



SGORL PCF

Sociedad Gallega de Otorrinolaringología
y Patología Cervicofacial

Artículo Original

**EVALUATION OF THE IMPACT OF HEARING
LOSS IN ADULTS: TRANSLATION,
CULTURAL ADAPTATION AND VALIDATION
OF A QUESTIONNAIRE IN PORTUGAL**

**Evaluación del impacto de la pérdida auditiva
en adultos: traducción, adaptación cultural y
validación de un cuestionario en Portugal**

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Fecha de envío: 28/06/2022 Fecha de aceptación: 20/10/2022

ISSN:
2340-3438

Edita:
Sociedad Gallega de Otorrinolaringología

Periodicidad:
continuada.

Web:
www.sgorl.org/revista

Correo electrónico:
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Abstract

Objectives: Evaluation of the impact of hearing loss in adults (ERSA) is a questionnaire that assesses the specific quality of life of hearing-impaired adults with or without auditory rehabilitation. The aim of our study was to adapt ERSA questionnaire to the Portuguese reality and validate the version obtained for use in Portugal.

Material and Methods: We applied the final ERSA questionnaire to patients with hearing loss and auditory rehabilitation followed in a single institute. We translated ERSA questionnaire into European Portuguese and then we proceeded with the evaluation of the questionnaire regarding its feasibility and reliability (internal consistency and test-retest reproducibility).

Results: We obtained a good internal consistency, with a general Cronbach's α coefficient of 0.878. We also obtained an excellent test-retest reproducibility ($p < 0.001$), with a general Pearson coefficient of 0.948 ($p < 0.001$) and a general Cohen Kappa coefficient of 0.787 ($p < 0.001$).

Discussion: In the evaluation of internal consistency and test-retest reproducibility we obtained results comparable to the ones obtained by the ERSA authors, which prove the excellent feasibility and reliability of the Portuguese version.

Conclusions: Until now, there were no validated questionnaires to evaluate quality of life in patients with hearing loss with or without auditory rehabilitation in Portugal. Translation and validation of ERSA questionnaire will allow a more consistent and complete assessment of the specific quality of life of hearing-impaired adults and the comparison with international data. Thus, we recommend this version to be used in the Portuguese population with hearing loss.

Keywords

hearing loss; auditory rehabilitation; quality of life; patient evaluation; audiology.

Resumo

Objetivos: “*Evaluation of the impact of hearing loss in adults*” (ERSA) é um questionário que avalia a qualidade de vida específica de adultos com hipoacusia com ou sem reabilitação auditiva. O objetivo do nosso estudo consistiu em adaptar o questionário ERSA à realidade portuguesa e validar a versão obtida para utilização em Portugal.

Material e Métodos: Aplicámos o questionário final ERSA a doentes com perda de audição e reabilitação auditiva acompanhados num único hospital. Inicialmente, traduzimos o questionário ERSA para português europeu e, em seguida, procedemos à avaliação do questionário quanto à sua viabilidade e confiabilidade (consistência interna e reprodutibilidade teste-reteste).

Resultados: Obtivemos uma boa consistência interna, com coeficiente de Cronbach α geral de 0,878. Também obtivemos excelente reprodutibilidade teste-reteste ($p < 0,001$), com coeficiente de Pearson geral de 0,948 ($p < 0,001$) e coeficiente de Cohen Kappa geral de 0,787 ($p < 0,001$).

Discussão: Na avaliação da consistência interna e da reprodutibilidade teste-reteste obtivemos resultados comparáveis aos obtidos pelos autores do ERSA original, o que comprova a excelente viabilidade e fiabilidade da versão portuguesa.

Conclusões: Até à data, não existiam questionários validados para avaliar a qualidade de vida em doentes com hipoacusia com ou sem reabilitação auditiva em Portugal. A tradução e validação do questionário ERSA permitirá uma avaliação mais consistente e completa da qualidade de vida específica de adultos com défice auditivo e a comparação com dados internacionais. Assim, recomendamos que esta versão seja utilizada na população portuguesa com perda auditiva.

Palavras-chave:

Hipoacusia; reabilitação auditiva; qualidade de vida; avaliação do doente; audiologia.

Introduction

Hearing loss is considered the fourth-leading cause of disability globally and the most prevalent sensory impairment in the elderly, since one third of older adults aged ≥ 65 years old is affected by hypoacusia.¹⁻⁷ According to global estimates, over 1.3 billion people live, currently, with some degree of hearing disability.^{2,8}

As we all know, hearing loss can impair the exchange of information, with the consequent impact on everyday life, causing loneliness, isolation, dependence, decreased self-esteem, frustration and, ultimately, anxiety, depression and a cognitive decline. Therefore, the impact of hearing loss may be profound, with consequences for the social, functional and psychological well-being of the person. Various recent studies consistently show the tremendous impact of hearing loss on the individual's quality of life.¹⁻¹⁰ Presbycusis is the most common cause of adult hearing deficiency and, as the aging of the population progresses in developed countries, presbycusis also becomes a growing problem, compromising the quality of life of individuals and predisposing them to pathologies that are often associated with a lack of social interaction, such as depression and dementia.⁹ Nowadays, depression is five-times more common in hearing-impaired individuals than in the general population.¹ As such, optimal management of this condition not only requires early recognition and rehabilitation, but it should also include a complete assessment of the impact of hearing loss on the individual's quality of life, in order to early realize the importance of auditory rehabilitation as well as to plan psychosocial interventions if necessary, but also in order to understand the impact of the auditory rehabilitation, once done, on the individual's life and, if necessary, readjust it. The questionnaires most commonly used to assess quality of life in these patients (Nijmegen, APHAB and GBI) are known to be time-consuming, difficult for patients to fill out (specially the elderly ones) and also show poor sensitivity to small improvements or minor aggravations of hearing capacity.¹¹

Given this need to precisely assess the impact of hearing loss and its rehabilitation on quality of life, a questionnaire entitled Evaluation of the Impact of Hearing Loss in Adults (also written in French language by its authors: Évaluation du Retentissement de la Surdit e chez l'Adulte: ERSA) was drawn up and published in the scientific literature in 2018 by a group of authors dedicated to otology and auditory rehabilitation in Paris, France.¹¹

The ERSA questionnaire is easy to read and interpret by patients, is quick to fill out and is divided into 4 fundamental domains that govern daily life: quality of life, personal domain, social domain and occupational domain (this domain is only filled in by patients who remain employed and actively working on their jobs). Each of these domains comprises 5 simple questions, with response options on a visual scale numbered from 0 to 10 (0-not satisfied, 10-completely satisfied). The total score is obtained by summing the values of all responses given, with higher score indicating better quality of life. The maximum score is 200 for respondents who have a job and 150 for those not working or in retirement.

To our knowledge, the ERSA questionnaire has not yet been translated or validated in other countries. The aim of our study was to translate and culturally adapt this questionnaire to the Portuguese reality and to validate the version obtained for use in daily clinical practice and for scientific research purposes and data comparison in Portugal.

Material and Methods

Initially, we applied for authorization to translate and validate the ERSA questionnaire in Portugal and were granted permission from the corresponding author of the original questionnaire. Afterwards, we proceeded to the translation of the questionnaire into European Portuguese according to the methodology recommended by the scientific literature. We followed the translation, validation and cross-cultural adaptation methods described by the guidelines of Guillemin F et al and Terwee CB et al.^{12,13} Independent translations were performed by two Portuguese native speakers who were also fluent in English language. Trippingly, independent back translations were performed by two English native speakers who were also fluent in Portuguese. These two versions were assembled into a single one which was compared to the original questionnaire and proved to be very similar to it, with only minor non-significant differences. As such, we accepted the final translation of the questionnaire into European Portuguese.

After the translation process was completed, we started the evaluation of the questionnaire, regarding its feasibility and reliability (internal consistency and test-retest reproducibility). For this step, we invited 30 patients followed in otolaryngology consultations in our center with hearing loss and auditory rehabilitation in the form of conventional hearing aids. The patients were asked to complete the questionnaire on their own on two separate days, with a 15-day interval.

In this study, and according to the maximum scores of the questionnaire and its domains and for readers reference, we consider “ERSA/200” the ERSA questionnaire scored on all 4 domains (out of 200 maximum score) by those respondents who were still active workers, and “ERSA/150” to scores of all respondents on the 3 “quality of life”, “personal life” and “social life” domains (out of 150).

Statistical analysis was performed using SPSS 23.0 IBM Corp. Release 2015. IBM SPSS Statistics for MacOS, version 23.0. Armonk, NY.

Results

Our sample of 30 patients with hearing loss and auditory rehabilitation instituted in the form of conventional retroauricular hearing aids had a mean age of 71.1 (\pm 8.5 years old), with a minimum age of 55 and a maximum of 88 years old. Of the total sample, 20 (66.7%) patients were male and 10 (33.3%) were female. Concerning the laterality of hearing loss, 4 (13.3%) had unilateral hypoacusia and 26 (86.7%) had bilateral. Regarding the type of hearing loss, 23 (76.7%) had a sensorineural loss, 4 (13.3%) a mix type of hearing loss and 3 (10%) a conductive hearing loss. As for the rehabilitation, 11 (36.7%) patients were using a unilateral hearing aid and 19 (63.3%) had bilateral hearing aids. In patients with bilateral hearing loss of at least moderate degree in which only a unilateral auditory rehabilitation was performed, as far as we could understand, the decision of a unilateral hearing aid was made for economic reasons, with the idea of initially starting to rehabilitate the ear with better discrimination, given a speech reception threshold (SRT) equal between ears or the ear that had better SRT if vocal discrimination was symmetrical. 23 (76.7%) patients were active workers still performing their jobs and, as such, they answered to the 4 domains of the questionnaire (ERSA/200), while 7 (23.3%) did not work/were retired and so did not fill the occupational life domain (ERSA/150) (Table 1).

After the translation process of the original ERSA questionnaire, we obtained the final Portuguese version of the questionnaire - pERSA (Table 2).

When evaluating the viability of the Portuguese version of the questionnaire and during its application to our sample of patients, we verified proper understanding and acceptance, given our response rate of 100%, the absence of doubts from the patients while completing the questionnaire and the availability of patients to participate in the study. We also could perceive that its completion was quick as it did not take more than 5 minutes.

When assessing reliability, we observed good internal consistency with a general Cronbach's α coefficient of 0.878 and when we evaluated each questionnaire domain separately, we continued to obtain good to excellent homogeneity between different items: 0.956 for quality of life domain; 0.963 for personal life domain; 0.957 for social life domain; 0.824 for occupational life domain.

Besides the general internal consistency of the questionnaire as a whole we decided to also evaluate its reliability separately taking into account the number of items that were completed in the questionnaire. That is, we evaluated the questionnaires separately, depending on whether it was the questionnaire with the questions from the 4 domains completed (in active workers, for a maximum score of 200 points - ERSA/200) or the questionnaire completed by patients without work at the present moment or retired, who did not complete the domain of occupational life (for a maximum score of 150 points- ERSA/150), because in fact, in clinical practice, in order to assess the quality of life of our patients, we will always have both types of patients, active workers and non-workers/ retired. As such, we obtained a specific Cronbach's α coefficient of 0.981 for ERSA/150 and of 0.878 for ERSA/200. Even when we excluded each question individually, we always obtained α coefficient values that can be considered good to excellent (0.858-0.883 for ERSA/200 and 0.978-0.980 for ERSA/150).

Also, on the reliability of the questionnaire, we assessed the test-retest reproducibility, there was no statistically significant difference between the median of the total score in the first and second questionnaires (filled with a 15-day interval); for ERSA/200: 167.4 versus 161.4, $p=0.003$; for ERSA/150: 100.9 versus 102.2, $p<0.001$. We obtained a general Pearson correlation coefficient of $r=0.948$ ($p<0.001$), indicative of a strong positive correlation, and also for both ERSA/200 and ERSA/150, respectively: [$r=0.959$ ($p=0.003$)]

and [$r = 0.936$ ($p < 0.001$)], which is indicative of good test-retest reproducibility. To evaluate test-retest reproducibility we also calculated the Cohen Kappa coefficient, a concordance measure, for each item and we obtained an average general coefficient of 0.787 ($p < 0.001$) and an average specific coefficient for ERSA/200 of 0.802 ($p < 0.001$) and for ERSA/150 of 0.771 ($p < 0.001$). This Cohen Kappa coefficients confirm the good test-retest concordance of this version of the questionnaire (Table 2).

Discussion

The translation, validation and cultural adaptation of a questionnaire is a complex process, which involves a conceptually equivalent translation of the original one, and which must also be culturally acceptable in the destination country. In this case, the translation of the questionnaire followed the methodology described in the scientific literature, which is also the one adopted by several authors who performed translations of other quality of life questionnaires related to medical sciences.

To obtain a correct validation, the questionnaire must fulfill established international criteria of viability, reliability and reproducibility. With our study, we conclude that pERSA is a quick and easy-to-use questionnaire in patients with hearing loss, not only for clinical practice purposes but also for investigational and scientific contexts. It is also simple to implement by health professionals and enables a handy statistical treatment of data.

In the evaluation of internal consistency, we obtained a specific Cronbach's α coefficient of 0.981 for ERSA/150 and of 0.878 for ERSA/200, similar to the values previously reported by the authors that created the original ERSA questionnaire (0.880 for ERSA/150 and 0.910 for ERSA/200).¹¹ Concerning the Cronbach's α coefficient for each questionnaire domain, we obtained even better coefficient values than the ones originally obtained (0.956 versus 0.780 for quality of life domain, 0.963 versus 0.850 for personal life domain, 0.957 versus 0.870 for social life domain and 0.824 versus 0.85 for occupational life domain), which again proves the excellent internal consistency of the Portuguese version.¹¹

Also, while evaluating test-retest reproducibility, we test-retest differentials for ERSA/200 of 6 points and for ERSA/150 of 1.3 points, comparable to the values obtained by the ERSA authors (4 points and 6 points, for ERSA/200 and ERSA/150, respectively). Moreover, our specific Pearson correlations for ERSA/200 [$r = 0.959$ ($p=0.003$)] and ERSA/150 [$r = 0.936$ ($p<0.001$)] are very similar to the coefficients obtained by E.Ambert-Dhan et al., in the validation of the original ERSA questionnaire [$r = 0.950$ and $r = 0.930$ ($p<0.001$), respectively].¹¹ Once again, our results demonstrate the quality of the Portuguese version of the questionnaire.

Conclusions

To the best of our knowledge, until now, there were no validated questionnaires to assess quality of life in patients with hearing loss in Portugal. Translation and validation of the ERSA questionnaire in Portugal will allow a more consistent evaluation of the specific quality of life of these patients, as well as the effectiveness of auditory rehabilitation, either through conventional hearing aids or surgically implanted hearing devices.

It is, therefore, an extremely useful tool, reliable and very important to both clinical practice and scientific studies, allowing the generalization of results and comparison with international studies.

Thus, we recommend this version for use with the Portuguese population with hearing loss with or without auditory rehabilitation, being useful to compare quality of life status after and before rehabilitation and also to guide speech therapy.

Declaration of conflict of interest

No conflicts of interest.

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Tablas y Figuras

Table 1. Descriptive analysis of the sample of patients who completed the pERSA questionnaire.

	Frequency, n (%)		
	ERSA/150 (n = 23)	ERSA/200 (n = 7)	Total (n=30)
Gender			
Male	16.0 (69.6)	4.0 (57.1)	20.0 (66.7)
Female	7.0 (30.4)	3.0 (42.9)	10.0 (33.3)
Laterality of Hearing Loss			
Unilateral	1.0 (4.3)	3.0 (42.9)	4.0 (13.3)
Bilateral	22.0 (95.7)	4.0 (57.1)	26.0 (86.7)
Type of Hearing Loss			
Sensorineural	19.0 (82.6)	4.0 (57.1)	23.0 (76.7)
Mixed type	3.0 (13.0)	1.0 (14.3)	4.0 (13.3)
Conductive	1.0 (4.3)	2.0 (28.6)	3.0 (10.0)
Auditory rehabilitation			
Unilateral	8.0 (34.8)	3.0 (42.9)	11.0 (36.7)
Bilateral	15.0 (65.2)	4.0 (57.1)	19.0 (63.3)

Table 2. Portuguese version of the ERSA questionnaire - pERSA: Cronbach's α coefficient according to each questionnaire domain and Cohen Kappa (κ) coefficient for each item of ERSA/150 and ERSA/200.

Item/Excluded Item (per domain)	Cohen Kappa (κ) (p value)		Cronbach's α
	ERSA/150 n = 23	ERSA/200 n = 7	
Qualidade de Vida (Quality of Life) 0.956			
1. Como classifica a sua qualidade de vida? (How do you rate your quality of life?)	0.812 (p<0.001)	1.000 (p<0.001)	
2. Sente-se independente na sua vida diária? (Do you feel independent in your daily life?)	0.817 (p<0.001)	0.412 (p=0.022)	
3. Como está o seu estado de espírito neste momento? (How is your morale just now?)	0.820 (p<0.001)	1.000 (p<0.001)	
4. É, geralmente, autoconfiante? (Are you usually self-confident?)	0.554 (p<0.001)	0.726 (p<0.001)	
5. Sente vontade de assumir novos projetos? (Do you feel like taking on new projects?)	0.868 (p<0.001)	0.577 (p=0.001)	

Vida Pessoal (Personal Life)			
0.963			
1. Como é a sua comunicação com amigos e família? (What is communication with friends and family like?)	0.685 (p<0.001)	0.571 (p=0.001)	
2. Consegue acompanhar uma conversa sem saber previamente sobre o que é? (Can you follow a conversation without knowing what it's about in advance?)	0.690 (p<0.001)	0.848 (p<0.001)	
3. Consegue participar numa conversa com várias pessoas num ambiente silencioso? (Can you join in a conversation with several others in a quiet setting?)	0.816 (p<0.001)	0.861 (p<0.001)	
4. Sente-se bem a falar num ambiente barulhento (reunião familiar, jantar com televisão ligada, etc.?) (Are you okay talking in a noisy setting (family gathering, TV dinner, etc.?)	0.817 (p<0.001)	0.844 (p<0.001)	
5. Sente-se autoconfiante o suficiente para iniciar uma discussão com amigos ou família? (Are you self-confident enough to start a discussion with friends or family?)	0.869 (p<0.001)	0.412 (p=0.022)	

Vida Social (Social Life) 0.957			
1. Tem uma vida social satisfatória apesar da sua perda de audição? (Do you have a satisfactory social life despite your hearing loss?)	0.758 (p<0.001)	1.000 (p<0.001)	
2. Sente-se à vontade nos grupos sociais dos quais faz parte (clube desportivo, associação, atividades, vizinhança)? (Do you feel at ease in social groups you're part of (sports club, association, activities, neighborhood)?)	0.682 (p<0.001)	0.859 (p<0.001)	
3. Sente-se feliz por estar em contacto direto com amigos (cara a cara, telefone, etc.)? (Are you happy to be in direct contact with friends (face to face, telephone, etc.)?)	0.874 (p<0.001)	1.000 (p<0.001)	
4. Aborda facilmente pessoas que não conhece? (Do you easily approach people you don't know?)	0.625 (p<0.001)	0.831 (p=0.001)	
5. Sente-se bem a falar quando existem várias conversas a decorrer à sua volta? (Are you okay talking when there are several conversations going on around you?)	0.873 (p<0.001)	1.000 (p<0.001)	

Vida Ocupacional (Occupational Life)

0.824

Tem um emprego? (Do you have a job?)

1. Sim (Yes)

a) O mesmo de antes. (Same as before.)

b) Outro trabalho na mesma empresa. (Other job in same firm.)

c) Outro emprego. (Other work.)

2. Não (No)

a) Eu nunca trabalhei. (I never worked.)

b) Deixei de trabalhar devido à audição. (Stopped work because of hearing.)

c) Reformado. (Retired.)

Se respondeu “Sim”, continue para as 5 questões seguintes. (If you answered “Yes”, go on to the next 5 questions.)

1. Sente-se à vontade nas suas relações no trabalho?

(Are you at ease in your relations at work?)

-

0.720
(p=0.015)

2. Sente-se à vontade para participar em reuniões de trabalho (juntando-se à discussão)?

(Do you feel at ease taking part in meetings at work (joining in the discussion)?)

-

0.788
(p=0.002)

3. Sente-se à vontade em situações especiais como usar o telefone, falar numa língua estrangeira?

(Do you feel at ease in special situations like using the phone, using a foreign language?)

-

0.588
(p=0.011)

4. Pensa que poderia adquirir novos conhecimentos no trabalho (competências em línguas estrangeiras, cursos de formação, etc.)?

(Do you think you could make new acquaintances at work (foreign language skills, training courses, etc.)?)

-

1.000
(p<0.001)

5. Pensa que consegue progredir no seu trabalho apesar da sua perda de audição?

(Do you think you can progress in your work despite your hearing loss?)

-

1.000
(p=0.008)