Reviewer's report

Title: Main income sources and activities in people with self-reported hearing difficulties; a cross-sectional population-based study in Sweden

Version: 2 Date: 13 July 2012

Reviewer: Bo Engdahl

Reviewer's report:

General comments

The aim of the present study was to investigate the main income sources/activities in subjects with and without self-reported hearing difficulties, and associations with different socio-demographic factors. In view of the high prevalence of hearing problems, the research question posed is important. Although the number of similar studies on hearing problems may be limited, a few similar studies were mentioned by the authors confirming a relation between work status and hearing problems. So, the study is not entirely original and I think there are several cross-sectional studies linking work status and self-rated health problems in general. The study provides little new knowledge on the reasons for such an association with the limitations of using self-reported measure of hearing loss. The study credits however on studying the effects of socio-economic status (in terms of occupation), type of living area and country of birth and for being based on a large population based sample. The data from the Swedish Social Insurance Agency on sick-leave and disability pension contains information on diagnosis and data on diagnosis was previously published by some of the present authors (Friberg et al. 2012). I therefore wonder why not diagnosis was used in the present study. Controlling for diagnosis could reveal if the associations emanated from hearing loss as a diagnosis or not.

While reasons for why hearing problems may affect the work status are thoroughly discussed, possible reverse causality should also be considered. Becoming unemployed is associated with psychological stress leading to a decrease in perceived health (Thomas et al. 2005). The same could be said for sick leave and disability pension. It may be that reduced functional ability or poor general health decreases the ability to cope with hearing loss and thus increasing the self-reported prevalence.

Also, the possibility of confounding by unknown third factors should be stressed as the sizes of the associations are small (OR of 1.2-1.7). A main limitation of the study is the lack of an objective measure of the hearing status. Self-rated hearing problems may be related to factors such as general health (Chang et al., 2009), psychosomatic status (Hashimoto et al., 2004) and other factors independent of the actual hearing loss. It may be also that error in self-report is related to labor market status (Baker et al. 2004). That is, individuals may use their health status as justifying for not working.
In the conclusion it is stated that the associations with unemployment, long-term sickness absence, and disability pension were stronger among women than men. It should however be noted that the confidence intervals were overlapping and thus this difference was not statistically significant. The sex difference was explained by that “the hearing disability affects skills traditionally associated with women”, and that the that “the societal consequences of hearing impairment are more pronounced in women since they are already discredited because of some other characteristics, such as lower social status and self-image”. An additional possibility is that some of the difference may be due to measurement error in self-reported hearing: It is plausible that the probability of false reporting decreases with the intensity of the condition and the amount of false reporting would thus be lower among men in which the prevalence and amount of hearing loss is largest.

The data and the analysis seem solid. The paper is well written with data appropriately presented in tables.

The methods seem appropriate and well described. I found the analyses with sickness benefits/disability pension (tables 5 and 6) and with attachment to the labour marked (tables 7 and 8) as dependant variables superfluous. This is a cross-sectional study and I cannot see that the interpretation is gained by swapping hearing loss from being a dependant to an independent variable.

The limitations of self-reported measure of hearing should be stressed. The reliability of the single item measure used should be referenced, and if possible also its validity (or lack of) related to clinically assessed hearing loss or audiometry. Maybe it is possible to control for other possible spurious factors such as general health as mentioned earlier. Controlling for diagnosis as mentioned earlier would also strengthen the study.

I recommend revisions according to the following suggestions:

Major Compulsory Revisions

Introduction:
1. Please give references to previous works studying the association between SES or occupation and hearing loss.

2. First paragraph: The increase in prevalence of self-reported hearing loss found in the ULF/SILC is in conflict with studies from USA (Hoffman et al. 2010) and Australia (Zhan et al. 2010) indicating improved hearing, measured by audiometry, in the present adult generation compared to the past. Please, expand the reflections on possible changes.

Method:
3. The reliability of the single item measure used should be referenced, and if possible also its validity (or lack of) related to clinically assessed hearing loss or audiometry.
4. Please make additional analysis controlling for diagnosis (if available)

Discussion:

5. Page 15. As mentioned in the general comment section I miss a discussion on possible reverse causality.

6. Page 16. The sex difference was explained by that “the hearing disability affects skills traditionally associated with women”, and that the that “the societal consequences of hearing impairment are more pronounced in women since they are already discredited because of some other characteristics, such as lower social status and self-image”. An additional possibility is that some of the difference may be due to measurement error in self-reported hearing: It is plausible that the probability of false reporting decreases with the intensity of the condition and the amount of false reporting would thus be lower among men in which the prevalence and amount of hearing loss is largest.

Strength and limitations:

7. As mentioned in the general comment section I miss a discussion on possible confounding by unknown third factors and the possibility that measurement error in self-report is related to labor market status.

8. The limitations of self-reported measure of hearing should be stressed.

Conclusion:

9. In the conclusion it is stated that the associations with unemployment, long-term sickness absence, and disability pension were stronger among women than men. It should however be noted that the confidence intervals were overlapping and thus this difference was not statistically significant.

Minor Essential Revisions

10. Page 16, first paragraph last sentence: Is it really possible to suggest that hearing difficulties are on rise, the age distribution of these two data sets seems different. It seems that Rosenhall et al. 1999 incorporates 16-20 years olds.

Discretionary Revisions

Methods and results:

11. I found the analyses with sickness benefits/disability pension (tables 5 and 6) and with attachment to the labour marked (tables 7 and 8) as dependant variables superfluous. This is a cross-sectional study and I cannot see that the interpretation is gained by swapping hearing loss from being a dependant to an independent variable. I therefore suggest deleting all these four tables.

References:


Chang, et al. The Factors Associated with a Self-Perceived Hearing


Hashimoto Journal of Clinical Epidemiology 57, 2004:381–385


**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests