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Third-Party Disability in Spouses of Elderly Individuals: Comparing Outcomes with and without Hearing Aids Using SOS-HEAR

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ABSTRACT

Introduction: Individuals with age-related hearing loss face various activity limitations and participation restrictions. This condition significantly impacts their spouses and family members, a phenomenon known as third-party disability, defined by the World Health Organization as the disability and functioning of family members due to a significant other's health condition. This study aimed to measure the third- party disability among spouses of elderly individuals with and without hearing aids using the Significant Other Scale for Hearing Disability (SOS- HEAR).
Method: 120 normal-hearing older adults aged 60 to 80 years with spouses having hearing loss ranging from moderate to severe sensorineural or mixed hearing loss with and without hearing aids were selected from various private Audiology clinics across Kerala. Pure tone audiometry, immittance audiometry and SOS-HEAR questionnaire were administered.
Results: Descriptive statistical analysis revealed that higher auditory thresholds correlate with greater third-party disability. The mean average third-party disability scores were highest for the severe hearing loss group (58.00), followed by those with moderately severe (45.90) and moderate (40.58) hearing loss. Bonferroni pairwise comparison showed significant differences between moderate and severe hearing loss groups. The unaided group reported higher third-party disability (54.90) than the aided group (52.15). Among the SOS-HEAR domains, "Changes to Communication" was the most affected, followed by "Communication Burden." Spouses of unaided older adults experienced the greatest third-party disability. Overall, the aided group had lower mean scores in all domains, indicating reduced third-party disability with hearing aid use.
Conclusion: The study found that hearing aids reduce third-party disability for the significant others of individuals with hearing loss by improving their communication skills. Therefore, involving the significant others of individuals with hearing loss in the rehabilitation process is crucial.

Keywords: Third-party disability, age-related hearing loss, communication partner, spouses, hearing aid, SOS HEAR

INTRODUCTION

Age-related hearing loss (ARHL) represents the most prevalent sensory deficit within the elderly population. The ramifications of ARHL are multifaceted, adversely affecting numerous aspects of an individual's daily functioning. Often regarded as an invisible disability, ARHL is characterised by diminished auditory sensitivity and a decline in auditory perception, subsequently leading to impaired speech comprehension. Furthermore, ARHL is associated with alterations in non-auditory cognitive processes, including memory, attention, and executive functioning, thereby exacerbating the challenges faced by affected individuals.[1]. ARHL primarily impacts the ability to hear high-frequency sounds, making it challenging to understand speech, particularly in noisy environments. This deterioration of auditory input requires individuals to exert more effort to process and comprehend speech, which ultimately limits communication and restricts social interactions—an essential part of everyday life. As a result, this can lead to a perceived decline in quality of life. (QOL)[2].

ARHL has far reaching effect beyond the person with hearing loss (PHL) especially on family members or communication partners whose involvement is very crucial in PHL's experience in living with hearing loss. Communication partners are defined as "those with whom the person with hearing impairment communicates on a regular basis namely their spouses, siblings, children, friends, relatives, colleagues and caregivers"[3]. In elderly individuals, most commonly their significant family members especially spouses will be their communication partners. The caregivers of individuals with hearing loss often experience significant challenges, including caregiver burden, the role of being an interpreter, emotional consequences, and impacts on social life [4]. These negative outcomes are frequently reported by their communication partners. The role of communication partners is very important as their perception of the stigma of hearing aids and their strategy of coping play a big role in the PHL's decision to get a hearing aid[5].

The primary areas in which individuals with hearing loss (PHL) and their communication partners reported experiencing impacts are the auditory, social, and self domains. The auditory domain includes subdomains such as listening, communication, and speaking. The social domain encompasses elements such as isolation, relationships, social life, occupation, and interventions. The self-domain addresses aspects related to emotions, identity, effort, fatigue, and stigma [6]. Consequently, age-related hearing loss (ARHL) can profoundly affect not only the mental and physical health of family members and caregivers of PHL but also their overall quality of life.

The World Health Organization's International Classification of Functioning, Disability, and Health (ICF) advocate for a family-centered approach to care for individuals with hearing loss (PHL) and their significant others. The ICF expands the focus beyond mere impairment to encompass activities, participation, and contextual factors that affect both PHL and their families. Nevertheless, the predominant patient-centered care models employed in the audiological rehabilitation of PHL frequently neglect to acknowledge the contributions of family members and friends in the rehabilitation process. Furthermore, these models often fail to recognize the profound impact of hearing loss on the lives of family members and friends. Research has demonstrated that significant others experience levels of frustration and anxiety comparable to those experienced by individuals with hearing impairments [7]. Third-party disability in significant others can be evaluated using various questionnaires by assessing the impact on their communication, relationship and quality of life. Few questionnaires are specifically developed for significant others of persons with hearing loss namely Hearing Impairment Impact- Significant Other Profile (HII-SOP), Significant Other Scale for Hearing Disability (SOS-HEAR) etc. The

Significant Other Scale for Hearing Disability (SOS-HEAR) developed by Scarinci et.al was used in this study to measure the third party disability. The current study aimed to measure and compare third-party disability among spouses of older adults with age-related hearing loss, both with and without hearing aids, using the Significant Other Scale for Hearing Disability (SOS-HEAR).

MATERIALS & METHODS

Data for this study was collected from various private audiology clinics in Kerala, involving a total of 120 participants. The Significant Other Scale for Hearing Disability (SOS-HEAR) questionnaire, developed by Scarinci, Worrall, and Hickson in 2009, assessed third-party disability through 27 questions divided into six subscales:

1. Changes in Communication (6 questions)
2. Communication Burden (6 questions)
3. Relationship Changes (3 questions)
4. Socializing (4 questions)
5. Emotional Reactions (5 questions)
6. Concern for Partner (3 questions)

Scores on the SOS-HEAR ranged from 0 (indicating no problem) to 4 (indicating a complete problem), with higher scores reflecting greater third-party disability. The SOS-HEAR questionnaire was translated into Malayalam using a forward-backward translation method by bilingual professionals. To ensure accuracy and to avoid dialectical variations, the translated questionnaire was validated by three audiologists in Kerala. Participants were informed about the study and consented to include their audiological results, with no financial compensation offered. A total of 120 spouses of older adults (ages 60-80) with hearing loss were divided into two groups based on the hearing aid usage of the PHL, each group was subdivided into three groups of 20 individuals each, based on the severity of hearing loss (moderate, moderately severe, and severe)

***Inclusion Criteria*:**

- Older Adults aged 60-80 years.
- Spouses of older adults with moderate to severe sensorineural or mixed hearing loss.
- Bilateral normal hearing thresholds with 'A' type tympanogram
- Unaided group: No history of hearing aid use.
- Aided group: Minimum 2 years of hearing aid experience.

Exclusion Criteria

- Spouses with any otological or neurological conditions.
- Those with conductive hearing loss or associated medical conditions
- Spouses of individuals who have used hearing aids for less than 2 years

Pure tone audiometry and tympanometry were administered to both older adults with hearing loss and their spouses after which SOS HEAR was administered on the spouses. The most affected subscales of SOS-HEAR were identified based on group and severity of hearing loss.

STATISTICAL ANALYSIS

Data collected were analysed using SPSS software version 20, and descriptive statistics (mean and standard deviation) were calculated for all groups and subdomains of SOS-HEAR. A two-way ANOVA assessed significance across unaided/aided groups and severity levels of hearing loss (Moderate, Moderately Severe, Severe). Bonferroni pairwise comparisons were conducted for Moderate vs. Moderately Severe, Moderately Severe vs. Severe, and Severe vs. Moderate groups. Spearman's correlation examined the relationship between third-party disability and SOS-HEAR domains. The Mann-Whitney U test identified significant differences between aided and unaided groups in SOS-HEAR subdomains. Shapiro-Wilk tests checked for normality in the data and, the Mann-Whitney U test assessed score differences between male and

female subjects based on hearing status and severity of loss.

RESULTS AND DISCUSSION

Severity of hearing loss and third-party disability

Descriptive analysis using the mean and standard deviation measures was performed to evaluate the relationship between the severity of third-party disability in spouses of older adults and the degree of hearing loss in older adults irrespective of their amplification status (aided/unaided) and the results are shown in figure 1.

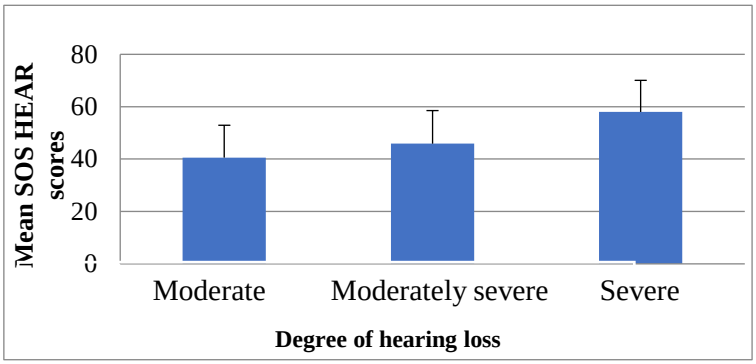

Figure 1: Mean SOS-HEAR scores of the spouses across different degrees of hearing loss of older adults

The findings indicated that the highest level of third-party disability reported by spouses was linked to a severe degree of hearing loss. In contrast, the lowest level of third-party disability was associated with a moderate degree of hearing loss among the three groups studied. Due to the significant differences in the severity of hearing loss, a Bonferroni pairwise comparison was performed to evaluate the significance between three specific pairs: moderate vs. moderately severe, moderately severe vs. severe, and severe vs. moderate. The results of this analysis are presented in Table 1.

Table 1: Pair-wise comparison of mean SOS HEAR scores between various degrees of hearing loss

Pairs	Difference	p-value
Moderate vs Moderately severe	-5.325	0.072
Moderately severe vs Severe	-12.100	0.000
Severe vs Moderate	17.425	0.000

The pairs moderately severe vs severe degree and severe vs moderate degree showed statistically significant differences with p=0.000, and there was no significant difference seen when moderate and moderately severe degrees were compared. The findings aligned with the study conducted by Nandurkar and Shende [8], which revealed that spouses of older adults with severe hearing loss experienced greater third-party disability compared to those whose partners had moderate hearing loss. Therefore, as the degree of hearing loss increases, the impact on the spouse also increases, leading to heightened third-party disability

Hearing aid usage and third-party disability

The effect of hearing aid usage among older adults on the third-party disability experienced by their spouses was examined by comparing the SOS-HEAR scores of spouses of hearing aid users with those of spouses of non-users. The mean and standard deviation (SD) of the spouses' SOS HEAR scores were calculated and are presented in Figure 2.

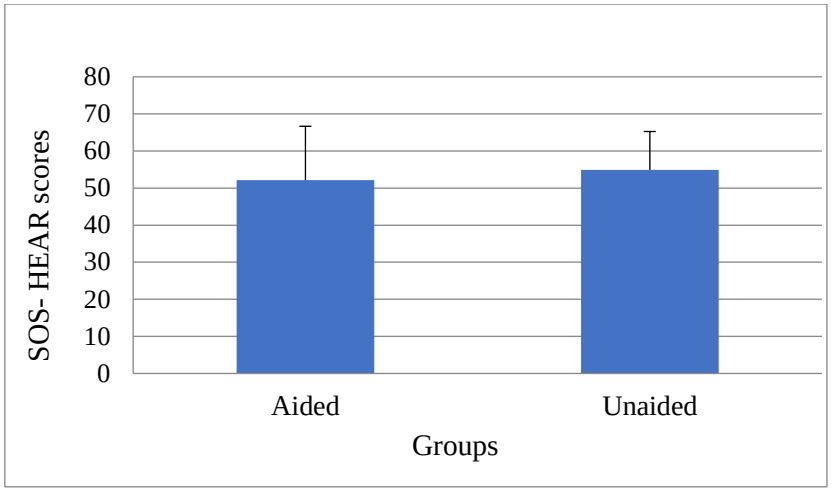

Figure 2: Mean SOS-HEAR scores of spouses across aided and unaided groups

Figure 2 illustrates that the mean SOS-HEAR scores were higher for the unaided group's spouses compared to the aided group, indicating that the spouses of unaided older adults experienced greater third-party disability than the spouses of aided older adults. These findings highlight the importance of hearing aid usage among older adults with hearing loss, as hearing aids can significantly enhance the quality of life for both the individuals affected and their significant others.

These results align with previous research that compared the quality of life of significant others of individuals with hearing impairments before and after they received hearing aids. The study reported a reduction in disability and an improvement in quality of life for both the individuals with hearing loss and their significant others following the fitting of hearing aids[9].

Third-party disability based on degree of hearing loss and hearing aid usage

An independent two-sample t-test was conducted to determine whether there is a statistically significant difference between the aided and unaided groups regarding the severity of hearing loss. The results are summarized in table 2 below.

Table 2: Comparing mean SOS-HEAR scores of aided and unaided groups for the degree of hearing loss

Severity	Groups	N	Mean	SD	T (38)	p-value
Moderate	Aided	20	32.90	10.09		
	Unaided	20	48.25	9.32	-4.994	0.000
Moderately severe	Aided	20	39.20	13.30	-3.925	0.000
	Unaided	20	52.60	7.48		
Severe	Aided	20	52.15	13.18	-3.472	0.001
	Unaided	20	63.85	7.30		

The findings indicate a highly significant statistical difference ($p = 0.000$) between the scores of the unaided and aided groups across all three degrees of hearing loss. The mean scores of the unaided groups were higher than those of the aided groups in each degree of hearing loss. This suggests that, regardless of the severity of hearing loss, spouses of older adults with hearing loss who are not using hearing aids experienced greater disability compared to those whose partners use hearing aids.

As the severity of hearing loss increased, the mean scores for both groups (aided and unaided) also rose, indicating that spouses of older individuals with severe hearing loss faced more challenges than those with partners who had lesser degrees of hearing loss.

These results align with a systematic review conducted by Wallace, which examined the

quality of life (QoL) and the social and emotional aspects of third-party disability experienced by communication partners of persons with hearing loss (PHL). This review compared communication partners of hearing aid users, cochlear implant users, and those who were unaided. It found that a reduction in third-party disability occurred following the fitting of hearing aids, cochlear implantation, or participation in group aural rehabilitation [10]. The benefits of using hearing aids extend beyond improved hearing to include positive effects on stress reduction, social participation, quality of life, and everyday functioning [11, 12].

Third-party disability and gender effect

This study investigated gender-based differences in the third-party disability experienced by spouses of older adults with hearing loss. The Shapiro-Wilk test indicated that the data significantly deviated from a normal distribution when analyzed by gender ($p < 0.05$). Consequently, a Mann-Whitney U test was conducted to evaluate differences in the type and severity of hearing loss between males and females, as illustrated in Figure 3.

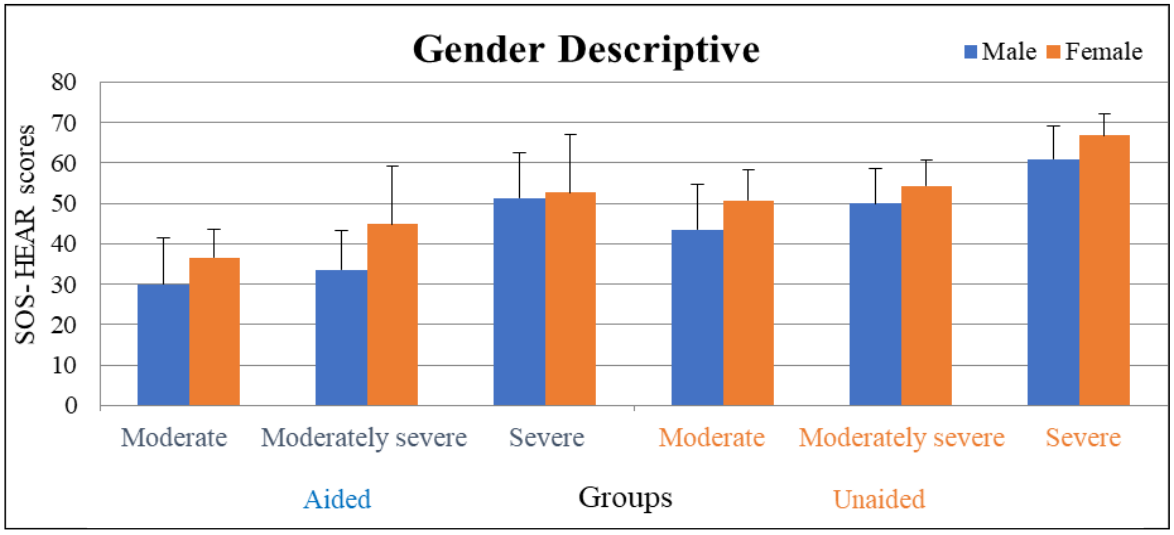

Figure 3: Gender-based mean SOS-HEAR scores for aided and unaided conditions and degree of hearing loss.

The results showed that the mean scores for females were higher than for males across all degrees of hearing loss in both aided and unaided conditions. However, only the aided moderate group showed a statistically significant difference ($p=0.020$) between the male and female scores. These findings were in agreement with the previous research findings which reported that females are more affected due to the hearing loss of the spouse as compared to males. Thus, female spouses showed a higher degree of third-party disability as compared to male spouses, as females play a major role in maintaining communication in a relationship [13, 14]. Since the data did not follow normal distribution in the case of gender, significance was not obtained. Therefore, the effect of gender on the total score could not be obtained.

Third-party disability of aided and unaided groups across SOS-HEAR subdomains

The study investigated the performance of individuals with varying degrees of hearing loss, both with and without the use of hearing aids, across different subdomains of SOS-HEAR. The aim was to gain a detailed understanding of how hearing aid usage and the severity of hearing loss affect each subdomain. A descriptive analysis was performed, calculating the mean and standard deviation for all SOS-HEAR subdomains across various groups and levels of severity. The results are illustrated in Figure 4.

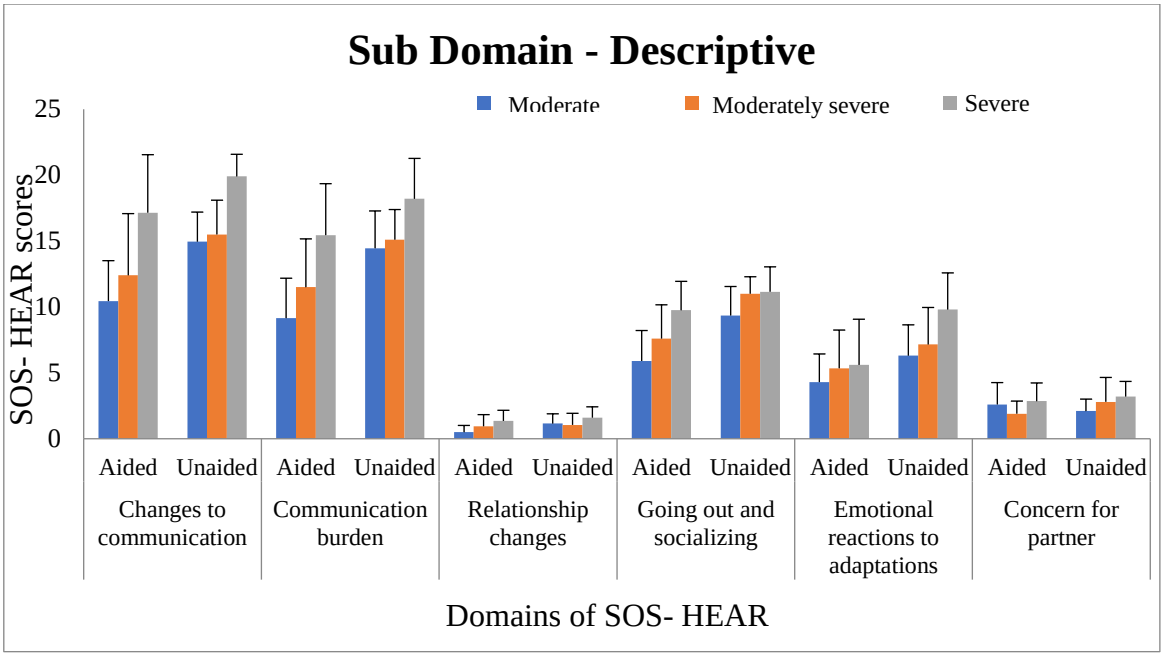

Figure 4: Descriptive analysis of all the subdomains of SOS-HEAR

As demonstrated in Figure 4, among the six subdomains of SOS-HEAR, the communication domain experienced the most significant changes, indicating a greater degree of third-party disability compared to the other domains. Additionally, spouses of older individuals with severe hearing loss scored the highest, reflecting a higher level of disability across all subdomains. In contrast, spouses of individuals who use hearing aids scored lower across all subdomains compared to spouses of older individuals without hearing aids.

In Figure 4, it is evident that among the six subdomains of SOS-HEAR, communication was the most impacted area, indicating a greater degree of third-party disability compared to the other domains. The data also shows that spouses of older individuals with more significant hearing loss reported the highest scores, reflecting higher levels of disability across all subdomains. In contrast, spouses of individuals using hearing aids scored lower across all subdomains when compared to spouses of older individuals without hearing aids. This suggests that spouses of older individuals with severe hearing loss had to make more adjustments to their communication compared to those whose partners had moderately severe or moderate hearing loss.

These findings align with existing literature, which indicates that as hearing impairment increases, it becomes increasingly challenging to convey communication messages effectively, leading to greater communicative adjustments by spouses. Additionally, spouses attributed their reduced communication with their partners to the increased time spent trying to communicate due to frequent breakdowns in understanding. They also noted specific changes in their communication style, particularly in terms of interactional communication.[15].

CONCLUSION

Age-related hearing loss is a prevalent issue that significantly impacts not only the affected individuals but also their significant others. The severity of hearing loss can profoundly influence the quality of life for both parties, as increased hearing impairment correlates with heightened third-party disability. This study highlights the essential role of hearing aids in alleviating these challenges by improving communication skills among individuals with hearing loss, thereby reducing the burden on their partners and caregivers. It is crucial to recognize the interconnected nature of hearing loss and its effects on social dynamics and relationships.

Consequently, involving significant others in the rehabilitation process is vital for fostering better communication and enhancing the overall quality of life for everyone affected by hearing impairment.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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