The impact of hearing loss on quality of life: development of the hearing-related quality of life questionnaire for Auditory-VIsual, COgnitive and Psychosocial functioning (hAVICOP)

Ceuleers Dorien¹, Kestens Katrien², Baudonck Nele³, Keppler Hannah⁴, ⁵, Dhooge Ingeborg¹, ², ⁵, Degeest Sofie²

¹ Ghent University, Department of Head and Skin
² Ghent University, Department of Rehabilitation Sciences
³ Ghent University Hospital, Department of Otorhinolaryngology

Introduction: Hearing loss can impact functioning in daily life negatively. The degree of impact of hearing loss on daily functioning is not only related to the decreased auditory input but also to other factors involved in speech processing, e.g. cognitive functions and visual input. Auditory rehabilitation is primarily focused on restoring auditory functions with hearing aids (HA) and/or cochlear implants (CI). However, a large interindividual variability in auditory outcome is observed. Because of this interindividual variability and the multiple factors involved in speech processing, it is important to consider the subjective impact of hearing loss and hearing rehabilitation on the quality of life. The aim of the current study was to develop a new holistic Patient Reported Outcome Measure (PROM), titled the hearing-related quality of life questionnaire for Auditory-VIsual, COgnitive and Psychosocial functioning (hAVICOP), to assess a variety of constructs which affect hearing-related quality of life, including auditory factors, (audio)visual factors, cognitive factors, listening effort and psychosocial factors.

Methods: Initially, a conceptual framework was set up and test items were prepared per (sub)domain. Then, preliminary testing was completed prior to further psychometric evaluation. Preliminary testing involved a semi-structured interview-based assessment in normal-hearing and hearing-impaired adults and an expert panel. For the further psychometric evaluation a new sample of 15 HA-users, 20 CI-users and 20 normal-hearing adults, matched for age, gender and educational level, filled in a digital version of the hAVICOP. Furthermore, the HA users also filled in the Speech, Spatial and Qualities of Hearing Scale (SSQ) [1]. The CI-users also filled in the Nijmegen Cochlear Implant Questionnaire (NCIQ) [2]. At last, both HA-users and CI-users filled in a generic health-related quality of life questionnaire, the TNO-AZL Questionnaire for Adult's Health-Related Quality of Life (TAAQOL) [3]. Based on these results, a factor analysis was conducted. Furthermore, internal consistency was assessed by calculating inter-item and item-total correlations and Cronbach's alpha, discriminant validity was assessed using a one-way Analysis Of Variance (ANOVA) with hearing status (i.e. normal-hearing, HA user, or CI user) as independent variable and the scores for the hAVCIOP as dependent variables. Finally, scores for the hAVICOP were related to answers on the SSQ and NCIQ and the TAAQOL to evaluate concurrent construct validity.
**Results:** The results of the factor analysis revealed that the test items grouped into three domains, named as 'auditory-visual functioning', 'cognitive functioning' and 'psychosocial functioning'. Furthermore, high levels of internal consistency were found for these three final domains. More specific, an α coefficient of 0.94, 0.92 and 0.94 was found for the domains auditory-visual functioning, cognitive functioning, and psychosocial functioning respectively. Discriminant validity showed significant differences between normal-hearing individuals and HA users on the one hand and between normal-hearing individuals and CI users on the other hand for the three domains and the total score. Finally, discriminant validity was considered good, with a fair to poor non-significant correlation for the total score of the hAVICOP and the total score of the TAAQOL, for the HA users and for the CI users respectively, and a moderate and very strong positive correlation for the total scores of the SSQ and the NCIQ respectively and the total score of the hAVICOP.

**Discussion:** The final version of the hAVICOP consists of three domains for hearing-related quality of life: (1) auditory-visual functioning, (2) cognitive functioning and (3) psychosocial functioning. The hAVICOP has a good internal consistency, discriminant validity and concurrent construct validity. In the future, including the subjective impact of hearing loss can lead to more patient-centered rehabilitation based on the individual needs and abilities of the patient. This can give a holistic overview of the impact of hearing loss on individual functioning in daily life and provide a starting point to set individualized rehabilitation goals. The hAVICOP could be used to evaluate the progress throughout the rehabilitation process from the patients perspective.

**Key words:** quality of life, questionnaire, auditory rehabilitation

**References:**