Quality of life for Preschool Children Suffering from Hearing Impairment in Rural Area

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Abstract

Background: Preschool children hearing impairment is considered one of the most prevalent global health concerns. Early identification and intervention of hearing impairment may have lifelong effects on the child's life. **Aim of the study**: to assess quality of life for Preschool Children Suffering from hearing Impairment. **Design:** A descriptive design was utilized in this study. **Setting:** The study was carried at outpatient audio clinics of Elmenofeya University Hospital, Health insurance clinics, special speech clinics and audio clinic. **Sample**: Purposive sample used in this study. They were 308 students; 161 male and 147female.predetremind inclusion criteria (The age from 3 < 6 years (pre-school age), Free from any other health problem. **Study tool**: The data for this study were collected by using two tools: **Tool I:** structured interview questionnaire: it consisted of **Part 1:** socio-demographic characteristics for children. **Part 2:** socio-demographic characteristics of mothers. **Part 3:** Past and present medical history of the children. **Part 4:** knowledge of mothers about hearing impairment. **Tool II:** Practice of mothers regarding hearing impairment. **Tool III:** Assessment of the quality of life of preschool children with hearing impairment. **Results**: it was found near to half of the preschool children was aged from 5 to 6 years, more than half of them were male, more than half of them were going to nursery, more than one third of children's mothers were Secondary education, near to half of them reported that the cause of the hearing impairment was Inflammation in the middle ear, more than half of the preschool children used Medical hearing aids, majority of the preschool children had speech problem, more than half of them had Consanguinity between parents, more than half of the mothers had unsatisfactory knowledge about hearing impairment, that only less than One-third of the mothers had good practice that improve the communication skills and their behavior, near to half of the preschool children had average quality of life. **Conclusion**: There was significant relation between health problems of preschool children with hearing impairment and their quality of life, also there was significant relation between socio-demographic characteristics and health problems of preschool children with hearing impairment. **Recommendation**: health education program to increase the mother's knowledge, improve their practice, and teach them the importance of early treatment and language training.

Key words: Hearing impairment, preschool age, quality of life, early intervention.

Introduction:

Hearing impairment is defined as a full or partial decrease in the ability to detect or understand sounds **(Anne et al., 2017).**

Hearing impairment is a general term referring to reduced functioning of the ear that can affect the intensity (loudness) and/or clarity of sounds heard. The most common type of hearing impairment in young children is conductive, which typically concerns how loud sound must be for a child to hear it. A second and more permanent type of hearing impairment is sensorineural, which involves damage to the cochlea (inner ear organ of hearing) or to the acoustic nerve to the brain **(Anne et al., 2017).**

Hearing impairment is a very common chronic disorder-affecting children and adults age groups. Its prevalence according to the World Health Organization (WHO), 360 million persons in the world have disabling hearing impairment and 328 million of these are adults while 32 million were children mostly in developing countries. Poor health-care systems and paucity of hearing health-care physicians

may be the contributing factors. Hearing impairment may be associated with severe physically challenged such as poor or no speech acquisition in children, social, emotional, and economic burden in adults **(Shuaibu et al., 2018)**.

Hearing impairment can be divided into conductive, sensorineural, and mixed. Conductive occurs when there is defect in the sound conducting mechanism of the ear. The lesion could be anywhere from external auditory canal to the footplate of the stapes, usually easily treatable. Sensorineural hearing impairment may be due to abnormality in the cochlear, auditory nerve, neural pathway, or their connection with auditory cortex. Moreover, may be associated with grievous consequences usually requiring rehabilitation. Mixed hearing impairment is due to abnormality causing both conductive and sensorineural hearing impairment **(Shuaibu et al., 2018).**

Hearing impairment can be due to congenital or acquired causes. It is congenital in form of hereditary and nonhereditary genetic factors such as maternal rubella and syphilis, low birth weight, birth asphyxia, drugs such as aminoglycosides and cytotoxic as well as severe neonatal jaundice. Acquired hearing impairment may occur at any age and can be due to infectious diseases such as meningitis, measles, and mumps. Others are chronic ear discharge, ototoxicity, and noise induced **(Korver et al., 2017)**.

Early identification of hearing impairment and early appropriate intervention before the age of 6 months can increase the possibility of normal speech and language development in hearing-impaired children. The appropriate intervention program must include family consultation, hearing aid description/fitting, auditory training, language learning, and educational strategies based on the needs and abilities of the baby or child **(Shojaei et al., 2016).**

Preschool age is a critical period and form the basis of human life. The ability of individuals to become productive individuals in society by effectively using their abilities for healthy personality development depends on the experiences gained in childhood. The child gains these experiences by communicating with the environment, exploring the environment through active experiments and benefiting from various educational environment. **(Güven, 2019).**

In general, a rural area or countryside is a geographic area that is located outside towns and cities. The Health Resources and Services Administration of the U.S. Department of Health and Human Services defines the word rural as encompassing "...all population, housing, and territory not included within an urban area. Many rural communities are now facing various problems such as economic, social and environmental problems. In developing countries, like Egypt, many rural areas are suffering from poverty, pollution, unemployment, poor public infrastructure and many other issues **(Asham, 2019).**

The World Health Organization defines quality of life (QOL) as individuals' perception of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. The definition encompasses six domains of quality of life including a physical domain, psychological domain, and level of independence, social relationships, environment, and spirituality / religion / personal beliefs **(Roland et al., 2016).**

Nurses should educate and support mothers with knowledge regarding pathologies and risk factors related to hearing and hearing impairment, as well as counselling patients towards appropriate referrals and keeping appointments that have been made. Also should learn them about the importance of the language training **(O'Donovan et al., 2019).**

Significance of the study:

Hearing impairment is a neglected chronic otological disorder with varying aetiology. It is one of the commonest sensory

disabilities worldwide. In 2014, WHO estimated that over 360 million people worldwide had different form of hearing impairment. It was found that 328 million were adults while 32 million were children **(WHO, 2018).**

Hearing impairment is now an important public health problem globally. It is one of the most common developmental disorders. According to estimates of the World Health Organization (WHO), 460 million people worldwide have disabling hearing loss, and 34 million of these are children **(Xuong and Tran, 2019).**

In Egypt, there have been no national surveys on the prevalence of hearing impairment and deafness and there are few hospital-based academic studies that give an idea about the magnitude of the problem. No conclusive data or recommendations could be drawn from such limited studies in Egypt. Therefore, there is a need to conduct a study on a national level **(Mahmoud et al., 2016).**

Aim of the study

This study aimed to assess quality of life for Preschool Children Suffering from hearing Impairment through:-

1- Assessing the mother knowledge about hearing impairment and its effect on the quality of life.
2- Assessing health status of the preschool children with hearing impairment.
3- Assessing the health problems of the preschool children with hearing impairment.
4- Assessing quality of life domains for preschool children with hearing impairment (physical, social, emotional, and psychological)

Research Questions

1. Is there a relation between socio-demographic characteristics and health problems of preschool children with hearing impairment?
2. Is there a relation between health problems of preschool children with hearing impairment and their quality of life?

Subjects and Methods

The subject and methods for this study were consisted of the following four main designs as the following:

I. **Technical design**
II. **Operational design**
III. **Administrative design**
IV. **Statistical design**

I. Technical design:

Research design:

A descriptive design will be used in this study.

Research setting:

The study conducted at outpatient audio clinics of Elmenofeya University Hospital and the homes of the study sample (preschool children)

Due to the rarity and the frequency of the study sample in Elmenofeya University Hospital as we collect 198cases only from 250 cases. We collect also all cases that hesitate to the Health insurance clinics, which represent 71 from 110 cases, and all cases that hesitate special speech clinics and audio clinic which represent 39 from 83 cases.

Sampling:

Sample type: Purposive sample used in this study.

Sample size: Pre-school children enrolled in the previously mentioned setting were included in the study. They were 308 students: 161 male and 147 female.

Sampling technique:

The recruited pre-school children were chosen according to the following criteria:

1.Already diagnosed.

2.The age from 3 < 6 years (pre-school age).

3.Free from any other health problem.

4.Attend with their mothers.

Tools for data collection:

The data for this study were collected by using three tools:

Tool I: Structured interview questionnaire:

An interviewing questionnaire was used to assess socio demographics. The researcher based on literature review designed it:

- **Part 1:** Socio-demographic characteristics for children as age, gender, birth order, and going to nursery. It consists of 5 questions.
- **Part 2:** Socio-demographic characteristics of mothers as age, income, level of education, occupation, number of the family member, and social status. It consists of 7 questions.
- **Part 3:** Past and present medical history of the children as medical history, family history, consanguinity between the parents, and history of disability (onset, causes, history of affection of other family member, regular follow up and using of assistance method). It consists of 8 questions.
- **Part 4:** Knowledge of mothers about hearing impairment as meaning, etiology, causes , signs and symptoms, prevention and treatment of hearing impairment **(Dudda, 2017).** The tool is adapted as some questions have been simplified. It consists of 9 questions.

❖ **Scoring system of mother's knowledge:**

Answers were calculated as following:

(2) Score for correct or complete answer (1) for incomplete answer and (0) for wrong answers. According to their responses. Their level of knowledge was categorized as following: Good (75 ≤ ─100%), Average (50 ≤ ─75%) and Poor (<50%).

Tool II:

- Reported practice of mothers regarding hearing impairment as practice regarding communication (It consists of 4 questions), and skills: skills how to care with medical hearing aid (It consists of 7 questions), and skills how to care with the electronic cochlea (It consists of 5 questions). Through observational chick list **(Dudda, 2017).** The tool is adapted as some questions have been simplified.

❖ **Scoring system of Mother's practices:**

Scoring classified into done (≥75%), not done (<75%).

Tool III:

Assessment of the quality of life of preschool children with hearing impairment as (development, and communication skills) and their families **(Judith, 2015).** The tool is adapted as some questions have been simplified. **It includes:**

- **Physical quality of life and behavior**

Such as wearing hearing aids, practice sport, practice hobby and watching TV. It consists of 8 questions.

- **Social quality of life**

Such as, visit friends and family, and participation in public events such as parties. It consists of 7 questions.

- **Psychological quality of life**

It included questions about feeling worry, feeling scared, depend on others, control of his angry and feeling depression and sadness. It consists of 5 questions.

- **Emotional quality of life**

It included questions quarrels with his peers, and faces difficulty hearing his friends while playing abroad. In addition, difficult to focus. It consists of 5 questions.

❖ **Scoring system of QOL:**

It was classified as high, average and low quality of life. Each items is converted from 0 to 100 score. Therefore, the higher score indicate high quality of life for children and scored as (≥75%), average QOL scored as (75 ≤ ─ 60%) and low QOL scored as (< 60%).

II. Operational design:

The operational design consists of preparatory phase, validity and reliability, pilot study, and field work.

i. Preparatory phase:

It included reviewing the recent and relevant literature covering various aspect of the study problem using books, articles, periodicals, magazines and internet in order to be acquainted with various aspect of research problem and to develop the acquired tools for data collection.

ii. Tool contents validity and reliability:

- **Validity:**

The developed study tools were tested and evaluated for their validity and reliability by group of experts in community nursing department, faculty of nursing and Ain Shams University.

The experts' elicited regarding the format, layout, consistency, accuracy, relevance and reliability of the tool.

The developed tools were modified according to the experts' opinion. These modifications were in form of omission or addition of some questions or rephrasing some statements.

- **Reliability:**

Alpha Chronbach Test was used to measure the internal consistency of the tool used in current study.

The internal consistency was measured to identify the extent to which the items of the tools measured the same concept and correlated with each other. It is used to compute correlation value among questions Corn Bach's Alpha and its value was (0.84).

iii. Pilot Study:

A Pilot study involved 31pre-school child (10% of total sample size) to test the clarity and applicability of tools and determine the needed time. After analyzing the pilot study results, the necessary modifications were done. Finally the children involved in pilot study were excluded from the study sample.

iv. Fieldwork:

Upon obtaining the official permissions, actual fieldwork and data collection tool, the researcher started the fieldwork in November (2019) and it was completed by the end of April (2020).

The researcher was available three days/week (Sunday, Monday and Wednesday) in Elmenofeya University Hospital, Health insurance clinics, and special speech clinics and audio clinic.

The researcher interviewed individually the mothers who agreed to participate in the study. The researcher explained the aim and objectives of the study to each mother.

The purpose of the study was explained to each child and caregiver to gain their consents and cooperation before participation, they were informed about their rights to withdraw from the study at any time and the data collected from them will be just for research and kept confidentially, and will be used just for the purpose of the study.

The study tools were filled by researcher, and each child and mothers took 20-30 minutes to fill the tools at the end of work shift.

III. Administrative Design:

An official permission to carry out the study was obtained by submission of a formal letter issued from the Dean of Faculty of Nursing, Ain Shams University to the director of each of the previously mentioned settings to collect the necessary data for current study after a brief explanation of the purpose of the study and its expected outcomes.

Ethical considerations:

Ethical approval was obtained from the Scientific Research Ethical Committee of faculty of Nursing, Ain Shams University before starting the studying. In addition, oral concept was obtained from each participant who agreed to share in this study.

The participant was assured that anonymity and confidentiality and the right to withdraw from the study at any time would be guaranteed. Ethics, values, cultural background and believes were respected.

IV. Statistical Design

The collected data were organized, coded and statistically analyzed using appropriate Statistical tests. The statistical analysis of data was performed using the statistical Package for Social Studies (SPSS), version 20.0 (SPSS Inc..,

Chicago, Illinois, USA). Quantitative data were expressed as means and standard deviations. Qualitative data were expressed as frequency and percentage. The following tests were used: correlation coefficient test and chi- square (x^2) test of significance was used to compare proportions between two qualitative parameters.

Significance of results:

Significance of results was classified according to p-value for correlation coefficient, the following level was used:

- (R start from (0-1))> 0.5 considered insignificant.
- From 0.5≥0.7 is low significant.
- From 0.7≥0.8 is moderate significant.
- From 0.8- 1 is high.

Results:

Table (1): shows that, **49.7%** of preschool children range from **(5-6**) years old and **52.3%** were male. Additionally this table reveals that, **38.6%** of the studied children were the second child, and **55.5%** of them were going to nursery.

Table (2): shows that, **59.7%** of mothers were aged **≥30 years, 65.3%** of them were Secondary education. Additionally this table reveals that, **81.8%** of them were married, and **56.8%** of them had insufficient income. Also, **58.1%** of them not working.

Figure (1): Shows that more than half **(41.6%)** of the mothers had poor knowledge about hearing impairment.

Table (3): shows that: 36.4% of their mothers know the sign language while 46.4% of them learn sign language from mixing with older people with hearing impairment. Additionally, 41.1% of them had average proficient and understanding sign language.

Table (4): this table reveals that **38.6%** of the studied sample had average physical quality of life and **42.2%** of them had average social quality of life. In addition, **45.5%** of them had average psychological quality of life, and **45.1%** of them had average emotional quality of life. Finally, **42.9%** of the studied children had average quality of life.

Table (5): reveals that there was a positive correlation between children`s socio demographic data and their health problem.

Table (6): reveals that there was a positive correlation between mother's total knowledge and their total reported practice (r>0.8).

Table (7): reveals that there was a highly significant correlation between the health problem related to hearing impairment and the QOL.

Table (1): Distribution of the pre-school children with hearing impairment according to their socio-demographic characteristics (n=308).

Characteristics of Children	No	%
1-Age (years):		
3≤ ─ 4 years	77	25.0
4≤ ─ 5 years	78	25.3
5-6 years	153	**49.7**
X2 ±SD	4.2±1.8	
2-Gender:		
Female	147	47.7
Male	161	**52.3**
3- Child birth order:		
First	96	31.2
Second	119	**38.6**
Third	62	20.1
Fourth	31	10.1
4- The child goes to nursery		
Yes	171	**55.5**
Sometimes	69	22.5
No	68	22.0

Table (2): Distribution of mothers according to their socio-demographic characteristics (n=308).

Characteristics of mothers	No	%
1- mother age		
≤20 years	3	1.0
20≤25 years	29	9.4
25≤30 years	92	29.9
≥ 30 years	184	**59.7**
X2 ±SD	23.1±7.1	
Educational level:		
-Do not read or write	29	9.4
-Secondary education	201	**65.3**
-university education / more	78	25.3
Family's monthly income -		
-Sufficient	133	43.2
insufficient-	175	**56.8**
Social Status		
Widowed-	20	8.4
-Divorced	30	9.7
-Married	252	**81.8**
Occupation:		
Work	129	41.9
Not working	179	**58.1**
Number of family members:		
From 3 and less than 5 individuals	129	**41.9**
≥5 individuals	179	58.1

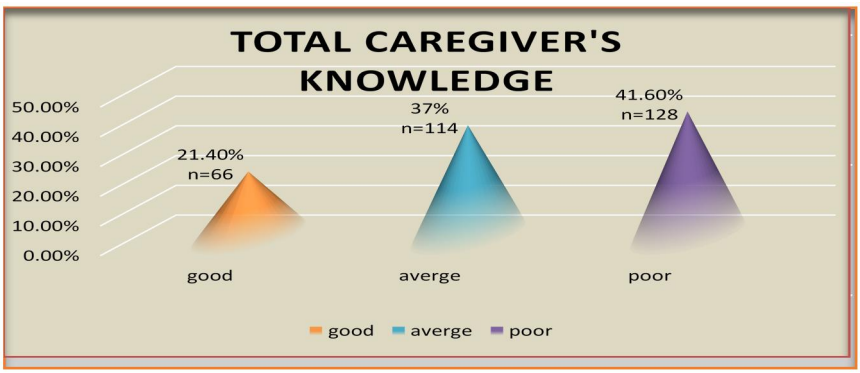

Figure (1): Frequency distribution of total the pre-school children with hearing impairment mother's according to their Knowledge about hearing impairment (n=308).

Table (3): Distribution of mothers of the studied children according to their communication with their children. (n=308).

A) Practices regarding communication	No	%
1- Recognizing the sign language		
Yes	112	36.4
No	196	63.6
A- learning sign language (n= 112)		
From a counselor and / or teacher for the deaf	18	16.0
Lessons through an adult education provider, or deaf organization	11	9.9
Instructions for using online video and resources	31	27.7
Mixing with older people with hearing impairment	52	46.4
B-Well do you know the sign language(n= 112)		
Good	23	20.5
Average	46	41.1
Poor	43	38.4
C- Understanding sign language(n= 112)		
Good	21	18.8
Average	46	41.1
Poor	45	40.1

Table (4): Distribution of preschool children with hearing impairment according to their total Level of quality of life (n=308).

Total Level of QOL (n=308)	Always (Good)		Sometimes (Average)		Never (Poor)	
	No	%	No	%	No	%
1) Physical Quality of life	98	31.8	119	**38.6**	91	29.6
2) Social Quality of life	101	32.8	130	**42.2**	77	25.0
3) Psychological Quality of life	67	21.8	140	**45.5**	101	32.7
4) Emotional Quality of life	75	24.4	139	**45.1**	94	30.5
Total QOL	85	27.6	132	**42.9**	91	29.5

Table (5): Relationships between demographic characteristics of pre-school children with hearing impairment and their hearing problems.

Hearing problems of pre-school children	Demographic characteristics of children			
	Age	Gender		Going to nursery
		Female	Male	
	R-Test	R-Test	R-Test	R-Test
Hearing problem affect your child's speech	0.91***	0.94	0.94**	0.91***
Child notice the loud noise	0. 85 ***	0. 86***	0. 82***	0. 87***
Result of the hearing test:-				
Medium	0.67*	0.69*	0.65*	0.93***
Weak	0.78**	0.85***	0.79**	0.74**
Very weak	0.83***	0.87***	0.81***	0.71**
Child notice when he is called by name	0.87***	0.87***	0.85***	0.87***
Child did not understand the orders	0.86***	0.83***	0.79**	0.88***

P value for correlation coefficient (r start from (0-1))> 0.5 considered insignificant-*0.5≥0.7 is low significant-From 0.7≥0.8 is moderate significant - and from 0.8- 1 is High
Based on research question No. 1

Table (6): Relationships between total level of mother's Knowledge of pre-school children and their practice regarding hearing, impairment.

Total level of mother's Practice for hearing impairment	Total	total level of mother's Knowledge about hearing impairment		r- Test
	No	Satisfy n=120	Un satisfy n=188	
Done	87	71	16	**0.88*** **
Not done	221	149	172	

***HS: 0.8-1 **MS: 0.7≥0.8 *S: 0.5≥0.7

Table (7): Relationships between hearing problems of pre-school children with hearing impairment and their total QOL.

Hearing problems of pre-school children	Total Level of QOL		
	High r-Test	**Moderate r-Test**	**Low r-Test**
Child notice the loud noise:- Yes	0.72**	-	
No			0.99***
Child notice when he is called by name:-			
Yes	0.96***	-	
No			0.98***
Result of the hearing test:- Medium	0.73**	-	-
Weak	-	-	0.81***
Very weak	-	-	**0.99*** **
hearing problem affect your child's speech:-			
Yes	0.87***	-	-
No	-	-	0.95***
Child understand the orders, even if he is not looking at the speaker:-			
Yes	0.99***	-	-
No	-	-	0.97***

***HS: 0.8-1 **MS:** 0.7≥0.8 ***S:** 0.5≥0.7

Based on research question no. 2

Discussion:

Hearing impairment is an invisible health condition with important implications on the individual's quality of life. Majority of individuals with disabling hearing impairment live either in low or middle-income countries. Hearing impairment, though substantially underestimated and under-treated is often a life-long disability that can cause profound damage to the development of speech, language, and cognitive skills in children depending on the severity and affected speech frequencies **(Jaiyeola, and Adeyemo, 2018).**

Since hearing, impairment deters the acquisition of language in addition to speech and cognitive skills in children, this disability pose a major difficulty during childhood. The Quality of Life (QoL) concept is important to understand children with hearing impairment because of the importance of communication and social participation in daily life. Hearing impairment can have a detrimental effect on the QOL of individuals in all domains **(Jaiyeola, and Adeyemo, 2018).**

Hearing impaired child finds it difficult to concentrate, cannot understand what is going on, has learning problems, and poor academic activities **(Adegbiji et al, 2018).**

Hearing impairment is an important public health concern with substantial economic and societal costs. In infants and children hearing impairment retards language development and educational progress **(Shuaibu et al., 2018).**

Socio- demographic characteristics of children and their mothers:

Regarding socio-demographic data of preschool children, the current study showed that, near to half of the studied children belonged to the age group (5-6 years), This result agreed with **Ajallouyan et al. (2016)** who studied **"**Consanguinity Among Parents of Iranian Deaf Children**"** and found that most of the studied children were in the age group of 5-6 years. In addition, this finding contradicted with **Dunmade et al. (2018)** who studied "Profound Bilateral Sensorineural Hearing Loss in Nigerian Children: Any Shift in Etiology?" and found that most of the studied children were in the age of 3 years.

Regarding the gender, the present study revealed that more than half of the studied children were male, This result agreed with **Zhang et al. (2020)** who studied **"**Quality of Life of Hearing-Impaired Middle School Students: a Cross-Sectional Study in Hubei Province, China**."** and found that more than half of the studied children were male. Also, this result contradicted with **Adegbiji et al. (2018)** who studied "Preschool Children Hearing Impairment: Prevalence, Diagnosis and Management in a Developing Country" and found that more than half of the studied children were female.

Regarding the going to nursery, the present study revealed that more than half of the studied children were going to nursery, this result agreed with **Akellot et al. (2019)** who studied **''**Association between parental involvement and academic achievement of deaf children at Mulago School for the deaf, Kampala, Uganda'' and found that most of the studied sample going to nursery.

In the current study, the characteristics of the studied children mothers, the study revealed that more than half of the studied children mothers their ages were more than 30 years**,** This result agreed with **Bakry et al. (2019)** who studied **"**Hearing loss-related knowledge and attitude toward neonatal hearing screening among Egyptian parents**"** and found more than half of the studied mothers were in the age group of 30-40 years.

Regarding the educational level, and social status, the present study revealed that more than third of the studied mothers had secondary education. Besides, majority of the mothers were married, This result supported by **Ramires et al. (2016)** who studied "Quality of life related factors for parents of children with hearing loss**"**. And found that two thirds of the studied mothers had secondary education, and most of the mothers were married. Also, this finding contradicted with **Graham et al. (2019)** who studied" Mapping the content of mothers' knowledge, attitude and practice towards universal newborn hearing screening for development of a KAP survey tool**"** and found that majority of the mothers were single and more than half of them had high school education.

Mothers Knowledge regarding hearing impairment:

Regarding the level of mother's knowledge about hearing impairment the present study revealed that near to half of the studied mothers had poor level of knowledge about hearing impairment (meaning & causes & signs and symptoms & early identification& early treatment) And this result supported by **Alsudays et al. (2020)** who studied **"**Parental knowledge and attitudes to childhood hearing loss and hearing services in Qassim, Saudi Arabia" and found that more than half of the studied sample had unsatisfactory level of knowledge about hearing impairment. In addition, this result contradicted with **Elbeltagy et al. (2019)** who studied "Hearing loss-related knowledge and attitude toward neonatal hearing screening among Egyptian parents" and found that more than half of the studied sample had satisfactory level of knowledge about hearing impairment.

The researcher views that most of the studied mothers didn't have enough knowledge about the hearing impairment to tack care of their children and prevent the complication so they need health teaching about causes& signs and symptoms & early identification& early treatment to avoid the possible complications.

Assessment of mother's practices regarding hearing impairment

Regarding the mother's recognition of the sign language the present study revealed that more than one third of the studied mothers know the sign language and near to half of them learned the sign language from mixing with older people with hearing impairment. This result agreed with **Akellot et al. (2019)** who studied "Association between parental involvement and academic achievement of deaf children at Mulago School for the deaf, Kampala, Uganda". And found that near to half of the studied sample know the sign language,

and less than two thirds of them learned the sign language from mixing with older people with hearing impairment. Also, this result contradicted with **Wanjiru, (2014)** who studied "Parental Attitudes towards Children with Hearing Impairment and Academic Performance: A Case of Kambui School for the Deaf, Githunguri District, Kiambu County, Kenya" and found that most of the studied mothers know the sign language.

The researcher views that most of the studied mothers didn't have good communication that improve their dealing and understanding of their children.

The Quality of Life for preschool children with hearing impairment regarding physical, social, psychological, and emotional aspects.

Regarding to the total quality of life of the preschool children with hearing impairment the present study revealed that less than half of the studied sample had average physical, social, psychological, and emotional quality of life. So the study revealed that the studied sample had average quality of life, this result agreed with by **Ramires et al. (2016)** who studied "Quality of life related factors for parents of children with hearing loss" and found that more than half of the studied sample had well or average quality of life.

Relationship between studied variables:

Regarding the relationship between demographic characteristics of pre-school children with hearing impairment and their hearing problems**,** the present study revealed that there was a positive correlation between children`s socio demographic data and their health problem, there is a highly significant relation between age, gender and type of the aiding device used (r>0.7*), and this result agreed with **Elbeltagy et al. (2019)** who studied **"**Hearing loss-related knowledge and attitude toward neonatal hearing screening among Egyptian parents" and found that there was a significant association between a child wearing a hearing aid and their age.

Regarding the relationship between demographic characteristics of pre-school children with hearing impairment and their hearing problems**,** the present study revealed that there was a positive correlation between gender and the child's speech problem, and this result disagree with **Shojaei et al. 2016** who studied "Effect of Early Intervention on Language Development in Hearing-Impaired Children" and found that no significant difference was seen between girls and boys in the speech development, showing that there is no effect of gender on language development of hearing-impaired children if they receive appropriate intervention.

Regarding the relationship between total level of knowledge among mothers and their practice regarding hearing, impairment**,** the present study revealed that there was a positive correlation between mother's total knowledge and their total reported practice. (r>0.8), and this result agreed with **Alsudays et al. (2020)** who studied **"**Parental knowledge and attitudes to childhood hearing loss and hearing services in Qassim, Saudi Arabia" and found that a significant association between attitude and knowledge ($p = 0.002$). Also this result disagree with **Elbeltagy et al. (2019)** who studied that Hearing loss-related knowledge and attitude toward neonatal hearing screening among Egyptian parents, and found that there was no significant association between knowledge and attitude ($p > 0.05$).

The researcher views that the satisfactory level of total knowledge was associated with a satisfactory level of total reported practice.

Regarding the relationship between hearing problems of pre-school children with hearing impairment and their total QOL**,** the present study revealed that there was a highly significant correlation between the health problem related to hearing impairment and the QOL. The children using hearing aid had high QOL(r>0.9***), and this result agreed with **Umansky et al. (2011)** who studied "The HEAR-QL: quality of life questionnaire for children with hearing loss" and found that hearing status and use of a device were

independently associated with the HEAR-QL, and the variables in the model accounted for 46% of the HEAR-QL total score variance. P<0.005 there is positive relation.

Conclusion:

On the light of the findings of the present study and research question, it can be concluded that:

- More than half of the studied preschool children were male.
- The majority of the studied preschool children had speech problem and did not notice the loud noise.
- More than two thirds of the studied preschool children's mothers had unsatisfactory knowledge about hearing impairment
- Less than one third of the children's mothers did the practice that improve the communication skills and their behavior.
- Near to half of the studied children had average Quality of life.
- There was significant relation between health problems of preschool children with hearing impairment and their quality of life
- There was significant relation between socio-demographic characteristics and health problems of preschool children with hearing impairment.

Recommendation:

- Health education program regarding the importance of early detection and early intervention of hearing impairment to prevent the complication.
- Health education program for mothers to improve the mother's knowledge and practices that improve the children communication skills and their behavior.
- Health education program regarding the importance of language training.
- Health education program regarding the importance of the national hearing screening program for newborn and children (preschool children and school children).

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