A Comparison of Mental Health in Hearing-impaired Elderly with Hearing Aid and without Hearing Aid

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Abstract

Introduction: Hearing loss can affect physical, mental and social health of deaf adults and lead cause depression, anxiety, isolation, suspicion and stress. This study was aimed to compare mental health in the hearing-impaired elderly with hearing aid and hearing-impaired elderly without hearing aids referring to Ahvaz Imam Khomeini Hospital.

Methods and Materials: In this cross- sectional study, the participants included 72 hearing-impaired elderly elderly aged 60 years or older who referred to Ahvaz Imam Khomeini Hospital, 36 of which were with hearing aids and 36 without. Each group consisted of 18 women and 18 men. Data collecting tool included Goldberg General Health Questionnaire–28 (GHQ-28). GHQ-28 included general health and four subscales of anxiety, depression, physical symptoms and social dysfunction**.** The independent *t*-test was used for analyzing the data.

Results: The mean mental health scores in hearing-impaired elderly without hearing aids and with hearing aid were as 48.13 (57.2%) and 35.66 (42.4%), respectively. Comparing the two groups means through *t*-test, it was concluded that differences between them is statistically significant (p=0.001). The mental health mean score between men and women in the two groups was significant p≤0. 049. In addition, the difference in the mean mental health subscales between the two groups was significant. Thus the hearing-impaired elderly without hearing aids compared to those with hearing aid are more likely to experience depression, anxiety, physical symptoms and social dysfunctions (p≤0. 003).

Conclusions: The results suggest that the hearing-impaired elderly with hearing aid compared to those without hearing aid have more mental health score.

Keywords: Hearing aid, hearing-impaired elderly, mental health.

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Introduction

Aging is a phenomenon considered as a stage of the natural course in human life, an inevitable process that occurs in all human beings. Aging can be defined from different perspectives. According to psychologists, aging is a period of life typically beginning at age 60-65, and changing the shape and function of the inner and outer organs of the body, which makes it difficult to adapt to the environment. Aging is not a disease but it is an inevitable period in the life passage and natural growth path (1). Today, aging with all its mental, social, cultural, doctrinal, and economic aspects is among serious and challenging issues in families and society in general, particularly in the developing and undeveloped countries (2). According to the World Health Organization (WHO), for every child born in underdeveloped countries there are 10 elderly people aged 65 years and older, a figure which is estimated to reach 15 in 2020 (3). According to data revealed by Iranian Population and Housing Census, it is estimated that the elderly population of Iran will reach over 26 million in 2050, comprising 26% of the country's total population (4). Given the increasing number of the elderly, their health issues, and mental health issues in particular, are of high significance (5). According to WHO, mental health is the ability to communicate with others harmoniously, to change and modify personal and social environments, and to resolve the personal contradictions and desires logically, fairly, and properly (6). A common deficiency among the elderly is hearing impairment. It is notable that in the United States, with 295 per 1000 cases, hearing impairment is ranked third among the 10 highest prevalent diseases in people over 65 years, and it is more frequent than visual impairment. Although the impacts of chronic diseases such as arthritis and heart disease are well known, little information is available on the impact of hearing loss on mental health (7). The studies have found that one and a half percent of Iranians are deaf (8). The negative impact of hearing loss on communication with others can be minimized through adjusting hearing aids and special rehabilitation programs (9). Researches in this area have revealed that hearing impairment in old age can affect one's physical, mental and social health. With a timely diagnosis of this complication and using hearing aid instruments such as hearing aids, we can prevent or reduce the consequent communication and psychological disorders (10). It is estimated that 25 to 40% of the population 65 years and older, 40 to 66% of people older than 75 years, and more than 80 to 90% of people over 85 suffer from hearing loss (11). Although the elderly are a vulnerable population in an urgent and immediate need of welfare services, mental health, social care and rehabilitation, and therefore it seems necessary to allocate part of the general budget to the elderly, unfortunately, no consistent and significant measures are taken in this area (12). In addition, due to impact of hearing loss and problems associated with it such as tinnitus, and vertigo on communication ability and quality of life and its high prevalence in the elderly, scientific planning and implementation seems necessary to identify and treat hearing problems in this population (13). In this regard, rehabilitation services should be designed to help people overcome problem causing disabilities. The use of a hearing aid is one of the most essential elements of an effective rehabilitation program, in this regard (14). Given that there has been no study on the mental health of the elderly with hearing loss in Khuzestan province, this study addressed and compared the issue of the mental health among the

hearing-impaired elderly with or without hearing aids.

Methods and Materials

In this cross-sectional and case-control study, the hearing-impaired elderly who referred to the audiology clinic of Imam Khomeini in Ahvaz were studied during the timeframe August–September 2012. The 28-item Goldberg General Health Questionnaire (GHQ-28) was used to collect data. The 28-GHQ measures public mental health and its four subscales including physical symptoms, anxiety, social dysfunctions and depression. Cronbach's alpha coefficient of the questionnaire, physical symptoms, anxiety, social function and depression, are reported in one study to be 0.97, 0.88, 0.90, 0.87 and 0.94, respectively (15). Moreover, Cronbach's alpha coefficient was measured to be 0.94 for an Iranian version of the mental health scale in a study conducted by Malakooti *et al.* in 2006 (16). In the present study, the Likert scale was used in scoring the answers and scores of 0-3 were considered equal to answers of "never", in a normal level, more than normal, and much more than normal, respectively. After scoring the questions, the total was calculated by summing all the scores. The score of 0-27, 28-55, and 56-84 were considered as the optimal level of public health, partly favorable and unfavorable mental health, respectively.

In this research, a purposive sampling method was used and the number of samples was based on the sample size formula as follows:

$$n=\frac{\left(Z_{1-\frac{\alpha}{2}}+Z_{1-\beta}\right)^2\left[S_1^2+S_2^2\right]}{\left(\bar{X}_1-\bar{X}_2\right)^2};$$

There were 36 participants (18 males and 18 females) in the case group, and 36 people (18 men and 18 women) in the control group; the questionnaire was given to them in their presence. A trained person was assigned to help the illiterate people complete the questionnaire. It should be noted that at the beginning, all seniors were evaluated for hearing and informed consent was received from all of them. Inclusion criteria for this study included having at least 60 years of age, a moderate to high level of hearing loss (average hearing threshold at three frequencies 500, 1000 and 2000 Hz, above 45 dB in each ear), and people with the hearing aid, who used digital hearing aids in both ears at least for one year continuously and were pleased with its performance. Exclusion criteria included any history of mental illness and severe physical illness and living in a nursing home. Data were analyzed by descriptive statistics and *t*-test using SPSS version 19.

Results

In this study, we examined 72 people with hearing loss, including 36 elderly with hearing aids and 36 elderly without hearing aids aged over 60 years with a mean age of 69.54 and a standard deviation of 6.68. The mean mental health scores in hearing-impaired elderly with and without hearing aids were 48.13 (57.2%) and 35.66 (42.4%), respectively. The number of illiterate participants in the group with hearing aids was 14 (14.54%) and in the group without a hearing aid 13 (36.1%); the number of participants with primary education in group with hearing aids was one (2.7%) and in group without hearing aids was four (11.1%); in the group with hearing aids 10 people had an education level of diploma or below (five had a diploma and five below). In the group without hearing aids this number was 11 (four had no diploma, and seven had a diploma). In the group with hearing aid 11 had attended a university program (three had an associate diploma, seven had bachelor, and one MA degree). Among the men having hearing aids three

were self-employed, 12 were pensioners, and three were under the support of the Imam Khomeini Relief Foundation; among the women having hearing aids, 11 received no pensions and seven were pensioners. Among the men without hearing aids three were self-employed, 13 pensioners and two under the support of the Imam Khomeini Relief Foundation. Finally, among the women without hearing aid, 10 received no pension, six were pensioners and two were under the support of the Imam Khomeini Relief Foundation. All the participants were married and their husbands were alive. The average monthly income of the subjects was 6,000,000 Iranian Rials (IRR) (250 USD). The mean scores of general health obtained through GHQ-28 showed a significant difference between the first group who were the elderly with hearing aid and the second group who were the elderly without hearing aids (Table 1). *T*-test showed that the difference in the two groups was significant (p=0.001). The mental health mean score for men and women in the two groups was significant p≤0. 049. In addition, the results indicated significant differences between the four sub-scales among older individuals with hearing loss with and without hearing aids (Table 2). These subscales are four dimensions of mental health (depression, anxiety, physical symptoms and social dysfunctions) based on the research questionnaire. Compared to the elderly with hearing aid, the hearing-impaired elderly without hearing aids experienced more depression, anxiety, physical symptoms and social dysfunctions (p≤0. 003). Furthermore significant differences were observed between overall mental health and its components in each gender in groups with and without hearing aids, except component of physical symptoms and anxiety in men. The mean overall scores of general health obtained by GHQ-28 showed a significant difference between the first group that were the elderly with hearing aid and the second group that were the elderly without hearing aids (Table 1). T-test showed that the difference in the two groups was significant (p=0.001). The mental health mean score between men and women in the two groups was significant p≤0. 049. In addition, the results indicated significant differences between the four sub-scales among older individuals with hearing loss with and without hearing aids (Table 2). These subscales are four dimensions of mental health (depression, anxiety, physical symptoms and social dysfunctions) which are based on the research questionnaire. The hearing-impaired elderly without hearing aids compared to the elderly with hearing aid experienced more depression, anxiety, physical symptoms and social dysfunctions (p≤0. 003). Furthermore significant differences were observed between overall mental health and its components in each gender in the groups with and without hearing aids, except component of physical symptoms and anxiety in men.

Table1: Comparison on the mental health among the hearing-impaired elderly with and without hearing aid

Variable	Group	n	Mean	SD	sig
Mental health	With hearing aid	36	66. 35	13.82	0.001
	Without hearing aid	36	48.13	15.42	

Table2: Comparison on the mental health scales among the hearing- impaired elderly with hearing aid and without hearing aid

Variable	Group	n	Mean	SD	sig
Anxiety	With hearing aid	36	9.41	3.12	0.002
	Without hearing aid	36	12.11	3.99	
Depression	With hearing aid	36	9.41	3.66	0.001
	Without hearing aid	36	12.41	4.01	
Social dysfunctions	With hearing aid	36	8.91	3.75	0.001
	Without hearing aid	36	12.00	4.32	
Physical symptoms	With hearing aid	36	8.00	3.60	0.003
	Without hearing aid	36	10.50	3.99	

Discussion

The current study was intended to compare mental health among the hearing-impaired elderly with and without hearing aids in Ahvaz. The obtained results and the statistical analyses in the study showed that the hearing-impaired elderly with hearing aids are mentally healthier than the hearing-impaired elderly without hearing aids.

These people experience anxiety, depression, impaired social functioning and fewer physical symptoms. It seems that it is due to the communicative deprivations that the elderly without hearing aid suffer from it. This finding is consistent with the results of the study by Hosseinabadi *et al.* (10). Other studies have also shown that the use of hearing aids in the people with hearing loss reduces anxiety, depression, and anger, and enhances the quality of life (17). Lupsakkot and Cynthia's studies were also indicative of such effects (17, 18). The results of the present study are also consistent with findings of Sagora about the psychological effects of hearing aid use in older adults. These findings indicated that anxiety, depression and anger reduced after using a hearing aid, consequently improving mental health (19). The results of the study conducted by Boi et al. in 2011 titled *'the hearing loss and depressive symptoms in the San Martino Hospital*, *Italy'*, showed that depression was significantly reduced in the elderly people with hearing loss who used hearing aids (20), this is consistent with the findings of the present study. As for the general mental health, the results of the study conducted by Oberg et al., titled 'hearing problems, understanding the implications of conversational speech and consequences of the use of hearing aids in the elderly people', are consistent with the present study's results. In this study, general health and mental health of people with hearing loss without a hearing aid, were worse than those with a hearing aid (21). Fellinger et al.'s study (2007) titled *'psychological distress and quality of life while hearing loss'* conducted in an

Australian hospitals showed that communicative abilities of the hearing-impaired people without hearing aids were lower than those with hearing aids. The study also revealed that the quality of life among people with hearing loss using hearing aids was significantly higher than those who did not use hearing aids (22). Therefore, this finding confirms the results of the present study.

Conclusions

Hearing-impaired elderly with hearing aids compared to those without hearing aids have more mental health score. Hearing loss and communicative disorders induced in the elderly lead to mental health problems. In addition, consistent and appropriate use of hearing aids leads to reduction of depression, anxiety, and physical symptoms and social dysfunctions and consequent improvement in mental health of the elderly. Thus, the communicative and psychological disorders can be prevented or reduced by timely diagnosis and the use of hearing aids.

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