

Quality of life of Elderly People with Hearing Impairment

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Abstract:

Background: Hearing impairment is the most common sensory deficit and a severe social and health problem that can impair the exchange of information. It significantly impacts everyday life causing loneliness, isolation, and frustration, as well as communication disorders. So, it affects the quality of life. **Aim:** Determine the quality of life of elderly people with hearing impairment. **Design:** Descriptive Correlational design. **Subject:** A purposive sample of 270 elderly people with hearing impairment attended the auditory Outpatient clinics at Ashmoun General Hospital affiliated to Ashmoun district and Shebin Elkom university Hospital at Shebin Elkom district. **Data Collection Instruments:** Two Instruments were used to collect the data **Instrument I:** Structured interview that included two parts. Part 1 concerned with socioeconomic demographic data, part 2 included older people quality of life questionnaire with 35 items. **Instrument II:** Hearing handicap inventory for elderly screening version scale (HHIE-S). **Results:** The study revealed that 85.2% of elderly had significant hearing impairment based on (HHIE-S); and more than two thirds of them were suffering from severe to moderate hearing impairment and the least frequency was mild and profound according to their Audiometry; a negative correlation between HHIE-S and all quality of life domains and grand total quality of life score. More than half of elderly perceived their quality of life as poor. **Conclusion:** Every domain of quality of life as well as total quality of life affected negatively by severity of hearing impairment, indicating that quality of life gets poor with severity of hearing impairment. **Recommendation:** Early hearing screening with high quality screening protocols in the primary care setting and health education for elderly to increase awareness about periodic hearing examination.

Key words: Hearing impairment; Quality of life; Elderly.

Introduction:

The ageing population is progressively and rapidly increased globally. Population aged 60 years or over numbered 962 million in 2017, more than twice as in the past and the number of older persons is expected to more than double in 2050, when it is projected to reach nearly 2.1 billion⁽¹⁾. According to World health organization elderly can be categorized elderly into three different groups: young old 60-74 year, old 75-84 year, and oldest old >85 years⁽²⁾.

Elderly population has many medical problems. One of the top three chronic medical conditions is hearing impairment (HI) and it is considered the number one of communication disorder among older people. The expected increase in the Proportion of individuals aged at least 65 years worldwide is likely to be associated with an increasing the prevalence of HI among the elderly. HI is the most common sensory deficit in the elderly population and it is remains an invisible disability in elderly that is not obvious to others; therefore, it tends to be ignored, unlike other health problems. If HI left untreated, it will affect considerably not only on patients and caregivers, but the society as a whole⁽³⁻⁶⁾.

Hearing impairment is a known risk factor for functional decline, reduced social participation, withdrawal and accidents; so good functional hearing is critically important for elderly to be able to manage themselves and take care of their own lives^(7,8).

Hearing impairment have different causes, including advanced age, loud noise by long-term exposure to sounds that are either too loud or last too long resulting in permanent hearing impairment, earwax or fluid buildup can block sounds that are carried from the eardrum to the inner ear and health conditions in older people, as diabetes or high blood pressure .Hearing impairment can also result from taking certain medications as Ototoxic medications that can damage the inner ear⁽⁹⁻¹²⁾.

Hearing impairment strongly associated with significant decrease in quality of life among older people. It is reported that elderly daily life affected by hearing impairment, since they have difficulties in exchanging information, in communicating with others, in make social relationships and engaging in public events and consequently reduce quality of life⁽¹³⁻¹⁷⁾.

Hearing impairment could affect the individual's ability to communicate with

others or limited communication because it impacts their everyday life, causing them to feel lonely, isolated and frustrated⁽¹²⁾. Hearing impairment also associated with depression, anxiety, frustration, social isolation, fatigue, interferes with understanding normal conversational speech and affects quality of life as a whole^(18,7,8).

In communicating with hearing impaired patients nurses should consider these strategies to receive the hearing impaired patient's attention before speaking, to make sure that elderly can be seen clearly, reduce unnecessary noise e.g. TV & radio, face the light and patient at all times, do not hide your mouth when talking behind e.g. The hand or a paper, talk straight to the hearing impaired patient, do not have a conversation with other people on the same time, speak clearly and not too fast, and repeat or rephrase if necessary, all important facts should be written down and do never shout into someone's ear or hearing aid⁽¹⁹⁻²²⁾.

The primary and main role of community health nurse with elderly people suffering from hearing impairment is early detection of HI by observing and assessing the level of hearing impairment by, asking question about changes in hearing, determine if symptoms occurred suddenly or gradually,

decide if symptoms are unilateral or bilateral, inquire whether any prior treatment for hearing conditions, determine if the sensory effect of the condition on the activity of daily living and then refer the elderly people for audiology investigation for diagnosis and treatment^(23,24).

Significances of the study

The World Health Organization expected that hearing impairment will become one of the top ten contributing factors to the burden of disease by 2030⁽²⁵⁾. This presents a growing problem because hearing impairment not only negatively affects the older adults' personal lives and the lives of their family members it increases the chance of becoming a potential burden to the society and the government⁽²⁶⁾.

Globally, 360 million people (that constitute 5% of the world's population) live with disability due to hearing impairment; from those nearly 180 million people aged 65 years and older (that constitute 30% of the population in this period of age) have hearing impairment that interferes with understanding normal conversational speech. Despite high-quality data available at national and local epidemiological on hearing loss, there is generally lacking awareness of the problem⁽²⁾. Approximately one in three

people in the United States between the ages of 65 and 74 have hearing impairment, and nearly half of those older than 75 have difficulty hearing⁽²⁷⁾. The prevalence of HI in the Egyptian elderly has been reported to be 44.3%⁽²⁸⁾. For this reason this study will be performed to determine the quality of life of elderly people with hearing impairment.

Aim of the study:

Determine the effect of hearing impairment on quality of life of elderly people.

Research questions:

What is the quality of life of elderly people with hearing impairment?

Subjects and Method:**Study design:**

Descriptive Correlational design was used to fulfill the aim of the study and answering the research question.

Setting:

The study was conducted at Outpatient Audiology clinics at Ashmoun General Hospital affiliated to Ashmoun district and Shebin Elkom University Hospital at Shebin Elkom district.

Subjects:

A purposive sample of 270 elderly people attended the previously mentioned settings for diagnosis and follow up who age 60 years or above, diagnosed with permanent

hearing impairment, have no disabilities in other parts of the body or devastating conditions such as cancer and renal failure and didn't wear hearing aid.

Sample size and power of the study:

In order to calculate the required sample size to determine the quality of life of elderly people with hearing impairment, the Epi website was used to calculate sample size, the assumptions were the following:

- Population size (for finite population correction factor or fpc) (N):1000
- Hypothesized % frequency of outcome factor in the population (p):44% +/-5
- Confidence limits as % of 100(absolute +/- %)(d):5%
- Design effect (for cluster surveys- DEFF):1
- Sample Size (n) for Various Confidence Levels

Equation:

Sample size n = [DEFF*Np (1-p)]/

[(d²/Z²1- α /2*(N-1) +p*(1-p)]

Used 95% confidence intervals, with a sample size of 275. We approximate it into 270 elderly as the study sample⁽²⁹⁾.

Instruments of data collection:

Two instruments used to collect the study data.

Instrument I: Structured interviewing included two parts.

Part 1: Concerned with socioeconomic demographic data of the study subjects that developed by the researcher. Consisted of name, age, sex, address, education, with whom do you live, marital status, income, occupation, helping from others, type of helping and grades of hearing impairment which taken from audiometer.

Part 2: Included short form of older people quality of life questionnaire (OPQOL-with 35 items) that developed by **Bowling and Gabriel**⁽³⁰⁾; to assess quality of life of the elderly. This questionnaire included eight domains of quality of life. These domains (life over all, health, social relationship, independence, control over life and freedom, home and neighborhood, psychological and emotional well-being , financial circumstances and leisure activities). The OPQOL consisted of 35 statements, that required the participants to indicate to what the extent to which he/she agrees with each statement by selecting one of five possible options :strongly disagree, disagree, neither agree nor disagree, agree and strongly agree, each with a score of 1–5.

Scoring system of OPQOL:

The 35 statements of the full OPQOL questionnaire cover life overall, health,

independence, control over life and freedom, home and neighborhood, psychological and emotional well-being , financial circumstances each of this domains included(4 items and scored 4–20).Social relationships (5 items and scored 5– 25), leisure and activities (6 items scored 6–30). The elderly being asked to indicate the extent to which he/she agrees with each statement by selecting one of five 1 – 5 Likert scale (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree and 5=strongly agree, each with a score of 1–5). The total score ranges from 35 (worst possible QOL) to 175 (best possible QOL). The total score of each elderly was categorized into “poor QoL” when the elderly achieved < 110.99 of the total score, and “good QoL” was considered when he/she achieved \geq 110.99 of the total score.

Instrument II: The Hearing Handicap Inventory for the Elderly Screening version (HHIE-S) scale developed by **Ventry and Weinstein**⁽³¹⁾. It was used to assess the degree of hearing impairment.

Scoring system of HHIE-S:

The HHIE-S consist of 10 questions with (yes, no ,or sometimes) the responses yes, scored 4score, sometimes scored 2 score and no, scored 0score. After all questions have been answered the total score equal

the sum of the scores assigned to each of the questions. The higher the HHIE-S score, the greater hearing impairment. The interpretation of score was the following: 0-8 indicated no hearing impairment, 10-24 indicated mild to moderate hearing impairment and 26-40 indicated significant hearing impairment.

Validity and Reliability of the Instruments:

Instrument I:

The (OPQOL-35) SF was previously validated on community-dwelling older populations, and ethnically diverse population samples, in Britain ⁽³²⁾.The (OPQOL-35) SF was further tested among geriatric service out-patients in Milan, Italy, Cronbach's alpha coefficient for the Italian outpatient population enrolled in this study was found to be 0.78,that indicated for internal consistency and shown to have excellent applicability to cognitively normal older people ⁽³³⁾.

Instrument II:

The HHIE-S version was translated into Japanese and reported a high reliability (Cronbach's alpha coefficient of 0.92) and good validity (Pearson's correlation coefficient of 0.53) in Japanese outpatients⁽³⁴⁾The sensitivity and specificity of HHIE-S are approximately 75-80% for identifying hearing impairment

of moderate or greater degree ^(35,36,31).Internal consistency reliability (Cronbach's alpha) coefficients have been reported between 0.87- 0.91 in a sample of older adults with hearing problems ^(31,37, 38). Test-retest reliability was reported as 0.80-0.85 ^(39,40).

Validation of the instruments was tested for its content validity and face validity by three experts in field of Family and Community Health Nursing and one expert in Geriatric nursing in Menoufia University who reviewed these instruments and recommended it for its consistency and adequacy.

Pilot study:

Pilot study was conducted on 27 elderly who represent 10% of the total sample with hearing impairment. The subjects of the pilot study were not included in the total sample of the research work. The Pilot study was carried out to test the applicability and clarity of the tools and detect any problems that might arise during the actual data collection. According to the results of the pilot study, the necessary and needed modifications and clarification were carried out, and then final form was finalized and used in data collection.

Administrative &Ethical considerations:

- Approval of ethical research committee was obtained at Faculty of Nursing – Menoufia University.
- An official permission was obtained from the director of hospital to carry out this study, after submitting a letter from the dean of faculty of Nursing Menoufia University explaining the purpose of the study and method of data collection.
- Oral and written consent was obtained from the participants who were willing to participate in the study after explanation of study purpose.
- Subjects of the study were assured for confidentiality of the information and collected data used only for research.

Data collection procedures:

- This study was conducted in a period of 8 months starting from May to December 2019.
- After obtaining approval and the informed consent was taken from each participant to conduct the study, the researcher was introduced herself with brief explanation about the purpose of study to the subjects.
- An interview was conducted by researcher with each participant to explain the purpose of the study and its importance. The data collection procedures were done with the subjects who fulfill the criteria of selection of the present study.
- The researcher collected the required data every day per week except Friday from 9A.M to 12P.M from Outpatient audiology clinics at Ashmoun General Hospital affiliated to Ashmoun district and ShebinElkom University Hospital at Shebin Elkom district.
- Duration and time required for each interview were different from one participant to another depending on participant's readiness.
- The subjects who have severe or profound hearing impairment take much time for more clarification and the researcher asked the relatives for helping and researcher may write some words to help them in understanding.
- The researcher was present with each subject to the doctor to take the hearing impairment grades and ask the doctor about hearing measurement.
- The subjects were asked to fill the questionnaires and for subjects they can't write the researcher fill it.
- The interview for each subject took about 20-25 minutes to collect the required data.
- The obtained data was organized and secured for data analysis.

Statistical analysis:

Data were collected, tabulated, entered and statistically analyzed by using SPSS (Statistical Package for Social Science) version 22. Graphics were done using Excel program.

1. Quantitative data were presented by mean(X) and standard deviation (SD). It was analyzed using student t- test for comparison between two means, and ANOVA (F) test for comparison between more than two means.
2. Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square (χ^2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used(if the table was 4 cells) , or Likelihood Ratio (LR) test (if the table was more than 4 cells). Correlation coefficient (r) was used to test the correlation between total score of HHIE-S with the grand total score of QoL as well as total score of each of its eight domains. Level of significance was set as P value <0.05 for all significant tests.

Results:

Table 1: Showed the distribution of elderly subjects according to their socio - demographic characteristics. The findings

in the table showed that approximately three quarters (73.7%) of them were in age group 60 – 69 years, 58.1% were widowed, and 50.7% were males. Near two thirds (62.2%) of them were living with offspring, more than half (52.6%) of them had not enough income, 47.8 % of them not work, and 37% of them get help from others basically financial help. **Table 2:** Illustrated that the majority of elderly within the four grades of HI either mild, moderate, sever or profound, perceived that they had significant hearing impairment (89.3%, 65.5%, 93.9%, and 96.6% respectively). This result might indicate that once the elderly feel there is hearing impairment even if mild or moderate grades; his/her perception is that he/she has significant hearing impairment. There was a significant difference between elderly grades of audiometry hearing impairment and self-reported grades by HHIE-S.

Table 3: Showed negative correlation between HHIE-S total hearing impairment score and all quality of life domains $p < 0.05$ for all domains. Moreover there was negative correlation between HHIE-S total hearing impairment score and grand total quality of life score. This means that quality of life gets poor with increased hearing impairment and that develop

support to the answer of the research question.

Table 4: Demonstrated the relationship between grand total Quality of life score of elderly and their hearing impairment grades. From the table, more than half (53.7%) of subjects who were suffering from hearing impairment perceived poor total score of QoL; while 46.3% of elderly subjects xbg;pawl perceived good overall QoL this means that QOL affected with HI and reduced. So the research question has been answered.

Table5: Showed that there was no statistical significant differences between the elderly' socio-demographic characteristics and hearing impairment grades ($p > 0.05$) for each; except occupation. Elderly subjects who are in free work had higher percentage of significant hearing impairment than the other two groups {not work (82.9%) or retired (82.3%)}, $P=0.03$.

Table 6: Revealed that, there were no statistical significant differences between socio-demographic characteristics of elderly subjects and their quality of life ,this mean that meaning of QOLis same for elderly regardless their socio-demographic characteristics with $P > 0.05$ for each.

Fig.1: Distribution of hearing impairment grades of studied elderly subjects

according to their self- reported hearing impairment (HHIE-S).The figure revealed that the majority (85.2%) of elderly had significant hearing impairment and the least of them had mild to moderate hearing impairment (14.8%)

Fig.2: Illustrated that distribution of hearing impairment grades among studied elderly subjects according to their Audiometry (medical hearing measurement). From the figure, more than two thirds of studied elderly were suffering from severe to moderate hearing impairment (36.7% and 31.1%) respectively and the least frequency was mild hearing impairment with 10.4%, while 21.9% of them had profound hearing impairment

Table 1: Distribution of the studied elderly subjects according to their socio-demographic characteristics (N=270)

Socio demographic characteristics	N0.	%
Age groups		
60 – 69 years	199	73.7
70years or more	71	26.3
Residence		
Urban	143	53.0
Rural	127	47.0
Gender		
Male	137	50.7
Female	133	49.3
Marital status		
Single	0	0
Married	103	38.2
Divorced	10	3.7
Widowed	157	58.1
Educational Level		
Illiterate	165	61.1
Primary	77	28.5
Secondary	16	5.9
University degree	12	4.5
Occupation:		
Not working	129	47.8
Free work	45	19.7
Retired	96	35.5
Income:		
Enough	124	45.9
Not enough	142	52.6
Enough and save	4	1.5
Living with:		
Alone	30	11.1
Spouse	72	26.7
With offspring	168	62.2
Have help from others?		
Yes	100	37.0
No	170	63.0
If yes, types of help (N=100)		
Financial help	90	90.0
Physical help	3	3.0
Other help for life	7	7.0
Total	270	100

Table 2: Relation between Audiometry hearing impairment grades and self-reported hearing impairment grades of the study subjects (N=270)

Audiometry hearing impairment grades	Self-reported hearing impairment grades		Total N0.%	P value
	Mild to moderate hearing impairment (12- 24) N0.%	Significant hearing impairment (26- 40) N0.%		
Mild	310.7	2589.3	28100	LR = 36.4, P=0.000 HS
Moderate	2934.5	5565.5	84100	
Sever	66.1	9393.9	99100	
Profound	23.4	5796.6	59100	
Total	4014.8	23085.2	270100	

Table 3: Correlation between total hearing impairment score (HHIE-S) and total score of quality of life domains of the study subjects (N=270)

	Grand total QoL	Life overall	Health	Social Relation- ship	Indepen- dence	Home & Neighbor -hood	Psychologi- -cal well-being	Financial Circumst- ances	Leisure, religion
Total HHIE-S hearing score	r= -0.12 P= 0.04	r= - 0.01 P= 0.80	r= - .05 P= 0.37	r= - .10 P= 0.07	r= - .02 P= 0.70	r= - .21 P= .000	r= - .03 P= 0.53	r= - 0.14 P= 0.02	r= - 0.04 P= 0.48

r = Correlation coefficient

Table 4: Relationship between grand total quality of life score of elderly and their hearing impairment grades (N=270)

Groups of grand total QoL score	Groups of total hearing score		Total NO%	P value
	Mild to moderate Hearing impairment (12- 24)	Significant hearing impairment (26- 40) NO%		
Poor QoL (<110.99)	2665	11951.7	14553.7	X ² =2.4, P=0.12 NS
Good QoL (>=110.99)	1435	11148.3	12546.3	
Total	40100	230100	270100	

Table 5: Relation between socio-demographic characteristics of studied elderly subjects and their hearing impairment grades (N=270)

Socio-demographic characteristics		Hearing impairment grades					
		Mild to moderate hearing impairment		Significant hearing impairment		Chi-square	
		N	%	N	%	X ²	P-value
Age (years)	60 - 69years (n=199)	29	14.6	170	85.4	0.035	0.85
	70 years or more (n=71)	11	15.5	60	84.5		
Occupation	Not working(n=129)	22	17.1	107	82.9	6.8	0.03
	Free work (n=45)	1	2.2	44	97.8		
	Retired (n=96)	17	17.7	79	82.3		
Gender	Male (n=137)	19	13.9	118	86.1	0.19	0.13
	Female (n=133)	21	15.8	112	84.2		

Residence	Urban (n=143)	18	12.6	125	87.4	1.2	0.27
	Rural (n=127)	22	17.3	105	82.7		
Total(n=270)		40	14.8	230	85.2		

Table 6: Relation between socio-demographic characteristics of studied elderly subjects and their quality of life grades (N=270)

Socio-demographic characteristics		Total QoL groups		Total score QoL groups			
		Poor QoL (<110.99)		Good QoL (≥110.99)		Chi-square	
		N	%	N	%	X ²	P-value
Age (years)	60 - 69years(n=199)	91	45.7	108	54.3	0.09	0.75
	70 years or more (n=71)	34	47.9	37	52.1		
Occupation	Not work(n=129)	61	47.3	68	52.7	0.12	0.94
	Free work(n=45)	20	44.4	25	55.6		
	Retired(n=96)	44	45.8	52	54.2		
Gender	Male(n=137)	58	42.3	79	57.7	1.8	0.18
	Female(n=133)	67	50.4	66	49.6		
Residence	Urban(n=143)	68	47.6	75	52.4	0.19	0.60
	Rural(n=127)	57	44.9	70	55.1		
Total(n=270)		125	46.3	145	53.7		

NS= No statistical significance(P > 0.05)

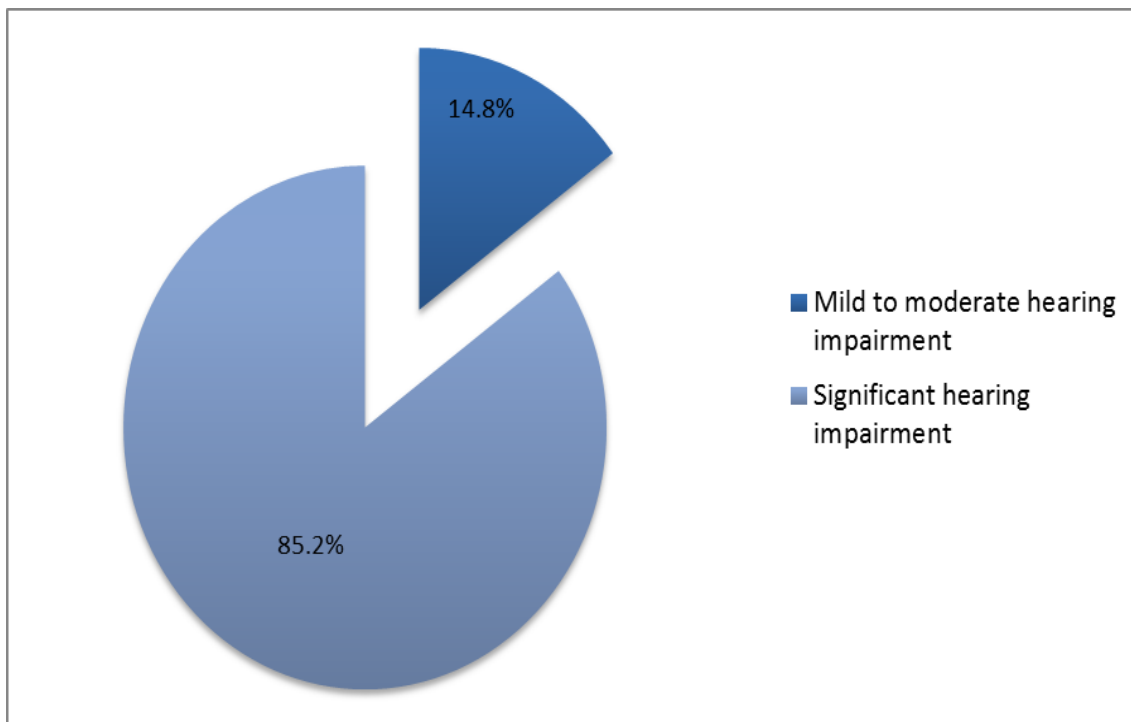


Fig.1: Distribution of the elderly subjects according to their self- reported hearing impairment based on(HHIE-S)scale (N=270)

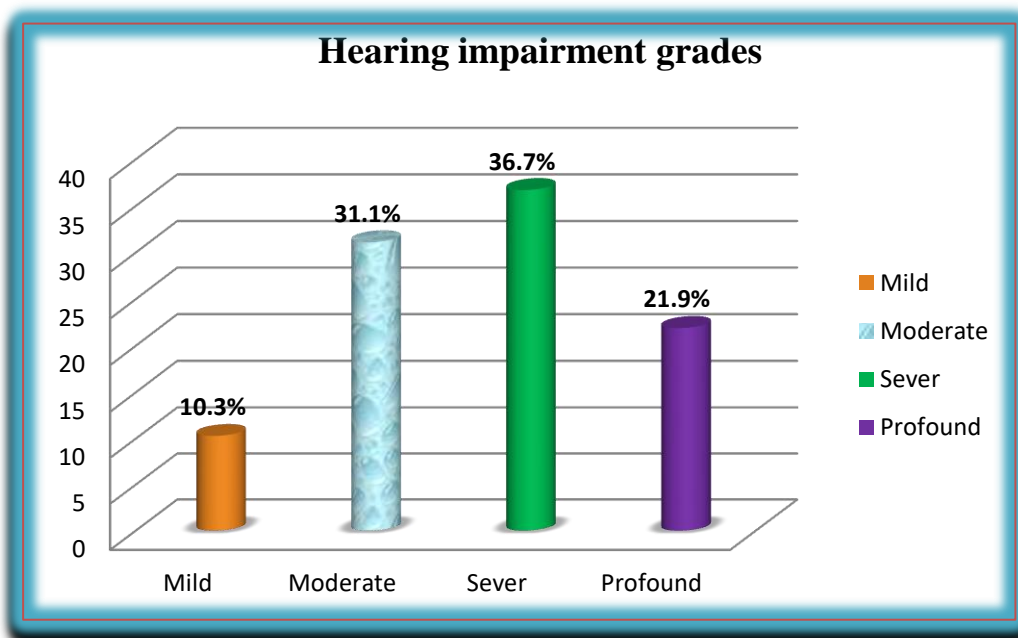


Fig.2:

Distribution of the elderly subjects according to their hearing impairment grades based on audiometry (N=270)

Discussion:

Hearing impairment (HI) is considered the third most prevalent chronic medical condition, and it is becoming a severe social and health problem. HI can impair the exchange of information, thus it significantly impacting everyday life, causing loneliness, isolation, dependence, and frustration, as well as communication disorders. So that, HI consequently reported to reduce quality of life (QoL). Hearing impairment considered the causative factor to the social isolation^(6-8,41-43).

Regarding socio-demographic characteristics of studied elderly subjects the findings of current study illustrated that approximately three quarters of them were in age group 60 – 69 years, more than half of them were widowed, about two thirds were illiterates, more than half were living in urban area, and 50.7% were males. Near two thirds of them were living with their off spring's, more than half of them had not enough income, near half of them do not work, and more than one third of them get help from others basically financial help.

Regarding self-reported hearing impairment grades by HHIE-S, the present study indicated that the majority(85.2%) of elderly had significant hearing impairment

(severe and profound) this result supported by **Mattosand Veras(2010)⁽⁴⁴⁾** who carried out a study in Brazil and found that significant hearing loss was found in 82.4%. Moreover in study conducted by **Barriviera et al. (2013)⁽⁴⁵⁾** in Northern Parana; their finding indicated that 91.56% of subjects had significant hearing loss. These slightly different findings may be due to the different criteria of each study sample and sample size. Regarding hearing impairment grades among studied elderly subjects according to their Audiometry the current results revealed that, more than two thirds of studied elderly were suffering from severe to moderate hearing impairment and least frequency of them were suffering from mild and profound hearing impairment. These results supported by **El-Sayed (2016)⁽⁴⁶⁾** who assess effect of hearing loss on quality of life among elderly in Zagazig City, Egypt, who reported that the most prevalent degree of hearing loss among the studied elderly was severe to moderate hearing loss. Moreover, a study conducted in Nigeria by **Olaosunet al.(2013)⁽⁴⁷⁾** they reported that the most prevalent degree of hearing loss was moderate to severe hearing loss.

Regarding relation between the grades of hearing impairment based on audiometry

and self-reported hearing impairment, the result of the present study showed that there was a significant difference between the grades determined by audiometry and elderly self-reported hearing impairment as assessed by HHIE-S; this means the elderly perceived hearing impairment as a significant problem even if it is mild or moderate grades. This result supported by **Polku et al. (2018)**⁽¹⁷⁾ who study hearing impairment and quality of life among community-dwelling older adults in Finland, they found that perceived hearing difficulties (self-reported) in everyday life situations were more strongly associated with older adults' well-being than audiometrically assessed hearing impairment, as associations were observed with all the domains of QoL. So that it can be illustrated that perceived hearing difficulties had significant impact on daily life than measured by audiometry. So, along with audiometric measurements, health care practitioners should also take into account the effects that hearing problems on people's ability to manage in everyday life.

Regarding the total quality of life scores among the studied elderly subjects, the current study illustrated that more than half of studied elderly subjects perceived poor total quality of life based on their scores so

research question has been answered, the current findings supported by **El-Sayed (2016)**⁽⁴⁶⁾ who found that more than half of the studied elderly had low total quality of life score. Also **Pelucchiet al. (2012)**⁽⁴⁸⁾ who study the impact of hearing loss on quality of life in older adult in Italy, they found that about two thirds of their studied subjects perceived poor total quality of life score.

In addition this result supported by **Johnson et al. (2019)**⁽⁴⁹⁾ who carried out study about community based assessment of health-related quality of life in the elderly with hearing impairment in Bengaluru South in India they reported that about 51.75% of elderly with poor total quality of life score; **Lasisi and Gureje (2014)**⁽⁵⁰⁾ who conducted study on disability and quality of life among elderly persons with self-reported hearing impairment from the Ibadan study of aging in Nigeria, they reported that there was a strong association between hearing impairment and quality of life; QOL become poorer with HI. The result of the present study showed a negative correlation between total hearing impairment score and all quality of life domains (life over all, social relation, independence, home and neighborhood, psychological and emotional wellbeing,

financial circumstances, leisure and activity). Moreover, also there was negative correlation between total hearing impairment score and grand total score of quality of life. This means that quality of life gets poor with increased hearing impairment; these results provide answer to the research question. These results came in the same line with those reported by **Simpson et al.(2016)**⁽⁵¹⁾ who conducted a study in United States, health-related quality of life in older adults and hearing loss; they revealed that mild HL (hearing loss) appears to have a small effect on QoL and moderate/severe HL conferred a clear reduce of QoL; so it can be illustrated that, the severity of hearing impairment affected all quality of life domains and QOL decreased as a whole.

Concerning relation between socio-demographic characteristics (age, occupation, gender and residence) of studied elderly subjects and their hearing impairment grades the current study showed that no statistical significant differences between the elderly' socio-demographic characteristics and hearing impairment grades for each; except occupation. Elderly subjects who are in free work had higher percentage of significant hearing impairment than those who don't work or retired. These results

supported by **Braz et al.(2010)**⁽⁵²⁾ who found that no significant differences between hearing impairment and gender, age, residence and marital status and also reported that worked elderly with hearing impairment more than retired. Moreover, **Awad et al.(2016)**⁽⁵³⁾ they showed that there was no statistical significant difference between HI and socio-demographic data. That may be due to worked elderly more exposed to noise in work than retired and not working.

Concerning relation between HI and age the current study showed there no statistical significant differences between HI and age, in spite of there were no statistical significant differences there were slightly less three quarters of elderly subjects were in age group 60 – 69 years and this may be due early elderly seek medical health services than late elderly. This result was supported by **Olaosun et al.(2013)**⁽⁴⁷⁾ who assessed effect of hearing loss on quality of life among older people in Nigeria and reported that more than two thirds of the studied subjects (68%) were early elderly patients (aged 65 – 74 years old). This may be due to the life expectancy in the African countries is low because of bad health care services. Also, **Zhanget al.(2013)**⁽⁵⁴⁾ who study quality of life (QOL) and hearing impaired older

Adults in Sanliurfa, Turkey; they found that about 72.9% of studied group in age group 59-69 that in the same line of the current results.

On the other hand this result is in disagreement with **Mehmet et al. (2013)**⁽⁵⁵⁾ who study quality of life (QOL) and attitudes toward hearing impaired Older Adults in Sanliurfa, Turkey they reported that hearing impairment increased with age and studied sample had 75 years and over more than in early elderly. This difference may be due to most of sample participants in their study had age 75 years and over.

Concerning relation between socio-demographic characteristics of studied elderly subjects and their quality of life, the current results revealed no statistical significant differences between socio-demographic characteristics (age, occupation, gender and residence) of elderly subjects and their quality of life. These results supported by **El Kady (2012)**⁽⁵⁶⁾ who reported that no statistical significant differences were found between socio-demographic characteristics and QoL. This may be due to that the quality of life should be the same meaning for every individual regardless of their socio-demographic characteristics.

Conclusion:

Based on the findings of the current study, it can be concluded that hearing impairment significantly has a negative effect on elderly's quality of life. The most affected domain of quality of life was life over all followed by social relation.

Recommendations:

- Early hearing screening with high quality screening protocols in the primary care setting is needed to determine people at risk of hearing impairment.
- Increasing elderly people awareness about the importance of regular hearing assessment for early detection and management.
- Health education for elderly to increase awareness about periodic hearing examination.

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