# Rehabilitation of individuals with severe to profound hearing impairment

## - A register study

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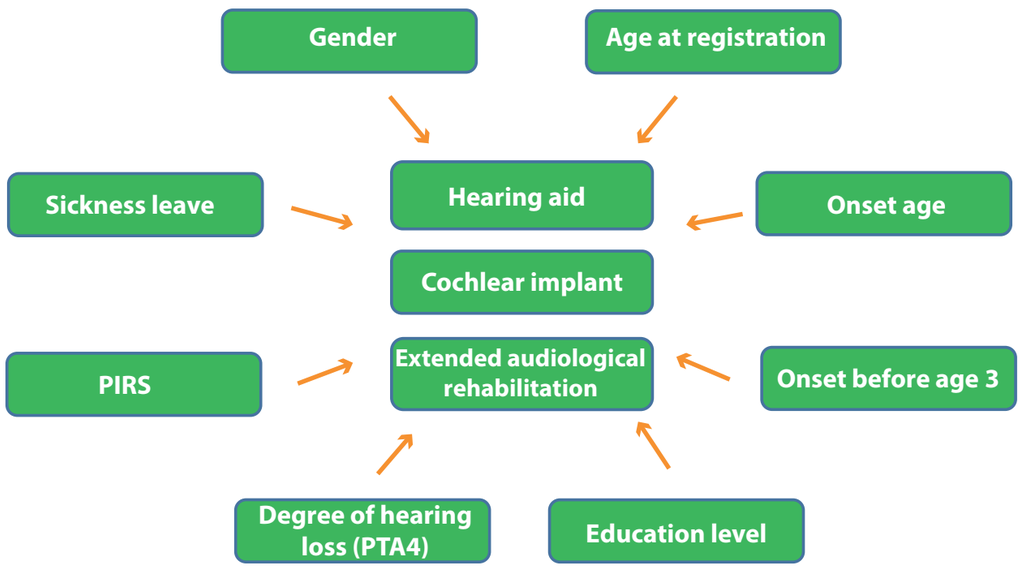
## Background

Patients with a severe-profound hearing impairment are often in need of more extended audiological rehabilitation. Audiological rehabilitation should be individualized and it is the patient's needs that are essential for what rehabilitation the patient is offered (Socialstyrelsen, 2012). There is however a lack of knowledge about what factors influences what rehabilitation interventions are provided to patients with severe-profound hearing impairment.

## Aim

The aim was to examine if gender, age, onset age for severe-profound hearing impairment, education level, degree of hearing impairment, self-rated PIRS (Problem impact rating scale) (Persson et al, 2005) and sickness leave affect which type of audiological rehabilitation intervention (hearing aids, cochlear implants (CI) or extended audiological rehabilitation) was provided to the patients.

Figure 1 Studied variables




## Method

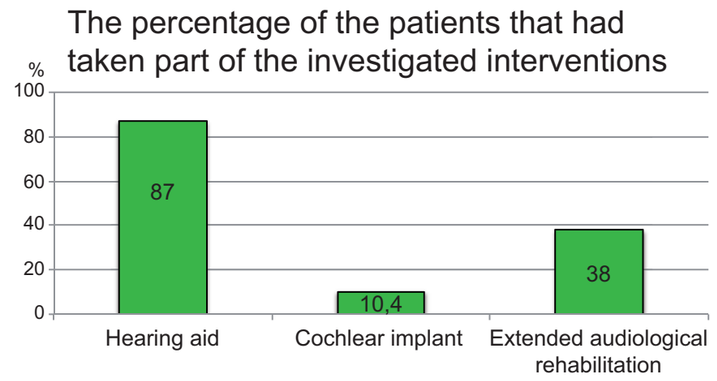
Data from *The Swedish Quality Register of Otorhinolaryngology, (*2014) was used and 2319 patients aged 19-101 had been registered 2006-2012. The inclusion criterion was PTA4 ≥ 70 dB on the better ear, and 22 patients were excluded. All patients filled out a questionnaire when registered about hearing aid, CI and taken part of extended audiological rehabilitation. Extended audiologcial rehabilitation was defined when the patient had received at least three different rehabilitation interventions during the adult life. The quality register also contains various demographic data that was used in the analysis, see figure 1. The PIRS asks the patient to rate on a scale (0-100) what impact the hearing impairment has on their daily life; 0 indicates no impact and 100 indicate complete impact. Strong negative impact was defined at ≥ 70. The analysis was conducted with multiple logistic regression.

**References**

1. Persson. J., Bernfort, L., Hellbom, G., Danemark, B., Vorg, E., Gullbrandsson, A. & Husberg, M. (2005). Cost- effectivness in rehabilitation of hearing impaired people. In Pruski, A. & Knops, H. (ed). *Assistive technology: from vertuality to reality* (p. 750-754). Amsterdam: IOS Press.
2. Socialstyrelsen. (2012). *Rehabilitering för vuxna med syn- eller hörselnedsättning. Landstingens habiliterings- och rehabiliteringsinsatser.* Article nr: 2012-1-25. Publiced at www.socialstyrelsen.se
3. The Swedish Quality Register of Otorhinolaryngology. (2014). 2014-08-13 Available at: https://stratum.registercentrum.se/#!page?id=1532

## Results

Figure 2




*Hearing aid*

In total, 87 % of the patients had been provided with at least one hearing aid. The results indicate that degree of hearing impairment affected to whom of the patients in the quality register hearing aids had been provided to; the lower PTA4, the higher possibility of receiving a hearing aid. All other variables were non-significant. The coefficient of determination ($R^2$) explains 18.6 % of the variance in the model.

*Cochlear implant*

Only 10.4 % of the patients had been fitted with CI. The analysis showed statistical significance for age at registration, degree of hearing impairment and PIRS. The coefficient of determination ($R^2$) explains 27.8 % of the variance in the model. Only 11.3 % of the patient aged 19-40 had been provided with CI. The results also showed that the higher PTA4, the greater possibility of receiving a CI, which is not an unexpected result. The majority of the patients that had been provided with a CI had scored < 70 on the PIRS and only 29. 5 % of the patient that scored ≥ 70 had a CI.

*Extended audiological rehabilitation*

In total, 38 % of the patients had taken part of extended audiological rehabilitation. Significant differences were found for all independent variables in the model, except for education level. The coefficient of determination ($R^2$) explains 20.3 % of the variance.

The gender distribution was 44.5 % male and 55.5 % female. The results showed that the younger age when register, the greater possibility of having received extended audiological rehabilitation. The results were significant for those patients that had an early onset of severe-profound hearing impairment (before age 3), and for those patients that had self-rated PIRS ≥ 70; 45.3 % of these patients had taken part of extended audiological rehabilitation.

## Conclusions

Degree of hearing loss was the only factor that influenced whom had received hearing aid. Age at registration, degree of hearing impairment and the results in PIRS influenced to whom CI had been provided to. All investigated factors, except education, influenced to whom extended audiological rehabilitation had been provided to.

The results can help therapists in the Audiological health care to provide more individualized rehabilitation interventions to the patient group with severe-profound hearing impairment.

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