

# Psychological Determinants and their Outcomes among Children with Hearing Impairment

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## ABSTRACT

**Background:** Children with hearing impairments face numerous challenges in their psychosocial development. Making it essential to study the psychological determinants that shape their experiences and psychological outcomes. Among these determinants are self-esteem and self-efficacy, which may be linked to various aspects of mental health, such as emotional symptoms and behavioral problems. **Objectives:** This study aims to assess the psychological determinants and their outcomes among hearing-impaired children and to identify the relationship between certain demographic characteristics in children with hearing impairment. **Methods:** A cross-sectional study was conducted on a sample of 100 children with hearing impairment and their parents enrolled in hearing and speech centers at Al-Hilla city. The study used modified and developed questionnaires for the purpose of study. Data was collected through interviews and analyzed electronically by using SPSS 27. **Results:** The results indicate that more than half of the children showed moderate levels of psychological determinants. Psychological outcomes were also at a moderate level. Furthermore, the psychological outcomes were moderate level. The study found a strong correlation between variables and a strong association with specific demographic data such as parental education, occupation, economic status, and residency at a  $p$ -value of 0.05. **Conclusion:** This study emphasizes the importance of integrating psychiatric and pediatric nursing within multidisciplinary care teams and the necessity of developing specialized psychological support programs based on a holistic approach that includes the child, family, and surrounding environment. It also recommends conducting future longitudinal studies to monitor psychological changes across developmental stages, focusing on the effectiveness of nursing interventions in improving the mental health of this group.

**Keywords:** Children, Hearing Impairment, Outcomes, Psychological Determinants

## INTRODUCTION

Hearing impairment is a growing global health issue, as the World Health Organization (WHO) estimates that approximately 430 million people worldwide suffer from disabling hearing loss, including 34 million children. This number is expected to rise to 700 million by 2050, particularly in low- and middle-income countries (WHO, 2026). This study underscores the crucial role of nursing staff in the early detection of psychological problems and the provision of emotional and educational support to children with hearing impairments and their families. Nursing effectively contributes to the design and implementation of targeted psychological intervention programs that enhance self-efficacy and self-esteem and reduce the severity of behavioral and emotional problems, positively impacting the child's quality of life and social adjustment. In the Arab world, the prevalence of hearing impairment varies between countries, ranging from 1.2 to 18 per 1,000 live births, with the highest rate recorded in Iraq at 76.3% (Ghannam *et al.*, 2024; Sidenna *et al.*, 2020). Studies show that hearing impairment is associated with an increased risk of psychological and behavioral disorders, resulting from the linguistic and social difficulties children face in their daily environments (de Jong *et al.*, 2024).

Hearing impairment is an umbrella term that refers to a disability ranging in severity from mild to profound (Eidan & Aldoori, 2026). It may be caused by genetic factors or develop gradually as a result of certain medical conditions. According to the British Association of Audiologists, hearing impairment is classified into four grades: mild (21–40 dB), moderate (41–70 dB), severe (71–95 dB), and profound (over 95 dB) (National Deaf Children's Society, 2025).

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Children with mild to moderate hearing loss can process language information with the help of hearing aids, while those with severe or profound hearing loss experience significant difficulties with auditory processing even with these devices. Their speech difficulties are often related to their inability to hear, rather than to an organic defect in their speech organs (Nian *et al.*, 2024). Hearing loss is a significant factor in the development of various psychological disorders, including anxiety and depression, as well as challenges with adjustment and self-discipline. Children with hearing impairment may develop low self-esteem, which may be related to the use of assistive devices or associated syndromes and communication challenges (Warner-Czyz *et al.*, 2015).

Furthermore, these children are more prone to behavioral problems, such as conduct disorders and hyperactivity (Bigler *et al.*, 2019; Scherer *et al.*, 2022). The findings confirm that hearing impairment not only affects mental and physical health but also extends to academic performance and social integration. Therefore, early detection of hearing loss and the provision of appropriate interventions are essential to mitigating its psychological and social impacts (Mutar & Aldoori, 2022).

## **METHODOLOGY**

### **Study Design and Setting**

A cross-sectional study (purposive sample) was conducted on a sample of 100 children with hearing impairment and their parents, who were selected purposively. This sample is distributed throughout hearing and speech centers the Babylon Governorate/Middle of Iraq.

### **Study Instruments**

The questionnaire is a tool used to help collect data that contributes to achieving the results expected by the study. So the researchers designed this questionnaire, which aims to clarify the study objectives and significance by obtaining answers to the study's questions.

This questionnaire consists of four parts, which include the following:

**Part I:** This section is composed of socio-demographic information, which includes child age, sex, parent education level, occupation, income/month, and residency.

**Part II:** This section is composed of medical history for hearing-impaired children, which includes age at diagnosis, severity of hearing impairment, cause of hearing impairment, use of hearing aids, whether the child has difficulty with speech, and if another child in the family had hearing impairment.

**Part III:** This section deals with psychological determinants, which consist of fifteen items: ten of them ask about self-esteem and five of them about self-efficacy (Al-Saeed & Al-Dobooni, 2020).

**Part IV:** This section deals with psychological outcomes and consists of 15 items: five of them are about emotional symptoms, five of them are about behavioral problems, and five of them ask about hyperactivity (Jung & Beebe, 2016).

### **Inclusion Criteria**

Children diagnosed with hearing impairment of any degree and aged between 8 to 12 years were included in the study, as this age range was considered appropriate and consistent across both study settings.

### **Exclusion Criteria**

Children with additional disabilities, such as visual impairment, autism, or other developmental disorders, were excluded from the study. In addition, children younger than 8 years or older than 12 years were not included, to maintain consistency within the selected age group across both study settings.

### **Ethical Consideration**

This study was approved by the Ethical Approval Committee of the University of Babylon, Iraq, with reference number 70 on 10<sup>th</sup> March, 2025.

Informed consent was taken from deaf and speech centers in Babylon province. Furthermore, the consent of the children's parents was obtained to participate in the study. Data was obtained from children and their parents to assess the questionnaire's reliability, and the test was delivered to 10% from the study population who were not part of the initial sample. The Cronbach's alpha was found to be 0.902 for psychological determinants and 0.926

for psychological outcomes. SPSS version 27 was used for statistical analysis (descriptive and inferential). Results were considered statistically significant if the *p*-value was less than 0.05.

The findings from the socio-demographic data of the study sample (N=100) reveal that most of the children (46%) were between the ages of 10 and 11 years. In relation to sex of child (54%) were female. Regarding the child order among his siblings, they were within (1-3) children, about mothers' education (35%) were high school graduates, and fathers' education (29%) were high school graduates, about mothers' occupation (92%) were unemployed, while (55%) of fathers' occupation were unemployed. Regarding residence, (52%) were rural. Finally, (41%) have enough economic status to some extent (Table 1).

**RESULTS**

*Table 1: Sample Characteristics*

Categories		<i>f</i>	Percentage (%)
<b>Age of Child (Years)</b>	8-9	18	18.0
	10-11	46	46.0
	12	36	36.0
	Total	100	100.0
	Mean ± (SD)		10.81 ± (1.22)
<b>Sex of Child</b>	Male	46	46.0
	Female	54	54.0
	Total	100	100.0
<b>Child's Order Among Siblings</b>	1-3	57	57.0
	4-6	37	37.0
	More than 6	6	6.0
	Total	100	100.0
<b>Mothers' Education</b>	Unable to read and write	0	0
	Read or write	13	13.0
	Primary graduate	14	14.0
	High school graduate	35	35.0
	Institute or college graduate	27	27.0
	Postgraduate	11	11.0
Total	100	100.0	
<b>Fathers' Education</b>	Unable to read and write	10	10.0
	Read or write	10	10.0
	Primary graduate	27	27.0
	High school graduate	29	29.0
	Institute or college graduate	20	20.0
	Postgraduate	4	4.0
Total	100	100.0	
<b>Mothers' Occupation</b>	Employed	8	8.0
	Unemployed	92	92.0
	Total	100	100.0
<b>Fathers' Occupation</b>	Employed	45	45.0
	Unemployed	55	55.0
	Total	100	100.0
<b>Residence</b>	Rural	52	52.0
	Urban	48	48.0
	Total	100	100.0
<b>Economic Status of the Family</b>	Enough	23	23.0
	Enough to some extent	41	41.0
	Not enough	36	36.0
	Total	100	100.0

Note: *f* (Frequency)

According to the medical history of the children, most were diagnosed after the age of 3 (69%); 54% had severe hearing impairment. 52% had an unknown cause of hearing impairment, 73% used hearing aids, and 78% experienced difficulty in speech. Finally, (33%) of other children in the family had hearing impairment as present in (Table 2).

**Table 2: Medical History for Children with Hearing Impairment**

Categories		<i>f</i>	Percentage (%)
Age at Diagnosis	< 1 year old	5	5.0
	1 <sup>st</sup> year	12	12.0
	2 <sup>nd</sup> year	14	14.0
	> 3 <sup>rd</sup> year	69	69.0
	Total	100	100.0
Severity of Hearing Impairment	Mild	3	3.0
	Moderate	15	15.0
	Severe	54	54.0
	Profound	28	28.0
	Total	100	100.0
Cause of Hearing Impairment	Unknown	52	52.0
	Disease	22	22.0
	Congenital	24	24.0
	Accident	2	2.0
	Total	100	100.0
If caused by Disease, what is it	Otitis media	7	7.0
	Meningitis	7	7.0
	Other	8	8.0
	Total	22	22.0
Did the Child use Hearing Aids	Yes	73	73.0
	No	27	27.0
	Total	100	100.0
Does the Child have Difficulty in Speech	Yes	78	78.0
	No	22	22.0
	Total	100	100.0
Another Child in the Family with Hearing Impairment	Yes	33	33.0
	No	67	67.0
	Total	100	100.0

Note: *f* (Frequency)

By studying psychological outcomes, there are 55% of children having a moderate overall psychological outcome, and there are 59% of children having a moderate overall psychological status (Table 3).

**Table 3: Overall Psychological Determinants among Children with Hearing Impairment**

Domains		<i>f</i>	Percentage (%)	<i>p</i> -value
Self Esteem	Low	20	20.0	0.001 Sig.
	Moderate	48	48.0	
	Good	32	32.0	
	Total	100	100.0	
	Mean ± SD	2.15 ± .4		
Self-Efficacy	Low	58	58.0	0.001 Sig.
	Moderate	28	28.0	
	Good	14	14.0	
	Total	100	100.0	
	Mean ± SD	1.65 ± .5		
Overall Psychological Symptoms	Low	27	27.0	0.001 Sig.
	Moderate	59	59.0	
	Good	14	14.0	
	Total	100	100.0	
	Mean ± SD	1.90 ± .4		
Emotional Symptoms	Low	45	45.0	0.001 Sig.
	Moderate	43	43.0	
	Good	12	12.0	
	Total	100	100.0	
	Mean ± SD	1.8 ± .45		
Behavioral Problems	Low	25	25.0	0.001 Sig.
	Moderate	29	29.0	
	Good	46	46.0	
	Total	100	100.0	
	Mean ± SD	2.1 ± .5		
Hyperactivity	Low	34	34.0	0.001 Sig.
	Moderate	32	32.0	
	Good	34	34.0	
	Total	100	100.0	
	Mean ± SD	2.02 ± .53		
Overall Psychological Outcomes	Low	24	24.0	0.001 Sig.
	Moderate	55	55.0	
	Good	21	21.0	
	Total	100	100.0	
	Mean ± SD	1.97 ± 0.42		

Note: *f* (Frequency)

Table 4 presented the relationships between selected socio-demographic characteristics and both psychological determinants and psychological outcomes among children with hearing impairment, using the Chi-square ( $\chi^2$ ) test at a significance level of  $p \leq 0.05$ . The findings indicate that child age has no statistically significant association with either psychological determinants or psychological outcomes. Similarly, sex of the child shows no significant relationship with psychological determinants or psychological outcomes. Regarding child order among siblings, the results also reveal no statistically significant association with psychological determinants or outcomes. In contrast, mother's education level demonstrates a highly significant association with both psychological determinants and psychological outcomes. Likewise, father's education level shows a statistically significant relationship with psychological determinants and psychological outcomes. With respect to mother's occupation, there is a significant association with psychological determinants, while no significant relationship is found with psychological outcomes. On the other hand, father's occupation shows a significant association with both psychological determinants and psychological outcomes. Furthermore, place of residence is significantly associated with psychological determinants and outcomes.

Also, family economic status demonstrates a strong significant relationship with both psychological determinants and psychological outcomes (Table 4).

**Table 4: Association Between Psychological Determinants and Outcomes and Demographic Characteristics in Children with Hearing Impairment**

Socio-Demographic Characteristics	$\chi^2$ (Determinants)	Tabulated $\chi^2$ Value	Significance	$\chi^2$ (Outcomes)	Tabulated $\chi^2$ Value	Significance
Child Age	7.245	9.48	N.S	4.804	9.48	N.S
Sex of Child	1.361	5.99	N.S	4.074	5.99	N.S
Child Order among Siblings	6.693	9.48	N.S	7.038	9.48	N.S
Mother's Education	32.509	15.507	Significant	43.980	15.507	Significant
Father's Education	25.008	18.307	Significant	29.482	18.307	Significant
Mother's Occupation	6.043	5.99	Significant	5.609	5.99	N.S
Father's Occupation	14.078	5.99	Significant	15.002	5.99	Significant
Residence	20.305	5.99	Significant	19.929	5.99	Significant
Family Economic Status	19.611	9.48	Significant	29.439	9.48	Significant

\*Chi- square, If  $\chi^2$  Calculate >  $\chi^2$  table reject the null hypothesis (significant relationship), N.S = no significant, Sig= significant, p-value=0.05

By studying psychological outcomes, there are 55% of children have a moderate overall psychological outcome, and 59% of children have a moderate overall psychological status (Table 5).

**Table 5: Correlation between Psychological Determinants and Outcomes in Hearing Impaired Children**

Psychological Outcomes	Psychological Determinants	
	<i>r</i>	0.817
Significance	0.000	

## DISCUSSION

Children with hearing impairments face significant psychosocial challenges that negatively impact their quality of life. These challenges include a range of psychological problems such as anxiety, depression, low self-esteem, and psychological distress. Psychological distress is defined as a state of emotional disturbance accompanied by symptoms of anxiety and depression (Continisio *et al.*, 2023).

The results of the current study showed that the 10-11 age group represented the highest percentage of hearing-impaired children. This finding is consistent with the results of a study conducted by Sharma *et al.* (2023). The study showed that most children with subclinical hearing loss ( $\leq 25$  dB) in the 10-11 age group which demonstrated lower academic performance in reading and short-term memory, reflecting the importance of this stage in cognitive and educational development.

Regarding the child's sex, the results of the current study indicated that the proportion of females was slightly higher than males. This result is consistent with a comparative study conducted by Durankaya *et al.* (2025). Regarding the educational level of the parents, the highest percentage of mothers and fathers of the hearing-impaired children were high school graduates. The results of the current study are consistent with a

study conducted by Al-Saeed and Al-Dobooni (2020), showing the highest percentage of parents with hearing-impaired children with a high school graduate.

From researchers' opinion, the educational level of parents, especially the mother, plays a pivotal role in health awareness, access to medical services, and making appropriate decisions regarding the child's health. Mothers and fathers with a university or institute education often have a greater awareness of the importance of early screening and therapeutic intervention, which positively affects the child's chances of normal hearing and language development.

Regarding the occupation of mothers in the hearing-impaired group were unemployed. As for fathers, more than half of them were unemployed. These findings are consistent with the study by Cheng and Li (2024), which showed that parents of children with hearing impairments experience greater occupational and psychological stress, which may lead to their withdrawal from the labor market or reduced participation in it. Regarding residency, indicated that more than half of children with hearing impairment live in rural areas. These findings are consistent with the study by Pilka *et al.* (2021) conducted in Poland, which showed that children in rural areas suffer from higher rates of hearing loss than their urban peers. From the researcher's point of view is due to poor health services, the prevalence of middle ear infections, and the lack of regular hearing screening programs.

The findings of the current study indicated that two-fifths of children with hearing loss belong to families with somewhat adequate economic status. These results are consistent with the study by Binios *et al.* (2023), which indicated that children from low-income families suffer from poor linguistic and cognitive development. These results suggest low quality and extent of language exposure in the home environment. This affects their ability to benefit from hearing rehabilitation programs.

Regarding age at diagnosis, it was indicated that more than two-thirds of hearing loss diagnoses in children occurred after the age of three years. This finding disagrees with the study by Qasim *et al.* (2022), which indicated that fewer than two thirds of children were diagnosed at the age of their first year. Researcher opinion: The rate of hearing impairment diagnosis after the age of three reflects a gap in the implementation of early screening programs and may indicate a lack of community awareness or a weak healthcare infrastructure for pediatric hearing assessment. Regarding the severity of hearing loss, the current study, as shown in Table 2, showed that more than half of children had severe hearing impairment. These results are consistent with a study conducted by Meinzen-Derr *et al.* (2014), in which the researcher found that the percentage of children with severe hearing loss varies, reaching 67%. While the researchers perceived that high rate of severe hearing loss among children reflects several interconnected factors. From the researcher's point of view, genetic factors, recurrent ear infections, and a lack of specialized healthcare services in some settings also contribute to the development of the condition to advanced levels of impairment.

The finding showed that 73% of children with hearing impairments use hearing aids, while 27% reported not using them. Comparing this result with recent studies, Nelson *et al.* (2024) study, which analyzed data on hearing aid fitting for children in the United States, showed that the percentage of children fitted with hearing aids was approximately 82%, which is higher than the percentage recorded in the current study. This disparity may reflect differences in health policies or in the level of community awareness of the importance of early intervention. The results of the current study, shown in (Table 2), showed that more than three quarters of children with hearing impairments had speech difficulties. This finding is consistent with a study by Al-Saeed and Al-Dobooni (2020), which showed that more than two thirds of children with hearing impairment had speech difficulties. The researcher believes this high percentage indicates the profound impact of hearing loss on the development of speech skills. Proper speech requires accurate auditory perception of linguistic sounds, which is lacking in these children, especially in cases of early or severe hearing loss.

In pursuit of the first objective related to assessing the psychological determinants and their outcomes among children with hearing impairments, the results of the current study showed that more than half of children with hearing impairments demonstrated moderate responses, while nearly one-third of them recorded poor results, a worrying percentage indicating a fragility in psychological structure, particularly in aspects of

self-image and confidence in personal abilities. A systematic review, which was conducted by Khalid *et al.* (2025), supported the findings of the current study. This review included 46 studies on the mental health of hearing-impaired children and concluded that they are more vulnerable to psychological disorders than their hearing peers, especially in unsupportive educational environments.

From the researcher's point of view, that psychological determinants, represented by self-esteem and self-efficacy, are the most important indicators reflecting the mental health of school-age children. The study results indicate that children with hearing disabilities face multiple challenges in building a positive self-image, due to several factors, including poor verbal communication with peers and teachers, leading to feelings of isolation and ineffectiveness. Lack of societal appreciation for their abilities, which negatively impacts their self-esteem. In addition, there is a lack of specialized psychological support in public schools.

In terms of overall psychological outcomes, more than half of children with hearing impairment had moderate outcomes, and a quarter of them had low overall psychological outcomes. This finding is consistent with the findings of a comparative study conducted by Al-Saeed and Al-Dobooni (2020), which at children with hearing impairments had higher rates of behavioral and emotional problems and hyperactivity than their normal-hearing peers. From the researcher's point, the impact of hearing impairment on children's psychological and behavioral adjustment. This is due to a lack of family and school support, delayed therapeutic intervention, poor-quality rehabilitation services, and impaired verbal and social communication, which leads to difficulty expressing emotions and understanding others.

Regarding the relationship between certain demographic characteristics in children with hearing impairment, the results in Table 4 showed that a wide range of demographic factors, including place of residence, parents' occupation, education level, and economic status, are closely related to the psychosocial outcomes of hearing-impaired children. These results are consistent with the study by Warren *et al.* (2023) demonstrated that socioeconomic differences, including type of health insurance, family income level, and place of residence, directly impact hearing-related quality of life for children with hearing loss. The study demonstrated that children living in areas of higher social deprivation experience poorer psychosocial outcomes, even when medical support is available. This finding is supported by a study that stated that a comprehensive systematic review of 46 studies showed that deaf and hard-of-hearing children are more susceptible to internalizing disorders such as anxiety and depression and that environmental factors such as school type, parental education level, and communication skills play a crucial role in determining their level of psychosocial health (Khalid *et al.* 2025; Fahim *et al.* 2025).

From the researcher's point of view, hearing-impaired children are not only affected by the hearing loss itself but also deeply interact with the demographic factors surrounding them. Place of residence, parents' level of education, and economic status are not merely social backgrounds but are crucial determinants in shaping the psychological and social development of these children. This calls for multidimensional intervention, not limited to medical support but also encompassing family awareness, community support, and the provision of inclusive educational environments.

### **Limitations**

Dealing with the hearing-impaired child requires repeated speech several times, which takes more time during data collection. Some children have acquired sign language because of their integration with deaf children, which makes communication with them and their understanding an impediment to interacting with them. Difficulties in communicating with parents of the children for the purpose of completing information about the child's health status.

### **Future Scope**

Future study may observe the psychological development of children with hearing impairment across various age cohorts. There exists potential for the development and assessment of specialised nursing interventions and support programs that improve self-esteem, self-efficacy, and general mental health. Furthermore, the incorporation of technology-assisted therapy and community-based activities may enhance the social and emotional results for these children.

## CONCLUSION

Nursing plays a critical and multifaceted role in addressing the psychological determinants associated with hearing impairment in children. Nurses act as essential advocates and facilitators of care, not only addressing the physical health needs of these children but also promoting their mental and emotional well-being. By implementing comprehensive assessment strategies, nurses can identify psychological challenges early, enabling timely interventions that foster resilience and coping skills. Additionally, creating a nurturing environment builds trust and encourages children to express their feelings, thereby improving their quality of life. Through education and collaboration with families and interdisciplinary teams, nurses can empower caregivers with the knowledge and resources necessary to support the children's development effectively. This holistic approach not only addresses immediate concerns but also lays the foundation for long-term positive outcomes in social functioning and mental health.

## Recommendations

Nurses should develop protocols to screen for hearing loss during well-child visits and create educational materials for parents of hearing-impaired children, highlighting available resources like audiology services and rehabilitation programs. Implementing support groups or counselling services for families, led by nurses, can offer emotional support. Tailored nursing interventions should enhance self-esteem and self-efficacy in affected children, with family involvement in activities. Regular assessments, interdisciplinary collaboration, and psychoeducation for families on communication strategies, developmental challenges, and emotional well-being are essential to provide comprehensive support. Additionally, involving families in care plans and connecting them to community resources can ensure holistic care for the child and family.

## CRedit Authorship Contribution Statement

N.H.E: Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data curation, Writing - original draft, Visualization. N.M.D: Conceptualization, Resources, Writing - review and editing, Supervision, Project administration.

## AI Assistance Declaration

AI tools (Chat GPT) were used for language refinement. All content was reviewed and validated by the authors.

## Conflict of Interest

The authors declare that they have no competing interests.

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