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Effects Of Hearing Impairment On Social Abilities In The Elderly

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ABSTRACT

Hearing loss is a global health problem with increasing prevalence, especially in the elderly. This condition not only affects communication skills, but also affects the social and psychological aspects of individuals, such as social isolation, depression, and decreased self-confidence. Difficulties in interacting can lead to limitations in social participation and self-adjustment, which ultimately reduces the quality of life of the elderly. This study aims to determine the characteristics of individuals who experience hearing loss in the elderly, determine the effect of hearing loss on social disabilities in the elderly, determine the social disabilities that occur as a result of hearing loss in the elderly. This research uses quantitative methods with an analytical survey approach and *cross-sectional* design. The results showed that of the 40 respondents, the majority were in the age range of 45-59 years. A total of 25 respondents (62.5%) were female, and 15 respondents (37.5%) were male. Of these, 29 respondents (72.5%) had hearing loss, while 11 respondents (27.5%) did not have a loss. Statistical analysis showed that hearing loss had a significant effect on social disability in the elderly (*p-value* = 0.001), Most experienced mild social disability as many as 26 respondents (22.5%). Hearing loss causes difficulties in communication, which can increase the risk of social isolation and reduce their quality of life.

Introduction

The sense of hearing is one of the five human senses that functions to detect and perceive sound waves. The sense of hearing serves to recognize various kinds of sounds determine the location of the source and establish communication among humans in everyday life. Hearing loss is a health problem that is increasing in prevalence worldwide. The World Health Organization (WHO) estimates that

more than 460 million people in the world suffer from hearing loss in 2021, and this estimate is likely to increase in the coming years (WHO, 2021). Hearing loss can be caused by various factors, such as excessive noise exposure, genetic factors, ear infections, aging, and complications due to certain diseases.(World Health Organization, 2021)

Based on Riskesdas 2013, the prevalence of hearing loss in the population over 5 years old is 2.6 of all regions in Indonesia. The high rate of hearing loss threatens the occurrence of moderate, severe to very severe deafness. In addition, congenital deafness occurs in 1-2 births. Deafness is sensorineural from mild to very severe.(Ministry of Health of the Republic of Indonesia, 2019). Of the 28,297 total individuals (age (mean ± SD): 35.29 ± 12.78 years for men and 35.01 ± 12.79 years for women) of the Indonesian population, 220 people had hearing problems (with a prevalence of 7.8 per 1000 people). The prevalence of self-reported hearing problems in those aged 15~25, 26~35, 36~45, and 46~64 years were 0.48, 0.48, 0.85, and 1.4 per 1000 people, respectively. Thus, the prevalence of hearing problems increases with age.(Hearing loss prevalence in the United States, 2011)

A decline in hearing function usually occurs in older people. The prevalence of hearing loss increases significantly each year with age, with nearly two-thirds of adults aged 70 years and older experiencing hearing loss that has a significant effect on daily communication. Identifying the symptoms of hearing loss in an individual begins with the understanding that hearing involves two main processes: (1) the transduction and encoding of sound into neural signals that occur in the cochlea, and (2) the decryption of neural signals in the brain and central auditory cortex. In most elderly people, age-related hearing loss is the result of a slow and progressive accumulation of damage to the cochlear cells due to repeated exposure to noise, microvascular problems and aging. This damage causes the cochlea to no longer be able to accurately encode complex sounds such as speech, resulting in distorted signals being sent to the brain, which often makes the individual feel like the other person is "talking out of turn". This leads to common statements such as "I can hear you, but can't understand you." Therefore, individuals with hearing loss generally face fewer problems when under ideal listening conditions.(Fitriana M, 2022)

According to reports from the World Health Organization (WHO), hearing loss is becoming increasingly common among older people worldwide as a serious health problem. People with hearing loss often face limitations in communication, resulting in difficulties interacting with family and friends, and reduced participation in social activities. In addition, hearing loss issues also negatively impact social and psychological aspects, including social isolation, the onset of depression, and decreased self-confidence, ultimately affecting overall quality of life.(Hearing loss prevalence in the United States, 2011)

Individuals with hearing loss often face difficulties and challenges in communicating with those around them, especially when it comes to adapting to new or unfamiliar situations. This condition can also lower their self-confidence and make them feel suspicious of others more easily. As a result, they have difficulty adjusting or even choose to withdraw from the social environment, thus being unable to play an active role in the community where they live. This has the potential to make a person feel isolated from daily social

interactions, which means they are also disconnected from social norms and rules in society.(Lestari, 2016)

Hearing loss in society can lead to social rejection in joint activities, where the advantages or potential possessed by Deaf individuals are often ignored. This social rejection arises because social interaction relies heavily on communication between two or more parties. Difficulties in communicating experienced by both parties can trigger serious obstacles that interfere with the social adjustment ability of individuals with hearing loss. In fact, as social creatures, humans are expected to have good adaptability in social life.(Lestari, 2016)

Therefore, research on the influence of hearing loss on social disability in the elderly is very important. With a deeper understanding of the relationship between hearing loss and social impairment in this group, it will be easier to develop appropriate intervention strategies to improve their quality of life and social well-being.

Method

This study uses a quantitative method with an analytical survey approach and cross-sectional data collection. Data were collected through structured questionnaires given to respondents to identify the relationship between the variables studied. The research was conducted at Pampang Health Center in August 2024 until completion. The study population was individuals aged ≥ 46 years with good general condition, and the sample was selected using Accidental Sampling technique. Based on the Slovin formula, the minimum sample size was 33 people, plus the possibility of dropping out 10%, making the total sample 40 people. Samples selected based on the inclusion criteria and then conducted a garputala test to detect hearing loss. Then asked to fill out the *Hearing Handicap Inventory for the Elderly-Screening* (HHIE-S) questionnaire to assess social disability. The data obtained were analyzed using the Chi-Square bivariate test to see the relationship between hearing loss and social disability in the elderly.

Results and Discussion

Research Results

This study was conducted on patients who examined themselves at the Pampang Health Center with a total of 40 respondents with an elderly group of 50 - 75 years. The study was conducted by means of an initial screening hearing test using a tuning fork to obtain subjects who met the inclusion and exclusion criteria. Then obtained a sample that experienced hearing loss 29 people and 11 of them were normal. The subjects then filled out the *Handicap Inventory Elderly-Screening* (HHIE-S) questionnaire to see the disability that occurred. The data obtained were then recorded and statistically analyzed.

Table 1. Frequency and Percentage Distribution of Respondents' Characteristics

	Frequency (people)	Percentage (%)
Gender		
Female	25	62.5%
Male	15	37.5%
Age		
45-59 (*middle age*)	31	77.5%
60-74 (*old)*	6	15.0%
75-90 *(elderly)*	3	7.5%
Types of Hearing		
Normal	11	27.5%
Conductive	9	22.5%
Sensorineural	9	22.5%
Mixed	11	27.5%

Table 1 shows that the majority of respondents were female as many as 25

people (62.5%), while men totaled 15 people (37.5%). In terms of age, the 45-59 years group dominated with 31 people (77.5%), followed by 60-74 years of age with 6 people (15.0%), and 75-90 years of age with 3 people (7.5%). Based on the type of disorder, there were 11 people with normal conditions and 11 people with mixed disorders, each amounting to 27.5%, while conductive and sensorineural disorders were experienced by 9 people each (22.5%).

Table 2. Frequency Distribution of Hearing Loss Variables by Age

			Age (year)		
			45-59	60-74	75-90
Types of Hearing	Normal	Frequency (people)	11	0	0
		Percentage (%)	100.0 %	0.0%	0.0%
	Conductive	Frequency (people)	6	3	0
		Percentage (%)	66.7%	33.3%	0.0%
	Sensorineural	Frequency (people)	6	0	3
		Percentage (%)	66.7%	0.0%	33.3%
	Mixed	Frequency (people)	8	3	0
		Percentage (%)	72.7%	27.3%	0.0%

Table 2 shows the distribution of hearing loss by age. There were 11 people in the normal category (100%) in the age range of 45-59 years. There were no respondents with normal categories in the age range of 60-74 years or 75-90 years. Furthermore, there were 9 people who had conductive hearing loss. Of these, 6 people (66.7%) were in the age range of 45-59 years, and 3 people (33.3%) were in the age range of 60-74 years. No one had conductive hearing loss in the age range of 75-90 years.

For the sensorineural hearing loss category, 9 people had sensorineural hearing loss. Of this category, 6 people (66.7%) were in the age range of 45-59 years, and 3 people (33.3%) in the age range of 75-90 years. No respondents aged 60-74 years had sensorineural hearing loss. A total of 11 people had mixed hearing loss. Of these, 8 people (72.7%) were aged 45-59 years, and 3 people (27.3%) were aged 60-74 years. No respondents at the age of 75-90 years had mixed hearing loss.

Table 3. Distribution of the effect of hearing loss on social skills

Types of Hearing	**Social disabilities**						
	No Hendaya		Lightweight Hendaya		Severe Hendaya		*P-value*
Normal	11	27.5 %	0	0.0 %	0	0.0 %	0.001
Distracte	0	0.0 %	26	22.5 %	3	7.5 %	

The results of the analysis using the Chi-Square alternative *likelihood ratio test* showed a p value of 0.001. This value indicates that $p < 0.05$, which means that there is a significant influence between the type of hearing loss and social disability in the elderly.

Discussion

Hearing loss is the partial or total inability to hear sound in one or both ears. Hearing loss can occur in various age groups. One of the most common types in the elderly is presbycusis, which is a sensorineural hearing loss due to a degenerative process. Presbycusis is thought to be the result of a gradual decline in hearing function influenced by various factors such as heredity, metabolism, arteriosclerosis, hormones, infection, noise exposure, or multifactorial factors.(Phoebe, Purnami, Maramis, & Djuari, 2023; Wardoyo et al., 2022)The aging process is complex as age syndromes affect various organ systems, including hearing function. Changes in homeostasis and physiology that occur with age contribute to the complexity of hearing loss in the elderly.(Phoebe et al., 2023)

Research into the relationship between sex hormones and hearing loss suggests that changes in hormone levels, particularly estrogen and progesterone in women, can affect hearing function. After menopause, estrogen and progesterone levels decrease significantly, which is thought to contribute to the increased risk of hearing loss in postmenopausal women. Some early studies indicated that *hormone replacement therapy* (HRT) may reduce the risk of hearing loss by stabilizing *hormone* levels. However, further studies have found that HRT may have serious side effects and does not always provide protective benefits to hearing.

On the other hand, the hormone testosterone, which is predominant in men but also present in women in smaller amounts, plays an important role in various bodily functions. Although the specific role of testosterone in hearing function is not fully understood, some studies suggest that balanced testosterone levels are important for overall health . In general, age-related hearing loss (presbycusis) is more common in men than women, but after menopause, the prevalence of hearing loss in women increases, which may be related to the decrease in estrogen and progesterone levels (Frisina et al., 2021). This is in line with the results of this study which show that the prevalence of hearing loss is higher in women as many as 25 people (62.5%) compared to men with 15 people (37.5%).

This finding differs from research conducted by Joyo Wardoyo, Dwi Marliyawati, and Muyassaroh, who found a higher prevalence in men. This difference could be due to the characteristics of the study population or other factors, such as exposure to noisy work environments, smoking habits, or certain health conditions that are more commonly experienced by men.(Wardoyo et al., 2022)Thus, these findings emphasize the importance of considering hormonal factors as one of the factors that influence the prevalence of hearing loss, especially in postmenopausal women, in addition to environmental and lifestyle factors that may differ between men and women.

In terms of age, the majority of research respondents were in the *middle-aged* age group (50-59 years) with 31 people, followed by *old* (60-74 years) with 6 people, and *olderly* (75-90 years) with 3 people. This shows that hearing loss is more dominant in the middle-aged age group ((Rara Enggola Handayani & Baluqia Baluqia, 2024; Wardoyo et al., 2022)50-59 years), which may be influenced by the age distribution in this study . Hearing loss has a significant impact on the lives of older people, both socially and psychologically. One of the main impacts is difficulty in communicating, which hinders their ability to convey or understand information well. As a result, many older people feel frustrated at not being able to interact effectively. This can lead to a sense of stress and loneliness, especially when they feel ignored or unable to follow conversations in their surroundings. The inability to communicate fluently often discourages older adults from participating in social activities. Over time, they tend to withdraw and choose to isolate themselves, which worsens their mental and emotional state.(Rara Enggola Handayani & Baluqia Baluqia, 2024)

Hearing loss can cause older people to feel reluctant to participate in social activities, increasing the risk of social isolation. This situation creates a cycle that is difficult to break, where difficulties in communication trigger social isolation, which in turn negatively affects the mental health of the elderly. Various studies have shown that this

impact often develops into psychological problems, such as anxiety and depression, which further worsen their quality of life...(Mick et al., 2014; Raflianda fair, 2019; Rantung et al., 2018).

In addition to social and psychological impacts, hearing loss also affects the decline in cognitive function of the elderly. Research conducted by Cunningham LL, Tucci DL, related to *Hearing Loss in Adults* shows that presbycusis can accelerate the decline in cognitive functions, such as memory and thinking skills. This occurs because brain stimulation through hearing is significantly reduced, so the brain loses the input needed to maintain optimal cognitive function. Seniors with hearing loss are also more susceptible to overall brain function decline.(Cunningham & Tucci, 2017)

Research conducted by Ade Asyari, Hendra Permana, Al Hafiz, and Rossy Rosalinda states that there is a significant relationship between hearing loss and decreased cognitive function. Subjects with hearing loss have a 5.88 times greater risk of cognitive impairment compared to those without hearing loss. In addition, hearing loss was also found to have a significant relationship with the level of depression in the elderly. The more severe the hearing loss, the higher the risk of depression, especially with age. This reinforces the importance of early detection and intervention of hearing loss to reduce its adverse impact on the mental and cognitive health of the elderly.(Asyari, Permana, Hafiz, & Rosalinda, 2019; Marengoni et al., 2011; Putri1, Ristyaning, Sangging2, & Himayani3, 2023)

Conclusion

Based on the results of research and discussion that has been carried out regarding hearing loss with social disabilities in the elderly, it can be concluded that the prevalence of the majority of respondents who experience hearing loss is in the age range of 45 - 59 years with the majority of women as many as 25 respondents (62.5%) and men as many as 15 respondents (37.5%) with 29 respondents experiencing hearing loss while 11 respondents are in the normal category or no impairment. Hearing loss has a significant effect on social disability in the elderly (p-value = 0.001), most of them experience mild social disability as many as 26 respondents (22.5%) Elderly people with hearing loss have difficulty communicating, which can lead to an increased risk of social isolation.

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