Quality of Life and Satisfaction among Patients Who Use Hearing Aids

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Abstract

Background: Hearing loss is a very common condition, especially among the elderly. A large number of people that have disabling hearing loss may benefit from hearing aids.

Aim: The purpose of this study was to measure quality of life and satisfaction among patients who use hearing aids.

Methods: A cross-sectional study was conducted, in which 100 patients who came in contact with an audiology center in Athens took part. Glasgow Hearing Aid Benefit Profile (GHABP) and 12-Item Short Form Health Survey (SF-12) were used. Alongside with the questionnaires, demographic and relevant to their hearing aid information were collected. Student's t-test, Pearson correlation and Linear regression analysis with the sequential process of integration/abstraction to find independent factors associated with the various scales that generated dependency coefficients (b) and their standard errors (SE), were used.

Results: Patient's perception of disability affects use of hearing aid and patients' satisfaction. More specifically patients who used hearing aid more and perceived its benefits showed higher scores in the physical health of SF-12. Age was found to correlate statistically with patients' satisfaction from the hearing aid and decreases as age increases. Also greater subjective perception of disability caused by hearing loss means increased usage of a hearing aid and life satisfaction.

Conclusion: Using a hearing aid improves physical aspects of quality of life of patients with hearing loss. The total duration of wearing a hearing aid and the degree of hearing loss play an important role in the use made by the patient.

Keywords: Hearing aid, quality of life, patients' satisfaction.

1. Introduction

Disabling hearing loss is a chronic illness which refers to hearing loss greater than 40 dB in the better hearing ear when we talk about adults and greater than 30 dB in the better hearing ear in the case of children (Olusanya et al., 2014). Although it is not a potentially fatal disease, if left untreated, it can cause significant impairment of quality of life.

According to the World Health Organization, over 5% of the world's population has disabling hearing loss (WHO, 2015). Estimates on the magnitude of disabling hearing loss that are based on 42 population-based studies show that 91% of those confronting hearing loss problems are adults (about 328 million) and 9% are children (about 32 million), the majority of whom live in South Asia, Asia Pacific and Sub-Saharan Africa (WHO, 2012). The hearing impairment is a disease that presents one of the highest prevalence rates in the elderly. Approximately one-third of persons over 65 years are affected by hearing loss problems (WHO, 2012), while age-related hearing impairment is the third most prevalent chronic condition in people aged 65 years or older in the United States (Li-Korotky, 2015).

Relevant epidemiologic data are not available in Greece. However, according to the findings of a study that was conducted among 1246 recruits in an artillery training center of the Greek Army, the bilateral hearing loss

prevalence was 6.2%, while bilateral and unilateral hearing loss prevalence was 29.9% (Michas et al., 2014). If we take into account that ratios in a similar age group in the US was under 2% (Lin et al., 2011), the fact that prevalence increases with age (WHO, 2012), and that the sample in the specific study was representative for the Greek male population, since enrolment in the army is obligatory in Greece, we could say that the above numbers were alarmingly high (Michas et al., 2014).

Hearing loss can negatively affect the exchange of information with others, a particularly important aspect of everyday life and communication. It has been found that the decline of hearing is associated with social isolation, difficulties in learning and perception, reduced independence, depression, impaired work performance, enhanced negative emotions such as irritability, negativity, anger and anxiety and increased risk for personal safety (Arlinger, 2003; Chia et al., 2007).

Despite the importance of hearing in everyday life, hearing loss is a disease that often remains undiagnosed and several times even when diagnosed, is left untreated. Many people confronting hearing loss problems in both developed and poor countries do not seek or receive accurate hearing health care, while the current production and use of hearing aids meets less than 10% of the global need in the specific aspect (Lancet, 2016).

However, although it has been ranked as the fifth leading cause of years lived with disability, higher than many chronic diseases such as dementia and diabetes mellitus, the research in the specific field continues to be limited (Lancet, 2016). Among all the other fields, the study of patients with impaired hearing loss satisfaction from the use of hearing aids can give us a picture of how these affect their everyday life, while it might enlighten the parameters that are related with the potential rise of their usage.

The aim of the current research was to measure quality of life and satisfaction among patients using a hearing aid. Hearing aids are supposed to help users socialise by making it easier for them to take part in group activities and improve their relationships since as hearing impaired people who use hearing aids are thought to have greater self-confidence, stronger self-image and better communicative functioning, resulting in overall higher self-esteem, than those without aids.

2. Methods

2.1 Participants and Procedure

The study was conducted in patients who visited or called for a home visit to a particular technical company during a two-month period of time, which was considered as an adequate time for reaching a sufficient sample. Patients older than 18 years, who were using their hearing aids for more than six weeks, were studied. This time was considered sufficient for the patients to adapt to their new reality and to establish an impression of the benefit from the hearing aid use. The study included patients with moderate to severe hearing loss in both ears. We excluded patients with varying degrees of hearing loss between the two ears, people who used their hearing aids for less than one hour a day and patients suffering from congenital hearing loss. In total, 171 patients were reached. From the 139 patients that met the inclusion criteria, 100 finally participated in the study (71.94% response rate). Personal interviews were conducted by researchers. The Ethics Committee of the Hellenic Open University granted permission for conducting the research. In addition, informed consent to participate in the study was obtained from participants.

2.2 Measures

For data collection two questionnaires were used, the Glasgow Hearing Aid Benefit Profile (GHABP) and 12-Item Short Form Health Survey SF-12. Glasgow Hearing Aid Benefit Profile (GHABP) consists of six predefined situations of everyday life where the patient has the role of listener (Kemker & Holmes, 2004). It is a self-report tool, assessing auditory disability, auditory handicap, and hearing-aid benefit. The questions cover aspects of initial disability, handicap, hearing aid use, hearing aid benefit, satisfaction, and residual disability (Kemker & Holmes, 2004). It is designed to be used in everyday clinical practice, both for individual patient management and as part of a quality-assurance program. In each of these cases, questions are asked to evaluate seven parameters and forming its dimensions: (i) occurrence (the frequency of occurrence in everyday life), (ii) initial difficulty-initial disability (from the disability without using the hearing aid), (iii) handicap (disability caused by hearing loss), (iv) use (the degree of use of the hearing aid in any case), (v) benefit from the hearing aid (relative to initial difficulty) (hearing aid benefit), (vi) residual difficulty-residual disability (from the disability despite using the hearing aid) and (vii) satisfaction (from using the hearing aid) (Kemker & Holmes, 2004).

SF-12 consists of 12 questions creating two scales reflecting the mental and physical health and overall health-related quality of life (Ware et al., 1996; Kontodimopoulos et al., 2007). The scales for physical health (Physical Component Summary - PCS) and mental health (Mental Component Summary - MCS) are calculated

using the results of the twelve questions, ranging from 0 to 100, where a score of zero indicates the lowest level of health and 100 shows the highest level of health (Ware et al., 1996; Kontodimopoulos et al., 2007). The SF-12 includes eight dimensions: (i) physical functioning, (ii) role physical, (iii) role emotional, (iv) mental health (v) bodily pain, (vi) general health, (vii) vitality and (viii) social functioning. The first four dimensions are estimated by using two items each, while the four remaining are represented by a single item (Kontodimopoulos et al., 2007).

2.3 Statistical Analysis

Data were subjected to analysis with (SPSS 17.0). Kolmogorov-Smirnov Test was used to assess data normality distribution. Student's t-test and Pearson' (r) correlation were used.   Linear regression analysis with the sequential procedure entry / removal (stepwise) was used to find independent factors associated with the various scales that generated dependency coefficients (b) and their standard errors (ES). Significance levels are bilaterally and statistical significance was set at 0.05.

3. Results

The sample consisted of 100 patients using a hearing aid with a mean age of 69.1 years (± 17.6). Table 1 shows demographics of participants and data on their hearing aid. The 53.0% of participants were male. Also, 57.0% of participants had a Behind the ear (BTE) hearing aid. The 56.0% of the participants using this type of hearing aid from 1 to 10 years, while the 54.0% of subjects were wearing a hearing aid over 10 years. 73.0% of the participants used it 8 to 16 hours a day. Finally, 66.0% of the participants had moderately severe hearing loss.

Table 1. Demographics of the sample

		N	%
Sex	Male	53	53.0
	Female	47	47.0
Age, average ± SD		69.1±17,6	
Type of headset	intra auricular headset	43	43.0
	Posterior auricular headset	57	57.0
Time use this headset	6 weeks up to 11 months	8	8.0
	1 up to 10 year's	56	56.0
	Over 10 years	36	36.0
Total time using headphones	Less than 6 weeks	1	1.0
	6 weeks up to 11 months	1	1.0
	1 up to 10 year's	44	44.0
	Over 10 year's	54	54.0
Daily use	1 up to 4 hours per day	8	8.0
	4 up to 8 hours per day	19	19.0
	8 up to 16 hours per day	73	73.0
Hearing loss	Light	7	7.0
	moderate	27	27.0
	moderately severe	66	66.0

Table 2 shows correlation of "Use" of hearing aid with demographics and type of the hearing aid. Participants who had moderately severe/ severe hearing loss had significantly higher score on the dimension "Use". Patients who used handset total of over 10 years had a significantly higher score on the dimension "Use" (Mean=27.7, P=0.021) compared with participants who used handset less than 10 years (Mean=25.6, P=0.021).

Table 2. Correlation between "Use" dimension of hearing aid and demographic characteristics

		"Use" dimension		
		Mean	SD	p-value
Sex	Male	26.5	5.1	0.560
	Female	27.0	4.1	
Type of hearing aid	intra auricular headset	26.7	5.0	0.923
	posterior auricular headset	26.8	4.4	
Hearing loss	Light / Medium	24.4	5.3	<0.001
	Moderately severe / severe	27.9	3.8	
Duration of wearing hearing aid (in years)	Less than 10 year's	25.6	5.7	0.021
	Over 10 year's	27.7	3.3	

Table 3 shows the 'Pearson' correlation between "Benefit" dimension and age. There was a significant negative correlation between "Benefit" dimension and age (r= -0.43) so the older the patient the less the benefit from using the hearing aid.

Table 3. Pearson correlation between "Benefit" dimension and age

		Age
"Benefit "dimension	r	-0.43
	P	<0.001

Table 4 shows the multivariate linear regression with dependent variable the scores of participants in the dimension 'Benefit' by using sequential entry/removal (stepwise) method. Specifically: Participants who used BTE type of hearing aid benefited 2.17 times lower than those who used In the ear hearing aid (ITE). Patients who wore a hearing aid over 10 years used 1.56 times more than those who wore it less than 10 years, while those using a hearing aid 8-16 hours a day scored 5.98 times higher on 'Use' dimension compared to those who used it less than 8 hours a day. As age increased, both participants reduced their scores on "Benefit" and "Use" dimension.

Table 4. Multivariate linear regression analysis between Benefit/Use dimension and sample characteristics

"Benefit" dimension		Coefficient β (beta)	SE	P
Age		-0.11	0.02	<0.001
Type of headset	intra auricular headset	0.00*		
	posterior auricular headset	-2.17	0.81	0.009
"Use" dimension				
Duration of wearing hearing aid (in years)	Less than 10 year's	0.00*		
	Over 10 year's	1.56	0.72	0.034
Daily usage	Less than 8 hours per day	0.00		
	8 up to 16 hours per day	5.98	0.83	<0.001
Age		-0.04	0.02	0.038

Table 5 shows Pearson correlation between SF-12 and GHABP dimensions. There was a significant positive correlation between physical health and dimensions "Use" (r=0.24, P=0.016) and "Benefit" (r=0.20, P=0.049), so, the greater use of hearing aid or more benefit from its use the better physical health the patient had.

Table 5. Pearson correlation coefficients between SF-12 and GHABP dimensions

GHABP dimensions		Physical health	Mental health
Occurrence	r	-0.15	0.02
	P	0.142	0.880
Initial difficulty-initial disability	r	-0.18	-0.08
	P	0.076	0.459
Handicap	r	-0.04	-0.17
	P	0.690	0.103
Use	r	0.24	-0.10
	P	0.016	0.331
Benefit	r	0.20	-0,01
	P	0.049	0.919
Residual difficulty-residual disability	r	-0.10	0.02
	P	0.333	0.836
Satisfaction	r	0.12	0.04
	P	0.262	0.689

4. Discussion

Hearing loss is a very common condition, especially among the elderly. Given that life expectancy increases and the population ages it is evident that an increasing proportion of the population suffers from hearing loss (Li-Korotky, 2015; Olusanya et al., 2014; WHO, 2015; WHO, 2012).

As it was indicated by the results of this study, the degree of hearing loss is positively associated with the use made by the patient. This is consistent with the results of previous studies that show that patients with higher hearing loss used their hearing aid more (Wong et al., 2003; Bertoli et al., 2009).

Our study also showed that total duration of wearing a hearing aid influences positively its daily use. This agrees with the findings of Saunders and Jutai who showed that patients using hearing aids over the years wore their hearing aid more every day (Saunders & Jutai, 2004). Moreover, our finding is consistent with the results of a lot of previous studies where duration of hearing aid experience was positively associated with its' regular use (Gopinath et al., 2011; Jerram & Purdy, 2001; Öberg et al., 2008; Uriarte et al., 2005).

Age appears to influence benefit dimension of GHABP. These data is with agreement with results of previous research where younger age patients have higher levels of satisfaction with their hearing aid than older ones (Hosford-Dunn & Halpern, 2001). However, there are also studies that have reached different findings. Chang et al supported that age is not correlated with satisfaction and benefit dimensions because of hearing aid usage (Chang et al., 2008). In general, the majority of studies seem to agree that there is no influence of age on either hearing aid use or satisfaction, while at the same time most of these studies reporting on age included participants who are older than 60 years (Knudsen et al., 2010).

Concerning type of headset and benefit dimension, patients who used posterior auricular headset were less benefited. The literature review did not provide clear evidence regarding this difference.

Comparing the dimensions of GHABP with those of SF-12, only physical health scale was positively correlated with the dimensions 'use' and 'benefit'. However, a number of studies show that hearing aids do improve other aspects of Quality of Life, such as the ones related to mental health status and social function. The results of a study conducted among patients with bilateral hearing loss, using hearing aid for at least five years, show that the impact of hearing impairment on the quality of life may be minimized with hearing aids usage (Tsakiropoulou et al., 2007). Cohen found that the use of hearing aids improves quality of life in the areas of hearing and communication but also in areas such as the increase in activities, self-esteem and socialization (Cohen et al., 2004). Dalton et al, in an attempt to measure the effect of difficulty in communicating, because of hearing loss on quality of life, found that the large degree of hearing loss makes patients communication difficult and has an impact on six of the eight scales (physical functioning, physical role, energy, social functioning, role sensuous mental health) of the SF-36 (Dalton et al., 2003). Other researchers used the "HHIE-s" (Hearing Handicap Inventory for the Elderly - short) and found

that the use of hearing aids, six months after its implementation, halved the score disability (Vuorialho et al., 2006; Lofti et al., 2009).

A number of study limitations must be taken into account. First, the sample size was relatively small. Second, a non-probability sampling was used, since the participants were selected on the basis of convenience. So, the extent to which the findings may be generalized is limited. Finally, although general health status instruments like SF-12 and SF-36 have been used in relevant studies, a number of researchers believe that the above instruments lack the appropriate sensitivity to assess the gain in health-related Quality of Life as a result of hearing aid use (Hol et al., 2004).

5. Conclusions

According to World Health Organization estimates more than 360 million adults and children worldwide have disabling hearing loss (WHO, 2015; WHO, 2012). People with hearing loss may have a lot of benefits from hearing aids and the usage of other assistive devices. The assessment of quality of life improvement and the factors associated to widen the use of hearing aids by the patients can contribute to this direction. Due to the findings of the current research, degree of hearing loss, age and type of hearing aid has had an impact on the usage, the satisfaction and the quality of life for people with hearing problems. In addition, it seems that the degree of subjective perception of disability caused by hearing loss significantly affects the use of a hearing aid and satisfaction from patients.

Concerning recommendation for practice, future studies should focus on identifying factors related to constant use of hearing aids, since the more a patient uses it the more he/she is incorporated to his/her everyday life. Studies indentifying differences as far life satisfaction and quality of life among patients who use different types of headsets (analog or digital) may also be proved useful to this direction. Moreover, further studies relevant to the perception of disability are needed, since due to the findings it affects use of hearing aid and life satisfaction. Finally, further research in order to distinct between short term and long term benefits and benefits in different everyday life aspects after hearing aid usage is needed.

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Competing Interests Statement

The author(s) declare that they have no competing interests'.

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