Psychosocial Problems among Children with Hearing Impairment

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Abstract

Background: Hearing impairment is a reduced ability to hear sounds in the same way as other people. Face a set of (a) psychological problems such as anxiety, depression, and low self-esteem and (b) social problems such as social isolation, communication problems, acceptance, and participation. **Aim:** This study aimed to assess the psychosocial problems among children with hearing impairment. **Design:** A descriptive research design was utilized in this study. **Setting**: This study was carried out at Hearing and Speech Institute in Imbaba, Giza. Governorate, affiliated to General organization for teaching hospitalities and institutes **Subjects:** A purposive sample of 100 children with hearing impairment. **Data collection tool:** Data was gathered using the tools (1) a Structured interview questionnaire to assess children with hearing impairment demographic data;(2) psychological problems among children with hearing impairment questionnaire; and (3) social problems among children with hearing impairment questionnaire. **Results:** Data analysis shows that half (50%) of the studied children had moderate levels of psychological problems, also more than half (50%) of the studied children had high levels of social problems. There was a highly statistically significant relation between the psychological problems of the studied children and their social problems p< 0. 001.There was a highly statistically significant positive correlation between the psychological problems of the studied children and their social problems of social acceptance, participation, relationship problems, communication problems and social problems p< 0. 001. **Conclusion**: The children with hearing impairment had moderate psychological and high social problems. **Recommendations:** Develop an educational program for families who caring for children with hearing impairment to give them information about how to care with these children

Keywords: Hearing Impairment, Psychological Problems, Social Problems.

Introduction

Hearing impairment refers to any degree of hearing loss, mild to severe, and can occur when there is a problem with a part of the ear, including the inner, middle, and outer ears, or the nerves needed for hearing. One of the most important properties of all humans is the ability to be able to hear, listen and understand verbal communication. Not recognizing and treating impairment can seriously impair a child's ability to speak and understand language. Impairment can lead to failure in school, teasing by peers, social isolation, and emotional difficulties. **(Aljedaani, et al., 2023).**

Living with a hearing impairment does not only have consequences for speech recognition but may also affect the psychological and social aspects of individual life. Therefore, hearing impairment affects individuals' cognitive competence, since it reduce the individual's ability to recognize things, particularly the aspects directly related to hearing that reduce his ability to sustain normal activities and processes **(Mumtaz, et al, 2023).**

Children with hearing impairment face a set of psychological problems and difficulties that persons with hearing impairment face which severe impact their psycho-social health. Psychological problems such as anxiety, depression, low self-esteem, and psychological distress, psychological distress is defined as the condition of emotional disturbance with feelings of anxiety (e.g., feeling restless and tense), and depression (e.g., feeling hopeless and loss of interest). People may experience psychological distress while coping with the stressful,

disturbing or harmful circumstances in their daily life **(Continisio, et al., 2023),** and also these children face many social problems such as communication problems, social isolation, and lack of social acceptance and participation. Furthermore, hearing impairment may relate directly to the increment of fear and dependency. Hearing loss poses a serious risk to the mental well-being and overall children's lives. children may experience diminished self-esteem that in effect leads to poor mental health and decline in psychological well-being and significantly negative connotation and it accounts for poor well-being in general. **(Continisio, et al., 2023).**

Therefore. The care of people with special needs is an important task, punctuated by many difficulties, which requires first, the recognition of the value of the human being, then the commitment and the will to change the view of its owners and the society in all its spectrum to integrate them as productive members according to their capacities. so, the role of psychiatric mental health nursing is to reduce psycho-social problems. **(Wong, et al., 2020).**

Hearing impairment**:** is a disability that can affect the effective functioning of the total personality no matter the period of onset. Among the earliest attempts to define hearing impaired was the one made by the Committee of Nomenclature of the Conference of Executives of American Schools for the Deaf, which says that the deaf are those people in whom the sense of hearing is non-functioning for the ordinary purpose of life. According to them also, hard of hearing can be defined as those in whom the sense of hearing although defective is functional with or without a hearing aid **(Mumtaz al., 2023)**

Significance of the study:

Hearing impairment is a reduced ability to hear sounds in the same way as other people. Globally, hearing impairment is a common sensory disease and represents a major health challenge for a large proportion of the population worldwide. Across the world, 466 million people have a disabling hearing impairment, over 5% of the world's population, of whom 23 million are children. In Egypt alone, 20.9% of children suffer from hearing impairment. Hearing impairment is a prevalent condition, representing psychological and social challenges. **(Wang et al., 2019).**

Psychological challenges that hearing-impaired persons may face and affect their lives such as anxiety, stress, depression and low self-esteem. Also, people who struggle with hearing impairment often feel isolated which also contributes to many social problems such as social isolation, social acceptance and participation problems, relationship problems and communication problems. This group has many problems that need to be treated to help them continue life more easily (**Rijke, et al., 2022).**

Hence, psychiatric mental health nurses need to assess the psychological and social problems among children with hearing impairment to employ various educational programs and interventions to deal with these problems, which can help them develop their capacities and prepare them to understand the world around them, improving their abilities of social interaction, social control and enhancing their psycho-social health.

Aim of study

The aim of this study was to assess psychological problems among children with hearing impairment.

The aim of this study was achieved by assessing:

1. Assessing the psychological problems among children with hearing impairment (anxiety, stress, feeling depressed and self-esteem).

2. Assessing the social problems among children with hearing impairment (social acceptance and participation, relationship problems and communication problems).

3. Assessing the relation between psychological and social problems among children with hearing impairment.

This aim was achieved through answering the following questions:

1. What are the psychological problems among children with hearing impairment?

2. What are the social problems among children with hearing impairment?

3. What is the relation between psychological and social problems among children with hearing impairment?

Subject and Methods

Research design: exploratory design was used in this study to assess psychosocial problems among children with hearing impairment.

Research setting: The study was conducted at the Hearing and Speech Institute in Imbaba, Giza Governorate, affiliated to the General Organization for Teaching Hospitalities. This institute is the first institute in the Middle East to provide an integrated service to t the Hearing and Speech Institute in Imbaba treatment of hearing loss and speech defects. This institute consists of two buildings the first building was established in 1968 and a new building in 2005. The institute consists of 4 floors. The ground floor has clinics for all departments namely nose, ear, audiology, intelligence testing, speech, social service, office, patient service office, head nurse office and a pharmacy.

Subjects of the study:

The actual subjects of this study were determined according to the formula for the determined sample size included 100 children with hearing impairment from a total number of 160 children with hearing impairment between 6 years to 16 years.

$$N = \frac{N \times P(1-P)}{\{(N-1 \times (d^2 / z^2) + \}(1-P))}$$

(Steven , et al., 2012)

Tools for data collection:

The tools used for data collection were:

I. Structured Interview questionnaire.

to assess demographic characteristics of children with hearing impairment, such as name, age, sex, the number of siblings, child ranking, academic stage, residence and family history of hearing impairment.

2-Tool II psychological problems among children with hearing impairment questionnaire ***were*** developed by Alramamneh,et al, 2019 and modified by the researcher, to assess psychological problems among children with hearing impairment.

The psychological problems questionnaire consists of 3 domains (36 items)

A) Anxiety and stress containing (12) items.

B) Feeling of depression containg (14) items

C) Self-esteem containing (10) items

Scoring system for psychological problems among children with hearing impairment

- Scoring for each statement as follows:

Positive statements:

- Raley = 1
- Sometimes = 2
- Always = 3

Each question from each domain was rated from 1 to 3 marks, and the scores of each item were summed up and the total was divided by the number of items.

Total psychological problems were considered low if the total mean score of total psychological problems was from (38-68),

considered moderate if the total mean score of total psychological problems was from (69-83) and considered high if the total mean score of total psychological problems was from (84-108).

	Low	Moderate	High
Anxiety	12-19	20-27	28-36
Depression	14-23	24-33	34-42
Self-esteem	10-16	17-23	24-30
Total	36-68	69-83	84-108

Negative statements (reversed scored): (items numbers 3 and 21).

- Raley = 3
- Sometimes = 2
- Always = 1

3-Tool III: social problems among children with hearing impairment questionnaire were developed by Alramamneh, et al., 2019 and modified by the researcher, to assess social problems among children with hearing impairment.

The Social problems questionnaire consists of 3 domains (20 items)

A) Social participation problems contain (7) items

B) B) Relationship problems contain (7) items

C) Communication problems contain (6) items

Each question from each domain was rated from 0 to 2 marks, and the scores of each item were summed up and the total was divided by the number of items.

Total social problems were considered low if the total mean score of social problems was from (0-13), considered moderate if the total mean score of social problems was from (14-27), and considered high if the total mean score of social problems was from (28-40).

Social participation problems	Low	Moderate	High
	0-4	5-9	10-14
Relationship problems	0-4	5-9	10-14
Communication problems	0-3	4-7	8-12
Total	0-11	14-27	28-40

Negative statements (reversed scored): (items numbers 6, 8, 10, 15, 16, 17 & 19).

- Raley = 3
- Sometimes = 2
- Always = 1

Pilot Study

The pilot study was carried out at the mid of September 2023 before data collection on a group of 10% of the sample (10 children with hearing impairment) later to test and evaluate the clarity, feasibility and applicability of the research tools, to estimate the time needed to collect data. According to the results of the pilot study, no modifications were made to the tools, and the pilot study was included in the study sample.

Fieldwork

First step:

Before starting the data collection, the researcher met with the head nurse in the outpatient clinic after introducing herself, she explained the nature and purpose of the study to gain her written consent and cooperation. Confidentiality of any obtained information was assured, and the subjects were informed about their right to participate or not in the study. The subjects were also assured of anonymity and that data will only be used for the study.

Second step:

Before starting the data collection, the researcher met with children with hearing

impairment in well-ventilated, quiet as possible and adequate space then introduced myself and explained the nature and purpose of the study to gain their oral approval and cooperation.

Data collection tools were distributed among children with hearing impairment at the Hearing and Speech Institute in Imbaba, Giza and they were asked to fill them out individually. Instructions were then given as to how to answer each questionnaire and what details had been administered and an explanation of what had been measured would be given to them. Time was given for questions to be asked.

It was emphasized that there should be no talking or consultation with other children during the administration of the test "Every attempt was made to provide ample spacing between respondents and their peers to keep their responses as private as possible. Respondents were also asked not to discuss or share their responses with anyone.

Data was collected daily for 2 days/week (Sunday and Thursday) in the morning (9:00 am – 11:00 p.m.) for 30-40 minutes four children per day at the Hearing and Speech Institute in Imbaba, Giza Governorate, affiliated to the General Organization for Teaching Hospitalities.

Once the questionnaires had been completed and collected, an explanation of what had been measured was given and assurances were given that a report back on the results would be given once the research had been completed. Lastly, after finishing lots of thanks were given to the children, head nursing and nurses authorities for their cooperation.

Limitation of the study: -

Frequent interruption and over crowdedness of the outpatient clinic due to unavailability of a suitable place for interview.

In cooperation with the head nurse, I was sitting in the office collecting the sample, and each child came to me with his family

E. Ethical Considerations:

After securing official requirements for carrying out this study, the subjects were informed about choosing to participate or not. The researcher took oral consent from the patients if they needed to participate, besides, they were informed about the patient's right to withdraw at any time without giving a reason.

III. Administrative Design:

The researcher to obtain approval to conduct the research study, the researcher received official permissions from the following authorities:

1. The chairperson and the council members of the Psychiatric/ Mental Health Nursing Department, the Ethical Committee, and official letters from the Dean of the Faculty to responsible authorities in the Institute of Hearing and Speech.

2. Responsible authorities at the General Secretariat for hospitals and educational institutions, institute of hearing and speech.

IV. Statistical design:

The statistical analysis of data was done by using the computer software Microsoft Excel Program and Statistical Package for Social Science (SPSS) version 22. Data were presented using descriptive statistics in the form of frequencies and percentages for categorical data, the arithmetic mean (X) and standard deviation (SD) for quantitative data. Qualitative variables were compared using chi-square test (X) 2, P-value to test the association between two variables and Pearson correlation test (R-test) to the correlation between the study variables.

Degrees of significance of results were considered as follows:

- P-value ≥ 0.05 Not significant (NS)
- P-value < 0.05 Significant (S)
- P-value < 0.01 Highly Significant (HS).

Results

Table (1) showed that more than two-fifths (43.0%) of the studied children their ages ranged from 9-<12 years. Also, more than three-fifths (59.0%) of them were residing in urban areas. Regarding number of siblings, it was found that two-fifths (40.0%) of them had one sibling. Also, more than two-fifths (41.0%) of them were the first between their siblings. Moreover, more than half (59.0%) of them were at the primary stage. Furthermore, the majority (82.0%) of them didn't have a family history of hearing impairment.

Table **(2)** showed that half (50.0%) of the studied children had a moderate level of psychological problems with a mean ± SD score of 76.19±21.12.

Figure **(1)** showed that (50%) of the studied children had a moderate level of total psychological.

Table **(2)** showed that more than half (52.0%) of the studied children had a high level of social problems with a mean ± SD score of 20.98±8.44.

Figure **(3)** showed that more than half (52.0%) of the studied children had high levels of social problems. Also, more than one-third (34.0%) of them had a moderate level of social problems. While the minority of them (13.0%) had low levels of social problems.

Table (4) displayed that there was a highly statistically significant relation between the psychological problems of the studied children and their total social problems. (P= < 0.01).

Table (5) revealed that there was a highly significant positive correlation between the psychological problems of the studied children and their social acceptance and participation, relationship problems, communication problems and social problems.

Table (1): Frequency percentage distribution of the studied children according to their sociodemographic characteristics (**n=100).**

Items		No.	%
Age (years)			
6-<9		16	16.0
9-<12		43	43.0
12-<15		21	21.0
15-16		20	20.0
Mean SD	**10.01±2.75**		
Residence			
Urban		59	59.0
Rural		41	41.0
Number of siblings			
One		40	40.0
Two		30	30.0
Three		20	20.0
Four or more		10	10.0
Ranking of the child			
First		41	41.0
Second		27	27.0
Third		24	24.0
Last		8	8.0
The academic stage			
Primary stage		59	59.0
Preparatory stage		41	41.0
Family history from hearing impairment			
Yes		18	18.0
No		82	82.0

Table (2): Frequency percentage & mean scale distribution of the studied children according to their total levels of psychological problems **(n=100).**

Psychological problems subscales	Low		Moderate		High		Mean ± SD
	No.	%	No.	%	No.	%	
Anxiety and stress	23	23.0	23	23.0	54	54.0	**26.19±7.76**
Feeling depressed	37	37.0	43	43.0	20	20.0	**27.15±7.80**
Self-esteem	65	65.0	21	21.0	14	14.0	**22.98±5.96**

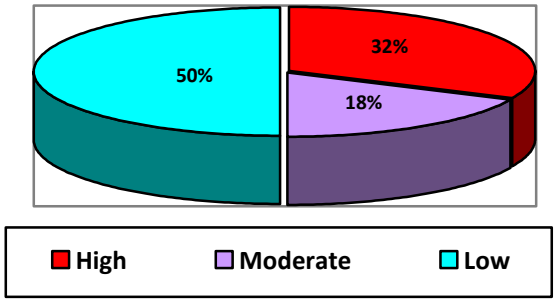

Figure (1): Percentage distribution of the studied children according to total levels of psychological problems **(n=100).**

Table (3): Frequency percentage & mean scale distribution of the studied children according to their total levels of social problems **(n=100).**

Social problems subscales	Low		Moderate		High		Mean ± SD
	No.	%	No.	%	No.	%	
Social acceptance and participation	12	12.0	36	36.0	52	52.0	**8.96±4.39**
Relationship problems	18	18.0	40	40.0	42	42.0	**8.11±4.26**
Communication problems	6	6.0	25	25.0	69	69.0	**9.48±3.20**

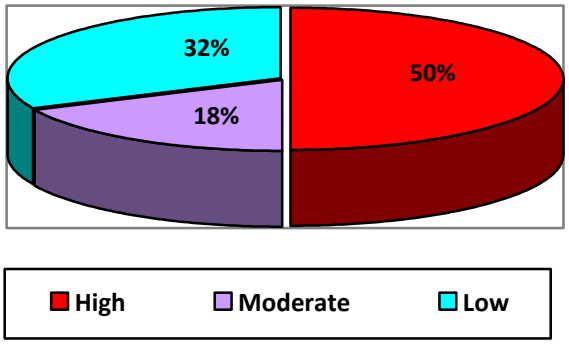

Figure (2): Percentage distribution of the studied children according to their total levels of social problems **(n=100).**

Table (4): Relation between total levels of psychological problems and total social problems among the studied children **(n=100).**

Total levels		Total levels of social problems						X^2	P-Value
		High (n=52)		Moderate (n=30)		Low (n=18)			
		No.	%	No.	%	No.	%		
Total levels of psychological problems	High	29	55.8	3	10.0	0	0.0	**56.33**	**0.000****
	Moderate	23	44.2	21	70.0	6	33.3		
	Low	0	0.0	6	20.0	12	66.7		

X^2 = Chi-square test. **highly significant at p ‹ 0.01.

Table (5): Correlation between total score of psychological problems and social problems among the studied children **(n=100)**.

Variables		Social acceptance and participation	Relationship problems	Communication problems	Total social problems
Anxiety and stress	**R**	0.909	0.918	0.875	0.907
	p-value	0.000**	0.000**	0.000**	0.000**
Feeling depressed	**R**	0.883	0.911	0.816	0.865
	p-value	0.000**	0.000**	0.000**	0.000**
Self-esteem	**R**	0.855	0.873	0.802	0.839
	p-value	0.000**	0.000**	0.000**	0.000**
Total psychological problems	**R**	0.907	0.925	0.852	0.894
	p-value	0.000**	0.000**	0.000**	0.000**

r=correlation coefficient test **highly significant at p ‹ 0.01.

Discussion

The presence of childhood hearing impairment can have significant adverse effects on all areas of development including language, speech, literacy, education, and cognitive and psycho-social functioning **(Wong, et al., 2020).** However, psycho-social development has been rated as one of the highest areas of concern by parents of children who are deaf or hard of hearing. The majority of the literature has reported that, although not inevitable, DHH children have higher rates of psycho-social problems including anxiety, stress, depression, low self-esteem, communication problems, and relationship problems. Therefore, it is necessary to pay special attention to this sector of the population to meet their basic needs and to help them to maintain their health as long as possible. Hence this study aims to assess the psycho-social problems among children with hearing impairments.

Regarding the demographic of the studied subject, the present study showed that less than half of the studied children's ages ranged from 9-<12 years.

From the researcher’s point of view the fact that a hearing impairment problem with a child’s ears reduces their ability to detect sound and interferes with a child’s speech and language skills, so the parents may be unable to detect the problems until hearing impairment affects language skill acquisition, interpersonal relationships, and academic and social life.

The present study revealed that more than half of the studied children were residing in urban areas.

This may be due to the improvement of medical services and increased awareness of people in urban areas than rural areas.

A similar finding was consistent with two studies, the first study was conducted by **Dikeç et al. (2023)** who studied" Experiences of Hearing Parents of Children with Hearing Loss" and showed that ages ranging from 9 to 10 years

constituted the highest percentage among institutionalized and non-institutionalized children. In addition, a similar second study finding by **Natarajan, et al., (2023)** studied" Noise-induced hearing Loss "and reported that noise has been recognized as a factor contributing to hearing impairment.

Also, the findings disagreed with Mishra**, Saxena, & Rodrigo, (2022)** who conducted a study titled "Hearing impairment in the extended high frequencies in children despite clinically normal hearing" and reported the majority of the children with hearing impairment due to conditions at the time of birth that leading to hearing impairment.

Regarding the total levels of psychological problems, the findings of the current study showed that more than half the studied children had moderate levels of total psychological problems.

This can be because losing the ability to hear can dramatically impact the way that people interact with others and experience life. It can also put them at greater risk for developing psychological problems such as anxiety stress, depression, and low self-esteem.

A similar finding was consistent with two studies, the first study was conducted by **Bai, et al., (2023)** who studied " Emotion recognition with residual network driven by spatial-frequency characteristics of EEG recorded from hearing-impaired adults in response to video clips " and demonstrated that the rate of psychological problems such as anxiety stress, depression, and low self-esteem has increased in deaf children with hearing impairment and adolescents compared with the general population, according to most studies and many factors have been associated with the risk of developing mental health problems among deaf adolescents: factors related to deafness or hearing impairment including cause, degree, age of onset, and additional complexities; and psychological and interpersonal factors. In addition, a similar second study findings by **Xusnora, & Yulduz (2022)** Who studied " Ways to develop vocabulary in children with Hearing impairment." revealed that anxiety, depression, exhaustion, social isolation, and social-emotional health related to physical changes are the most relevant afflictions found in persons with hearing impairment.

Regarding the total levels of social problems, the findings of the current study showed that more than half of the studied children had high levels of social problems.

This result may be due to that people with hearing impairment often avoid social situations because they can't follow a conversation; sometimes they lose the thread and attempt to participate based on what they thought they heard and give responses that are not relevant or get an unexpected reaction from those they are speaking with. They may be laughed at or insulted. This often causes embarrassment, a blow to self-esteem, and often depression. In addition. Hearing problems put them in situations where this can happen. Not just limited to conversation, individuals will avoid sitting with others at meals, recreational activities that once gave them joy, lectures, shopping, religious services, and activism.

This result is like a study conducted by **Prado-Warring et al., (2023)** entitled " Relationships between coping behaviors and social loneliness in adults with self-reported hearing problems " They mentioned that relationships between coping behaviors and social problems in children with self-reported hearing problems.

Concerning the relation between total levels of psychological problems and total levels of social problems among the studied children, the study results displayed that, there was a highly statistically significant relation between total levels of psychological problems of the studied children and their social problems. In which the studied children who had low levels of social problems had low levels of psychological problems.

From the researcher's point of view, children with hearing impairment often report feelings of social isolation, withdraw from social situations, and struggle with anxiety over

meeting new people. Even meeting friends becomes challenging, as they feel embarrassed that they can't understand half of what they're saying. hearing impairment is also linked to depression, stress, anxiety, and low self-esteem.

This result was supported by **Alieksieieva (2024)** who performed a study entitled There was a highly statistically significant relation between the psychological and social problems of the studied children and, he explained that when communication breaks down, frustration creeps in. That frustration can lead to resentment, which leads to further breakdown in communication and intimacy.

Conclusion

Based on the results of the present study and research questions, the following can be concluded:

Less than two thirds of children with hearing impairment had low levels of self-esteem. and more than two thirds of them had high levels of communication problems. In addition to there was highly significant relation between psychological problems and social problems of the studied with children with hearing impairment.

Recommendations

Based on the results of the current study, the following recommendations were suggested:

1.Develop an educational program for families who caring children with hearing impairment to give them information about how to care with these children

2.The establishment of counseling program for children with hearing impairment to improve their psychological well-being

3.The development of rehabilitation program to enhance quality of life for children with hearing impairment and their caregivers.

4.Further research is advised to determine the variables influencing children with hearing impairment

5.Further studies for large sample size should be done to genderized the results

6.Designing psychological education program for all nurses who communicate with children with hearing impairment to give them information about how to communicate with children

References

Aljedaani, W., Krasniqi, R., Aljedaani, S., Mkaouer, M. W., Ludi, S., & Al-Raddah, K. (2023). If online learning works for you, what about deaf students? Emerging challenges of online learning for deaf and hearing-impaired students during COVID-19: a literature review. Universal access in the information society, 22(3), 1027-1046.

Alieksieieva, H. (2024, January). Formation of readiness for the use of digital technologies in future qualified computer workers with hearing impairments. In Forum for Education Studies (Vol. 1, No. 1).

Alramamneh, A. K. S., Sabayleh, O. A. O., & Drei, S. M. A. (2019). Psychological and social problems of hearing-impaired students and the adopted coping strategies in deaf schools. Journal of Educational and Social Research, 10(2), 205-205.

Bai, Z., Liu, J., Hou, F., Chen, Y., Cheng, M., Mao, Z., ... & Gao, Q. (2023). Emotion recognition with residual network driven by spatial-frequency characteristics of EEG recorded from hearing-impaired adults in response to video clips. Computers in Biology and Medicine, 152, 106344.

Continisio, G. I., D'Errico, D., Toscano, S., Maldonato, N. M., De Falco, R., Nunziata, F., ... & Malesci, R. (2023). Parenting Stress in Mothers of Children with Permanent Hearing Impairment. Children, 10(3), 517.

Dikeç, G., Türk, E., Yüksel, E., Çelebi, K., & Özdemir, M. (2023). Experiences of Hearing Parents of Children with Hearing Loss: A Qualitative Study. Children, 10(7), 1129.

Mishra, S. K., Saxena, U., & Rodrigo, H. (2022). Hearing impairment in the extended high frequencies in children despite clinically normal hearing. Ear and Hearing, 43(6), 1653-1660.

Mumtaz, N., Saqulain, G., & Babur, M. N. (2023). Hearing impairment and its impact on children and parents in Pakistan. Eastern Mediterranean Health Journal, 29(1), 33-39.

Natarajan, N., Batts, S., & Stankovic, K. M. (2023). Noise-Induced Hearing Loss. Journal of Clinical Medicine, 12(6), 2347.

Prado-warring, L. T., Henke, C. E., Pronk, M., Kramer, S. E., & Stam, M. (2023). Relationships between coping behaviors and social loneliness in adults with self-reported hearing problems. Ear and hearing, 41(4), 1040-1050.

Rijke, W. J., Vermeulen, A. M., Willeboer, C., Knoors, H. E., Langereis, M. C., & van der Wilt, G. J. (2022). Wellbeing as capability: Findings in hearing-impaired adolescents and young adults with a hearing aid or cochlear implant. Frontiers in Psychology, 13, 895868.

Saxena, U., & Rodrigo, H. (2022). Hearing impairment in the extended high frequencies in children despite clinically normal hearing. Ear and Hearing, 43(6), 1653-1660.

Steven K. Thompson., (2012): Sampling' 3rd ed, John Wiley & Sons, p59-60.

Wang, J., Sung, V., le Clercq, C., Burt, R., Carew, P., Liu, R., …& Wake, M. (2019) High prevalence of slight and mild hearing loss across mid-life: a cross-sectional national Australian study. Public Health 168. 26-35.

Warringa, L. T., Henke, C. E., Pronk, M., Kramer, S. E., & Stam, M. (2023). Relationships between coping behaviours and social loneliness in adults with self-reported hearing problems. Ear and hearing, 41(4), 1040-1050.

Wong, C. L., Ching, T. Y., Leigh, G., Cupples, L., Button, L., Marnane, V., ... & Martin, L. (2020). Psychosocial development of 5-year-old children with hearing loss: Risks and protective factors. International journal of Audiology, 57(sup2), S81- Xusnora, Y., & Yulduz, A. (2022, March). Ways to develop vocabulary in children with hearing impairment. In E Conference Zone (pp. 229-230).

Xusnora, Y., & Yulduz, A (2022, March). Ways to develop vocabulary in children with hearing impairment. In E Conference Zone (pp. 229-230).