Noise Exposure and Hearing Protection in Marching Band Students

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Background and Purpose

Musicians, marching band students in particular, are at risk for Noise Induced Hearing Loss (NIHL) as they are frequently exposed to sound levels ranging from 85-114dB (Dinakaran, & Rejoythadathil, 2018; Jansen et al., 2008; Libbin, 2008). It is recommended that those exposed to loud sounds wear ear protection regularly (Audiological Services for Musicians and Music Industry Personell, 2019.; Loud Noise Dangers, n.d.). Musicians are often reluctant to wear hearing protection for various reasons (Jin et al., 2013). Standard earplugs are typically offered to marching band members.

The purpose of this study was to determine how many band members use hearing protection, their concerns about its' use, and whether the type of protection used, standard or custom, impacted wearing time.

Research Questions

1. Do members of the Razorback Marching Band (RMB) use hearing protection during practice/performances?
2. What are the reasons RMB members do not wear hearing protection consistently?
3. Will provision of custom earmolds with musician acoustic filters impact wearing time?

Procedures

Methods

- Pre-Season
  - Survey completion
  - Hearing assessments
  - Earmold impressions/fitting
- Post-Season
  - Survey completion
  - Hearing assessments

Participants

- Total of 36 RMB members
- Age ranging from 18-23
- Normal hearing sensitivity
- Practice three times weekly
- Instrumentation varied including woodwinds, brass, and percussion

Results

Number of Participants Wearing Ear Protection Pre- and Post-Season

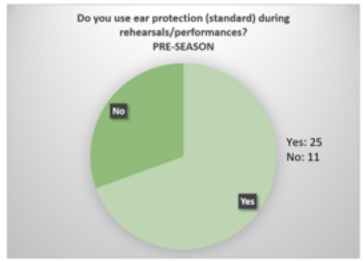

Figure 1

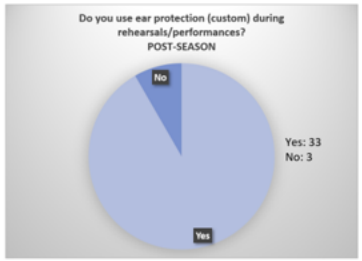

Figure 2

As seen in Figures 1 and 2, initially 11 members were not using their standard earplugs at all, whereas only three members were not using their custom earmolds at the end of the study.

Reasons Participants Did Not Consistently Wear Types of Ear Protection

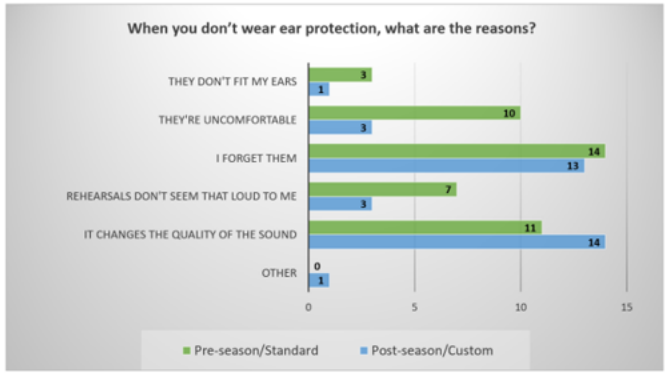

Figure 3

As seen in Figure 3, comfort, sound quality, and remembering hearing protection were the most reported reasons for lack of use.

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Results (cont.)

Subjects' Reported Wearing Time During Rehearsals and Performances

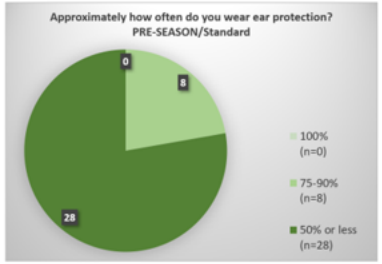

Figure 4

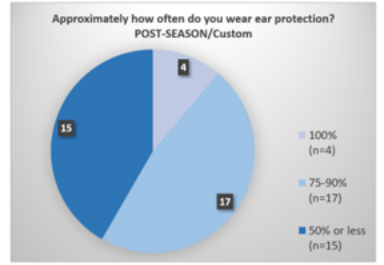

Figure 5

As shown in Figures 4 and 5, wearing time increased overall with the use of custom earmolds. Standard earplugs were not used 100% of the time by anyone in the study whereas four members reported 100% use of custom earmolds. The number of members who wore ear protection 75-90% of the time more than doubled with the use of custom earmolds.

Discussion and Conclusions

At the beginning of the study participants only had access to standard earplugs. For the majority of participants, wearing time increased with the provision of custom earmolds. The data indicated this finding was primarily due to improved fit and comfort.

Sound quality continued to be a concern with the use of custom earmolds. Only eight participants reported consistently using standard earplugs, whereas 21 participants reported consistently using custom earmolds. Altered sound quality may be associated with increased wearing time for individual users.

Provision of custom earmolds was associated with increased number of RMB members who wore ear protection as well as increased wearing time overall. Future research should explore the use of different types of acoustic filters and their impact upon sound quality perceptions. Assessment of tinnitus and reported changes would be valuable in future studies. Finally, including an educational component about NIHL may impact the number of members who use ear protection as well as wearing time.

References

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