

## Health Educational Program for Students with Hearing Impairment and Deafness regarding their Quality of Life

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### Abstract

**Background:** Hearing impairment is diminished acuity to sounds which would otherwise be heard normally and deafness is inability to understand speech even in the presence of amplification. **The aim** of this study was to evaluate health educational program for students with hearing impairment and deafness regarding their quality of life. **Research design:** A quasi experimental design was utilized in this study. **Setting:** This study was conducted at Al -Amal School for Mute and Deafness in Benha City. **The sample:** All hearing impaired and deaf students were included in the study; total sample included 100 students with age group 14-19 years. **Tools:** **I):** A structured interviewing questionnaire which consists of four parts to assess **a):** Socio-demographic characteristics **b):** Medical history **c):** Students' knowledge regarding hearing impairment and deafness disease **d):** Reported practices of the students **II):** Scale to measure the attitude of students toward hearing impairment and deafness, and **III):** Scale to measure quality of life of students with hearing impairment and deafness. **Results:** 67% of the studied students had good knowledge while 96% of the studied students had satisfactory practices, 71% of the studied students had positive attitudes and 55% of studied students had good quality of life post program. There were positive highly statistically significant correlations between studied students' total attitudes score and their total knowledge score & statistically significant correlation between the studied students' total practices scores and their total knowledge score pre-program. There were positive statistically significant correlations between the studied students' total attitudes score, total practices score and total knowledge score also, there were positive statistically significant correlations between total practices score, total attitudes score and total quality of life score post program. **Conclusion:** Health educational program succeeded to improve knowledge, practices, attitudes and quality of life of studied students with hearing impairment and deafness. **Recommendations:** Psychosocial rehabilitation program should be held to meet the needs of students with hearing impairment and deafness and improve their quality of life in cooperation with school health nurse

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**Key words:** Deafness, Hearing impairment, Quality of life, Students

### Introduction:

Hearing Impairment (HI) is one of the commonest birth defects. It is estimated to be the fourth highest cause of disability. It is a partial or total inability to hear sounds due to the absence of electrical stimuli to the brain. Hearing impairment as a disability category is similar to the category of deafness, but it is not the same. Deafness is HI that so severe and is not simply deprivation of sound, it is

rather deprivation of language (**Brown & Cornes, 2021; Desalew et al., 2021**).

Hearing Impairment affects millions of people around the world. Nearly 360 million persons suffer HI in the world. Thirty-two million children >5% of worldwide has different degrees of hearing impairment. Nearly 75% of hearing impaired is in developing countries. By 2050 nearly 2.5 billion people are projected to have some degree of hearing impairment and at least 700

will require hearing rehabilitation. The main areas of the world affected by disabling HI are South Asian and African regions, with prevalence rate almost four times that of the high income regions. 12.5% of children between 6 and 19 years of age suffer from different degrees of hearing impairment. Approximately 38 to 42% of students become deaf through viral infection or congenital syndromes also have cognitive, language, learning, emotional, neurological and physical disabilities or a combination of all which affect development and school achievement **(World Health Organization (WHO), 2021)**.

Hearing Impairment can occur in only one ear or in both ears, covers all degrees and types of the Hearing Loss (HL), ranging from mild loss to profound deafness. The most common causes of hearing impairment and deafness are considered heredity, congenital defects, viral infection, accidents, tinnitus condition, medications that may lead to hearing damage and prolonged exposure to loud noise. The most common symptoms that appear on school age students; doesn't react to loud sounds, does not seek out or detect where sound is coming from, shows signs of behavioral problems or social difficulties, experiences problems keeping up at school or grades slipping, is easily frustrated or experiences communication breakdowns, cannot understand what saying unless looking directly at the face of speaker, being exhausted at the end of school from concentrating to understand speech **(Haile, 2021)**.

Treatment for HI varies depending upon the cause and degree of the impairment. Treatment may involve removing wax or dirt from the ear or treating an underlying

infection. If there is damage or a structural problem with the eardrum, surgery may help to repair. If the problem is with the cochlea or hearing nerve, a hearing aid or cochlear implant may be recommended. Lip reading and sign language can replace or complement oral communication and socialization especially for school age students with profound deafness. Preventive strategies of HI include immunization against rubella and measles to reduce congenital infections, immunization against the basic childhood diseases, newborns should be tested for HI at the birth, annual examinations of the ear to discover the medical conditions before causing hearing damage, foreign objects should not be inserted into the ear canal, avoidance of the drugs that have side effects of the hearing and protecting against the excessive noise exposure **(Liu et al., 2019)**.

The HI lowers the quality of life and has many undesirable physical, psychological, and social effects. School age students with HI and deafness are known to have more school and mental health problems, have a negative impact on the learning of verbal language, lack of cognitive function, reading, writing and academic performance, have moderate to severe depression, significantly associated with anxiety and impaired social interaction and communication. Also, school age students constitute an important group and deserve to experience well-being as health and wellbeing for this population group is important for potential societal influence and lifestyle related attitudes and habits are formed at this stage and persist across the life span **(Sayed et al & Sultan et al., 2018)**.

Community Health Nurse (CHN) plays an important role in improving quality of life of students' with HI and deafness. The

School Health Nurse (SHN) as a most important role of CHN plays a vital role on the front lines to improve the physical, psychological, social health and educational process for students with HI and deafness. SHNs promote the health and safety, intervene with actual and potential health problems, provide case management services, collaborate with others to build student and family capacity for adaptation, self-management and learning. The SHN also plays an important role in promoting communication between students with HI and deafness to learn communication effectively with one another and with others. The SHN should prevent of further disease related deterioration through providing rehabilitation program and providing emotional, social, psychological support for the students with HI and deafness and maintain regular follow up (Alabama Institute for Deaf and Blind, 2021).

### **Significance of the study:**

The prevalence of hearing loss in Egypt (16.02%) is higher than many other developing countries. The rate is also higher than that of Oman (5.53%) and Saudi Arabia (13%) which as Arab countries has ethnic, cultural and traditional similarities to Egypt. In Egypt, from 6 randomly selected governorates (Alexandria, Dakahlia, Luxor, Marsa-Matrouh, Minia and North Sinai), 4000 individuals were screened for hearing loss. HI is being 22.4% in children aged 0-4 years and the prevalence of HI among children in the age of adolescence was reported as 20.9%. A more recent study found hearing loss among 13.7% of school children in Ismailia governorate. The HI became a common problem due to the combined effects of the noise and hereditary. In Egypt, the accurate estimation of hearing loss among children is

difficult to be determined because of the absence of a national hearing screening program until now and the estimation depends only on the hospital-based academic studies (Elbeltagy et al., 2019; Sayed et al., 2018).

Nowdays, Ministry of Health and Population announced that an audiometric survey of 1,780,000 newborns has been conducted as part of a presidential initiative for early detection and treatment of hearing loss and impairment in newborns which was launched in September 2019 and revealed that 105,091 children were transferred to a second examination, a week after the first examination in the same unit, adding that 9,991 children were transferred after the second test to hospitals and 30 referral centers nationwide. the child's failure to pass the second test most of the time does not mean that the child has a hearing loss, but needs advanced tests in the referral centers of the initiative, stressing that early detection of hearing impairment and facilitates treatment opportunities (Audiology Worldnews, 2021).

### **Aim of the study:**

This study aimed to evaluate health educational program for students with hearing impairment and deafness regarding their quality of life

### **Research Hypothesis:**

Health educational program will improve the knowledge, practices, attitudes and quality of life of hearing impaired and deaf students.

### **Subject and Methods:**

#### **Research design:**

A quasi experimental research design was used for this study.

### **Setting:-**

The study was conducted at Al-Amal School for Mute and Deafness in Benha City which considered the only established place for educating of such students.

### **Sampling:-**

All hearing impaired and deaf students attending to previously mentioned setting were included in the study (the total number of students are 100), in preparatory and secondary stage in the age group of 14-19 years.

### **Tools of data collection: Three tools were used in this study:**

**First tool:** A structured interviewing questionnaire was developed by the researcher, which cover the following four parts:-

**The first part:** Concerned with the demographic characteristics of students which included (6) items (sex, age, ranking in the family, level of education, residence and type of the family) in addition to family characteristics which included (3) items (age, level of education and occupation).

**The second part: A-** Concerned with medical history of students with HI and deafness as reported from the mothers which included (13) items.

**B-** Concerned with medical history of the mothers of students with HI and deafness which included (6) questions.

**Third part:** It was concerned with students' knowledge related to HI and deafness which consists of (10) questions.

### **Scoring system:**

The scoring system for student's knowledge was calculated as follows (2)

score for a correct and complete answer, while (1) score for a correct and incomplete answer, and (0) for an incorrect answer and don't know. For each area of knowledge, the score of the items was summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a present score. The total knowledge score was considered good when total score of knowledge was  $\geq 75\%$   $>14$  while considered average when the total score was  $50 - < 75\%$   $9- <14$  and considered poor when the total score was  $< 50\%$   $<9$ .

**Fourth part:** It was concerned with reported practices of students with HI and deafness which included; Care of the hearing aids, follow up, rest and sleep and oral care.

### **Scoring system:**

The scoring system for student's practices was calculated as follows (1) score for done practicing and (0) score for not done practicing. The score of the items was summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a present score. The total practices scores were considered satisfactory for students using hearing aids if the score of the total practices  $> 60\%$   $>15$  and considered unsatisfactory if it is  $\leq 60\%$   $\leq 15$ . The total practices scores were considered satisfactory for students not using hearing aids if the score of the total practices  $> 60\%$   $>9$  and considered unsatisfactory if it is  $\leq 60\%$   $\leq 9$ .

**Tool (II):** Scale to measure the attitude of students toward hearing impairment and deafness adapted from **Cooper et al, (2004):** The questionnaire was measured on a Likert scale like type of (Agree, Neutral and Disagree). It was translated into Arabic by the researcher which included (17) items.

**Scoring system:**

Attitude scale score was calculated as (2) scores for agree, (1) scores for neutral and (0) for disagree. The total attitude score was considered positive if the score  $\geq 75\%$   $\geq 26$  while considered neutral if it equals 50- $<75\%$  17-26, and considered negative if it is  $<50\%$   $<17$ .

**Tool (III):** Scale to measure the quality of life of students with HI and deafness which included (30) items adapted from **Dahan et al, (2018)**. The scale was measured on a Likert scale like type of (always, sometimes and never) which was modified by the researcher to assess the impact physical, psychological and social status on quality of life of the students. It was translated into Arabic by the researcher.

**Scoring system:**

Quality of life scale score was calculated as (0) scores for always, (1) scores for sometimes and (2) for never. The score of the items was summed-up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score. The total quality of life score (30) was considered good if the score  $>75\%$  ( $>45$ ) points while considered average if it is 50-75% (30-45) points, and considered poor if it is  $<50\%$  ( $<30$ ) points.

**Content validity and Reliability:**

The tools validity was done by five of Faculty's Staff Nursing experts from Community Health Nursing Specialties who reviewed the tools for clarity, relevance, comprehensiveness, applicability and reliability. The panel ascertained the face and content validity of the tools. The reliability was done by Cronbach's Alpha coefficient test which revealed that which of the two tools

consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was 0.88, practice was 0.91, attitude was 0.80, and quality of life was 0.86.

**Administrative approval:**

Approval to conduct the study was obtained by submission of an official letter issued from the Dean of Faculty of Nursing, Benha University to administrator of Mute and Deafness school, requesting approval and cooperation for data collection and oral consent from the students to conduct the study, the administrator inform the teachers to facilitate the researcher's work during data collection to meet the students at previously mentioned setting.

**Preparatory phase:**

Preparation of the study design and data collection tools was based on extensive review of the current and past available national and international references related to the research title was done, using a journal, textbooks and internet search was done. This was necessary for the researcher to be acquainted with and oriented about aspects of the research problem as well as to assist in the development of data collection tools. Also prepared handout for studied students that included all items about HI and deafness, this took time for preparing the tools about two months.

**Ethical considerations:**

All ethical issues were assured; oral consent has been obtained from each student before conducting the interview and given them a brief orientation to the purpose of the study. They were also reassured that all information gathered would be kept

confidentially and used only for the purpose of the study. Students had right to withdraw from the study at any time without giving any reasons.

### **Pilot study:**

The pilot study was carried out on (10) students who represented 10% of the sample size. The pilot study was aimed to assess the tool clarity, applicability and time needed to fill each sheet, completing the sheet consumed about 30- 45 minutes. No modifications were done, so the pilot study sample was included in the total sample.

### **Fieldwork:**

The data was collected from students who attended in the previously selected school through the interview with them. The study was conducted at a period of six months which started from the half of October 2020 to the end of April 2021. The researcher was attended two days/ week for school from 9.00 am to 12 pm., those days were Monday and Wednesday to collect data with distributed instruction guidelines about hearing impairment and deafness to improve health, these days are chosen according to the study schedule of the students and these days appropriate for the researchers, the average number of interviewed students was between 25 students/day divided into two groups depending on their responses to the interviewer, seven sessions were applied and each session took 30-40 minutes. The teachers of Amal School for Mute and Deafness helped researcher in the data collection and in explaining the instructional guidelines to the students. The researcher implemented the educational program through 4 phases as the following:

**(I) Assessment phase:** In this phase of the health educational program, assessed knowledge, practices, attitudes and quality of life of the studied students through collection and analysis of baseline data from the filled tools. In this phase the researcher did the pre-test.

**(II) Planning phase:** The researcher identified the important needs for target group, set priorities of needs, goals and objectives were developed.

**(III) Implementation phase:** In this phase the researcher implemented the health educational program sessions for the students with the clearance of general and specific objectives through seven sessions each session took 30-40 minutes.

### **Methods of teaching:-**

- Lectures / discussion.
- Demonstration and re-demonstration.
- Brain storming
- Role play

### **Media used:-**

- Handout & colored posters.
- Brochures & Videos

**(IV) Evaluation phase:** After implementing the educational program, the researcher applied the post- test immediately to evaluate the knowledge acquired. Evaluation was done by using the post –test questionnaire which was the same formats of pre- test in order to compare the change in the studied subjects' knowledge, practices, attitudes and quality of life immediately after the implementation of the program.

### **Statistical design:-**

All data collected were organized, tabulated and analyzed by using the Statistical Package for Social Science (SPSS version 21), which was used frequencies and percentages for qualitative descriptive data,

and chi-square coefficient ( $\chi^2$ ) was used for relation tests, mean and standard deviation was used for quantitative data, linear correlation coefficient ( $r$ ) and matrix correlation to detect the relation between the variables (P value).

**Significance levels were considered as follows:**

Highly significant (HS)	$P < 0.001^{**}$
Significant (S)	$P < 0.05^*$
Not significant (NS)	$P > 0.05$

**Results:**

**Table (1):** Shows that; 54% of studied students were males, 36% of them their age ranged from 16 to less than 18 years old with the mean age  $16.47 \pm 1.67$  and 43% of them were the second in their family ranking. Regarding to educational level; 52% of the studied students were in the secondary stage, 77% of them lived in rural areas and 61% of the studied students lived in small family.

**Figure (1):** This figure illustrates that; 27% of studied students had good knowledge pre-program which increased to 67% at post program. While 42% of them had poor knowledge at pre-program, and then this percentage decreased to 17% had poor knowledge post program. Only 31% of them had average knowledge at pre-program, and then this percentage decreased to 16% had average knowledge post program.

**Figure (2):** This figure illustrates that; 42% of the studied students had satisfactory practices pre-program, and then this percentage increased to 96% post program.

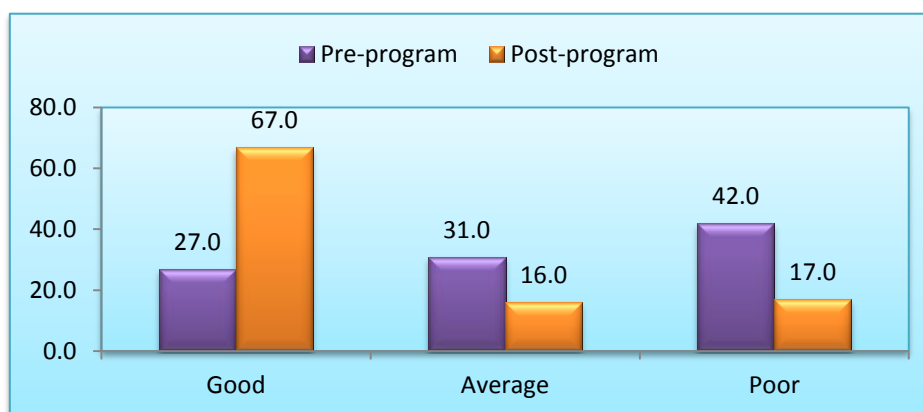
**Figure (3):** This figure illustrates that; 31% of the studied students had positive attitudes pre-program, and then this percentage increased to 71% post program.

**Figure (4):** This figure shows that; 12% of the studied students had good total scores of quality of life pre-program which increased to 57% post program. 57% of the studied students had poor total scores of quality of life pre-program which decreased to 17% post program. Only 31% of the studied students had fair total scores of quality of life pre-program which decreased to 26% post program.

**Table (2):** Shows that; there were positive highly statistically significant correlations between the studied students' total attitudes score and their total knowledge score & statistically significant correlation between the studied students' total practices scores and their total knowledge score pre-program. While post program, there were positive statistically significant correlations between the studied students' total attitudes score, total practices score and total knowledge score also, there were positive statistically significant correlations between total practices score, total attitudes score and total quality of life score.

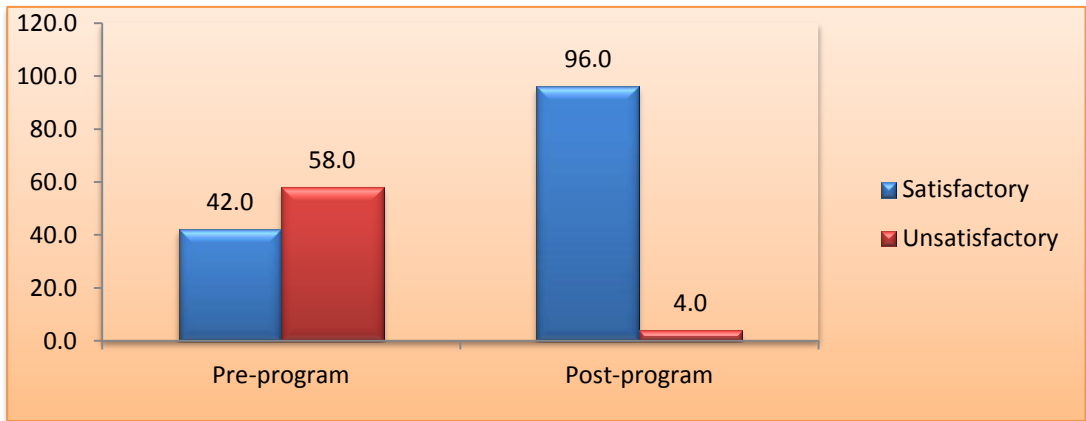
**Table (1): Percentage distribution of the studied students regarding their demographic characteristics (n=100).**

Demographic characteristics	%
<b>Sex</b>	
Male	54.0%
Female	46.0%
<b>Age</b>	
14<16	30.0%
16<18	36.0%
18+	34.0%
<b>Mean ± SD= 16.47±1.67</b>	
<b>Students' ranking in the family</b>	
First	34.0 %
Second	43.0 %
Third and more	23.0 %
<b>Educational level</b>	
Preparatory	48.0 %
Secondary	52.0 %
<b>Residence</b>	
Urban	23.0 %
Rural	77.0 %
<b>Type of the family</b>	
Small family	61.0 %
Extended family	39.0 %

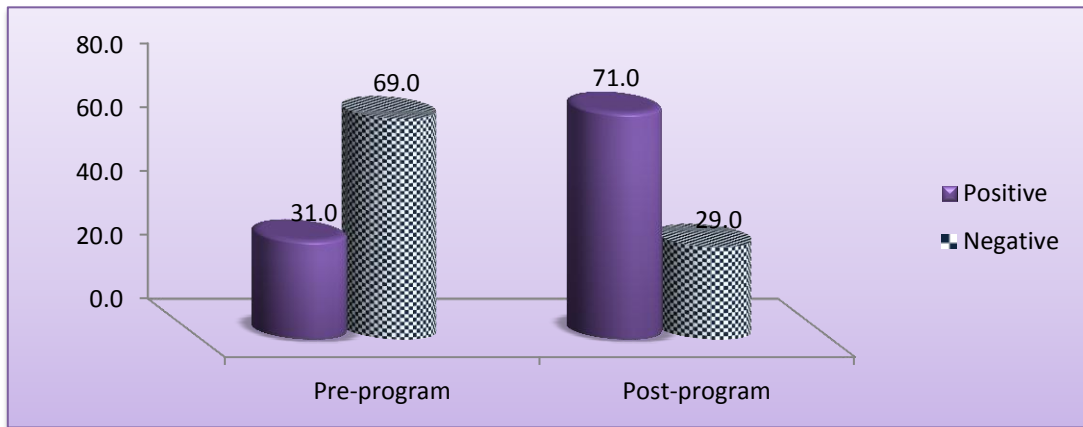


**Figure (1): Percentage distribution of the studied students regarding their total knowledge score about hearing impairment and deafness pre and post program (n= 100).**

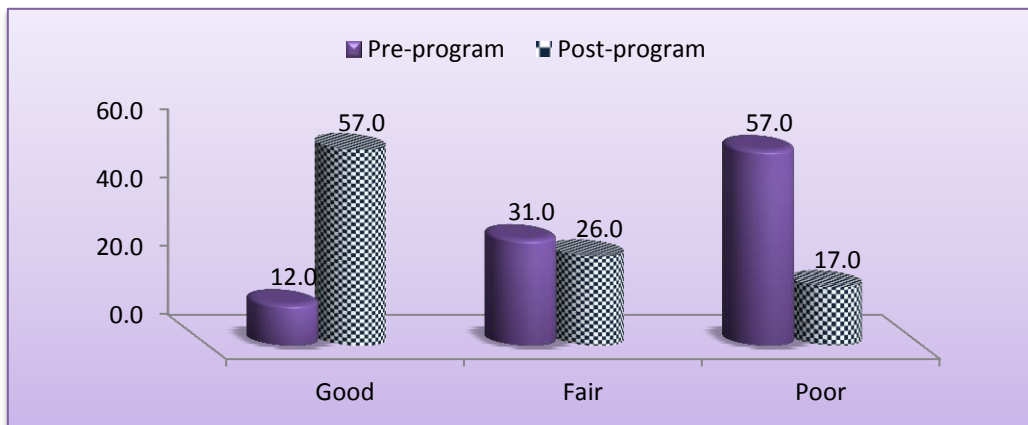




**Figure (2):** Percentage distribution of the studied students regarding their total reported practices score pre and post program (n=100).



**Figure (3):** Percentage distribution of the studied students regarding their total attitudes score pre and post program (n=100)



**Figure (4):** Percentage distribution of the studied students regarding total quality of life score pre and post program (n=100).

**Table(4):Correlation matrix between studied students total knowledge score, total practices score, total attitude score and total quality of life score pre and post program (n=100).**

Items		Pre				Post			
		Knowledge	Practices	Attitude	QOL	Knowledge	Practices	Attitude	QOL
<b>Knowledge</b>	R	1	.353	.902	-.075-	1	.822	.208	.008
	p-value		.049*	.000**	.459		.023*	.038*	.934
	N	100	100	100	100	100	100	100	100
<b>Practices</b>	R	.353	1	.121	.071	.822	1	.055	.649
	p-value	.049*		.232	.480	.023*		.589	.013*
	N	100	100	100	100	100	100	100	100
<b>Attitude</b>	R	.902	.121	1	-.106-	.208-	.055	1	.844
	p-value	.000**	.232		.293	.038*	.589		.020*
	N	100	100	100	100	100	100	100	100
<b>QOL</b>	R	-.075-	.071	-.106-	1	.008	.649	.844	1
	p-value	.459	.480	.293		.934	.013*	.020*	
	N	100	100	100	100	100	100	100	100

**\*\* Highly statistically significant difference (P < 0.001) \* Statistically significant difference (P < 0 .05)**

## **Discussion:**

Hearing impairment is still a significant cause of disability in the 21<sup>st</sup> century and the burden is more severe in developing countries. The challenge is more significant because routine screening for hearing impairment and early intervention is unfortunately not carried out. Hearing impairment and deafness can have a significant effect on the quality of life. Deafness is not simply the deprivation of sound. It is rather deprivation of language (WHO, 2021; Polack et al., 2017).

The study aimed to evaluate health educational program and its effect among studied students with hearing impairment and deafness. Health educational program was expected to be effective method to improve QOL of the students with hearing impairment and deafness evidenced by significant improvement in the students' knowledge, practices, attitudes and significant improvement in the QOL of students with HI.

According to socio demographic characteristics of the studied school students, the current study revealed that; more than half of them were males. This might be due to hearing impairment more common in males than females and males are more likely to be exposed to accidents, head injuries and loud noises e.g. firearms. This study was in consistent with Patel et al., (2017), who studied "The impact of hearing loss on daily life style and schooling among children between 5 and 15 years age-group", New Civil Hospital, Su-rat, (n= 246), and reported that, 61.8% of their studied students were males.

However, this study findings disagreed with Asghari et al., (2017), who studied "The prevalence of hearing impairment by age and gender in a population-based study", Iran, (n= 4370) and found that, 54.1% of the studied students were females.

The current study revealed that; more than one third of the studied students aged from 16 to less than 18years old, with the mean age was  $16.47 \pm 1.67$ . This might be due to the prevalence of the disease between children as they are more risk for otitis media and childhood infections as measles, meningitis and mumps and these factors of hearing impairment were often not well assessed. This study finding was in agreement with Abdel Rahman et al., (2020); who studied "Prevalence and risk factors for hearing disorders in secondary school students", Ismailia, Egypt, (n=2750), and found that, 66.2% of the studied students their age were 16-18 years old.

While, this study finding was in disagreement with Milano et al., (2016); who studied "Adjustment and other factors related to high school aged students identified as hearing impaired", Youngstown State University, USA, (N=456) and found that, 56% of the studied students their age were ranged from 13-19 years old with the mean age  $14.82 \pm 1.7$ . Also, this study finding was in disagreement with Leclair and Saunders, (2019); who studied "Meeting the educational needs of children with hearing loss", USA, (n=1500), and found that, 61% of the studied students their age were 14 years old.

Concerning the students' ranking in the family, this study revealed that, approximately two fifths of the studied students ranked the second in the family. This study was in the same line with Antonopoulou et al., (2021), who studied "Parenting styles of mothers with deaf or hard-of-hearing children and hearing siblings in Cyprus", (n=30), and found that half of the children were the second born. However, this study was in disagreement with Abd Elkader, (2018), who studied "Effect of oral health training program on knowledge and practices of hearing impaired children and their caregivers", Cairo, (n=52), who found that, more than three quarters of their studied children ranked first to third in their families.

Concerning to students' educational level, the present study revealed that; more than half of the studied students were in secondary stage. This might be due to the poor academic achievement and lower cognitive abilities so, large numbers of students were being in the same stage and take more time to passing it. This study was in agreement with **Satapathy, (2019)**, who studied "The psychological and demographic correlates of academic performance of hearing impaired adolescent", India, (n=111), and found approximately most of their studied students were in secondary stage. However this study finding disagreed with **Rosa and Angulo, (2019)**, who studied "Attitudes of children with hearing loss towards public inclusive education", Canary Islands, Spain, (n=297), and found that, 35% of the studied students were in the secondary stage while 51% were in the primary stage.

The current study revealed that; more than three quarters of the studied students lived in rural areas. This might be due to the rural areas tends more to relatives' marriage (consanguinity) which considered one of the causes of hearing impairment and also, The Mute and Deaf School is considered the only governmental school in Benha City that surrounded with multiple villages. This study was in the same line with **Sofie et al., (2019)**, who found that, most of their studied students lived in the rural areas. Also this study in agreement with **Mann et al., (2021)**, who studied "Incidence of hearing impairment among rural and urban school going children: A survey", Chandigarh, (n=1670), and found that, more than two thirds of the studied students lived in the rural areas.

Concerning to the type of the family, this study revealed that, three fifths of the studied students lived in the small family. This study was in the same line with **Wood and Turnbull, (2021)**; who studied "The impact of the deafness on the family life", University of Kansas, (n=404), and found that, 67% of their studied children lived in small family while 10% of them lived in extended family.

Regarding total knowledge of the studied students, the present study revealed that; approximately two fifths of studied students had poor knowledge pre implementation of health educational program. While there was highly statistically significant improving in all items after implementation of health educational program in which two thirds of the studied students had good knowledge regarding hearing impairment and deafness  $P < 0.001$ . From the researcher point of view, this might be due to implementation of health educational program which helps studied students to acquire knowledge about hearing impairment and deafness. This finding was not consistent with **Alsaawi et al., (2021)**, who reported that 58.2% of their study participants had good knowledge and there were significant awareness toward the hearing loss ( $p < 0.001$ ).

Regarding to total reported practices of the studied students, the present study revealed that; more than half of the studied students had unsatisfactory practices pre implementation of health educational program, and then this percentage increased to most of them had satisfactory practice post implementation of the program. From the researcher point of view, this might be due to the effect of health educational program that help in improving studied students` practices regarding hearing impairment and deafness. This study supported by **CDC c, (2020)**, who studied "Hearing loss treatment and intervention services", and reported good educational and interventional plans which include close monitoring, getting a hearing device and how to take care, follow-ups, family support and early intervention treatment services for any health problems has a significant improvement on the children health and their practices.

Regarding to studied students' total attitudes score, the present study revealed that; more than two thirds of them have negative attitudes toward hearing impairment and deafness in pre implementation of the program. From the researcher point of view, this might be due to the feeling that they were

being different about other people and were being sorry about themselves as hearing impairment deprived them from engaging in age-appropriate activities, communication skills, and language skills. Then this percentage decreased to less than one third of them post program. This study finding was in the same line with **Furnham and Lane, (2021)**; who studied "Actual and perceived attitudes towards deafness", and reported that; the deaf and hearing impaired had more negative attitudes towards hearing impairment and deafness than the hearing people actually had.

Regarding to the total score of quality of life, the present study revealed that; more than half of the studied students had good total scores of quality of life post implementation of health educational program. From the researcher point of view, this might be due to health educational program achieved its aim in improving students` quality of life with hearing impairment and deafness. This finding was in the same line with **Jaiyeola and Adeyemo, (2018)**, who studied "Quality of life of deaf and hard of hearing students in Ibadan metropolis", Nigeria, (n=110), and reported that, those students aged 17 years or more, (51.3%) of them had good quality of life post health related intervention. But, this study finding disagreed with **Sultan et al., (2018)**, they reported that, 36% of them reported having a good quality of life.

Concerning correlations between the studied students` total practices, total attitude and total knowledge; the present study revealed that; there were positive highly statistically significant correlations between the studied students' total attitudes score and their total knowledge score & statistically significant correlation between the studied students' total practices scores and their total knowledge score pre-program. While post program, there were positive statistically significant correlations between the studied students' total attitudes score, total practices score and total knowledge score. From the researcher point of view, this might be due to

attributed to the fact that; the knowledge was the baseline of practices & attitudes, affect positively on their practices and attitudes and knowledge play an important role in changing behavior leading to change of practices of the studied students.

Concerning correlations between the studied students` total practices, total attitudes and total quality of life, the present study revealed that; there were positive statistically significant correlations between total practices score, total attitudes score and total quality of life score post implementation of health educational program. From the researcher point of view, this finding might be due to the studied students who had unsatisfactory practices and negative attitudes could affect their quality of life and this improved as a result of the implementation of health educational program.

### **Conclusion:**

Two thirds of the studied students had good knowledge post implementation of health educational program, most of the studied students had satisfactory practices, more than two thirds of the studied students had positive attitudes toward hearing impairment and deafness, and more than half of the studied students had good quality of life post program. There were positive highly statistically significant correlations between the studied students' total attitudes score and their total knowledge score & statistically significant correlation between the studied students' total practices scores and their total knowledge score pre-program. While post program, there were positive statistically significant correlations between the studied students' total attitudes score, total practices score and total knowledge score also, there were positive statistically significant correlations between total practices score, total attitudes score and total quality of life score.

### **Recommendations:**

1-Psychosocial rehabilitation program should be held to meet the needs of the students with

hearing impairment and deafness and improve their quality of life in cooperation with school health nurse.

2-The school health nurses should be knowledgeable about community health services and community resources that help the students with hearing impairment and deafness.

3- Continuous application of health educational programs for students with hearing impairment and deafness to enhance students' knowledge, practices, attitudes and quality of life.

4-Further researches are proposed to explore the effect of health educational program on the prevention of effects of the hearing impairment and deafness for the students among large sample size.

5-Additional research in hearing impairment and deafness is needed especially in the area of psychological, social effects and future view about their lives.

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