

Acceptance of hearing protection aids in members of an instrumental and voice music band

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Summary

There are barriers to effective hearing protection among musicians. **Aim:** To investigate the acceptance of hearing protection aids in members of an instrumental and voice music band. **Material and method:** A prospective study of 34 members of the Municipal Indaial Band. Sound pressure levels were measured during a rehearsal, indicating mean levels ranging from 96.4 dB(A) to 106.9 dB(A). Subjects answered questionnaires and underwent audiometry. They attended a lecture in which folders and hearing protection aids were provided; subjects were asked to try using the protectors for 3 months. **Results:** At the end of the study period, 56.2% reported not liking hearing protection, while 43.7 % accepted such protection. The most common complaints were discomfort with sounds (58.8%) and tinnitus (47%). 77.1% said that music might cause hearing impairment. A statistically significant difference was observed in the right ear at 4 and 6 kHz and at the left ear in 3, 4 and 6 kHz when median thresholds were compared with those from unexposed controls. **Conclusion:** Although most subjects seemed aware of the risk, few took preventive measures against hearing loss. This suggests the need for periodic educational campaigns and specific legislation tailored to music professionals.

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INTRODUCTION

We usually do not think of music as being a noise, but rather as a pleasant sound. However, when played loud, it may become a potential threat to the human ear¹.

There are some differences between music and noise. In music, the temporal pattern is floating, the main frequencies are low, damped even further by the stapes, and it is usually pleasant. Noise, however, has a continuous temporal pattern, the main frequencies are high and it is unpleasant to the human ear.

The association between noise exposure and occupational hearing loss has been described for more than one century, however, it was only after the 60's that some researchers showed some concern with the effects of music to hearing^{2,3}.

Studies have shown hearing loss in rock band members, sound cars, orchestras, ballroom bands, or even in individual music instruments training⁴⁻⁸.

Hearing loss preventive measures have been suggested to musicians based on numerous scientific researches, such as: acoustic treatment of rehearsing environments, audiologic follow up and individual hearing protection, among others⁶⁻⁸.

Today, musicians from Brazil and abroad have been offered specific in-the-ear protection devices. They allow for damping balance in all the frequencies, with a uniform sound reduction, avoiding the effect of occlusion and, consequently, sound distortion. Options range from simple models of standard size that offer different music damping, to customized ear protection devices.

The current investigation aims at studying the acceptance of individual hearing protection devices by band members and singers during their research and performances.

MATERIALS AND METHODS

This investigation was carried out in the city of Indaial, involving the members of the City Band. This band is made up of 36 members, 6 women and 30 men, with ages varying between 19 and 76 years, mean age of 40 years. This study was a historical cohort with cross-sections.

The band has the following members: vocal (8) persons, keyboards (1), saxophone (5), drums and percussion (3), clarinet (2), tube (1), electrical guitar (1), bass (1), trombone (5), trumpet (6), transversal flute (1), conductor (1), sound mixer (1). The band is paid by the Town Hall of Indaial, and they have an engagement with the Town Hall of 4 times per month between rehearsals and performances. We had 34 individuals participating in this investigation after having been duly informed about it and signing the informed consent form. The present study was approved by the Ethics Committee of the Tuiuti

University of Paraná, under protocol # 001/2005.

The participants were submitted to a questionnaire with open questions and multiple-choice questions with: identification, type of musical instrument the person plays, for how long the person had been playing the instrument (as a musician, singer, or sound mixer operator), how often they rehearse and perform, individual practice, previous or concomitant exposure to industrial noise, auditory complaints, family history of hearing loss, diseases, medication use and hearing care.

The questionnaire was applied by the researcher prior to the auditory assessment.

Audiologic assessment of the band members was carried out after an acoustic rest of fourteen hours, under the following routine:

a) Visual inspection of the external acoustic meatus: for that we used a Welch Allyn otoscope aiming at checking for some obstruction that would prevent the test from being carried out. If there was any alteration the subjects were referred to otolaryngological evaluation and then they returned for their audiologic evaluation.

b) Audiometry: Tonal threshold audiometry was carried out in a sound proof booth, with a clinical audiometer - MAICO, model MA-41, TDH39 headphone, checked according to ISO 8253-1 standard and Resolution 296/03 of the Federal Board of Speech and Hearing Therapy. The goal of tonal audiometry was to determine the air conduction hearing thresholds in the frequencies of 250, 500, 1000, 2000, 3000, 4000, 6000 e 8000 Hz, and bone conduction in the frequencies of 500, 1000, 2000, 3000 e 4000 Hz.

In order to classify the hearing thresholds of band members we used the criteria of audiometric alterations proposed by Fiorini (1994)⁹:

- Audiograms suggesting normal hearing: individuals who had all bilateral thresholds within the range of 25dBHL.

- Audiograms suggesting noise induced hearing loss (NIHL): individuals who had hearing loss configuration (thresholds above 25dBHL) in the frequencies of 6 and/or 4 and/or 3 kHz).

- Audiograms with other types of classification: individuals who had hearing loss thresholds above 25dBHL, and whose audiometric configuration did not match previous classifications.

In order to analyze the audiograms we excluded 11 individuals (32.3%) exposed to other noisy professional activities that are not related to music (2 trumpet, 1 trombone, 1 tube, 1 clarinet, 2 saxophone), as well as individuals with conductive hearing loss (1 trumpet, 1 clarinet), mixed hearing loss (1 drums and percussion), and one individual with profound unilateral sensorineural hearing loss (1 drums and percussion).

Of the population analyzed in this study we had

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