

## Ear Protectors and Their Action in Protecting Hearing System of Workers against Occupational Noise

**Authors :** F. Forouharmajd, S. Pourabdian, N. Ziayi Ghahnavieh

**Abstract :** For many years, the ear protectors have been used to preventing the audio and non-audio effects of received noise from occupation environments. Despite performing hearing protection programs, there are many people which still suffer from noise-induced hearing loss. This study was conducted with the aim of determination of human hearing system response to received noise and the effectiveness of ear protectors on preventing of noise-induced hearing loss. Sound pressure microphones were placed in a simulated ear canal. The severity of noise measured inside and outside of ear canal. The noise reduction values due to installing ear protectors were calculated in the octave band frequencies and LabVIEW programmer. The results of noise measurement inside and outside of ear canal showed a different in received sound levels by ear canal. The effectiveness of ear protectors has been considerably reduced for the low frequency limits. A change in resonance frequency also was observed after using ear protectors. The study indicated the ear canal structure may affect the received noise and it may lead a difference between the received sound from the measured sound by a sound level meter, and hearing system. It means the human hearing system may probably respond different from a sound level meter. Hearing protectors' efficiency declines by increasing the noise levels, and thus, they are not suitable to protect workers against industrial noise particularly low frequency noise. Hearing protectors may be solely a reason to damaging of hearing system in a special frequency via changing of human hearing system acoustical structure. We need developing the subjective method of hearing protectors testing, because their evaluation is not designed based on industrial noise or in the field.

**Keywords :** ear protector, hearing system, occupational noise, workers

**Conference Title :** ICSHS 2018 : International Conference on Speech and Hearing Sciences

**Conference Location :** Paris, France

**Conference Dates :** July 19-20, 2018