic engagement, or more adaptive coping strategies. Attitudes toward amplification have been shown to influence usage patterns (Walker, 2025), and it is possible that female students in this sample held more positive perceptions of hearing aid use. Additionally, differences in perceived or actual social support may have buffered female students against academic challenges more effectively than males (Xu, 2023). The lower performance observed among male students highlights the need for gender-sensitive interventions that address motivation, self-concept, and engagement.

Findings from this study underscore the significant role hearing aids play in supporting academic achievement among adolescents with hearing impairment, while amplification improves access to instructional content and is associated with better academic outcomes, students continue to face significant cognitive and psychosocial challenges that may limit their full academic potential.

Conclusion

This study demonstrates that hearing aid utilization is significantly associated with improved academic achievement among secondary school students with hearing impairment. Students who used hearing aids performed better on an objective Academic Achievement Test than their peers without amplification, underscoring the critical role of auditory access in supporting learning within inclusive educational settings. However, the findings also reveal that improved academic performance does not eliminate the substantial cognitive and psychosocial challenges faced by these students, including increased listening effort, social withdrawal, and reliance on alternative communication methods. The observed gender differences in academic achievement further suggest that academic outcomes are shaped by a complex interplay of auditory, cognitive, and psychosocial factors. Overall, the study highlights that while hearing aids are essential for academic access, they are most effective when embedded within broader, holistic support systems that address classroom acoustics, communication flexibility, and students' psychosocial well-being.

Recommendations

Based on the findings of this study. It is recommended that:

1. Hearing aids be made readily accessible to secondary school students with hearing impairment through school-based and public health support systems.
2. Schools should ensure that classroom environments are acoustically supportive by reducing background noise and incorporating visual teaching materials.
3. Teachers working with students with hearing impairment should receive training on effective communication strategies, including the use of clear speech, visual cues, and flexible instructional approaches.
4. Psychosocial support services should be provided within schools to promote peer interaction, confidence, and emotional well-being among students with hearing impairment. In addition, regular collaboration between audiologists, educators, school counselors, and families is recommended to support consistent hearing aid use and address students' educational and communication needs.

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