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<td>Author(s)</td>
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Research Paper

Gender differences in improvement of older-person-specific quality of life after hearing-aid fitting

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ABSTRACT

Background: Age-related hearing loss is the third most common reason for disability in the world and has a significant impact on quality of life (QoL) amongst older adults.

Objective: To determine how the QoL assessment in older-person-specific domains differs between older men and women with age-related hearing loss before and after hearing-aid fittings.

Methods: The present study was carried out with 105 hearing-impaired outpatients (aged ≥ 60 years) before and after hearing-aid fittings at the University Hospital Olomouc, Czech Republic. The instrument used was the World Health Organization Quality of Life-Older Adults module (WHOQOL-Old). It was completed before hearing-aid fittings and after the first check-up hearing-aid adjustment. The Wilcoxon paired test multiple logistic regression was used to evaluate changes in the QoL after hearing-aid fittings. The distributions of men and women into three subgroups, improved, unchanged, and worsened in each domain, were compared using Fisher’s exact test.

Results: A significant QoL improvement when fitting a hearing-aid in the area of Sensory abilities was confirmed in both men and women (p < 0.001). In Autonomy, a significant improvement was recorded only amongst men (p = 0.010). In Past, present and future activities and Social participation, a significant improvement was only recorded amongst women (p = 0.029; p = 0.001). Significant differences were revealed between men and women in changes for Sensory Abilities (p = 0.019), Social Participation (p = 0.036) and Intimacy (p = 0.002).

Conclusions: The findings of this study suggest that there are gender differences in QoL improvement amongst people with age-related hearing loss after hearing-aid fitting.

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Hearing impairment is an increasingly important public health problem which leads to reduced quality of life (QoL) of an individual, isolation, dependence and frustration in both developed and developing counties. 1 Age-related hearing loss is a progressive, bilateral and symmetric hearing deficit, primarily at high frequencies. It is an extremely common hearing impairment and its prevalence will increase considerably over the following decades since the number of elderly people is increasing worldwide. 2 Age-related hearing loss is the third most common reason for disability in the world. 3 In Europe, about 30% men and 20% women aged 70 + suffer from a pure-tone average (PTA) hearing loss of 30 dB (dB) or more in the better ear. In the age category 80 +, it is as high as 55% men and 45% women. 4 The impact of age-related hearing loss on QoL for older adults is significant. The consequent functional and cognitive impairments are sources of ongoing frustration which dampen mood and communication. 5 It causes social isolation, loneliness, dependence, and
frustration a decline in the instrumental activities of daily living, increasing reliance on the community or family support and a decline in psychological well-being. Age-related hearing loss has a significant impact on QoL amongst older adults.

The subjectively perceived impact of hearing loss on QoL is highly individual and there are more contributing factors. Campos states that there are differences between men and women in the assessment of different QoL domains. Tajvar et al. also confirm that evidence of gender differences has been reported regarding assessment of health-related QoL (HRQoL). The impact of age-related hearing loss on QoL can be reduced with the help of hearing-aids. Hearing handicap perceptions by older adults improve significantly after hearing-aid fittings, although certain social and emotional limitations remain. When using a hearing-aid, the assessment of improvement in different QoL domains may differ according to gender. A study by Niemensivu et al. claims that using a hearing-aid leads to improvement in the domain of “hearing” in both genders. However, the overall HRQoL change revealed a certain gender effect with a change recorded only in female participants. Additionally, there was only a marginal but statistically significant impact on QoL amongst older adults. Tajvar et al. also confirm that there are differences between men and women in the assessment of different QoL domains. Campos states that there are differences between men and women in the assessment of different QoL domains. 

Results

Statistical processing

Data analysis was performed based on a gross score and medians in each of the WHOQOL-Old domains in the first and second stage of the research (before using a hearing-aid and with a hearing-aid). Data normality was verified using the Shapiro-Wilk test. The Wilcoxon paired test was used to evaluate changes in domains of QoL after hearing-aid fittings. The distributions of men and women into three subgroups (improved, unchanged and worsened) in each domain were compared using Fisher's exact test. Multiple logistic regression was used to find significant predictors for the improvement of the Global QoL. Statistical package IBM SPSS Statistics version 22 was used to analyze the data. A significance level below 0.05 was considered statistically significant (p < 0.05).

Participants

During the research period, the Phoniatic Clinic at the University Hospital in Olomouc prescribed hearing-aids to 131 outpatients aged ≥ 60 years based on a tone and speech audiometry examination. Out of the 131 patients approached, 107 older adults agreed to take part in the study, signed the informed consent form and completed the questionnaire with the help of a research nurse. Two participants did not return for the check-up three months later due to their general health deterioration. The total of 105 older (80.15%...
of the total number approached) adults completed the questionnaire in both stages of the research. The sample comprised 49 (46.7%) women and 56 (53.3%) men. The average age of the outpatients who completed the research was 74.9 (SD 8.2; range from 60 to 90 years of age), as shown in Table 1. There was no significant age difference between women and men. 66.7% participants lived in a household with another person, most often a partner. There was a significantly higher number of women who lived without a partner (44.9% women vs. 23.2% men; p = 0.010).

WHOQOL-old

Before hearing-aid fitting (phase one) better QoL was found in women in the domains Past, present and future activities (p = 0.008) and Social participation (p = 0.021), whereas in men better QoL was in the domain Death and Dying (p = 0.033). After three months with a hearing-aid (phase two) better QoL was found amongst women in the domain Past, present and future activities (p = 0.005), Social participation (p = 0.002). Amongst men better QoL was in domain Intimacy (p = 0.037). Neither men nor women differed significantly in global score of QoL in the phase one and two (Table 2).

Table 3 lists the medians for each domain of the WHOQOL-Old. A significant improvement in QoL when wearing a hearing-aid was confirmed among both men and women in the domain Sensory abilities (p < 0.001). In Autonomy, there was a significant improvement in men only (p = 0.010). In the domains Past, present and future activities and Social participation, a significant improvement was only confirmed in women (p = 0.029; p = 0.001).

Table 4 lists the percentages of women and men who reported improvement (A), no change (B) or worsening (C) in each of the QoL domains when wearing a hearing-aid. Significant differences were revealed between men and women in changes in Sensory Abilities (p = 0.019), Social Participation (p = 0.036) and Intimacy (p = 0.002). In these domains, there was a significant improvement amongst women.

Multiple logistic regression shows that the predictors of changes in QoL when wearing a hearing-aid were gender, age, type of hearing-aid, household and reported hearing-aid usage. Significant predictors of improvements of QoL among older adults when wearing a hearing-aid was gender and age. The chance for improvement of QoL in men was 0.318 times smaller compared to women. The chance of improvement of QoL per unit increasing of age (i.e. about 1 year) is 1.071 higher (Table 5).

Discussion

The results of this study focused on changes in QoL assessment amongst elderly who were first prescribed a hearing-aid indicate differences between men and women. Significant predictors of improvements of QoL among older adults when wearing a hearing-aid was gender and age. A significant improvement in the Sensory abilities was confirmed in both men and women. Our results are in agreement with a Finnish study which also described a positive change in the mean hearing-specific scores in adults with hearing impairment as a result of hearing-aid rehabilitation.25

In Autonomy, there was significant improvement in men only. In contrast, Klink states that no changes were observed in the autonomy domain amongst respondents with a cochlear implant. However, these German participants were much younger (average age 49.6) than our respondents and Klink’s sample had a majority of women (81.8%). In Klink’s study, autonomy was defined in terms of self-confidence, self-reliance and independence from social norms.23 The Autonomy domain – as defined in the WHOQOL-Old questionnaire our study is based on – includes items about freedom to make own decisions; feeling in control of one’s future, the ability to do things one would like to; people around are respectful of one’s freedom. The reason our research did not reveal a significant improvement in the Autonomy domain amongst women may be related to the fact that more than half of them lived alone. The Czech Republic ranks first among post-Communist countries in Europe in the rate of elders living alone. The elderly perceive personal autonomy as autonomy inside a family supporting network and therefore the alone living women did not necessarily perceive hearing improvement as a significant change in relation to their own autonomy.

In the domains Past, present and future activities and Social participation, a significant improvement was recorded in women. In a Brazilian study, Carvalho-Loures confirmed that these areas are extremely important for women.24 Li et al. states that social activity among women in Taiwan was significantly linked with QoL assessment only in young-old women (aged 64–75). These findings may reflect changes in gender roles and the social context across different generations. There is a similar factor manifested in Chinese culture.17 In contrast, Lee et al. claims that the relationship between social participation and self-rated health was maximized in elderly women.26 A Lebanese cross-sectional study also confirmed gender differences in the effect of social support on

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<th>Descriptive characteristic of participants.</th>
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<tr>
<td>Sample N(%)</td>
<td>105 (100)</td>
</tr>
<tr>
<td>Age average ± SD;</td>
<td>74.8 ± 8.18;</td>
</tr>
<tr>
<td>Household, N(%)</td>
<td>60–90;</td>
</tr>
<tr>
<td>Lives alone</td>
<td>35(33.3)</td>
</tr>
<tr>
<td>Lives with a partner</td>
<td>51(48.6)</td>
</tr>
<tr>
<td>Lives with other people</td>
<td>15(18.1)</td>
</tr>
<tr>
<td>Type of HA prescribed, N(%)</td>
<td>84(80.0)</td>
</tr>
<tr>
<td>Behind the ear</td>
<td>21(20.0)</td>
</tr>
<tr>
<td>Reported HA usage, N(%)</td>
<td></td>
</tr>
<tr>
<td>More than 8 h/day</td>
<td>9(8.6)</td>
</tr>
<tr>
<td>5–8 h/day</td>
<td>23(21.9)</td>
</tr>
<tr>
<td>1–4 h/day</td>
<td>44(41.9)</td>
</tr>
<tr>
<td>Sometimes (more than 1 h/week, less than 1 h/day)</td>
<td>25(23.8)</td>
</tr>
<tr>
<td>Rarely (less than 1 h/week)</td>
<td>4(3.8)</td>
</tr>
<tr>
<td>Never</td>
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health-related QoL in old age.° Hajek et al. claim that women’s high social ties over the course of life might lead to a faster compensa-
tion for the loss of social support in old age.*

In the Intimacy domain, there was no significant improvement amongst either men or women, although women had a higher score than men. This corresponds with the findings by Bilgili and Arpazi who also state that elderly women had higher average scores in the intimacy sub-scales.° The domain Intimacy includes the following items: experiencing love in your life, opportunities to love and opportunities to be loved. Emotional security for an aged person is often provided by his/her life partner or children. These are the closest people who know the person intimately and demonstrate their affection regardless of the person’s hearing impairment. For this reason, the effect of fitting a hearing-aid in improving hearing impairment is not necessarily seen as a factor which would increase the opportunity to love and be loved. However, there is a significant improvement among women in our research compared to men. This may be due to the fact that almost half the women lived alone. Improvement in hearing might be connected with higher chances of making new acquaintances which would provide opportunities to love and opportunities to be loved. This is also confirmed by a significantly higher improvement amongst women in the domains Social Participation and Intimacy compared to men.

In the Death and Dying domain, our respondents had the highest score before as well as after using a hearing-aid (Table 2). Varela also demonstrates that the score for the domain Death and Dying was the highest among respondents. The majority reported being afraid of feeling pain in the process of death, which was also observed in other studies that used the WHOQOL-Old.° Similar findings can be found in a Brazilian study.° In our research, the domain Death and Dying revealed significant worsening amongst a quarter of the men. Our hypothesis is that this might be due to factors not investigated in the second phase of the research. These factors might include recent experience with an incurable illness, the death of a close person or confirmation of a diagnosis or a participant’s relapse into a serious illness.

### Study limitations

The limitations of the present study should be mentioned when evaluating our results. This study suffers from some limitations, which need to be addressed in subsequent research. The results only cover a short period of time, the study is a cross-sectional one and thus cannot confirm the long-lasting effect of fitting a hearing-aid on QoL. Furthermore, the results in certain QoL domains may have been influenced by factors not investigated in the study, e.g. lacking information on education, income, cognitive function, disability or comorbidities. Further research is needed to explore the relationship between hearing loss and QoL, as well as the importance of various other variables affecting this relationship.

### Conclusion

The findings of this study confirm that there are differences in improvement in some of the older-person-specific domains of QoL.
between women and men fitting a hearing-aid. Significant differences were revealed between men and women in changes in the domain of Sensory Abilities, Social Participation and Intimacy. In these domains, there was a significant improvement amongst women. However, the existing research related to gender differences in QoL before and after following being fitted for a hearing aid is very scant. Therefore, it is necessary to continue this line of this research field.

Ethical approval

The whole study was conducted in accordance with the 1975 Helsinki Declaration, as revised in Brazil 2013. The study was approved by the Ethics Committee of the Faculty of Health Sciences, Palacky University Olomouc, Czech Republic. Informed consent to participate was obtained for the study contents, purposes, and protocols, data confidentiality and anonymity procedures, and participants’ freedom to discontinue the study had been explained. All subjects signed informed consent before enrolment.

Funding

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Conflicts of interest

There are no conflicts of interest associated with this manuscript, financial or otherwise. All the authors contributed adequately to the work described in the paper. The manuscript has been read and approved by all authors.

References