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ORIGINAL RESEARCH

Age-related hearing loss in individuals and their caregivers: effects of coping on the quality of life among the dyads

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Objectives: Age-related hearing loss (ARHL) impacts the daily living and quality of life (QoL) of affected individuals and the functioning of family caregivers. In the specific context of voluntary medical checkups, we examined sample dyads (ARHL individual and the caregiver) to determine whether QoL of patients and caregivers is influenced by coping strategies implemented either by themselves or their relatives.

Methods: This was a cross-sectional study with a descriptive/correlative design performed in a French preventive health center (Regional Institute for Prevention of Aging, Marseille, France) for the beneficiaries of pension funds of private sector employees. The samples included beneficiary–caregiver dyads. The beneficiaries had bilateral (mild to moderately severe) ARHL. Self-reported data were collected as follows: QoL using the World Health Organization Quality of Life questionnaire, coping strategies using the Brief Coping Orientation to Problems Experienced Scale, and anxiety and mood using visual analog scales.

Results: The final sample comprised 44 beneficiaries and 44 caregivers. The caregiver was the partner of the beneficiary in 73% of cases. The QoL scores of the social dimension were significantly lower for beneficiaries and caregivers compared with French age- and sex-matched controls. Among beneficiaries and caregivers, coping strategies based on problem solving were the most commonly used strategies. The use of positive thinking strategies was associated with higher QoL scores. The more one member of the dyad used an avoidance coping strategy, the more the other member used a positive thinking strategy.

Conclusion: This study emphasizes that QoL of individuals with age-related hearing impairment and their natural caregivers is related to the coping strategies that they use. This finding suggests that targeted interventions should be offered to help individuals who experience emotional difficulties to implement more efficient coping strategies.

Keywords: age-related hearing impairment, caregivers, dyads, quality of life, coping, emotional status

Introduction

Hearing impairment is one of the most common disabilities in humans, affecting more than 250 million people worldwide.¹ In France, its prevalence has been increasing: five million individuals are hearing impaired, which corresponds to 8% of the French population. Furthermore, 70% of the hearing-impaired people are over 60 years of age.² Aging is the most common cause of hearing impairment and is referred to as age-related hearing loss (ARHL).

The consequences of ARHL include difficulty interpreting speech sounds, which often results in a reduced ability to communicate, as well as impaired physical and

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Therefore, because they must confront a disability that produces progressive lifestyle changes, it is important to study how ARHL individuals and caregivers handle the problems of daily life and how the ability to cope with difficulties actually impacts QoL. Coping is commonly defined as the cognitive and behavioral efforts that are implemented to solve the problems and reduce the stress that these problems may cause.^{14,15} The literature generally distinguishes active and avoidant coping strategies.¹⁶ Active coping strategies are thought to be better methods to address stressful events, and avoidant coping strategies appear to be a psychological risk factor for adverse responses to stressful life events.¹⁶

In the specific context of a voluntary medical checkup, we examined a sample of dyads that included the ARHL individual and his/her main caregiver to determine whether QoL of individuals is influenced by the coping strategies implemented either by themselves or their relatives.

Methods

Design and settings

We conducted a cross-sectional study with a descriptive/ correlative design. The recruitment of dyads (ARHL individual and caregiver) was made in a French preventive health center (Institut Régional d'Information et de Prévention de la Sénescence, Marseille, France, nonprofit association, law 1901). This center is affiliated with the pension funds of private sector employees (Association générale des institutions de retraite complémentaire des cadres and l'Association pour le régime de retraite complémentaire des salariés, <u>http://</u> <u>www.agirc-arrco.fr/l-agirc-et-larrco/</u>). This center performs 3,000 annual health checkups for beneficiaries and/or partners of these beneficiaries, including medical, psychosocial, and cognitive prevention. The visit lasts a half day. A healthy diet and physical activity are systematically promoted.

Sample selection

The samples included beneficiary–caregiver dyads. The selection criteria for the beneficiaries were as follows: age above 55 years, having bilateral (conductive and/or sensorineural) ARHL, having a degree of hearing loss from mild (\geq 21 dB) to moderately severe (<70 dB) according to the Clark's classification,¹⁷ ability to speak/read French, and agreeing to participate. The selection criteria of the caregivers were as follows: aged above 18 years, designated by the beneficiary as the most involved person in his/her life, able to speak/or read French, and agreeing to participate.

Data collection

Enrollment was performed on the day of the prevention visit. For the beneficiary, the following clinical data were gathered using their medical records and an examination by a doctor of the center: dizziness, tinnitus, visual deficit, and chronic disease. The nature of the relationship between the beneficiary and caregiver was recorded as the partner, child, or other. The age, sex, educational level, marital status, and professional status were recorded for both the beneficiary and his/her caregiver.

Self-reported data, including QoL, emotional status, and coping strategies, were collected by means of questionnaires that were completed by the beneficiaries and caregivers.

- QoL was assessed using the French version of the World Health Organization Quality of Life (WHOQoL) questionnaire, which is a generic questionnaire used worldwide,^{18,19} that describes four domains: physical health, psychological health, social relationships, and environment.
- Coping strategies were assessed using the Brief Coping Orientation to Problems Experienced Scale (BriefCope).^{20,21} This questionnaire includes 28 items that explore the following 14 strategies: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Confirmatory factor analyses conducted among cancer patients and caregivers (Baumstarck unpublished data 2016) have shown a satisfactory goodness of fit, encouraging a reduction to four dimensions that include social support, problem solving, avoidance, and positive thinking. Higher scores in these

four dimensions reflect a higher tendency to implement the corresponding coping strategies.

• Anxiety and mood were assessed using visual analog scales that ranged from 0 to 100. Higher scores indicated a higher level of anxiety and a greater likelihood of mood disorders.

Ethics

Regulatory monitoring was performed in accordance with the French law that requires the approval of a French ethics committee (Comité d'éthique, Aix Marseille University, February 4, 2015, Number 2014-02-04-04). Written consent forms to participate in the study were obtained from every beneficiary and caregiver.

Statistical aspects

Due to the exploratory nature of the study, there was any sample size calculation. The study was proposed to all consecutive eligible participants during the study period. After performing descriptive analyses of the characteristics of beneficiaries and caregivers, QoL scores were computed using the algorithms provided by the developers of the tool. The WHOQoL scores of beneficiaries and caregivers were compared to those obtained from French age (six classes)- and sex (women/men)-matched controls from a normal sample of 16,392 subjects.¹⁹ The scores of coping were provided in the four scores corresponding to a four-factor structure that was previously explored by our team. Comparisons between the scores of beneficiaries and caregivers (QoL, coping strategies, anxiety, and mood) were performed using the Wilcoxon test. To assess the relationships between the QoL scores and coping processes for beneficiaries and caregivers, respectively, Spearman's correlations were performed. Bootstrapping estimates of parameter standard errors were collected to obtain robust standard error estimates and confidence intervals. The bootstrap percentile approach was used to calculate 95% confidence intervals, which generated 1,000 bootstrap subsamples.

Results Sample

During the period between February 2015 and July 2015, 51 beneficiaries agreed to participate in the present study and provided written informed consent. We experienced no refusals. Of the 51 beneficiaries, 44 nominated a caregiver who agreed to participate. Therefore, the final sample was composed of 44 beneficiaries and 44 caregivers who were assessed a maximum of 2 weeks after the prevention visit and their main characteristics are presented in Table 1. The caregiver was the partner of the beneficiary for 73%, the child for 9%, and the parent for 5% of the cases. The mean duration of completion was 15 minutes.

QoL, coping strategies, and emotional status of the beneficiaries and caregivers

The QoL scores of beneficiaries and caregivers are provided in Figure 1A and B, respectively. Of the three dimensions of the WHOQoL for which French norms are available,¹⁹ the scores of the social dimension were significantly lower for beneficiaries and caregivers compared with age- and sex-matched controls. The respective four QoL scores of beneficiaries did not differ from those of caregivers (all *P*-values >0.05).

Globally, beneficiaries and caregivers used the four types of coping strategies at similar levels (Figure 2). Among

Table I Sample characteristics

	Patients	Caregivers
	(N=44)	(N=44)
	n (%)	n (%)
Sex		
Females	19 (43)	27 (61)
Males	25 (57)	17 (39)
Age		
Mean \pm SD	70.63±9.47	64.4±12.79
Min–max	57–93	19–87
Marital status		
Single	8 (18)	7 (16)
Couple	36 (82)	37 (84)
People living at home		
0	9 (21)	7 (16)
\geq	35 (79)	36 (39)
Children at home		
No	37 (84)	29 (83)
Yes	5 (16)	6 (17)
Educational level	. ,	
Low (<12 years)	26 (59)	17 (39)
High (≥12 years)	18 (41)	24 (61)
Chronic disease		
No	27 (64)	30 (68)
Yes	15 (36)	14 (32)
Visual deficit		
No	24 (57)	24 (54)
Yes	18 (43)	20 (46)
Hearing aid use		
No	13 (33)	N/A
Yes	26 (67)	N/A
Tinnitus		
No	25 (57)	N/A
Yes	19 (43)	N/A
Dizziness	·	
No	33 (75)	N/A
Yes	11 (25)	N/A

 $\label{eq:standard} \mbox{Abbreviations: SD, standard deviation; min-max, minimum-maximum; N/A, not applicable.}$

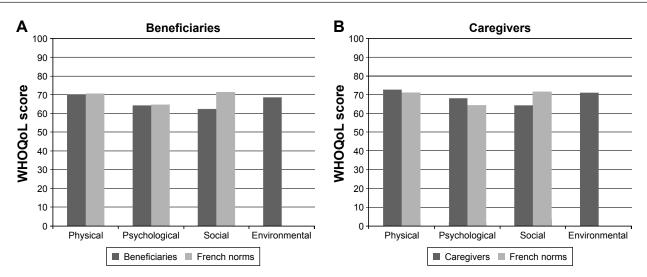


Figure I Comparisons (A) beneficiaries, (B) caregivers, of WHOQoL scores between the participants and French age- and sex-matched norms. Note: The higher the scores, the higher the QoL level. Data from Baumann et al.¹⁹ Abbreviation: WHOQoL, World Health Organization Quality of Life.

beneficiaries and caregivers, the strategies that were based on social support and avoidance were the least used strategies, and the strategies based on problem solving were the most used strategies. The mean levels of anxiety and mood disorders did not differ between beneficiaries and caregivers (anxiety: 5.0 ± 3.0 vs 5.0 ± 3.1 , *P*=0.971; mood: 3.7 ± 2.7 vs 4.2 ± 3.1 , *P*=0.406).

Relationships between emotional status, coping strategies, and QoL for beneficiaries

As expected, the anxiety and mood disorder scores were significantly and negatively correlated with the respective psychological and physical QoL scores (coefficients ranged from -0.39 to -0.56). When beneficiaries used positive

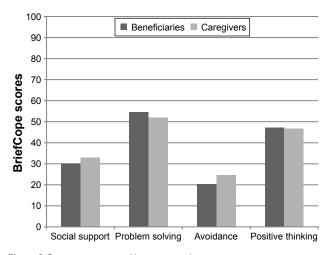


Figure 2 Coping strategies used by patients and caregivers. Note: Scores ranged from 0 to 100.

thinking strategies, they reported significantly higher QoL scores in all dimensions; when they used problem-solving strategies, they reported significantly higher QoL scores in the physical and psychological dimensions. Being avoidant and using social support seeking strategies were not associated with QoL. All the correlations are detailed in Table 2.

Relationships between emotional status, coping strategies, and QoL for caregivers

The anxiety and mood disorder scores were significantly and negatively correlated with the respective psychological and social QoL scores. The physical QoL score correlated with the anxiety level. When implemented by caregivers, problem-solving and positive thinking coping strategies were significantly associated with all of the caregiver QoL scores (except for positive thinking strategies and the social QoL score, and problem-solving and the environmental QoL scores). Being avoidant and using social support strategies were not associated with QoL. All the correlations are detailed in Table 3.

Interrelations between beneficiaries and their caregivers for coping strategies and QoL

The social and environmental QoL scores of beneficiaries and caregivers were correlated, but not the physical and psychological QoL scores. The psychological QoL score of the caregiver was linked to the environmental QoL score of the patient. The more the caregiver used an avoidance coping strategy, the more the patient used a positive thinking

Table 2 Relationships between QoL scores and emotional status and coping strategies for patie	Fable 2 Relationship	s between QoL scor	es and emotional status	s and coping strate	gies for patients
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	Quality of life (WHOQoL)					
	Physical	Psychological	Social	Environment		
Emotional status ^a						
Anxiety						
Sample	-0.407**	-0.389*	-0.220	-0.250		
Bootstrap bias	0.017	0.005	0.002	0.010		
95% CI	(-0.615, -0.134)	(-0.623, -0.088)	(-0.492, 0.076)	(-0.535, 0.082)		
Mood disorders						
Sample	-0.453**	-0.560**	-0.213	-0.178		
Bootstrap bias	0.010	0.011	0.014	0.001		
95% CI	(-0.688, -0.154)	(-0.740, -0.309)	(-0.483, 0.149)	(-0.490, 0.161)		
Coping strategies ^b						
Social support						
Sample	-0.205	0.153	0.272	0.047		
Bootstrap bias	0.002	-0.006	-0.007	-0.001		
95% CI	(-0.490, 0.114)	(-0.168, 0.420)	(-0.096, 0.570)	(-0.266, 0.345)		
Problem solving						
Sample	0.381*	0.506**	0.246	0.125		
Bootstrap bias	0.005	-0.006	0.003	0.000		
95% CI	(0.080, 0.650)	(0.214, 0.726)	(-0.060, 0.524)	(-0.167, 0.425)		
Avoidance						
Sample	-0.065	0.026	0.094	-0.042		
Bootstrap bias	0.000	-0.002	-0.005	0.002		
95% CI	(-0.338, 0.261)	(-0.258, 0.298)	(-0.189, 0.370)	(-0.322, 0.253)		
Positive thinking						
Sample	0.473**	0.467**	0.317*	0.322*		
Bootstrap bias	-0.007	-0.007	-0.005	-0.003		
95% CI	(0.226, 0.681)	(0.161, 0.708)	(-0.009, 0.599)	(0.014, 0.614)		

Notes: *VAS (visual analog scale) from 0 (less) to 10 (high level); *coping strategies from the BriefCope questionnaire. *P<0.05, **P<0.01.

Abbreviations: WHOQoL, World Health Organization Quality of Life; CI, confidence interval; BriefCope, Brief Coping Orientation to Problems Experienced Scale.

	Quality of life (WHOQoL)					
	Physical	Psychological	Social	Environment		
Emotional status ^a						
Anxiety						
Sample	-0.319*	-0.644**	-0.519**	-0.289		
Bootstrap bias	0.012	0.018	0.003	0.002		
95% CI	(-0.564, -0.018)	(-0.770, -0.434)	(-0.676, -0.323)	(-0.561, -0.002		
Mood disorders			· · · · ·	,		
Sample	-0.271	-0.730***	-0.380*	-0.259		
Bootstrap bias	0.005	0.007	0.005	0.000		
95% CI	(-0.571, 0.040)	(-0.841, -0.566)	(-0.596, -0.140)	(-0.527, 0.042)		
Coping strategies ^b			· · · · ·	, , ,		
Social support						
Sample	0.089	-0.206	0.124	-0.029		
Bootstrap bias	-0.01 I	0.004	-0.010	0.001		
95% CI	(-0.229, 0.345)	(-0.495, 0.076)	(-0.230, 0.428)	(-0.327, 0.271)		
Problem solving				, , ,		
Sample	0.317*	0.418**	0.338*	0.348		
Bootstrap bias	0.006	0.000	-0.006	-0.012		
95% CI	(-0.029, 0.609)*	(0.119, 0.675)	(0.020, 0.606)	(0.007, 0.625)		
Avoidance						
Sample	-0.020	-0.204	-0.037	0.059		
Bootstrap bias	0.011	0.001	0.001	0.002		
95% CI	(-0.320, 0.311)	(-0.489, 0.097)	(-0.380, 0.294)	(-0.252, 0.351)		
Positive thinking				, , ,		
Sample	0.359*	0.558**	0.221	0.532**		
Bootstrap bias	-0.006	-0.010	0.000	-0.008		
95% CI	(0.067, 0.616)	(0.245, 0.763)	(-0.128, 0.536)	(0.256, 0.713)		

Notes: *VAS (visual analog scale) from 0 (less) to 10 (high level); *coping strategies from the BriefCope questionnaire. *P<0.05, **P<0.01.

Abbreviations: WHOQoL, World Health Organization Quality of Life; Cl, confidence interval; BriefCope, Brief Coping Orientation to Problems Experienced Scale.

strategy. The more the caregiver used a social support coping strategy, the more the patient used a problem-solving strategy. When the patient's use of social support strategies increased, the physical QoL score of the caregiver was higher; similarly, when the caregiver's use of social support strategies increased, the physical QoL score of the patient was higher. The more the caregivers used problem-solving strategies, the higher were the environmental QoL scores for their beneficiaries, and the more the caregivers used positive thinking strategies, the higher were the social QoL scores for their beneficiaries. All these results are presented in Table 4.

Table 4 Relationships between caregivers' and patients' scores

Patients	Caregivers								
	WHOQ ₀ L	-			Coping ^a	Coping ^a			
	Physical	Psychological	Social	Environment	Social	Problem	Avoidance	Positive	
					support	solving		thinking	
WHOQoL									
Physical									
Sample	-0.165	0.074	0.093	0.203	0.361*	0.209	-0.058	0.101	
Bootstrap bias	0.001	-0.007	-0.004	0.000	-0.014	-0.005	0.007	-0.002	
95% CI	(-0.444,	(-0.245,	(-0.185,	(0.119,	(0.067,	(-0.084,	(-0.327,	(-0.206,	
	0.142)	0.368)	0.342)	0.474)	0.588)	0.487)	0.248)	0.397)	
Psychological									
Sample	-0.123	0.054	0.135	0.096	0.278	0.258	0.054	0.109	
Bootstrap bias	0.004	0.002	-0.003	-0.008	0.002	-0.007	-0.006	-0.006	
95% CI	(-0.411,	(-0.257,	(-0.177,	(-0.237,	(-0.082,	(-0.035,	(-0.274,	(-0.203,	
	0.207)	0.357)	0.430)	0.381)	0.608)	0.524)	0.354)	0.419)	
Social									
Sample	0.143	0.190	0.371*	0.242	0.204	0.023	-0.109	0.321*	
Bootstrap bias	-0.020	-0.005	-0.007	-0.003	-0.010	-0.004	0.004	-0.008	
95% CI	(-0.230,	(-0.163,	(0.048,	(0.065,	(-0.128,	(-0.290,	(-0.416,	(0.004,	
	0.424)	0.509)	0.624)	0.524)	0.491)	0.329)	0.232)	0.571)	
Environment									
Sample	0.163	0.325*	0.284	0.438**	0.235	0.348*	0.152	0.282	
Bootstrap bias	-0.00 I	-0.009	-0.005	-0.004	-0.013	0.001	-0.00 I	0.000	
95% CI	(-0.155,	(0.007,	(-0.056,	(0.147,	(-0.099,	(0.052,	(-0.142,	(-0.025,	
	0.478)	0.580)	0.598)	0.677)	0.532)	0.597)	0.431)	0.550)	
Coping ^a									
Social support									
Sample	0.437**	0.116	0.045	0.054	0.070	0.162	0.019	0.272	
Bootstrap bias	-0.009	0.000	-0.003	0.008	-0.005	-0.009	-0.002	0.001	
95% CI	(0.167,	(-0.220,	(-0.295,	(0.282,	(-0.246,	(0.138,	(-0.320,	(-0.077,	
	0.672)	0.475)	0.373)	0.386)	0.378)	0.476)	0.338)	0.564)	
Problem solving									
Sample	-0.007	-0.123	-0.092	-0.054	0.358*	0.175	0.248	-0.066	
Bootstrap bias	0.002	0.003	0.002	0.007	-0.004	-0.006	-0.00 I	0.000	
95% CI	(-0.297,	(-0.415,	(-0.404,	(-0.377,	(0.006,	(-0.164,	(-0.074,	(-0.399,	
	0.309)	0.191)	0.226)	0.293)	0.628)	0.473)	0.524)	0.273)	
Avoidance									
Sample	0.057	-0.017	-0.182	-0.082	0.094	0.231	0.184	0.188	
Bootstrap bias	0.000	0.000	-0.002	-0.009	0.011	0.014	-0.002	-0.004	
95% CI	(-0.240,	(-0.332,	(-0.439,	(-0.377,	(-0.198,	(-0.092,	(-0.095,	(-0.165,	
	0.361)	0.295)	0.115)	0.194)	0.390)	0.512)	0.463)	0.473)	
Positive thinking									
Sample	-0.158	-0.144	0.025	0.193	0.271	0.163	0.400**	0.046	
Bootstrap bias	0.002	0.007	0.011	-0.00 I	-0.007	0.002	-0.003	-0.001	
95% CI	(-0.455,	(-0.434,	(-0.259,	(-0.144,	(-0.067,	(-0.185,	(0.073,	(-0.243,	
	0.152)	0.182)	0.322)	0.495)	0.556)	0.470)	0.688)	0.357)	

Notes: ^aCoping strategies from the BriefCope questionnaire. *P<0.05, **P<0.01.

Abbreviations: WHOQoL, World Health Organization Quality of Life; Cl, confidence interval; BriefCope, Brief Coping Orientation to Problems Experienced Scale.

Discussion

This is the first study to assess whether QoL of age-related hearing impaired individuals and their caregivers is influenced by the coping strategies implemented either by themselves or their relatives.

The first finding of this study indicated that QoL of individuals with age-related hearing impairment was affected on the social dimension in comparison with French age- and sex-matched norms. Indeed, it is well documented that the consequences of hearing impairment include the inability to interpret speech sounds, which often produces a reduced ability to communicate; impairs physical and social functions; and leads to cognitive deficits, mood disturbances, and stigmatization.³⁻⁷ However, this study highlighted that the social dimension of QoL of the closest caregiver of these individuals is also significantly impacted. Closely participating in the daily life of an individual with age-related hearing impairment may be difficult and hampering. The progressive social deprivation that the ARHL individual imposes on him/herself may entrain a broader social deprivation of their closest relatives,^{22,23} specifically in the situation in which the two individuals are partners. Because of the isolation of the ARHL individual, caregivers are deprived of some of their independence and freedom.

The second interesting result of this study was that the emotional status of beneficiaries and caregivers was quite close. The chronic status and progressive course of the impairment partially explained that people similarly adjust their emotional status when facing this situation. This finding is not in line with the literature which shows discrepancies between patients and caregivers in their anxiety and mood levels. Caregivers were more often anxious than patients with chronic diseases,²⁴ cancer patients,²⁵ and terminally ill patients.²⁶ However, these studies reported dissimilar situations with life-threatening and toxic treatments that have rapid and important consequences on the everyday life of patients and their relatives.

Our study also showed that beneficiaries and their caregivers implemented similar coping strategies, using strategies based on problem solving and positive thinking more than strategies based on looking for social support or avoidance. This result suggests that people who know each other very well and who are faced with the same difficult event tend to cope with it similarly. However, the effectiveness of the employed coping strategies depends on the cognitive, behavioral, and social resources that the individuals are able to mobilize. Because of the progressive impairment process, individuals with ARHL and their caregivers have a long time to adapt and develop specific coping strategies. In the case of acute and severe disease, authors reported that patients usually begin to organize their lives more, accept their limitations, and find ways to manage limitations 6 months after the disease diagnosis,²⁷ but only limited amounts of data are available concerning the strategies used by people with ARHL.²⁸

While the influence of emotional distress on OoL of the individuals was expected, the relationships between the nature of the coping strategies used and their QoL level were less evident. Individuals who used active coping strategies, such as problem-solving or positive thinking strategies, reported higher QoL scores. Active coping strategies are thought to be better methods to address stressful events, and avoidant coping strategies appear to be a psychological risk factor for adverse responses to stressful life events.¹⁶ Developing a better understanding of the ways patients and their relatives support each other and cope together during stressful situations may aid in the development of couple-focused interventions. Our study encourages a systematic assessment of ARHL individuals and caregiver coping styles, to identify individuals who do not use healthy coping strategies, and offers targeted psychological interventions. Furthermore, cognitive training and psychosocial support may serve as important additions to hearing loss rehabilitation.29

Lastly, some researchers have shown the importance of investigating the ways that coping strategies implemented by individuals from a social group (couples, families, etc) influence outcomes among the other members of the group. In this study, regarding the interrelations within the dyads, we showed that the use of active coping strategies (problem solving and positive thinking) by the ARHL individual was linked to the use of passive coping strategies (avoidance and social support) by their caregivers. In the same way, we showed that a better QoL of each member of the dyad was associated with the use of passive coping strategies by the other member of the dyad. The two members likely run in opposition "as communicating vessels".

Some limitations should be considered. First, the representativeness of our sample should be discussed. The people involved in this study voluntarily chose to perform a health checkup, which indicated that they were concerned about prevention and health promotion. However, we know that a significant proportion of individuals with ARHL are in denial about their impairment, may be reluctant to seek help from the health care system, and do not wish to be managed. Replication of our findings in these groups is required. Second, the small sample size and exploratory nature of our analysis did not allow for a deeper investigation of several associations with QoL or coping, especially investigations regarding sociodemographics, hearing aid use, and the nature of the dyadic relationship. The degree of hearing loss and the cognitive decline should also be examined to better understand their influence on QoL of the individuals. The exploratory nature of this work allows scheduling larger studies integrating these various parameters. However, the bootstrapping ensured the robustness of our results. Third, the study employed an observational and cross-sectional design, which did not allow for causality inferences to be made between coping strategies and QoL. Thus, it remains unknown whether an individual's coping strategies actually influence QoL and that of his/her relatives over time. This study did not use specific dyadic analyses based on a specific actor-partner interdependence model specifically developed to study the dyadic relationships that integrate a conceptual view of interdependence in two-person relationships.^{30,31} People in a dyadic relationship strongly influence each other's cognitions, emotions, behaviors, and QoL. However, this approach preferentially requires a large sample size to assess effects within longitudinal designs.

Conclusion

This study emphasizes that QoL of individuals with agerelated hearing impairment and their natural caregivers is related to the coping strategies that they use. This finding suggests that targeted interventions should be offered to help individuals who experience emotional difficulties to implement more efficient coping strategies.

Disclosure

The authors report no conflicts of interest in this work.

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