

Working in preschool increases the risk of hearing-related symptoms - a cohort study among Swedish women, International Archives of Occupational and Environmental Health, Sofie Fredriksson, Jeong-Lim Kim, Kjell Torén, Lennart Magnusson, Kim Kähäri, Mia Söderberg, Kerstin Persson Waye; Department of Occupational and Environmental Medicine, Public Health & Community Medicine, Institute of Medicine, Sahlgrenska Academy, University of Gothenburg, sofie.fredriksson@gu.se

**Online Resource 1** Questionnaire items, response alternatives and derived variables. The translation from Swedish has not been validated.

Questionnaire item in full text	Response alternatives	Derived variables
<b>Hearing loss</b> "Do you have a hearing loss?"	- Yes - No - Don't know	Self-reported hearing loss was defined as responding: "yes". Also used in non-response survey.
<b>Difficulty perceiving speech</b> "Do you <u>at work</u> have trouble hearing what is said in an environment where several people are talking at the same time?"  "Do you <u>in leisure time</u> have trouble hearing what is said in an environment where several people are talking at the same time?"	- Yes - No  <i>Same response scale for both items.</i>	Difficulty perceiving speech was defined as responding: "yes" to both work and leisure time.
<b>Tinnitus</b> "Do you have tinnitus (a ringing, whistling or other sound without an external source), that lasts more than five minutes each time?"	- No - No, but I have had it - Yes, a few times each month or more seldom - Yes, once or twice a week - Yes, many times each week - Yes, everyday	Tinnitus was defined as responding: "Yes, once or twice a week" or more often Also used in non-response survey, where the response scale was: - No - Yes, once or twice a week or more often
<b>Hyperacusis</b> "Are you sensitive to sounds (feel discomfort or pain by everyday sounds)?"	- No - No, but I have had - Yes, a few times each month or more seldom - Yes, once or twice a week - Yes, many times each week - Yes, everyday	Hyperacusis was defined as responding: "Yes, once or twice a week" or more often.
<b>Sound-induced auditory fatigue</b> "Do you, during or after work, experience any of the following symptoms or disorders?" - Sound fatigue"	- Never, seldom - A few times each month - Once or twice a week - Many times each week - Everyday	Sound-induced auditory fatigue was defined as responding: "once or twice a week" or more often.  The item was included in a matrix with other symptoms, such as headache and tiredness.
<b>Symptom onset</b> "When did you first notice that you had [hearing loss/ difficulty perceiving speech/tinnitus/hyperacusis]? Try to respond even if you do not remember the exact year or age when it was first noted."	- Year (e.g. 2004) - Age (e.g. 46)  (free text)	Onset age was used if reported. Onset year was recalculated to onset age if reported. Age was used if both were reported, unless they differed by >3 years. If so, they were treated as missing.
<b>Can't hear conversation due to noise</b> "Is the sound level at your workplace sometimes so high that you have difficulty hearing what other people are saying?"  <b>Have to raise voice due to noise</b> "How often are you at your workplace exposed to such high sound levels that you have to raise your voice to be able to talk to other people?"	- Never/almost never - About 25% of time - About 50% of time - About 75% of time - Always/almost always  <i>Same response scale for both items.</i>	Reporting "About 25% of time" or more was used as cut-off for each item.  Noise exposed strata was defined as reporting: "25% of time" or more often on both items.
<b>Hearing protection at work</b> "Do you use earplugs or other hearing protection devices at your current workplace?"	- Always/almost always - Often - Sometimes - Never/rarely	Hearing protection at work defined as responding: "always" or "often".
<b>Changed job or workplace due to noise</b> "Have you ever changed job or workplace due to noise or high sound levels?"	- No - Yes	Having ever changed job due to noise was defined as responding: "yes".
<b>Stressful working conditions</b> - Effort-Reward Imbalance, 10 items  - COPSOQ, emotional demands, short emotional scale 2 items	The items and response alternatives are published elsewhere: (Siegrist J., 1996) (Berthelsen, H. et al., 2013)	Imbalance between efforts and rewards were defined as an ERI ratio >1. Emotional demands were defined as responding: "always" or "often" on both items. Stress exposure strata was defined as having either ERI ratio >1 or emotional demands according to the definition given above.
<b>Stress (used in non-response analysis)</b> "How have you felt during the last 3 months?" - I have had days where I constantly feel stressed."	- Not at all - Sometimes - Pretty often - Almost all the time	Stress was defined as responding: "pretty often" or "almost all the time".

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### Online Resource 1 Continued

Questionnaire item in full text	Response alternatives	Derived variables
<b>Employment status</b> "What is your current main employment status?"	<ul style="list-style-type: none"> <li>- Currently working</li> <li>- On leave of absence or on parental leave</li> <li>- Job-seeker and/or in unemployment program</li> <li>- Student</li> <li>- Early retirement, disability pension or long-term sick leave (more than 3 months)</li> <li>- Age retired</li> <li>- Other</li> </ul>	Currently working was defined as responding: "currently working".
<b>Education level</b> "What is your highest attained education level?" <i>Item answered by the population control cohort only.</i>	<ul style="list-style-type: none"> <li>- Elementary school or similar</li> <li>- 2-years upper secondary school</li> <li>- 3-4 years upper secondary school</li> <li>- University shorter than 3 years</li> <li>- University 3 years or longer</li> <li>- Not completed compulsory school</li> </ul>	University- level education for controls were defined as responding: "university shorter than 3 years" or "university 3 years or longer".  All preschool teachers have a university degree.
<b>Family monthly income</b> "How much is the household's approximate total monthly income before taxes?"	<ul style="list-style-type: none"> <li>- 0-14999 SEK per month</li> <li>- 15000-29999 SEK per month</li> <li>- 30000-44999 SEK per month</li> <li>- 45000-59999 SEK per month</li> <li>- 60000 SEK or more per month</li> </ul>	Family income of 30000 or more was used as a cut-off.
<b>Education and income combined</b> Based on the variables "education level" and "family monthly income"		Three levels were defined: <ul style="list-style-type: none"> <li>- Both university education 3 years or longer and family income <math>\geq 30000</math> SEK</li> <li>- Either university education 3 years or longer or family income <math>\geq 30000</math> SEK</li> <li>- Lower education level than university and family income <math>&lt; 30000</math> SEK</li> </ul>
<b>Smoking</b> "Have you ever smoked daily during at least a month?"	<ul style="list-style-type: none"> <li>- No</li> <li>- Yes</li> </ul>	Smoking was defined as responding: "yes".
<b>Family history of hearing loss</b> "Did any of your biological parents and/or siblings have a hearing loss before the age of 55 years?"	<ul style="list-style-type: none"> <li>- No</li> <li>- Yes</li> <li>- Don't know</li> </ul>	Family history of hearing loss was defined as responding: "yes".
<b>Ear infections</b> "Have you ever had problems with otitis or ear infections?"	<ul style="list-style-type: none"> <li>- Never or at most one time</li> <li>- Yes, a few times</li> <li>- Yes, many times and/or long-term</li> </ul>	Recurrent infections was defined as responding: "yes, many times and/or long-term".
<b>Tympanostomy tube</b> "Have you ever had ventilation tubes implanted in your eardrum?"	<ul style="list-style-type: none"> <li>- No</li> <li>- Yes</li> </ul>	Tympanostomy tube was defined as responding: "yes".
<b>Noisy activities leisure time</b> "How often in your leisure time do you participate in activities where noise or high sound levels occur? With activity we mean for example: shooting/hunting, playing in a band, concert/disco, driving motorcycle, working with noisy tools/machines."	<ul style="list-style-type: none"> <li>- Every day (4 points)</li> <li>- Some or a few times each week (3 points)</li> <li>- Some or a few times each month (2 points)</li> <li>- Some or a few times each year (1 point)</li> <li>- Never/rarely (0 points)</li> </ul>	Leisure time exposure was defined as responding: "some or a few times a month" or more often.  Points calculated for sum score of leisure noise index are given in parenthesis for each response alternative.
<b>Hearing protection leisure time</b> "Do you use hearing protection when you engage in noisy leisure activities?"	<ul style="list-style-type: none"> <li>- Always/almost always (0 points)</li> <li>- Often (1 point)</li> <li>- Sometimes (2 points)</li> <li>- Never/rarely (3 points)</li> </ul>	Hearing protection in leisure time was defined as responding: "always/almost always" or "often".  Points calculated for sum score of leisure noise index are given in parenthesis for each response alternative.
<b>Loud music in headphones</b> "How often do listen to portable music players with headphones?"  "When you listen, approximately how much of the maximum volume setting do listen to?"	<ul style="list-style-type: none"> <li>- Every day (4 points)</li> <li>- Some or a few times each week (3 points)</li> <li>- Some or a few times each month (2 points)</li> <li>- Some or a few times each year (1 point)</li> <li>- Never/rarely (0 points)</li> <li>- 25% of max volume (1 point)</li> <li>- 50% of max volume (2 points)</li> <li>- 75% of max volume (3 points)</li> <li>- 100% of max volume (4 points)</li> </ul>	Loud music in headphones was defined as responding: "some or a few times a month" in combination with a volume of "75% of max" or more.  Points calculated for sum score of leisure noise index are given in parenthesis for each response alternative.