

## Assessment of Knowledge and Attitudes of Caregivers Regarding Hearing Impairment among Children at Minia City

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### Abstract

**Background:** Hearing impairment is a partial or total inability to hear. A deaf person has little to no hearing. Hearing loss may occur in one or both ears, it can affect the ability of children to learn spoken language. **Aim:** The study aimed to assess of knowledge and attitudes of caregivers regarding hearing impairment among children at Minia City. **Study design:** A cross sectional descriptive design used to conduct in this study. **Subject:** Random cluster sample of 268 caregivers. **Setting:** This study was carried out at Alamel School for the Deaf and Hearing impairment at Minia city. **Tools:** Two tools was utilized in this study, **first tool** was an interviewing structured questionnaires sheet was contained two parts: **Part 1:** Socio-demographic characteristics about caregivers and such as age, sex and residence. **Part II:** Assess caregivers' knowledge, about hearing impairment that includes definition, causes, symptoms, consequences and management of hearing impairment and **second tool** was attitude scale. **Results:** The results show that 86.5% of children suffer from hearing problem less than one year. Regarding knowledge about symptoms & signs, 58% of caregivers didn't know about screen test for early detection hearing loss. There is highly statistically significant difference as regard the level of caregiver's knowledge in relation to residence. There is positive attitude of caregiver regarding hearing impaired child can be manageable if helped and supported. **Conclusion:** More than half of caregiver didn't have enough knowledge about hearing impairment. There is highly statistically significant difference as regard the level of knowledge of caregiver's relation to residence, also there is positive attitude of caregiver regarding hearing impaired children. **Recommendations:** The study recommended providing health education for caregivers about hearing impairment among children at Minia city and investigating the effect of caregivers' knowledge about hearing impairment among children

**Keywords:** Knowledge, Attitudes, Caregivers, Hearing Impairment, Children

### Introduction

The senses have a major impact on the life of all organisms. They are responsible for the perception of the world around us; they help shape experiences and affect the ability to interact with the surroundings. Generally, life is richer with sharp and well-functioning senses, and their function is often taken for granted (Ze ng & Djalilian, 2010). Hearing loss is the most common sensory defect in humans. According to the World Health Organization, over 270 million people worldwide have moderate to profound hearing loss, with one fourth of these cases beginning in childhood. In most cases, hearing loss is a multifactorial disorder caused by both genetic and environmental factors (Kim et al., 2010).

Disabling hearing loss refers to hearing loss greater than 40 decibels in the better hearing ear in adults and a hearing loss greater than 30decibels in the better hearing ear in children. The overall development of a child is determined on how healthy a child is. It determines child ability to acquire knowledge and skill, though there are various reasons, a child is to be labeled as challenged, one of the most important reason is disruptive functioning of the five basic senses (to see, to hear, to smell, touch and to taste) (Ferrite et al., 2017).

Deafness is not simply the deprivation of sound. It is rather deprivation of language. Even this view is considered to be narrow at present. It is now believed that hearing impairments of a very mild and episodic kind do much more than interfere with what children can hear of the language around them. Hearing impairment affects not only the language development of the child but also many aspects of the child's social, emotional and educational development. When there is a more sever sensor neural loss, early social interactions between the parents and the child are disrupted.

These early stages are crucial to later language development (Reddy, 2010).

Permanent childhood hearing impairment is best identified through newborn hearing screening programs. Early identification and effective management of hearing loss optimizes outcomes. It was making sound audible from the first months of life through hearing aids. It is possible to harness auditory plasticity and maximize lifetime auditory potential. Infants with profound hearing loss or auditory neuropathy the option of cochlear implantation may give improved hearing for speech, typically at around 12 months of age. The onus of responsibility for using hearing aids and providing a suitable sound environment for the child falls on the parents (Marriage et al., 2017).

The National Dissemination Center for Children with Disabilities (NICHCY) explains that hearing loss falls into four subcategories: conductive, sensor neural, mixed and central. These identify the location in the body in which the hearing impairment occurs (Johnson, 2017). Hearing loss is categorized as slight, mild, moderate, severe or profound, depending on how well an individual can hear the frequencies that are commonly associated with speech (Carew et al., 2018).

Possible causes of congenital hearing loss such as infections during pregnancy (German measles, toxoplasmosis and cytomegalovirus), ototoxic medication used during pregnancy, and disorder of the brain or nervous system. Possible causes of acquired hearing loss such as untreated middle-ear infections, perforation of the eardrum, and serious injury to the head (Meiklejohn et al., 2015).

Caregivers have a primary role in communicating with and offering care to residents of long-term elder care facilities. It is therefore important that they have the necessary knowledge, attitudes and behaviors to provide quality care to

residents, also the decisions taken by them depend on their knowledge and attitude. Positive attitudes and interactions between caregivers and residents have been reported to improve residents' quality of life and their psychological and social well-being (Sorin-Peters et al., 2010). Attitude means manner effective communication despite the loss of normal hearing (Cole & Flexer, 2015).

The community health nurse may assess for the presence of a hearing impairment and refer the client for audio logical evaluation and treatment. The nurse provides support, counseling, and advice on locating affordable resources (e.g., funding for a hearing aid that is not covered by Medicare) and securing appropriate intervention (Smith, 2013)

### Significance of the study

According to the last update of the WHO, (2017) 360 million people worldwide, equaling 5% of the world's population, have a disabling hearing loss (328 million adults and 32 million children). Most of these people live in low-income and middle-income countries where treatments for hearing loss are more difficult to obtain and consanguinity increases the risk of recessive disease (Mahmoud et al., 2016 & Diwan, 2017).

In Egypt, there have been no national surveys on the prevalence of hearing loss and deafness and there are few hospital-based academic studies that give an idea about the magnitude of the problem (Cohen, 2014). 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

The aim of this study was to assess of knowledge and attitudes of caregivers regarding hearing impairment among children at Minia City

### Research questions

- Are there a relationship between caregivers' socio-demographic and their knowledge regarding hearing impairment?
- Are there a relationship between caregivers' knowledge and attitudes regarding hearing impairment?

### Subject and Methods

#### Research Design:

A descriptive design was used to conduct this study.

#### Setting:

- This study was conducted at Alamel School for the Deaf and Hearing impairment at Minia city beside Minia University Hospital. Alamel School is a governmental school followed to the Ministry of Education. It serves all districts of Minia Governorate, student age in entering school from 6yrs to 12yrs with hearing impairment degree 70db, it contains primary school, preparatory school and secondary. It contains 75 teachers, 2 social teachers and one school Bachelor nurse

#### Subjects:

Selected random sample of 226 caregivers were recruited, 26 of them were in pilot study and were excluded from sample.

#### Inclusion criteria:

- All caregiver who were cooperative and their deaf children.

#### Exclusion criteria:

- Caregivers' who were refuse to participate in this study.

#### Data collection Tools

- The data were collected using the following tools:

**First tool: Interviewing questionnaire**, it was containing two parts as the following:

1. Socio demographic data of the caregivers: - Caregiver socio demographic question; it was used to assess socio-demographic characteristics it consisted of question such as age, sex, education, marital status, occupation.... etc.
2. Knowledge regarding hearing impairment: Knowledge was assessed via 23 questions; it was used to assess general knowledge, symptoms, diagnosis, risk factors, complication, management, prevention and treatment.

#### Second tool: Attitude scale

It was used to assess caregiver's attitudes regarding children with hearing impairment by using attitude scale. It was adopted from Oketch (1982) and modified to suit the situation in Egypt. It was consist of twenty four items, used to find out attitudes of caregivers .it measures feelings, beliefs and behavior of caregivers towards children with hearing impairment.

#### Validity of the tool:

The tool was submitted to a jury of 5 experts in the field of community health from faculty of nursing at Minia Universities and Ain-shams Universities. Tool content validity was done to identify the degree to which tools supposed to be measured. The tools were examined for content coverage, sequence of items, clarity relevance, applicability, wording, length, format, and overall appearance. Some modification was done.

#### Reliability of the tool:

Reliability of the tool was performed to confirm consistency of tool. The internal consistency measured to identify the extent to which the items of the tool measured what it was intended to measure. Internal consistency of the tool was assessed with the Cronbach's alpha coefficient. Cronbach's alpha coefficient of 0.00 indicates no reliability and a coefficient of 1.00 indicates perfect reliability. However, a reliability coefficient of 0.70 is acceptable. The internal consistency was assessed and showed 84% reliability rate by using cronbach's Alpha test.

#### Ethical Consideration

Permission from ethical committee of the faculty of nursing to conducted the study. Approval from the director of Alamel School for the Deaf and Hearing impairment was

taken. Oral consent was taken to be included in the study subject. Before carrying out the study the investigator was clarify the aim of the study and its expected outcomes.

**Administrative design**

Before starting data collection, two(2) formal letters were issued from faculty of nursing, Minia University to directorate of education in Minia governorate, then to the director of Alamel School the Deaf and Hearing impairment to gain the administrative approval. The aim and importance of the study were explained at first.

**The Preparatory Phase:**

A review of the past and current local and international related literature including book, articles, and magazines was done to collect data about knowledge of hearing impairment including definition, causes, diagnosis, treatment, prevention, and attitude of caregivers regarding child impairment.

**Pilot Study:**

The pilot study was conducted before starting actual data collection. It was done on 26 participants (10%) to investigate and ensure the feasibility, objectivity, applicability, clarity and adequacy of the study tools and to determine possible problems in the methodological approach. The results of the pilot study used to test the proposed statistical and data analysis methods. The tools were completed without difficulty, adding support to the validity of the instrument. The pilot study sample was excluded from the main study sample. The necessary

correction and modification were carried out, also revealed that the questionnaire takes 25 minutes to be filled out by investigator.

**Field Work:**

Data were collected within three months from beginning of October to end of the December 2018, six sheet/day and two days/week at official school time from 8Am: 12Pm. The investigator met participants and they were interviewed in their schools at times that were convenient for them. The time spent to fill the questionnaire ranged between 25 minutes according to the needed explanation. Measures were taken to protect ethical rights of participant.

**Statistical Design:**

The collected data were coded, categorized, tabulated, and analyzed using the Statistical Package for the Social Science (SPSS 20.0). Data were presented using descriptive statistics in the form of percentages, frequency, mean and standard deviation. Inferential statistical tests of significance such as chi squared, Pearson correlation, and student t test were used to identify group differences and the relations among the study variables. Level of significance < 0.05 was used as the cut off value for statistical significance.

**Limitation of the study**

- Lack of caregivers □ cooperative  
Some caregivers" unwilling to participate in the study

**Results**

**Table 1: Demographic and baseline characteristics of study participants (n=200)**

Characteristics of the caregiver	No.	%
<b>The main caregiver</b>		
• Parents	191	95.5
• Others	9	4.5
<b>Age</b>		
• < 30 years	68	34
• 30-40 years	91	45.5
• □ 40 years	41	20.5
<b>Gender</b>		
• Male	8	4
• Female	192	96
<b>Consanguinity between parents</b>		
• Absent	55	27.5
• 1st degree relatives	106	53
• 2nd degree relatives	39	19.5
<b>Marital status</b>		
• Married	188	94
• Divorced	6	3
• Widowed	6	3
<b>Residence</b>		
• Urban	26	13
• Rural	174	87
<b>Educational level</b>		
• Illiterate	107	53.5
• Basic education	19	9.5
• Secondary education	50	25
• University level	24	12
<b>Occupation</b>		

Characteristics of the caregiver	No.	%
● Housewife	149	74.5
● Free workers	13	6.5
● Clerical	12	6
● Professional	26	13

Table (1) shows demographic and baseline characteristics of caregivers. The majority of the sample 95.5% are parents, less than half 45.5% of caregivers aged 30- 40years, 53% of them are first degree relatives. Regarding educational level, 53.5% are illiterate; also 74.5% of them are not working or housewife

Table 2: percentage distribution of caregivers' knowledge about hearing loss (n=200)

Questions	Correct Answer		Incorrect Answer		Don't know	
	N	(%)	N	(%)	N	(%)
<b>General Knowledge</b>						
1. Do you know that hearing impairment, also known as hearing loss?	41	(20.5)	57	(28.5)	102	(51)
2. Do you know that hearing impairment may be complete or partial?	52	(26)	33	(16.5)	115	(57.5)
3. Do you know that hearing impairment have degrees?	53	(26.5)	31	(15.5)	116	(58)
4. Do you know that ear wax prevent foreign body to enter the ear?	143	(71.5)	36	(18)	21	(10.5)
<b>Knowledge of symptoms and signs</b>						
5.a. Child does not move toward around voice	21	(10.5)	49	(24.5)	130	(65)
5.b. Lack of interest in the speech addressed to him	7	(3.5)	43	(21.5)	150	(75)
5.c. Presence of secretions outer the ear	111	(55.5)	80	(40)	9	(4.5)
5.d. Feeling of pain in the ear	167	(83.5)	28	(14)	5	(2.5)
5.e. Delaying in speaking	60	(30)	138	(69)	2	(1)
<b>Knowledge of early detection</b>						
6. Do you know about hearing screening test after birth?	49	(24.5)	34	(17)	117	(58.5)
<b>Knowledge of risk factors for child hearing loss</b>						
7.a. Head injuries and falls/excessive noise	69	(34.5)	57	(28.5)	74	(37)
7.b. Untreated ear infection	99	(49.5)	14	(7)	87	(43.5)
7.c. Excessive use of antibiotic/ototoxic drugs	135	(67.5)	16	(8)	49	(24.5)
7.d. Wax accumulation	30	(15)	118	(59)	52	(26)
7.e. complications resulting from infectious diseases	52	(26)	18	(9)	130	(65)
7.f. Maternal causes during pregnancy	191	(95.5)	6	(3)	3	(1.5)
7.g. Congenital	120	(60)	43	(21.5)	37	(18.5)
<b>Knowledge of preventive measures</b>						
8.a. washing of ear protect from hearing impairment of children	133	(66.5)	30	(15)	37	(18.5)
8.b. Women vaccinated against rubella before pregnancy protect from causing fetus hearing impairment	17	(8.5)	34	(17)	149	(74.5)
8.c. Children vaccination against children disease such as measles, rubella and mumps protect children from hearing impairment?	31	(15.5)	33	(16.5)	136	(68)
<b>Knowledge of treatment measures</b>						
9.a. There is medicine available to treat hearing loss in children	168	(84)	19	(9.5)	13	(6.5)
9.b. Cochlear implant help treat hearing impairment of children via knowing and discrimination of voices	164	(82)	21	(10.5)	15	(7.5)
9.c. Early treatment of hearing impairment in children lead to better results	123	(61.5)	39	(19.5)	38	(19)

Table (2) shows that there was lack of general knowledge regarding hearing loss. About one quarter of caregiver know that hearing loss may be partial or complete and there were degrees of impairment (26%) & (26.5%) respectively. About 72% from them know that ear wax prevents foreign body to enter the ear.

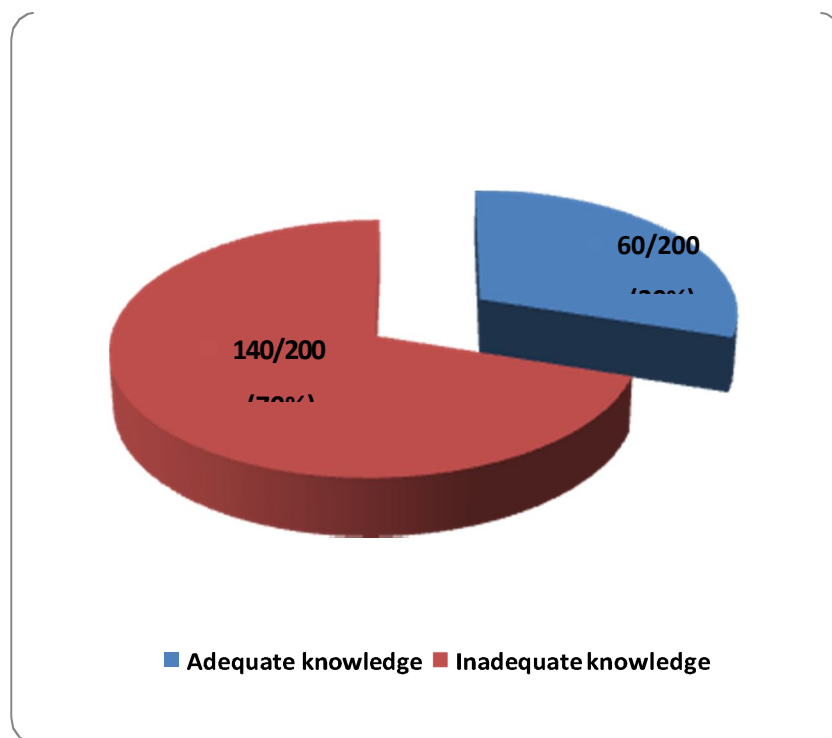
Regarding knowledge about symptoms & signs, feeling of pain in ears was the most frequently known symptoms (83%) followed by presence of secretions (55.5%). More than half of caregiver (58%) did not know about screen test for early detection hearing loss. Considerable portion of caregivers know about the common risk factors of hearing loss. The majority (95.5%) of the sample know about the maternal causes during pregnancy and (67.5) know about excessive use of antibiotic & ototoxic drugs as a risk factor of hearing loss. However, more than two thirds (68.5%) of caregiver did not know about the preventive measures to guard against hearing loss. As regard available treatment of hearing loss (HL) 84% of caregiver knows medicine available to treat hearing loss in children

Table 3: Relation between knowledge score and characteristics of caregivers (n=200)

Characteristics of the caregiver	Mean knowledge score Mean ± SD	P value
<b>The main caregiver</b>		
● Parents	9.76±2.93	0.9
● Others	9.78±2.81	
<b>Age</b>		
● < 30 years	10.47± 2.63	

Characteristics of the caregiver	Mean knowledge score Mean ± SD	P value
• 30-40 years	9.43± 2.97	0.05
• □ 40 years	9.29 ±3.11	
<b>Gender</b>		
• Male	10.0± 3.85	0.8
• Female	9.75 ±2.89	
<b>Marital status</b>		
• Married	9.77 ± 2.98	0.8
• Divorced	9.50 ± 2.07	
• Widowed	9.50 ± 1.87	
<b>Residence</b>		
• Urban	11.85± 3.30	0.0001*
• Rural	9.44 ±2.74	
<b>Educational level</b>		
• Illiterate	8.84 ±2.89	0.0001*
• Basic education	10.42 ± 2.26	
• Secondary education	9.84± 2.32	
• University level	13.16± 1.88	
<b>Occupation</b>		
• Not working/housewife	9.26 ±2.62	0.0001*
• Free workers	7.30 ±2.17	
• Clerical	11.33 ±3.05	
• Professional	13.11 ± 1.86	

**Table (3)** Regarding the mean knowledge score, the table above shows that urban caregiver, University and Professional have higher significant mean knowledge scores (11.85± 3.30), (13.16 ±1.88) and (13.11 ±1.86) respectively than rural, illiterate and free workers (9.44± 2.74),( 8.84± 2.89) and (7.30± 2.17),respectively .As regard gender and marital status there are no significant differences



**Figure (1)** Grades of knowledge among caregivers (n=200)

**Figure (1)** shows that (70%) of caregivers have adequate knowledge and (30%) of them has inadequate knowledge about hearing loss

**Table 4: frequency distribution of caregivers' attitude towards children with hearing impairment (n=200)**

Questions	SA		Agree		U		D		SD	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
<b>Domains of positive attitude</b>										
1. Believe that a hearing impaired child can be useful if helped and supported.	143	(71.5)	57	(28.5)	0	(0)	0	(0)	0	(0)
2. Believe taking care of a hearing impaired child is a blessing	90	(45)	110	(55)	0	(0)	0	(0)	0	(0)
3. Believe that it is my responsibility to take care of my hearing impaired child	79	(39.5)	121	(60)	0	(0)	0	(0)	0	(0)
4. Desiring in treating hearing impaired of my child.	87	(43.5)	113	(56.5)	0	(0)	0	(0)	0	(0)
5. Feel motivated when I see my hearing impaired child.	86	(43)	109	(57)	0	(0)	0	(0)	0	(0)
6. Feel happy with my hearing impaired child.	118	(59)	82	(41)	0	(0)	0	(0)	0	(0)
7. Love my hearing impaired child.	111	(55.5)	89	(44.5)	0	(0)	0	(0)	0	(0)
8. Feel important when taking my hearing impaired child to school	104	(52)	96	(48)	0	(0)	0	(0)	0	(0)
9. Provide everything that my hearing impaired child needs	77	(38.5)	123	(61.5)	0	(0)	0	(0)	0	(0)
10. Protect my hearing impaired child.	94	(47)	106	(53)	0	(0)	0	(0)	0	(0)
11. Play a lot with my hearing impaired child.	72	(36)	128	(64)	0	(0)	0	(0)	0	(0)
12. I am always there for my hearing impaired child.	61	(30.5)	138	(69)	0	(0)	0	(0)	0	(0)
13. Accept that my child has a hearing impairment	46	(23)	154	(77)	0	(0)	0	(0)	0	(0)
14. Do not except my hearing impaired child from the duties, tasks or from obedience properly demanded from all other children	20	(10)	178	(89)	1	(0.5)	1	(0.5)	0	(0)

**Table 4 (Cont): frequency distribution of caregivers' attitude towards children with hearing impairment (n=200)**

Questions	Strongly agree		Agree		Uncertain		Disagree		Strongly disagree	
	No	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
<b>Domains of negative attitude</b>										
1. Hearing impairment is punishment by God.	0	(0)	4	(2)	0	(0)	0	(0)	196	(98)
2. Hearing impairment is a result of witchcraft.	0	(0)	5	(2.5)	0	(0)	0	(0)	195	(97.5)
3. Believe that a hearing impaired child is not a burden	3	(1.5)	3	(1.5)	0	(0)	34	(17)	160	(80)
4. Feel sad when I see my hearing impaired child.	0	(0)	10	(5)	1	(0.5)	121	(60.5)	68	(34)
5. Feel guilty when I see my hearing impaired child	2	(10)	9	(4.5)	1	(0.5)	127	(63.5)	61	(30.5)
6. Do not show impatience to my hearing impaired child.	88	(44)	112	(56)	0	(0)	0	(0)	0	(0)
7. Felt confused when I learnt that my child was hearing impaired	96	(48)	104	(52)	0	(0)	0	(0)	0	(0)
8. Get isolated because of my hearing impaired child	0	(0)	22	(11)	1	(0.5)	120	(60)	57	(28.5)
9. Get bothered by my hearing impaired child's activities.	0	(0)	1	(0.5)	0	(0)	131	(65.5)	68	(34)
10. Don't like visiting my hearing impaired child in school.	0	(0)	7	(3.5)	0	(0)	0	(0)	193	(96.5)
Attitude score (mean ± SD)	<b>92.0±3.4</b>									

**Table (4)** shows attitude of caregiver which include positive attitude and negative attitude towards children with hearing impairment. Regarding to positive attitude 71.5% of caregiver reported that hearing impaired child can be manageable if helped and supported, 45% of caregiver agreed that taking care of a hearing impaired child is a blessing. Also, 77% of caregiver accepts their hearing impaired child. Also 89% of caregiver not except their hearing impaired child from the duties, tasks obedience properly demanded from all other children

Domains of negative attitude the majority (98%) of caregiver in favor to strongly disagreed that hearing impairment is punishment by God, 97.5% of caregiver strongly disagreed that hearing impairment is a result of witchcraft and 80% of caregiver strongly disagreed that a hearing impaired child is not a burden. Also 52% of caregiver agree with felt confused when they learnt that their child was hearing impaired ,60% of them disagreed about get isolated because of their hearing impaired child ,65.5% of caregiver disagreed that get bothered by my hearing impaired child's activities.

**Table 5: Relation between attitude score and characteristics of caregivers (n=200)**

Characteristics of the caregiver	Mean attitude score Mean±SD	P value
<b>The main caregiver</b>		
● Parents	92.05±3.48	0.9
● Others	91.89±2.20	
<b>Age</b>		
● < 30 years	91.42 ± 3.44	0.2
● 30-40 years	92.18 ± 3.72	
● □ 40 years	92.53 ± 2.56	
<b>Gender</b>		
● Male	89.88 ± 4.85	0.07
● Female	92.09 ±3.34	
<b>Marital status</b>		
● Married	92.14±3.32	0.002*
● Divorced	87.16 ±4.40	
● Widowed	92.50± 2.51	
<b>Residence</b>		
● Urban	92.07±3.19	0.9
● Rural	91.99±3.47	
<b>Educational level</b>		
● Illiterate	91.99 ± 3.57	0.3
● Basic education	92.05 ±2.74	
● Secondary education	91.50 ± 3.32	
● University level	93.04 ±3.45	
<b>Occupation</b>		
● Not working/housewife	92.04±3.32	0.09
● Free workers	91.30 ± 5.20	
● Clerical	90.08±1.73	
● Professional	92.96±3.79	

**Table (5)** shown that there are statistical difference between attitude and marital status with (p=0.002), also there are no statistical difference between socio demographic characteristics (the main caregiver, age, gender, residence, educational level and occupation) and attitude

**Table 6: Relation between level of knowledge and attitude score among study participants regarding children with hearing impairment (n=200)**

Attitude score Mean±SD	Knowledge		P value
	Adequate 92.01±2.6	Inadequate 91.9±3.7	
			0.9

**Table (6)** shows that there are no significant differences between attitude and knowledge score of both participants who have adequate & inadequate knowledge.

**Discussion**

Hearing impairment is a partial or total inability to hear. A deaf person has little to no hearing. Hearing loss may occur in one or both ears. In children hearing problems can affect the ability to learn spoken language and in adults it can cause work related difficulties. In some children, hearing loss can result in loneliness. Hearing loss can be temporary or permanent (**Bjorklund & Causey, 2017**).

Regarding demographic characteristics of the participants of caregivers, the current study revealed that majority (95.5%) of the caregivers were parents and less than half (45.5%) of them had from 30 to 40 years old, more than half (53%) of them of them were first degree relatives. Regarding educational level, more than half (53.3%) of the participants were illiterate and nearly three quarters (74.5%) of them were not working or housewife.

This results are in agreement with the study done by **Aras et al., (2014)** who studied “Health related quality of life in parents of children with speech and hearing impairment”

and found that majority of the caregivers were first degree relatives and having not working. In the same line, this result is congruent with **Stevenson et al., (2015)** who studied “emotional and behavioral difficulties in children and adolescents with hearing impairment” and found that more than half of the caregivers were illiterates and their ages ranged from 30 to 50years old

Regarding caregivers’ knowledge about hearing impairment, the current study revealed that more than half of caregiver didn’t know the concept of hearing impairment and its degree as (51% & 57.5% respectively) while more than two thirds (71.5%) of them know that ear wax prevent foreign body to enter the ear, from the researcher point of view this finding may be related to more than half of the sample are illiterate.

These findings are congruent with the study done by **Ravi et al., (2016)** who studied “knowledge and attitude of parents/caregivers towards hearing loss and screening in newborns—a systematic review” and found that more than half

of caregivers didn't have enough knowledge about hearing impairment. The other hand, the current study results are in disagreement with the study done by **Crowe et al., (2014)** who studied "speech, sign, or multilingualism for children with hearing loss" and stated that majority of caregivers didn't know the importance of ear wax for preventing foreign body to enter the ear. This may be due to changing massage of beliefs awareness by self or by others.

Regarding caregivers' knowledge about signs and symptoms of hearing impairment, the current study revealed that around two thirds of caregiver didn't know signs and symptoms of hearing impairment such as movement toward around voices and lack of interest in the speech addressed to him as (65% & 75% respectively), more than half (58.5%) of them didn't know about hearing screening test after birth, from the researcher point of view this finding may be related to the family don't explore hearing impairment through first year after birth.

The present study results are similar to the study done by **Narayansamy et al., (2014)** who studied "Knowledge and beliefs about ear and hearing health among mothers of young children in a rural community in South India." found that more than half of the participants didn't know manifestations of hearing impairment. On contrary, study is in disagreement with **Crowe et al., (2014)** who studied "Part of our world": Influences on caregiver decisions about communication choices for children with hearing loss" and stated that nearly half of the participants know signs and symptoms of hearing impairment and able to discover it easily. This may be due to the changing level of knowledge among different personnel

Regarding caregivers' knowledge about risk factors of hearing impairment, the current study revealed that more than two thirds (67.5%) of caregiver know that excessive use of antibiotic/ototoxic drugs considered risk factors of hearing loss (HI) and majority (95.5%) of them know that maternal causes during pregnancy, from the researcher point of view this finding may be related to this causes are most familiar to most people.

This results are in accordance with **Justice et al., (2018)** who studied "Increasing caregivers' adherence to an early- literacy intervention improves the print knowledge of children with language impairment" stated that more than two thirds of the participants didn't know risk factors of hearing impairment. This study is in the same line with the study done by **Ambrose et al., (2015)** who studied "Quantity and quality of caregivers' linguistic input to 18- month and 3-year-old children who are hard of hearing" stated that 64.3% of the participants have enough knowledge about risk factors of hearing impairment such as antibiotics and maternal causes during pregnancy

Regarding caregivers' knowledge about preventive measure of hearing impairment, the current study revealed that about two thirds (66.5%) of caregiver give correct answer about washing of ear protect from hearing impairment of children while more than two thirds (68%) of them didn't know that women vaccinated against rubella before pregnancy protect from causing fetus hearing impairment and children vaccinated against children disease such as measles, rubella and mumps protect children from hearing impairment, from the researcher point of view this finding may be related to more than half of the sample are illiterate.

In the same line this result is in agreement with the study done by **Mukara et al., (2017)** who studied "Knowledge and care seeking practices for ear infections

among parents of fewer than five children in Kigali, Rwanda" and indicated that more than half of the participants know the importance of washing ears in preventing hearing impairment. Also, this result is in congruence with the study done by **Ravi et al., (2016)** who studied "Knowledge and attitude (KA) survey regarding infant hearing loss in Karnataka, India" and found that more than half of the participants know that vaccination against children's disease such as rubella and mumps protect children from hearing impairment

Regarding caregivers' knowledge about treatment of hearing impairment, the current study revealed that majority of caregiver knows that there are available medications for treatment of hearing loss in children, cochlear implant help treat hearing impairment of children via knowing and discrimination of voices, and early treatment of hearing impairment in children lead to better results as 84%, 82% & 61.5% respectively).

The current study results in the same line, this result is congruent with the study done by **Bush et al., (2017)** studied "Promotion of early pediatric hearing detection through patient navigation" who found that majority of the participants know that hearing impairment can be controlled using medication and updated techniques that help hearing impaired children. Also, these results are in the same line with **Stevenson et al., (2015)** who studied "Emotional and behavioral difficulties in children and adolescents with hearing impairment" stated that 75% of the participants reported understanding the available treatment of hearing impairment.

Regarding the relation between caregivers' knowledge about hearing impairment and their demographic characteristics, the current study revealed that urban caregiver, university level education, and professional workers have higher mean knowledge scores than rural, illiterate, and free working/housewife. There no significant relation between caregivers knowledge and their gender and marital status.

This result is in agreement with the study done **Scarinci et al., (2018)** who studied "The parents' perspective of the early diagnostic period of their child with hearing loss", stated that there is a statistically significant relation between participants' knowledge about hearing impairment and their residence and level of education. Also, this result is congruent with **Mukara et al., (2017)** who studied "Knowledge and care seeking practices for ear infections among parents of fewer than five children in Kigali, Rwanda" stated that there is no statistically significant relation between participants' knowledge about hearing impairment and marital status

Regarding caregivers' attitude toward care of hearing impaired children, the current study revealed that more than two thirds (71.5%) of caregiver reported that hearing impaired child can be useful if helped and supported. More than half of caregiver agreed that taking care of a hearing impaired child is a blessing, having the desire to care, taking the responsibility to take care of hearing impaired child, feel happy and motivated, protect their hearing impaired child, and play a lot with their hearing impaired child, from the researcher point of view this finding may be related the caregivers feel with empathy to the children's have hearing impairment.

In the same line, the current study is in agreement with **Ravi et al., (2016)** who studied "Knowledge and attitude (K & A) survey regarding infant hearing loss in Karnataka" stated that more than two thirds of the participants have positive attitude regarding care of hearing impaired children and less than one third of them have negative attitude.



Regarding negative attitude domains, the current study revealed that majority of caregiver strongly disagreed that hearing impairment is punishment by God and disagreed that it is a result of witchcraft as (98% & 97.5% respectively). More than half of them reported feeling of confusion when they learnt that their child was hearing impaired and disagreed on getting isolated because of their hearing impaired child as (52% & 60%), from the researcher point of view this finding may be related the caregivers' religious.

This result is in disagreement with the study done by **Nabors et al., (2016)** that studied "Predictors of flourishing among children with hearing loss" and stated that feeling confused and punished by God is the main negative emotional effects of hearing impairment. Also, this result is congruent with the study done by **Crowe et al., (2014)** who studied "Speech, sign, or multilingualism for children with hearing loss" and found that nearly half of the participants have negative attitude regarding care of hearing impaired children.

Regarding the relation between level of knowledge and attitude scores among caregivers of children with hearing impairment, the current study revealed that there is no statistically significant relation between caregivers' level of knowledge and their attitude scores toward children with hearing impairment

In the same line, this result is in agreement with the study done **Stevenson et al., (2015)** who studied "Emotional and behavioral difficulties in children and adolescents with hearing impairment" and stated that there is no statistically significant relation between participants' knowledge about hearing impairment and their attitude. Also, this result is congruent with **Mukara et al., (2017)** who studied "Knowledge and care seeking practices for ear infections among parents of fewer than five children in Kigali, Rwanda" and stated that there is a highly statistically significant relation between participants' knowledge about hearing impairment and their attitude.

## Conclusion

**Based on the finding of the present study, it can be concluded that:**

The majority of children suffer from hearing problem less than one year. More than half of caregivers did not know about symptoms & signs of screen test for early detection hearing loss. Regard mean knowledge score among urban, illiterate, free workers and professional education have higher significance difference than rural, also there was no significant difference between attitude and knowledge score for both participants who have adequate and in adequate knowledge.

## Recommendation

### The current study recommended that

- Providing health education for family caregivers through strengthens immunization programs to prevent hearing impairment, which is a complication of infectious diseases, such as congenital rubella, meningitis, mumps, and measles.
- Investigating the effect of caregivers' knowledge about hearing impairment among children
- Investigating the effect of caregivers' attitude about hearing impairment among children

Continuous supervision of maternal and neonatal care by the ministry of health and population.

Periodic hearing screening for early identification should be done for children before 6 months of age

## References

1. Ambrose, S. E., Walker, E. A., Unflat-Berry, L. M., Oleson, J. J., & Moeller, M. P. (2015). Quantity and quality of caregivers' linguistic input to 18-month and 3-year-old children who are hard of hearing. *Ear and Hearing*, 36(0 1), 48S.
2. Aras, I., Stevanović, R., Vlahović, S., Stevanović, S., Kolarić, B., & Kondić, L. (2014). Health related quality of life in parents of children with speech and hearing impairment. *International journal of pediatric otorhinolaryngology*, 78(2), 323-329.
3. Bjorklund, D. F., & Causey, K. B. (2017). *Children's thinking: Cognitive development and individual differences*. Sage Publications.
4. Bush, M. L., Taylor, Z. R., Noblitt, B., Shackelford, T., Gal, T. J., Shinn, J. B., ...& Studts, C. R. (2017). Promotion of early pediatric hearing detection through patient navigation: a randomized controlled clinical trial. *The Laryngoscope*, 127, S1-S13.
5. Carew, P., Mensah, F. K., Rance, G., Flynn, T., Poulakis, Z., & Wake, M. (2018). Mild-moderate congenital hearing loss: secular trends in outcomes across four systems of detection. *Child: care, health and development*, 44(1), 71-82.
6. Cole, E. B., & Flexer, C. (2015). *Children with hearing loss: Developing listening and talking, birth to six*: Plural Publishing.
7. Cohen, B. E., Durstenfeld, A., & Roehm, P. C. (2014). Viral causes of hearing loss: a review for hearing health professionals. *Trends in hearing*, 18, 2331216514541361.
8. Crowe, K., Fordham, L., McLeod, S., & Ching, T. Y. (2014). „Part of our world“ : Influences on caregiver decisions about communication choices for children with hearing loss. *Deafness & Education International*, 16(2), 61-85.
9. Diwan, S. (2017). Readability ease of online hearing related information in Hindi.
10. Ferrite, S., Mactaggart, I., Kuper, H., Oye, J., & Polack, S. (2017). Prevalence and
11. causes of hearing impairment in Fundong Health District, North- West Cameroon. *Tropical medicine & international health*, 22(4), 485-492
- 12.
13. Johnson, A. (2017). Readability and quality of web-based information related to noise-induced hearing impairment.
14. Justice, L. M., Chen, J., Tambyraja, S., & Logan, J. (2018). Increasing caregivers' adherence to an early- literacy intervention improves the print knowledge of children with language impairment. *Journal of autism and developmental disorders*, 48(12), 4179-4192.
15. Kim, E. B., Susan, M. B., Scott, B., & Heddwen, L. B. (2010). *Ganong's review of medical physiology*. McGraw-Hill Companies; p.213.
16. Mahmoud, R., Shabana, M. I., Seleit, A. M., El- hamshary, A. A. S., & Hosni, N. A. (2016). School-based hearing screening program in children, four to seven years old, Quesnay City, Minufia, Egypt. *Advanced Arab Academy of Audio-Vestibology Journal*, 3(2), 35.
17. Marriage, J., Brown, T. H., & Austin, N. (2017). Hearing impairment in children. *Paediatrics and Child Health*, 27(10), 441-446. Available at [http://www.paediatricsandchildhealthjournal.co.uk/article/S1751-7222\(17\)30143-9/fulltext](http://www.paediatricsandchildhealthjournal.co.uk/article/S1751-7222(17)30143-9/fulltext). Accessible at 23 July 2017
18. Meiklejohn, D. A., Corrales, C. E., Boldt, B. M., Sharon, J. D., Yeom, K. W., Carey, J. P., & Blevins, N. H. (2015). Pediatric semicircular canal dehiscence: radiographic and histologic prevalence, with clinical correlation. *Otology & Neurotology*, 36(8), 1383-1389.

19. Mukara, K. B., Waiswa, P., Lilford, R., &Tucci, D. L. (2017). Knowledge and care seeking practices for ear infections among parents of under five children in Kigali, Rwanda: a cross-sectional study. *BMC Ear, Nose and Throat Disorders*, 17(1), 7.
20. Nabors, L., Stough, C. O., Merianos, A., &Peugh, J. (2016). Predictors of flourishing among children with hearing loss. *International journal of pediatric otorhinolaryngology*, 91, 170-174.
21. Narayansamy, M., Ramkumar, V., &Nagarajan, R. (2014). Knowledge and beliefs about ear and hearing health among mothers of young children in a rural community in South India. *Disability, CBR & Inclusive Development*, 25(4), 119-135.
22. Oketch, J. G. (1982). Analysis of attitude towards mathematics among standard seven pupils and their teachers. KERA. Research report. Bureau of education research KU.
23. Ravi, R., Gunjawate, D. R., Yerraguntla, K., Rajashekhar, B., & Lewis, L. E. (2016). Knowledge and attitude of parents/caregivers towards hearing loss and screening in newborns—a systematic review. *International journal of audiology*, 55(12), 715- 722.
24. Reddy, G. L. (2010). *Hearing Impairment: An Educational Consideration*. Discovery Publishing House, 11, 73-74.
25. Scarinci, N., Erbası, E., Moore, E., Ching, T. Y., &Marnane, V. (2018). The parents' perspective of the early diagnostic period of their child with hearing loss: Information and support. *International journal of audiology*, 57(sup2), S3-S14.
26. Smith, F. (2013). *Community public health nursing practice, health for families and population*, Elsevier Saunders. symbol effects in accidents with sharp instruments. *Brazilian Journal of Nursing*, 65(5), 809-814.
27. Sorin-Peters, R., McGilton, K. S., & Rochon, E. (2010). The development and evaluation of a training programme for nurses working with persons with communication disorders in a complex continuing care facility. *Aphasiology*, 24(12), 1511-1536.
28. Stevenson, J., Kreppner, J., Pimperton, H., Worsfold, S., & Kennedy, C. (2015). Emotional and behavioural difficulties in children and adolescents with hearing impairment: A systematic review and meta-analysis. *European child & adolescent psychiatry*, 24(5), 477-496.
29. WHO (2017). *The state of food security and nutrition in the world 2017. Building resilience for peace and food security*. FAO, Rome. URL: <http://www.fao.org/3/a-i7695e.pdf> (Accessed 16 May 2018).
30. Zeng, F. G., & Djalilian, H. (2010). Hearing impairment. *The Oxford handbook of auditory science: Hearing*, 325-348