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Self-reported Communication Strategies Used by Individuals with Hearing Loss and its Influence on the Hearing Loss Related Quality of Life of their Communication Partners

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Abstract

Background: Hearing loss can significantly impact the social, functional, and psychological well-being of both the individual with hearing loss (IWHL) and their communication partner (CP). Existing literature indicates that third-party disability increases with increasing degree of hearing loss. Very few studies have investigated the effects of communication strategies used by IWHL on third-party disability in their CPs. Hence, this study was conducted to investigate the communication strategies used by IWHL and its influence on hearing loss-related quality of life of their CPs. Methods: Two questionnaires were administered to 30 pairs of IWHL and CPs: the Communication Strategies Scale (CSS) of the Communication Profile for the Hearing Impaired for IWHL and the Hearing Impairment Impact-Significant Other Profile (HII-SOP) for their CPs. Statistical analysis encompassed Pearson correlation and linear regression to explore the relationships between communication strategies used by IWHL and hearing loss related Quality of Life (QoL) among CPs. Results: A significant positive correlation was found between the total score of the CSS and scores of the HII-SOP communication strategy subscale. All three subscales of the CSS were significantly correlated with the HII-SOP scores. The maladaptive behaviors were negatively correlated with the HII-SOP scores, whereas the verbal and nonverbal communication strategies were positively correlated. A regression analysis revealed that the CSS used by IWHL explained 26.7% of the variance in third-party disability experienced by the CPs. Conclusion: Overall, this study underscores the importance of addressing communication challenges in IWHLs to improve the QoL of both IWHL and their CPs.

Keywords Third-party disability · Spouses of individuals with hearing loss · Maladaptive strategies · Verbal strategies · Nonverbal strategies, hearing impairment Impact-Significant other profile (HII-SOP) · Communication strategies scale · Communication profile for the hearing impaired (CPHI)

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Introduction

While understanding the causes of disability across the globe, the second highest position is captured by hearing loss (Vos et al., 2017). The estimated number of people affected by hearing loss globally is around 466 million (World Health Organization, 2018). Hearing loss can significantly impact an individual's social, functional, and psychological well-being (Ciorba et al., 2012). Numerous studies have shown that acquired hearing loss may negatively impact a person's quality of life (QoL) and psychological health, leading to social isolation, sadness, anxiety, and even cognitive deterioration in those who are impacted (Gates & Mills, 2005; Heine & Browning, 2002; Monzani et al., 2008). According to Bowling, QoL can include a wide range of components such as functional capacity, degree and quality of social interaction, psychological well-being, bodily sensations, and life satisfaction, especially the effect of perceived health on the ability to live a fulfilling life or health-related QoL (Bowling, 1995). Definitions of health-related quality of life (HRQoL) generally cover four main domains: (a) physical and occupational functioning, (b) psychological functioning, (c) social interaction, and (d) bodily sensations and personal perceptions of overall health (Abrams et al., 2002; Ware, 2000).

Understanding how hearing loss affects QoL is crucial since communication problems impact social relationships. This is a fundamental component of daily life that people with hearing loss may find significantly compromised, which lowers their perceived QoL (Felce et al., 1995; Monzani et al., 2008). Hearing impairment is associated with HRQoL, particularly social interaction and psychological functioning. This is because effective communication is vital for conveying information, establishing and sustaining personal relationships, and managing the behavior of others (Heine & Browning, 2002). The extent to which hearing impairment affects communication and the issues related to coping with the affected communication depend on an individual's communication needs and the compensatory strategies they use (Demorest et al., 2011).

Hearing loss makes communication difficult, especially in noisy situations, contributing to poor social networking and social relationships (Carabellese et al., 1993; Kramer et al., 2002). Hearing impairment in adults can result in collateral effects on communication partners (CPs). The CPs of individuals with hearing loss experience difficulties and frustration mainly because they must repeat statements, keep television at greater volume, and reduce intimate relationships due to the inability to hear whisper and soft speech. Furthermore, hearing loss also comes with the added responsibility of functioning as an interpreter. This also leads to social isolation among CPs because they must stay home with hearing loss individuals (Wallhagen et al., 2004). It has also been reported that individuals with hearing loss engage less in social activities and experience more issues in their relationships with family and friends (Most & Aviner, 2009). Studies have also reported that hearing loss results in anger, guilt, resentment, reduced intimacy, and reduced quantity and quality of interactions. This reduces QoL in spouses of people with hearing loss (Piercy & Piercy, 2002). Some of the aspects leading to reduced QoL in spouses include (a) decreased overall communication between the couple, (b) decreased spontaneous and interactive communication, (c) reduced sharing of secrets, mainly in the presence of others,

and (d) increased requirement of repetition by their spouses which reduces the joy of effective communication (Scarinci et al., 2008).

The International Classification of Functioning, Disability and Health (ICF) introduced the term "third-person disability" to mean a disability experienced by a family member due to a significant other's medical condition (World Health Organization, 2001). Any health condition that affects a person also affects family members and loved ones, especially life partners (Kelly-Campbell & Plexico, 2012; Scarinci et al., 2008; Yorgason et al., 2007). The literature shows that third-party disability increases with increasing degree of hearing loss (Nandurkar & Shende, 2020). As the degree of hearing loss rises from moderate to severe, the communication load increases and additional alterations are required in communication (Nandurkar & Shende, 2020). However, studies have not investigated whether the communication strategies used by individuals with hearing loss affect third-party disability in their CPs. Studies have also indicated that involving communication partners in aural rehabilitation can benefit both individuals with hearing loss and their communication partners (Kramer et al., 2005). In this context, the present study investigated the communication strategies used by individuals with hearing loss and their influence on their communication partner's hearing loss-related quality of life. The objectives of the present study were to assess the self-reported communication strategies used by individuals with hearing loss, the hearing loss-related quality of life of the communication partners of individuals with hearing loss, and the relationship between self-reported communication strategies used by individuals with hearing loss and the hearing loss-related quality of life of their communication partners.

Method

This cross-sectional study was carried out after obtaining approval from the Institutional Ethics Committee (Protocol number: IEC KMC MLR 03/2023/105). The sample size was calculated using the formula $N = [(Z_\alpha+Z_\beta)/C]^2+3$ where, $Z_\alpha = 1.96$; $Z_\beta = 0.8416$; $C=0.5 * \ln[(1+r)/(1-r)]$. From the pilot study on 15 individuals, the r-value obtained between the communication strategies used by individuals with hearing loss and third-party disability in their CPs was −0.602. The minimum sample size required for this study was 19. The method used to conduct the pilot study was the same as that used in the main study. No changes were made in the sampling or questionnaires. Hence, the data from the pilot study were included in the main study (Thabane et al., 2010).

Materials

The following two questionnaires were used in the study.

1. "The Communication Strategies Scale" (CSS) of the Communication Profile for the Hearing Impaired (CPHI) (Demorest & Erdman, 1986) was administered for individuals with hearing loss. It comprises 25 questions spread across three areas: maladaptive behaviors, verbal strategies, and non-verbal strategies (Demorest &

Erdman, 1987). The frequency response scale is given to each item, where each item depicts a circumstance, a behavior, or a response that may take place frequently. This scale goes from 1 (Almost Never or Rarely) to 5 (Usually or Almost Always). The scoring of these items for the verbal and nonverbal subscales is option 1 gets 1 point, 2 gets 2 points, 3 gets 3 points, 4 gets 4 points, and 5 gets 5 points. Reverse scoring is applied for the maladaptive strategies subscale. The CPHI is scored so that low test scores indicate communication or adjustment issues, whereas high scores do not (Erdman & Demorest, 1998).

2. "The hearing impairment impact-significant other profile (HII-SOP)" (Preminger & Meeks, 2012) was used to assess third-party disability and Hearing Loss Related – Quality of Life (HL-QoL) in the CPs of individuals with hearing impairment. It is a 20-item scale that has three subscales that assess the following: (a) the emotions that arise from having a spouse with hearing loss as well as the effect of hearing loss itself on the marital relationship, (b) the effect of hearing loss on the spouse's social life, and (c) the communication strategies used by the spouse. The scoring consists of "Yes" = 5 points, "Sometimes" =2.5 points, and "No" =0 points, and total scores range from 0 to 100. Further, scores between 20 and 39 indicate mild third-party disability, scores between 40 and 59 indicate moderate third-party disability, and scores > 60 indicates severe third-party disability associated with hearing loss (Preminger & Meeks, 2012).

Participants

Thirty pairs of individuals with hearing loss and their CPs who visited the Department of Audiology and Speech -Language Pathology in a tertiary care hospital participated in this study. Individuals with any degree of unilateral or bilateral acquired hearing loss with or without amplification devices were included. Individuals with congenital hearing loss and individuals who did not have a CP who had come for evaluation were excluded. One CP of an individual with hearing loss: family members, spouses, siblings, children, and caregivers who talk with individuals with hearing loss daily, was included. An additional criterion for CPs was that they had to have lived together for at least five years. With this criterion, we tried to ensure that the CP was aware of the communication difficulties faced by the individuals with hearing loss. The CPs with self-reported hearing loss were excluded. Individuals above 18 years of age were considered for both groups. Both individuals with hearing loss and their CPs were included in the study after obtaining written informed consent.

Procedure

The survey started with a brief introduction in which the purpose of data collection was carefully explained. Individuals who consented to participate proceeded to fill out the questionnaire. Two separate surveys were conducted, one for the individuals with hearing loss and the other for their CPs. The survey began with obtaining the demographic and medical details of the participants following the audiological history. Details regarding the onset of hearing loss, type and degree of hearing loss, any other problems related to hearing loss, and audiological evaluation reports of pure

tone audiometry were included. If the participants were hearing aid users, details regarding the ear in which the hearing aid was worn and the duration of device usage were also collected. The Kannada language translated versions of the CSS and HII-SOP questionnaires used in the present study. The questionnaires for both groups took approximately 15 min to complete.

Statistical Analysis

The statistical analysis was performed with IBM SPSS software version 29 (IBM Corp, 2023). Descriptive statistics were applied to analyze the research data. Scores for each subscale and the total scores for each questionnaire were noted. Mann-Whitney U tests were administered to assess the potential difference in: laterality of hearing loss, type of hearing loss, hearing aid use and employment status. The Pearson product-moment correlation coefficient was calculated to assess the relationships between the communication strategies used by individuals with hearing loss and third party-disability among communication partners. A Principal Component Analysis (PCA) was performed to make factor reduction among the subscales of the CSS, and later, a regression analysis was performed with the CSS as the predictor variable and the HII-SOP score as the dependent variable.

Results

Table 1 provides the participants' demographic information of individuals with hearing loss and their CPs. The relationships between the CPs and the individuals with hearing loss were as follows. Among the 12 spouses, nine were husbands, and three were wives. There were twelve children in total—six sons and six daughters. One CP was the niece of the individual with hearing loss, one was son-in-law, three brothers, and one was the grandchild of the individual with hearing loss.

The individuals with hearing loss had conductive, sensorineural, or mixed types of hearing loss. The duration of hearing loss was at least six months for all participants. Thus, only long-standing conductive hearing loss was considered in the present study. Out of 30 individuals with hearing loss, 10 had unilateral hearing loss, and 20 had bilateral hearing loss, the severity of which varied from mild to profound. Six participants with hearing loss used hearing aids: two used binaural aids, and four used monoaural aids. Among the hearing aid users, four participants said they were satisfied with the hearing aids, and two were unsatisfied. The duration of use of hearing aids ranged from 1 to 10 years and the participants used the hearing aids for approximately 4 to 8 h per day. The participants with hearing aids were asked to answer the questionnaire while considering the situation in which hearing aids were not worn.

Self-reported Communication Strategies Used by Individuals with Hearing Loss

Table 2 provides descriptive data on the scores obtained by individuals with hearing loss in the CSS and its three subscales. The total score was normalized to obtain values between 1 and 5. All the subscales of the CSS are scored such that a lower score

Table 1 Demographic details - age, gender, education, and occupation of individuals with hearing loss and their communication partners

Parameter		Individuals with hearing loss	Communication Partners
Age	Mean (years)	56.90	41.53
	Standard deviation	16.97	16.14
	Range (years)	25 to 85	20 to 74
Gender	Male	12	18
	Female	18	12
Education	Profession or Honors	0	0
	Post graduates	0	2
	Graduates	8	9
	Plus 2/diploma	11	11
	10th or less	11	8
Occupation	Legislators, senior officials and managers, Income tax officer	0	1
	Professionals	1	1
	Technicians and associate professionals	1	5
	Clerks, Skilled workers and shop and market sales workers	7	7
	Agricultural and fishery workers	1	0
	Business/Self employed	3	1
	Unemployed	9	14
	Could not ascertain/retired/not mentioned	8	1

Table 2 Descriptive data on the scores obtained by individuals with hearing loss in the communication strategies scale (CSS) and its three sub scales

	Mean	Standard deviation	Range
Total CSS Score	3.09	0.42	2.4 to 4
Maladaptive strategies	4.01	0.66	2.78 to 5
Verbal Strategies	2.50	0.80	1 to 4.25
Non-verbal strategies	2.64	0.94	1 to 4.63

indicates problem behavior or an area that needs help or attention. That is, a lower score indicates that these strategies are used to a lesser extent. From the study results, it is evident that the study participants did not use many maladaptive behaviors. Their use of verbal and non-verbal strategies was also less common.

Certain variables that can potentially influence the use of communication strategies were identified: laterality of hearing loss (unilateral vs. bilateral), type of hearing loss (sensorineural or mixed vs. conductive), hearing aid usage (hearing aid users vs. non-hearing aid users), and employment status (employed vs. unemployed). Owing to the small sample size, a Mann-Whitney U test was run (Table 3.) to understand the effects of these variables. The table shows that individuals with bilateral hearing loss used verbal and nonverbal communication strategies more than individuals with uni-

lateral hearing loss did. However, this difference was not statistically significant. On the other hand, individuals with bilateral hearing loss used fewer maladaptive strategies than individuals with unilateral hearing loss, which was statistically significant. Table 3. also shows that individuals with sensorineural or mixed hearing loss did not significantly differ from participants with conductive hearing loss with respect to the use of communication strategies. Similarly, the use of hearing aids and employment status did not significantly influence the use of communication strategies.

Table 3. Mean, standard deviation, and Mann Whitney U test results for the total communication strategies scale (CSS) and its subscale scores with grouping variables: laterality of hearing loss (unilateral vs bilateral), type of hearing loss (sensorineural or mixed vs conductive), hearing aid usage (hearing aid users vs non-hearing aid users), and employment status (employed vs unemployed)

	Unilateral hearing loss (N= 10)	Bilateral hearing loss (N= 20)	Z value (df = 28)	Significance
Total CSS Score	3.05 ± 0.40	3.11 ± 0.44	105.00	0.843
Maladaptive strategies	4.49 ± 0.39	3.78 ± 0.64	30.50	0.002
Verbal Strategies	2.30 ± 0.89	2.81 ± 0.93	127.50	0.234
	Sensorineural/mixed (N=25)	Conductive (N= 5)	Z value(df = 28)	Significance
Total CSS Score	3.06 ± 0.40	3.25 ± 0.55	76.00	0.469
Maladaptive strategies	4.00 ± 0.66	4.09 ± 0.70	68.50	0.759
Verbal Strategies	2.45 ± 0.76	2.78 ± 1.02	79.50	0.357
Non-verbal strategies	2.62 ± 0.94	2.78 ± 0.10	71.50	0.636
	Employed (N= 14)	Unemployed (N= 16)	Z value (df = 28)	Significance
Total CSS Score	3.14 ± 0.50	3.05 ± 0.35	120.50	0.739
Maladaptive strategies	4.12 ± 0.76	3.92 ± 0.56	136.00	0.327
Verbal Strategies	2.59 ± 1.05	2.43 ± 0.51	121.50	0.708
Non-verbal strategies	2.6 ± 1.20	2.7 ± 0.66	97.50	0.560
	Hearing aid users (N= 6)	Non-hearing aid users (N=24)	Z value (df = 28)	Significance
Total CSS Score	3.03 ± 0.38	3.11 ± 0.43	81.00	0.659
Maladaptive strategies	3.69 ± 0.54	4.10 ± 0.67	103.00	0.112
Verbal Strategies	2.56 ± 0.64	2.49 ± 0.840	69.50	0.917
Non-verbal strategies	2.77 ± 0.83	2.61 ± 0.97	69.00	0.897

Hearing Loss-related Quality of Life in the Communication Partners of Individuals with Hearing Loss

The results of the HII-SOP questionnaire administered to the CPs showed that the mean HII-SOP score was 27 (SD = 20.97), with scores ranging between 0 and 77.5. The scores obtained across the three subscales of the HII-SOP are provided in Table 4. The distributions of the HII-SOP scores across different severities of the impact of hearing loss on CP are as follows: No third-party disability − 14 (46.66%), Mild third-party disability − 9 (30%), Moderate third-party disability − 5 (16.66%) and Severe third-party disability 2 (6.66%). The results indicate that most CPs did not experience third-party disability due to their partner's hearing loss. An attempt was made to determine whether the degree of third-party disability in the CP was related to the degree of hearing loss in the better ear of the individual with hearing loss. This is shown in contingency Table 5. The table shows that most CPs do not perceive any third-party disability when their partner has unilateral hearing loss. The responses were scattered for bilateral hearing loss on the basis of the degree of hearing loss in the better ear, such that no trend was observed between bilateral hearing loss and the severity of third-party disability. A Chi-square association test was not run as the data did not meet the test's assumptions with respect to the expected cell count. That is, one of the assumptions of Chi-square test requires the expected cell count to be greater than or equal to 5 in at least 80% of the cells and no cell should have an expected count less than 1.

Table 4 Descriptive data on the scores obtained by communication partners in the hearing impairment impact significant other profile (HII-SOP) and its three sub-scales

	Mean	Standard deviation	Range	Maximum possible score
HII-SOP Total	27	20.97	0 to 77.5	100
Communication strategies	10.75	7.72	0 to 22.5	25
Relationship emotions	13	13.27	0 to 50	55
Social impact	3.25	4.88	0 to 15	20

Table 5 Distribution of the severity of third-party disability in communication partners compared to the degree of loss in the better ear of individuals with hearing loss

	Degree of loss in the better ear				
Severity of third-party disability	Normal hearing	Mild	Moderate	Severe	Total
No third-party disability	7	1	5	1	14
Mild third-party disability	2	2	4	1	9
Moderate third-party disability	1	1	3	0	5
Severe third-party disability	0	1	1	0	2
Total	10	5	13	2	30

Table 6 The effect of the type of hearing loss (unilateral vs. bilateral) on the hearing impairment impact significant other profile (HII-SOP) total scores and subscale scores

	Unilateral hearing loss	Bilateral hearing loss	Z value (df = 58)	Significance
HII-SOP Total Score	14 ± 15.64	32.63 ± 21.61	−2.558	**0.010**
Communication strategies	5.75 ± 7.08	12.25 ± 7.52	−2.461	**0.013**
Relationship emotions	7.75 ± 8.70	15.75 ± 14.40	−1.466	0.155
Social impact	0.50 ± 1.58	4.63 ± 5.40	−2.367	**0.035**

A Mann-Whitney U test was run to determine the effects of the type of hearing loss (unilateral vs. bilateral) on the HII-SOP total and subscale scores. The results revealed that the HII-SOP total scores and subscale scores for communication strategies and social impact were significantly higher for the CPs of individuals with bilateral hearing loss than for those with unilateral hearing loss (Table 6). The lack of a significant difference between relationships and emotions was probably because of the high standard deviation obtained for a group with bilateral hearing loss. Whether the HII-SOP scores varied with the relationship between CP and the individual with hearing loss (child vs. spouse) was also assessed, and data from 12 children and 12 spouses was used for the Mann-Whitney U test. The results revealed that the HII-SOP total scores were similar across both groups, indicating similar third-party disability among children and spouses of individuals with hearing loss [$Z(58) = -0.984$, $p = 0.347$].

Relationship Between Communication Strategies Used by Individuals with Hearing Loss and Hearing Loss-related Third-Party Disability in Communication Partners

To understand the relationship between the communication strategies used by individuals with hearing loss and hearing loss-related third-party disability in CPs, a Pearson correlation coefficient was calculated between the total scores and scores for different subscales of both the CSS and the HII-SOP. Table 7 shows the correlation coefficients and the significance of these coefficients. The table shows no significant correlation between the total CSS score and the total HII-SOP score. However, there was a significant positive correlation between the total CSS score and the communication strategy subscale score of HII-SOP.

Among the subscales of the CSS, maladaptive strategies were significantly negatively correlated with all the subscales of the HII-SOP as well as the total score. This suggests that if individuals use less maladaptive strategies, the third-party disability experienced by their CPs is lower. Furthermore, the verbal strategies subscale of the CSS was significantly positively correlated with the communication strategies subscale of the HII-SOP as well as the total HII-SOP score. These findings indicate that, if individuals with hearing loss use more verbal strategies, their CPs also indicate the use of more communication strategies. Additionally, greater use of verbal strategies

Table 7 Pearson's correlation coefficients and its significance between the total scores and scores for different subscales of the communication strategies scale (CSS) and the hearing impairment impact significant other profile (HII-SOP) ($n=30$ for all analyses)

Communication Strategies	Third-party disability	Pearson's *r*	*P*
CSS Total Score	Social impact	−0.168	0.376
CSS Total Score	Communication strategy	0.515 **	0.004
CSS Total Score	Relationship emotions	0.202	0.286
CSS Total Score	HII-SOP Total Score	0.278	0.137
Maladaptive strategies	Social impact	−0.363 *	0.049
Maladaptive strategies	Communication strategy	−0.382 *	0.037
Maladaptive strategies	Relationship emotions	−0.477 **	0.008
Maladaptive strategies	HII-SOP Total Score	−0.527 **	0.003
Verbal strategies	Social impact	0.010	0.957
Verbal strategies	Communication strategy	0.502 **	0.005
Verbal strategies	Relationship emotions	0.335	0.070
Verbal strategies	HII-SOP Total Score	0.399 *	0.029
Nonverbal strategies	Social impact	0.042	0.826
Nonverbal strategies	Communication strategy	0.599 ***	< 0.001
Nonverbal strategies	Relationship emotions	0.375 *	0.041
Nonverbal strategies	HII-SOP Total Score	0.467 **	0.009

* indicates p<0.05, ** indicates p<0.01, *** indicates p <0.0001

is related to greater experience of third-party disability by their CPs. Finally, the nonverbal subscale of the CSS significantly positively correlated with the subscales of communication strategies and relationship emotions, along with total HII-SOP scores. Thus, the overall correlation findings indicated that, as the use of communication strategies (maladaptive, verbal, and non-verbal) by individuals with hearing loss increased, the hearing loss-related third-party disability experienced by their CPs also increased.

Since each of the subscales of the CSS was significantly correlated with the total HII-SOP score, a regression analysis was planned to understand the variance in the HII-SOP explained by the communication strategies used by individuals with hearing loss. Before this analysis, a Principal Component Analysis (PCA) was performed to make factor reduction. The PCA gives new variables that are linear functions of those in the original dataset, successively maximizes variance, and are uncorrelated with each other (Jolliffe & Cadima, 2016). Hence, instead of using three sub-scales as predictor variables in the regression analysis, we used PCA to understand whether the sub-scales could be reduced to fewer variables. The results indicated that the three sub-scales can be reduced to one component. This new component was used as the predictor variable, and the HII-SOP total score was used as the dependent variable for the regression analysis. This showed that overall communication strategies used by the individuals with hearing loss explained 26.7% of the variance in the total HII-SOP scores, which was significant ($p=0.003$).

Discussion

Self-reported Communication Strategies Used by Individuals with Hearing Loss

Communication strategies are frequently employed by people with hearing loss to help them overcome communication barriers. The communication strategies scale classifies communication strategies into three categories: maladaptive, verbal, and nonverbal (Demorest & Erdman, 1987). Examples include maladaptive strategies such as ignoring the speaker, pretending to understand, verbal strategies such as asking for repetition and explaining hearing loss, and non-verbal strategies such as lipreading and positioning themselves to reduce background noise. In the present study, the participants with hearing loss generally made less use of all three types of communication strategies. However, when a comparison was made among the three strategies, non-verbal strategies were used more often, and verbal and maladaptive strategies were used the least. This finding aligns with other study findings (Demorest & Erdman, 1987; Hallberg & Carlsson, 1991). The use of verbal and non-verbal strategies is a positive behavior. It is expected to contribute to better communication (Chisolm et al., 2004) and thus increase QoL in individuals with hearing loss. In contrast, using maladaptive strategies is expected to lead to poor communication and, thus, reduced quality of life in individuals with hearing loss.

In this study, verbal strategies were used less than non-verbal strategies. This is in accordance with the findings of Helvik et al. (2007). Findings from their study indicated that hearing-impaired individuals generally cope through non-verbal rather than verbal strategies; the most minor strategies used were maladaptive strategies. They tend to use more non-verbal strategies to increase the effectiveness of communication, avoid help from others, and reduce attention from others to the presence of hearing loss (Demorest & Erdman, 1986). We found less frequent use of maladaptive strategies. This finding is in line with Hande et al. (2018) who also reported less use of disengaged strategies among their participants. However, various maladaptive coping strategies such as retreating from social interactions, withdrawing from social settings, attributing hearing loss to external factors (e.g., a mumbling person), and denying the existence of hearing loss have been reported in the literature (Barker et al., 2017; Garstecki & Erler, 1999). Hallberg et al. (2008) reported that using maladaptive behaviors, including guessing missing information to avoid communication and pretending to hear, significantly reduces the QoL of individuals with hearing loss. In their study, Demorest and Erdman (1986) also reported the use of maladaptive behaviors such as avoidance in different forms. Demorest and Erdman(1989) reported a robust negative association between the use of maladaptive strategies and communication effectiveness. Communication was more effective when maladaptive strategies such as avoidance, dominating the conversation, and pretending to understand were rarely used. The findings of the present study support results of investigations in literature.

Communication strategies were compared between individuals with unilateral hearing loss and those with bilateral hearing loss. These findings indicate that individuals with bilateral hearing loss generally use all three types of communication strategies more than individuals with unilateral hearing loss do. However, in the case of maladaptive strategies, there was a statistically significant difference indicating greater

use of maladaptive strategies by individuals with bilateral hearing loss. This could be because individuals with unilateral hearing loss are able to communicate with minimal communication strategies due to normal hearing in the other ear. However, individuals with bilateral hearing loss face greater difficulty and use more communication strategies because of hearing loss in both ears. There was no significant difference among the participants with different types of hearing loss and hearing aid use in the use of communication strategies. These results should be interpreted with caution as there was uneven number of participants in each category. Also, hearing aid users answered the CSS considering the situation when not wearing the hearing aids. This could be an added reason for lack of significant difference in the present study. Notably, employment status did not influence the use of communication strategies. However, the types of employment were heterogenous, and meaningful conclusions are not possible with the present small sample. Such a comparison has not been made in literature.

Hearing Loss-related Quality of Life in the CPs of Individuals with Hearing Loss

When a person has hearing loss, not only does the individual suffer from a communication barrier, but the people surrounding the person, especially their spouses, children, siblings, and close ones, also suffer from a communication barrier, which is termed "third-party disability." Third-party disability negatively affects the hearing loss-related quality of life of the CPs of individuals with hearing loss. The present findings indicate no third-party disability in nearly half of the CPs (46.66%). Since there were many participants with unilateral hearing loss, this could have resulted in not having third-party disability among many CPs. This assumption was supported by the HII-SOP scores being significantly higher in the CPs of individuals with bilateral hearing loss than in those with unilateral hearing loss. Specifically, the scores were significantly higher for the communication strategies and social impact domains of the HII-SOP in the CPs of individuals with bilateral hearing loss than in their unilateral counterpart. Such a comparison has not been made in literature.

Among the three domains of the HII-SOP, the scores were high for communication strategies, followed by relationships and emotions, with the lowest score for social impact. Nandurkar and Shende (2020) reported similar findings in their study when they compared the scores of the Significant Other Scale for Hearing Disability (SOS-HEAR) among individuals with moderate and severe degrees of hearing loss. The results also revealed a statistically significant difference in the scores of moderate and severe degrees of hearing loss, indicating that the spouses of older adults with severe degrees of hearing loss experienced more third-party disability than did those with moderate hearing loss. All the participants in their study were nonusers of hearing aids. In the present study, statistical analysis was not performed for the HII-SOP scores according to the degree of hearing loss. However, upon visual inspection of the data, it was observed that the CPs of individuals with mild hearing loss had greater HII-SOP scores than did those with severe hearing loss. Notably, two individuals presented with severe hearing loss, and both participants used hearing aids. On the other hand, only one out of five participants in the mild hearing loss group used hearing aids. Thus, the use of hearing aids can be a significant factor in reducing third-party disability (Wallace, 2018).

An interesting finding of this study is that there was no significant difference between the third-party disability experienced by spouses and children of individuals with hearing loss. Studies have shown that spouses of individuals with hearing loss frequently experience frustration because of communication breakdowns, negative social impact because of embarrassment and worries about the problems faced by their spouses (Brooks et al., 2001; Hetu et al. 1993; Scarinci et al., 2008). The literature also shows that children of adults with hearing loss experienced increased effort and difficulties in communicating with their parents with hearing loss, leading to irritability and frustration (Preminger et al., 2015). Children are also worried about their parents' health and communication needs (Preminger et al., 2015). In the Indian context many children stay with their parents and communicate with them on a daily basis. Thus, the findings of the present study add to the literature on the third-party disability experienced by CPs other than spouses.

Relationships Between Self-reported Communication Strategies Used by Individuals with Hearing Loss and the Hearing Loss-Related Quality of Life in their CPs

An essential finding of this study is that 26.7% of the variance in third-party disability experienced by the CPs was explained by the communication strategies used by individuals with hearing loss. The communication strategies used by individuals with hearing loss, such as maladaptive, verbal, and non-verbal strategies, contribute to hearing loss-related QoL in their CPs. Using verbal and non-verbal strategies is expected to contribute to increased QoL in individuals with hearing loss (Chisolm et al., 2004) and CPs, whereas using maladaptive strategies is expected to lead to reduced quality of life in both. The findings from the study indicate that less use of maladaptive strategies results in less third-party disability. Studies have reported the use of a variety of coping mechanisms by individuals with hearing loss, such as denial of the loss, to preserve their sense of self and social identity and prevent them from being classified as "deviants." The use of such maladaptive strategies leads to frustration in their CPs. However, CPs want individuals with hearing loss to accept the presence of hearing loss and adjust to it so that they can help individuals with hearing loss overcome the issues faced by hearing loss (Hallberg & Barrenäs, 1993; Hétu et al., 1988; Scarinci et al., 2008). Additionally, studies indicate that denial of hearing loss can lead to conflicts in the relationship with CPs (Kamil & Lin, 2015). These findings of the present study align with literature.

The use of more maladaptive strategies affects all domains of the HII-SOP, including communication strategies, relationships, emotions, and social impact. A comparison was made between the questions on the communication strategies scale and those on the HII-SOP. A question from maladaptive strategies of the CSS states, "avoiding social situations." A similar question from the HII-SOP asks, "Is it difficult to enjoy social gatherings/hampers social life?". Individuals with hearing loss generally avoid social situations due to difficulty in communication in the presence of multiple speakers and background noise. Consequently, they may have difficulty coping in such situations. In such situations, the CPs may experience an excessive burden of communication and tend to avoid attending social gatherings with individuals with hearing

loss (Nandurkar & Shende, 2020). The use of verbal and nonverbal communication strategies is thought to help improve the hearing loss-related QoL of CPs (Chisolm et al., 2004). In contrast, the results of the present study indicate that greater use of these strategies resulted in poorer hearing loss-related QoL in their CPs. The literature did not report such findings. However, Demorest and Erdman(1989) reported that greater use of verbal and non-verbal strategies, such as looking at the speaker's face and requesting repetition, was not significantly associated with effective communication.

An interesting comparison was made between the CSS questions and the HII-SOP. Two questions from verbal strategies of the CSS state, "When I do not understand what someone has said, I ask them to repeat it" and "If someone repeats what they have said and I still do not understand, I ask them to repeat again." A related question from the HII-SOP asks the CP, "Do you feel like you are shouting all the time because of your significant other's hearing loss?" and "Does having to repeat what you say to your significant other all the time make you feel tired?". Thus, individuals with hearing loss may use a verbal communication strategy of asking for repetition when they do not understand what was told. They are trying to bridge the communication gap. However, the same use of verbal strategies might make the CPs feel that they are shouting all the time because of their partner's hearing loss or that they are tired because of repeating the information with their partners. It is possible that CPs do not understand the importance of the communication strategies used by individuals with hearing loss, which they perceive as burden. Additionally, the adjustments that CPs are required to make in communication or to provide communicative support to individuals with hearing loss could lead to an increased communicative burden on the CP (Nandurkar & Shende, 2020). This could be a possible reason for the findings of the present study.

Importantly, a discrepancy exists between the reported use of communication strategies and their actual use (Wilson et al., 1998). Hence, it is unknown whether the current study's participants actually used communication strategies to the reported extent. Also, the method of asking for repetition can affect the responses of the CPs. A polite request for repetition can be more acceptable by CPs than a commanding voice asking for repetition. The way the participants used the "asking for repetition" strategy is unknown. These findings may also explain the positive relationship between the use of verbal and nonverbal strategies by individuals with hearing loss and the third-party disability experienced by their CPs. These findings indicate the need to involve CPs throughout aural rehabilitation and provide counseling and communication strategy training for both CPs and individuals with hearing loss.

Conclusion

The present study investigated the influence of self-reported communication strategies that are used by individuals with hearing loss on the hearing-loss-related QoL of their communication partners. The results revealed that individuals with hearing loss in the present study used fewer communication strategies. Individuals with bilateral hearing loss used more communication strategies than individuals with unilateral hearing loss. The communication partners of individuals with unilateral hearing loss most likely experienced no third-party disability. Greater use of maladaptive strat-

egies resulted in more significant third-party disability among the communication partners, which is expected. However, greater use of verbal and nonverbal communication strategies by individuals with hearing loss resulted in more significant third-party disability in the communication partners. These findings also highlight possible sociocultural differences in the use of communication strategies and how their communication partners accept the use of these communication strategies.

Limitations and Future Directions

In this study, the relationships between age, education, degree of hearing loss, and duration of hearing loss on the use of communication strategies were not investigated. Further, limited data assessed the influence of employment status and use of hearing aids. Additionally, the influence of these parameters on third-party disability was not assessed. Furthermore, self-reported communication strategies could be verified in real-life situations, providing greater insight into communication dynamics between individuals with hearing loss and their communication partners.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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