Intensity Levels Generated by Bagpipers and the Potential Risk of Noise-Induced Hearing Loss or Other Hearing Related Symptoms



INTRODUCTION

It is well known that NIHL and other hearing related disorders such as tinnitus and hyperacusis are common findings among musicians. Hearing loss among classical musicians has been frequently investigated, however, no formal studies investigating the hearing health among bagpipers have been found.

How Can Bagpipes Cause NIHL?

- When played they are never silent and there are no breaks.
- This instrument is loud, and the intensity cannot be altered.
- It creates a sustained sound level that when exposed to for a specific duration of time can damage hearing.

Research Objective

• To determine if bagpipers are at risk for NIHL and other hearing related symptoms.

Research questions included:

(1)Is there a risk for NIHL among bagpipers?

- (2)What is the sound intensity level generated in the 4 variable conditions and which one has the greatest intensity: individual versus group practice and indoors versus outdoors practice?
- (3) Do bagpipers exhibit any symptoms or conditions related to NIHL and related disorders, and are they aware of the hearing health risks of being a bagpiper?

Hypothesis

For this study it was hypothesized that in an indoor group setting with no hearing protective measures in place, bagpipe musicians would be at an increased risk of developing hearing loss and/or hearing related symptoms as a result of exposure to harmful sound intensity levels exceeding the permissible exposure limit.

METHODS

Participants:

- 7 bagpipers, 18 to 51+ years if age, from the Kevin R. Blandford Memorial Pipe Band of Upland, California. 2 women and 5 men. **Procedure**:
- Sound intensity levels were measured using Edge 4 Personal Noise Dosimeters fitted to the pipers left shoulder within 10 to 12 cm of their ear. Measurements collected in 4 conditions:
 - Indoor solo
 - Indoor group
 - Outdoor solo
 - Outdoor group
- Dosimeters worn during the entirety of each condition.
- Dosimeters collected at end of each session and data analyzed.
- Pipers given anonymous questionnaire to complete.
- 10 measurements obtained from 7 participants (3 participants received two session recordings).

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100% daily dose according to NIOSH and OSHA standards.

2. Dose % and P-Dose % of All Group Conditions – 5, 10, & 60 mins – NIOSH Standards



• Projected Noise Dose (P-Dose) = use current dose % projected forward to give predicted dose over longer time period • This figure shows that after only 10 minutes the 100% daily noise dose was exceeded for all measurements according to NIOSH standards.

Is there a risk for NIHL among bagpipers?

• **YES!!!** Results showed that pipers are at risk of NIHL after only 10 minutes of playing as a group setting (indoors or outdoors), according to NIOSH standards and with longer durations the risk of NIHL becomes undeniable.

What is the sound intensity level generated in the 4 variable conditions and which one has the greatest intensity?

Results showed little intensity difference between indoor and outdoor conditions and more difference between solo and group conditions with group conditions having the greatest intensity.

SUMMARY & CONCLUSION

Do bagpipers exhibit any symptoms or conditions related to NIHL and related disorders, and are they aware of the hearing health risks of being a bagpiper?

- Results indicated that bagpipers experience other hearing related symptoms such as tinnitus and hyperacusis.
- Majority of participants believed there to be a moderate (29%) or high (43%) risk of NIHL while playing yet only 29% of the pipers always use ear protection.

FURTHER RESEARCH IS NEEDED

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• The projected dose % shows that a solo bagpiper would exceed to 100% daily noise dose according to NIOSH



