

Impact and Factors Associated with Presbycusis among 50 Years Old People of Parakou and Over in 2021

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Abstract

Introduction: Presbycusis or age-related hearing loss is a condition of insidious onset with significant socio-professional repercussions. The objective of this study was to determine the impact and factors associated with presbycusis among 50 years aged people or older in Parakou commune during 2021.

Methods: This was a cross-sectional, descriptive, analytical study with prospective data collection. The study has involved 541 50 years aged people or older, from February to May 2021. For each of them, a questionnaire was completed, otoscopy and tone audiometry performed. The ERSA questionnaire and the logistic regression model were used to determine the impact and factors associated with presbycusis. **Results:** The mean age was 59.48 ± 9.80 years and the sex ratio was 1.23. The prevalence of presbycusis was 50.28%. Age ≥ 80 years ($p = 0.002$), male sex ($p = 0.016$), low educational level ($p = 0.001$), family history of age-related hearing loss ($p = 0.018$) and presence of hearing loss ($p = 0.001$) were significantly associated with presbycusis in multivariate analysis. Of the life domains studied, personal life (mean score = 32.9 ± 10.52) was the most affected. Similarly, communication in a noisy environment (mean score = 4.39 ± 2.39) was the most affected aspect of personal life. **Conclusion:** Presbycusis leads to an impairment of personal life. A good knowledge of the associated factors and an early management could contribute to the improvement of the hearing health of the elderly.

Keywords

Presbycusis, Elderly, Hearing, Deafness

1. Introduction

Normal aging is a set of molecular, histological, physiological and psychological processes that accompany advancing age. In terms of hearing, this aging results in a neurosensorial damage responsible for a progressive bilateral sensorineural hearing loss called presbycusis [1]. It is the most frequent sensory deficit in the world [2] and its prevalence increases with age.

With the increase in life expectancy, it is obvious that presbycusis will increase in the coming years. Indeed, the population aged over 60 years will increase from 605 million in the year 2000 to 2 billion in 2050 [3]. In Africa, this number will increase from 56 to 215 million, almost as many as in Europe [4].

The onset of presbycusis may be accelerated by certain factors. Davanipour *et al.* [5] identified in their survey certain risk factors such as alcohol and tobacco consumption, high blood pressure and low socio-economic status. Studies have shown a higher prevalence in men than in women [5] [6].

Complications of presbycusis can be severe. Presbycusis can induce character disorders (anxiety, apathy, ...), mood disorders (depression), communication disorders, isolation and cognitive disorders [7] [8].

In view of all these considerations, the diagnosis of presbycusis and its management represent major public health issues in developing countries. The lack of existing data on this subject in Benin, and more specifically in Parakou town, motivated the present study, the objectives of which were: 1) to identify the factors associated with presbycusis among people of Parakou aged at least 50 years in 2021; 2) to evaluate its socio-professional impact.

2. Methods

This was a cross-sectional, descriptive, analytical study with prospective data collection, from February to May 2021, *i.e.* 04 months.

Were included in the study, people:

- aged 50 years and more;
- residing for at least six (06) months in the commune of Parakou in the course of the survey;
- who gave their consent to participate in the study.

Were not included in the study, people:

- who were absent or busy during survey team visitation;
- who objected to the performance of a pure tone audiometry;
- exposed to loud noise because of their work;
- who were ill and unable to answer questions promptly.

Were excluded from the study:

- people who had withdrawn at any time during data collection;
- people who had an abnormal otoscopic examination.

The sample was probabilistic, obtained through a four-stage cluster random sampling. In the first stage, clusters were selected from the city neighborhoods. In the 2nd stage, concessions were selected; in the 3rd and 4th stages, households

and individuals per household were selected (respectively). The sampling list consisted of the 42 neighborhoods of Parakou commune accompanied by their respective household counts; as presented by the 4th General Census of Population and Housing (RGPH 4) conducted by INSAE in 2013 [9].

The Schwartz formula was used to determine the sample size (n).

$$n = k * Z\alpha_2 * p * (1 - p) / i^2$$

With:

$\alpha = 0.05$: first-species risk, hence $Z\alpha = 1.96$;

$p = 22.7\%$ (Prevalence of presbycusis in Egypt) [10];

$i = 5\%$: the desired precision;

n : the expected sample size;

$k = 2$: cluster effect;

$n = 540$.

The variables studied were:

- presbycusis;
- socio-demographic variables;
- functional signs;
- medical history;
- lifestyle;
- audiometry result;
- socio-professional impact.

Diagnostic criteria

Presbycusis was retained when the following criteria were met:

- an age equal or superior to 50 years;
- the presence or absence of auditory discomfort reported on questioning;
- a normal otoscopic examination ;
- a sensorineural bilateral and symmetrical deafness (average hearing loss > 20 dB HL).

Symmetry was defined as a difference in perception between the two ears of less than 10 dB on the audiometric frequencies between 500 and 4000 Hz [11].

Data collection

The data collection tools were: a survey questionnaire, a HEINE Mini 3000 otoscope with 2.5× magnification, and a portable AUDIOSMART audiometer with a 3 - 4 hours measurement autonomy.

The socio-professional impact was assessed using the questionnaire “Evaluation of the impact of hearing loss in adults” [12]. The questionnaire includes four domains, “Quality of life”, “Personal life”, “Social life” and “Professional life”. Each domain consists of five questions written in a precise and short manner, in a common vocabulary and without negative wording. For each question, a visual analogue scale proposes a response from 0 to 10, allowing a quick count. The score 0 corresponds to a maximum difficulty, the score 10 to an ideal situation. The scores are averaged for each life domain. This average, for each domain, has a maximum value of 50 and a minimum value of 0. The lower the av-

erage, the greater the impact of the deafness on this area of life.

The data collection technique consisted of:

- an individual interview with each respondent;
- an otological examination of each respondent;
- a tonal audiometry.

Data processing and analysis

After collection, the data were verified, coded and then entered into EPI data 3.1.fr software. Data analysis was processed by the medium of Epi info 7.2.0.1. The qualitative variables were expressed in number and percentage and the quantitative variables in mean \pm standard deviation or median with the first and third quartile depending on whether the distribution was normal or not. The comparison of proportions was performed with the Pearson Chi-square test or Fisher's exact test, as appropriate. The comparison of quantitative variables was performed with the Student's test or the Kruskal-Wallis test, depending on whether the distribution was normal or not. A p-value of less than 0.05 allowed the recognition of statistically significant associations in univariate analysis.

Binary logistic regression was performed to adjust for associated factors. The initial multivariate analysis model included the associated variables in univariate analysis at a threshold of $p < 0.2$.

3. Results

A total of 541 people were included in this study.

Prevalence of presbycusis

Of the 541 persons who participated in the present study, the diagnosis of presbycusis was retained in 272, for a prevalence of 50.28%.

Characteristics of the respondents

The sex ratio (male/female) was 1.23. The average age was 59.48 ± 9.80 years with extremes of 50 and 96. Most of the respondents (71.11%) were exposed to noise.

Figure 1 shows the distribution of the respondents according to the type of

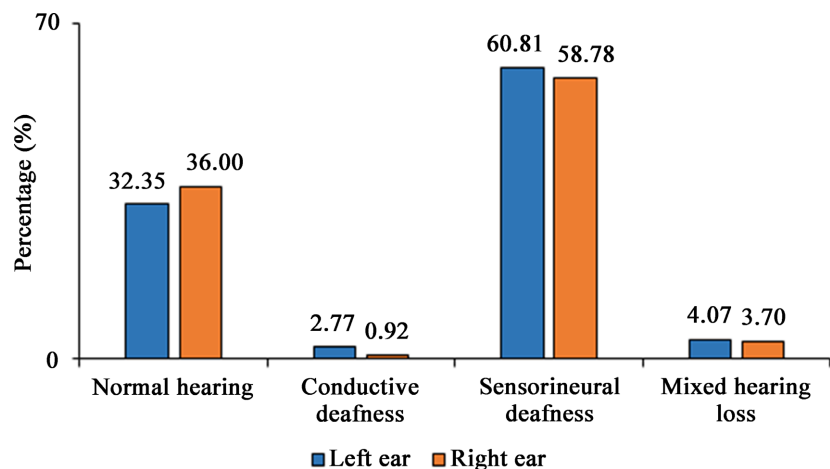


Figure 1. Distribution according to the type of deafness, of people aged at least 50 years in the commune of Parakou; February-May 2021 (n = 541).

hearing loss found.

As for the degree of deafness of the population studied, mild deafness was the most common. It was present in 56.56% of the respondents in the left ear and in 52.31% of the respondents in the right ear. On the right and left ears respectively, the moderate, severe and profound degrees represented 15.07% and 15.50%; 0.27% and 1.46%; 0.82% and 0.29%.

The other characteristics are shown in **Table 1**.

In univariate analysis, there was a significant association between presbycusis and certain socio-demographic variables (**Table 1**). There was also a significant association with hearing loss ($p < 0.001$), tinnitus ($p = 0.004$), vertigo ($p = 0.078$), osteoarthritis ($p = 0.024$), family history of age-related hearing loss ($p = 0.009$), alcoholism ($p = 0.009$), smoking ($p = 0.004$).

Table 1. Influence of various factors in the onset of presbycusis in people aged at least 50 years in Parakou; February-May 2021 (n = 272).

	N	Presbycusis		df	χ^2	p-value
		n	%			
Age						
[50 - 60[	306	122	39.87	3	41.09	<0.001
[60 - 70[	151	88	58.28			
[70 - 80[	53	34	64.15			
≥80	31	28	90.32			
Gender						
Female	242	106	43.80	1	7.34	0.007
Male	299	166	55.52			
Profession						
Craftsman	105	52	49.52	8	15.91	0.044
Shopkeeper	81	39	48.15			
Farmer	62	35	56.45			
Entrepreneur	13	5	38.46			
Housewife	113	49	43.36			
Retired	125	77	61.60			
Private employee	3	1	33.33			
Public employee	28	12	42.86			
Other	11	2	18.18			
Level of education						
Illiterate	15	6	40.00	4	16.11	0.003
Literate	187	111	59.36			
Primary	151	77	50.99			

Continued

Secondary	149	67	44.97			
University	39	11	28.21			
Noise exposure						
No	384	182	47.40	1	4.14	0.042
Yes	156	89	57.05			
Hearing loss						
No	376	167	44.41	1	16.95	<0.001
Yes	165	105	63.64			
Tinnitus						
No	282	125	44.33	1	8.34	0.004
Yes	259	147	56.76			
Vertigo						
No	203	112	55.17	1	3.11	0.078
Yes	338	160	47.34			
HBP						
No	433	215	49.65	1	0.34	0.561
Yes	108	57	52.78			
Osteoarthritis						
No	494	241	48.79	1	5.06	0.024
Yes	47	31	65.96			
Family history of age-related hearing loss						
No	406	191	47.04	1	6.80	0.009
Yes	135	81	60.00			
Alcoholism						
No	442	211	47.74	2	9.44	0.009
Yes	86	56	65.12			
Stop	13	5	38.46			
Smoking						
No	385	185	48.05	2	10.90	0.004
Yes	107	68	63.55			
Stop	49	19	38.78			

df = degree of freedom; HBP = high blood pressure.

From the multivariate analysis, it appears that the occurrence of presbycusis in adults in Parakou commune within 2021 is a function of age, sex, the presence of hypoacusis and the presence of a family history of age-related hearing loss (**Table 2**).

Table 2. Model of the multivariate analysis of factors associated with presbycusis in the commune of Parakou; February-May 2021 (n = 272).

	aOR	[95% CI]	p-value
Age			
[50 - 60[	1.00	-	-
[60 - 70[	1.86	[1.23 - 2.82]	0.003
[70 - 80[	1.76	[0.91 - 3.80]	0.090
≥80	7.61	[2.15 - 26.87]	0.002
Gender			
Female	1.00	-	-
Male	1.59	[1.09 - 2.33]	0.016
Noise exposure			
No	1.00	-	-
Yes	1.44	[0.93 - 2.24]	0.105
Hearing loss			
No	1.00	-	-
Yes	2.02	[1.33 - 3.07]	0.001
Tinnitus			
No	1.00	-	-
Yes	1.19	[0.8 - 1.77]	0.391
Vertigo			
No	1.00	-	-
Yes	1.05	[0.7 - 1.58]	0.813
Level of education			
Illiterate	2.18	[0.59 - 8.08]	0.244
Literate	4.12	[1.82 - 9.35]	0.001
Primary	3.27	[1.46 - 7.34]	0.004
Secondary	2.40	[1.07 - 5.38]	0.033
University	1.00	-	-
Family history of age-related hearing loss			
No	1.00	-	-
Yes	1.67	[0.06 - 0.31]	0.018
Osteoarthritis			
No	1.00	-	-
Yes	1.45	[0.7 - 2.99]	0.317
Alcoholism			

Continued

Stop	1.03	[0.27 - 3.88]	0.964
Yes	1.78	[0.97 - 3.29]	0.064
No	1.00		
Smoking			
Yes	2.51	[1.13 - 5.57]	0.023
No	2.53	[1.2 - 5.34]	0.015
Stop	1.00		

CI = Confidence interval.

Thus, when adjusted for other factors, people over 80 years of age were nearly 8 times more likely to develop presbycusis than those aged 50 to 60 years. Similarly, men were 1.59 times more likely than women. The risk of developing presbycusis was inversely proportional to the level of education.

The average scores obtained for different aspects of personal life among presbycusic people in Parakou are as follows: communication with relatives 6.97 ± 2.26 ; following a conversation without knowing the topic 7.24 ± 2.43 ; participation in a conversation with several people, in a quiet environment 6.76 ± 2.57 ; discussion in a noisy environment (family meeting, meal with television, ...) 4.39 ± 2.39 ; self-confidence to initiate a discussion with relatives 7.53 ± 2.84 . The aspect of personal life most affected was communication in noise.

4. Discussion

Prevalence of presbycusis

The prevalence of 50.28% found in the present study is close to those observed by Cruickshanks *et al.* in the United States in 2012 as well as Valero-Garcia *et al.* in Spain in 2018 who had reported prevalences of 42.7% and 54.87% respectively [13] [14].

It is however, lower than that reported by Lin *et al.* in the United States in 2011, Folorunso *et al.* in Nigeria in 2020 who had reported prevalences of 63% and 75% respectively [15] [16]. Similarly, lower prevalences had been found by Nash *et al.* in the United States in 2011 and Hannula *et al.* in Finland in 2011 who had reported prevalences of 6.1%, 14.1%, and 37% respectively [17] [18].

This large variability could be explained by the fact that there are very large differences in the method and diagnostic criteria used.

Indeed, the definition of deafness varied from one study to another. In the present study, we used the BIAP classification while other authors used the WHO classification [19]. Clearly, the lack of a common definition prevents the availability of comparable data on the prevalence of presbycusis.

The age ranges of the subjects surveyed differed from one study to another. There are no recommendations regarding the age limit for presbycusis. The choice of the age range of the study population was in most cases arbitrary and

the reasons for this choice were not often mentioned.

It should also be noted that the size of the target populations and the type of study were very different from each other. Nash *et al.* [17] conducted a cohort study with more than 3000 volunteers, whereas the study by Folorunso *et al.* [16] was a cross-sectional study with 114 volunteers.

Factors associated with presbycusis

In the present study, age was significantly associated with presbycusis and the prevalence of presbycusis increased with age. For example, subjects over 80 years of age were at least 8 times more likely to develop presbycusis than younger subjects. This finding corroborates that of Cruickshanks *et al.* [14] in the United States in 2012 and Lasisi *et al.* [20] in Nigeria in 2010. This association of age and presbycusis found by several studies could be explained by the aging of the hearing system. Indeed, the contingent of sensory cells (less than 20,000 hair cells per cochlea) that we are endowed with at birth is limited and non-renewable. This contingent diminishes irreversibly over the years [21].

Gender was significantly associated with presbycusis. The prevalence of presbycusis was higher among male subjects. This finding has been made by many authors [8] [15] [22]. This male predominance could be explained by several factors: the protective role of female hormones [23] [24], the difference in exposure to other exogenous factors that may favor the occurrence of presbycusis. Indeed, men are more exposed to noise than women from a very young age. Even more men than women work in construction, factories, mechanics or welding. The same applies to the other factors of smoking and alcohol consumption [25].

Educational level was significantly associated with presbycusis in the present study. Indeed, illiterate subjects were up to 4 times more likely to develop presbycusis than subjects with a university education. This finding is similar to that of several authors [14] [17] [26]. Indeed, a high level of education would represent an indicator of socio-economic status which is also indicative of better access to health care, a healthier environment and less stress at work. On the other hand, a low socio-economic level would be more likely to lead to cardiovascular disease, which is a risk factor for presbycusis [18].

In the present study, only osteoarthritis was significantly associated with presbycusis. This factor was also found by Sogebi *et al.* [26] in Nigeria in 2013. This association could be explained by the fact that osteoarthritis is an inflammatory disease and the autoimmune mechanisms it involves, could contribute to the progressive destruction of the inner ear [27].

From the results of the study, a family history of age-related hearing loss was associated with presbycusis. These data have met the requirements of those of Bouata *et al.* [28] who also reported a statistically significant association between presbycusis and a family history. This could be explained by the fact that genetic factors are involved in the occurrence of presbycusis. Indeed, several studies have investigated this link and have identified a number of genetic variants with

a statistical correlation that suggests that they may be involved in the development of presbycusis [29] [30].

Impact of presbycusis

In this survey,, all areas of life were impacted by presbycusis. The most impacted life domain was personal life. Several studies have shown that the first area to be affected once overt presbycusis is reached is the family area [28] [31] [32]. This could be explained by the fact that family members are the first to notice hearing difficulties. The patient, on the other hand, does not realize that he or she cannot hear well. This observation implies that the family and friends play a crucial role in the early detection of presbycusis. A diagnosis at this stage would allow an early management of presbycusis which could avoid the evolution towards complications.

In this research work, the aspect of personal life most affected was communication in noise. This finding was also presented by Espmark *et al.* [33] and Bouata *et al.* [28]. Indeed, presbycusis leads to a discomfort in noise which is characterized by a difficulty to follow a conversation in a group or in a noisy environment realizing the classic sign of the “cocktail”. The subject has the impression of hearing very well, even too well, especially motorcycles or any other violent noise. This phenomenon is explained by the fact that his painful threshold for high intensity sounds is confused, or almost, with his/her hearing threshold [34].

Strengths and weaknesses

This study has several strengths. It was conducted in a general population. Such type of study is the most relevant for determining the prevalence of a condition in the community. Method used was appropriate and the material collection was reliable. However, the study had some shortcomings: the audiometry was carried out in the respondents' homes, a setting in which the noise level was unknown, even though the examination was carried out away from any sound source. Voice audiometry was not performed. It could have provided additional data to better refine the diagnosis of presbycusis.

5. Conclusion

The prevalence of presbycusis was high among people over 50 years old in Parakou commune during 2021. Factors associated with presbycusis were: age \geq 80 years, male gender, educational level, family history of age-related hearing loss. The associated sign was hearing loss. Presbycusis had a negative impact on all areas of life but impacted more, the personal life of the affected subjects. Controlling and addressing the associated factors could significantly contribute to reducing the prevalence of presbycusis, improving the hearing health of elderly subjects.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Survey Form

Sheet N°.....

Date of investigation /...../...../...../

Address..... Phone.....

SESSION A: SOCIO-DEMOGRAPHIC AND CULTURAL FACTORS

A1	Age /.... / years			
A2	Gender	1 = Male	2 = Female	/...../
A3	Profession	1 = Private employee	2 = Public employee	3 = Retired
		4 = Entrepreneur	5 = farmer	6 = shopkeeper
		7 = Housewife	8 = craftsman	9 = Others (specify).....
A4	Ethnic group	1 = Dendi	2 = Bariba	3 = Fon and associates
		4 = Yoruba and associates		5 = Peuhl
		6 = Ditamari and associates		7 = Others (specify).....
A5	Religion	1 = Muslim	2 = Christian	3 = Endogenous
		4 = Other (to be specified		/...../
A6	Level of educational	1 = Literate	2 = Illiterate	3 = Primary
		4 = Secondary	5 = University	/...../
A7	Noise exposure	1 = Yes	2 = No	/...../

SESSION B: SYMPTOMS

B1	Hearing loss	1 = yes	2 = No	/...../
B1a	If yes, specify the side	1 = Right unilateral	2 = Left unilateral	3 = Bilateral
B2	Tinnitus	1 = yes	2 = No	/...../
B2a	If yes, specify the side	1 = Right unilateral	2 = Left unilateral	3 = Bilateral
B3	Otalgia	1 = yes	2 = No	/...../
B3a	If yes, specify side	1 = Unilateral right	2 = Left unilateral	3 = Bilateral
B4	Otorrhea	1 = yes	2 = No	/...../
B4a	If yes, specify the side	1 = Right unilateral	2 = Left unilateral	3 = Bilateral
B6	Vertigo	1 = yes	2 = No	/...../
B6a	If yes, specify:	1 = Brief	2 = Durable	/...../
B7	Other associated symptoms /...../			

SESSION C: HISTORY OF THE RESPONDENT

C1	Medical history:	1 = Diabetes	2 = high blood pressure (HBP)	3 = Asthma	/...../
		4 = Osteoarthritis	5 = Others: to be specified/...../		
		6 = None			
C2	ENT surgical history	1 = Yes (if yes, please specify		2 = No	/...../
C3	Family history of age-related hearing loss	1 = Yes		2 = No	/...../
C4	Therapeutic				
	Have you had any hearing symptoms after taking any of the following medicines:				

Continued

C4a	Macrolides	1 = Yes	2 = No	/..../	
C4b	Aminoglycosides	1 = Yes	2 = No	/..../	
C4c	Furosemide	1 = Yes	2 = No	/..../	
C4e	Non-steroidal anti-inflammatory drug (NSAID)	1 = Yes	2 = No	/..../	
C4f	Quinine	1 = Yes	2 = No	/..../	
C5	If YES to question C4 how often do you use these medicines:	1-occasionally	2-Regularly	3-Rarely	/..../
C6	Sound trauma				/..../
	Have you been the victim of a sound shock				/..../
	1 = Yes specify when (in years)	2 = No			

SESSION D: LIFESTYLE

D1	Alcohol status?	1 = Drinker;	2 = Non drinker;	3 = Stop	/..../
D2	Tobacco status	1 = Tobacco;	2 = Non-smoking;	3 = Stop	/..../

SESSION E: PHYSICAL EXAMINATION

E1	OD Otoscopy				
E1a	MAE	1 = Free	2 = cerumen impaction	3 = Wound	/..../
		4 = Inflammatory aspect	5 = Stenosis	6 = Other: to be specified /	/
E1b	Ear-drum	1 = Normal	2 = Inflammatory	3 = Retraction	/..../
		4 = Bulge	5 = Perforation	6 = Other: to be specified /	/
E2	OG otoscopy				
E2a	MAE	1 = Free	2 = BDC	3 = Wound	/..../
		4 = Inflammatory aspect	5 = Stenosis	6 = Other: to be specified /	/
E2b	Ear-drum	1 = Normal	2 = Inflammatory	3 = Retraction	/..../
		4 = Bulge	5 = Perforation	6 = Other: to be specified /	/

SESSION F: TONAL AUDIOMETRY

F1	Type of deafness				
F1a	Right side:	1 = Normal hearing	2 = Conductive deafness		/..../
		3 = Sensorineural deafness	4 = Mixed deafness		
F1b	Left side:	1 = Normal hearing	2 = Conductive hearing loss		/..../
		3 = Sensory deafness	4 = Mixed hearing loss		
F2	Average hearing loss				
F2a	Right ear = /...../ dB				
F2b	Left ear = /...../ dB				
F3	Degree of deafness				
F3a	Right side:	1 = Normal audiometry	2 = Mild deafness	3 = Moderate deafness	/..../
		4 = severe deafness	5 = Profound deafness or cophosis		
F3b	Left side:	1 = Normal audiometry	2 = Mild deafness	3 = Moderate deafness	/..../
		4 = Severe deafness	5 = Profound deafness or cophosis		

Continued




SESSION G: DIAGNOSIS

G1 **Diagnosis of presbycusis** 1 = yes 2 = No /...../




(If YES to question G1, answer session H)

SESSION H: SOCIO-PROFESSIONAL IMPACT




H1 **Quality of life**

H1a How do you rate your quality of life?
Not satisfactory *Moderately satisfactory* *Satisfactory*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H1b Do you feel independent in your daily life?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H1c How is your morale just now?
Not satisfactory *Moderately satisfactory* *Satisfactory*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----




H1d Are you usually self-confident?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----




H1e Do you feel like taking on new projects?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----




H2 **Personal life**

H2a What is communication with friends and family like?
Very difficult *okay* *Very easy*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H2b Can you follow a conversation without knowing what it's about in advance?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----




H2c Can you join in a conversation with several others in a quiet setting?
Never *Sometimes* *usually*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H2d Are you okay talking in a noisy setting (Family gathering, TV, dinner, etc.)?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Continued




H2e Are you self-confident enough to start a discussion with friends or family?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----




H3 Social life

H3a Do you have a satisfactory social life despite your hearing loss?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H3b Do you feel at ease in social groups you're part of (Sports club, association, activities, neighborhood)?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H3c Are you happy to be in direct contact with friends? (face to face, telephone, etc.)?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H3d Do you easily approach people you don't know?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H3e Are you okay talking when there are several conversations going on around you?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H4 Professional life




H4a Do you have a job? 1 = yes 0 = No If you answered yes, go on to the next 5 questions

H4b Are you at ease in your relations at work?
Not at all *More or less* *Totally*
  




1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H4c Do you feel at ease taking part in meetings at work (joining in the discussion)?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----




H4d Do you feel at ease in special situations like using the phone, using a foreign language?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

H4e Do you think you could make new acquaintances at work? (Foreign languages skills, training courses, etc.)?
Not at all *More or less* *Totally*
  

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Continued

H4f	Do you think you can progress in your work despite your hearing loss?									
	<i>Not at all</i>			<i>More or less</i>				<i>Totally</i>		
										
	1	2	3	4	5	6	7	8	9	10
