Sound intolerance:
Characteristics, psychosocial work factors and reactions to exposure

Johan Paulin

Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av filosofie doktorsexamen framläggs till offentligt försvar i Hörsal F, Humanisthuset, fredagen den 17 januari, kl. 09:00.
Avhandlingen kommer att försvaras på engelska.

Fakultetsopponent: Professor, David Baguley, Faculty of Medicine & Health Sciences, Nottingham, Storbritannien.

Department of Psychology
Sound intolerance: Characteristics, psychosocial work factors and reactions to exposure.

Abstract
This thesis aimed to broaden the knowledge of sound intolerance and the sub-category of hyperacusis by studying various characteristics of sound intolerance in general, its relation to psychosocial factors in the work environment, and its effects during noise exposure. Study I was based on data from a stratified sample in the Västerbotten Environmental Health Study. It examined the characteristics, background descriptions and comorbidities of self-reported and physician diagnosed individuals with hyperacusis, and compared them to a referent group. A majority of both hyperacusis groups actively tried to avoid sound sources, and experienced that they for the most part could affect the environment to make it less noisy. There were significantly increased risks for other diagnosed illnesses in the hyperacusis groups compared to the referent group, with large odds ratios for the psychiatric illnesses anxiety, depression, post-traumatic stress disorder and exhaustion syndrome. Other common illnesses were tinnitus, hearing impairment and musculoskeletal disorders. Study II used data from the Österbotten Environmental Health Study and focused on the psychosocial work environment for people with hyperacusis. Working participants with hyperacusis who were employed/on leave of absence/paternal leave/long-term sick listed were compared to a working referent sample on measures of psychosocial work factors. The hyperacusis group scored significantly higher on worry, social support, and reward, whereas the groups did not differ significantly with respect to emotional support, over commitment or effort. In Study III, a quasi-experimental design was employed to investigate how individuals with sound intolerance react to noise exposure over time, in terms of perceived sound intensity, unpleasantness, rated distractibility, symptoms, heart-rate variability and cognitive performance. Participants were divided into low, medium, and high sound intolerance groups, based on their self-rated sound intolerance. Compared to the other two groups, the high sound intolerance group perceived the noise as more unpleasant, stronger, and more distracting. They also rated the symptom as higher in intensity, showed deviations in heart rate variability, and performed poorer on a cognitive task selected to measure inhibition. In conclusion, the results suggest that persons with sound intolerance have relatively poor general health and hearing as well as high odds of comorbidity with various symptoms, including psychiatric diagnoses and functional somatic syndromes. In a working population, the sound intolerant show high odds for worrying about things at work, perceiving low social support at work and not feeling rewarded at work. Persons with high sound intolerance also have increased distractibility, sound unpleasantness, symptoms over time as well as lowered heart rate variability and cognitive performance when exposed to sounds.

Keywords
Sound intolerance, hyperacusis, psychosocial work environment, Noise Sensitivity Scale, noise, white noise.