

## Introduction

**Background:** Aquatic staff may be exposed to excessive noise, which can result in noise induced hearing loss (NIHL). NIHL can lead to decrease in quality of life, disruption of sleep, and/or a wide array of other mental or physical health problems. Ontario’s Occupational Health and Safety Act (OSHA) legislates workers should not be exposed to sound levels above 85 decibels (dB) over an 8-hour period.

**Gaps in Literature:** Limited research has been conducted to explore the occupational impact of noise in an aquatic facility, therefore, it is unknown if lifeguards and instructors are protected.

**This Study:** This pilot study explored the occupational noise exposure and staff perception to noise in indoor aquatic facilities with an emphasis towards lifeguard and/or instructors.

## Methods

**Location:** Visited eight indoor pools across the Greater Toronto Area (GTA)

**Participants:** Aquatic staff over 16 years old; recruited via convenient sampling

**Procedure:** Participants were asked to wear a personal dosimeter to measure personal sound levels and complete a questionnaire to determine their perception on noise. Dosimeters were fitted on staff who were on active duty, and out of the water as the equipment was not waterproof. All questionnaire were self-administered by participants. Additional observation data was collected on facilities and activities being performed during the site visit

**Equipment:** Dosimeters used were Bruel & Kjaer Type 4448 dosimeters. They were calibrated before each use.

## Results

The relative proportion of LAeq measured

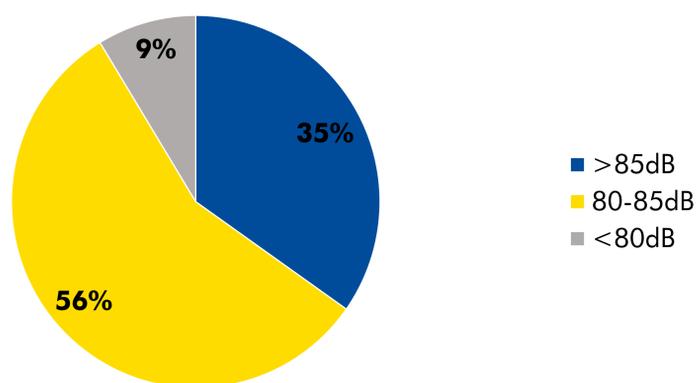


Figure 1. Breakdown of participants’ personal noise exposure (n=23). Ontario legislates workers should not be exposed to noise louder than 85dB per an 8-hour shift.

Percentage of staff who had a hard time hearing other staff or visitors due to noise

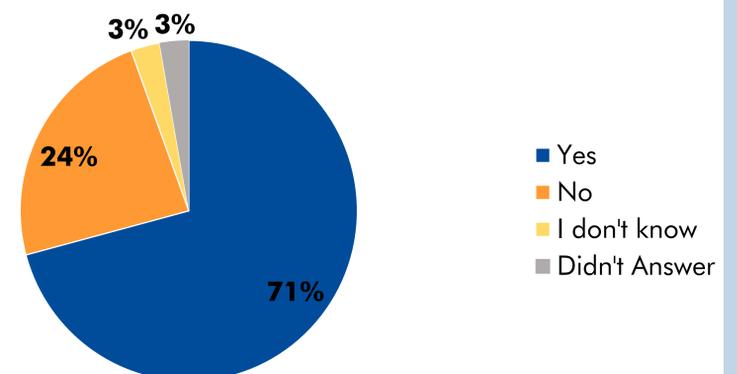


Figure 2. Most of the participants (n=23) recalled they have had a difficult time communicating with other staff or visitors due to the noise.

Noisiest Activities Identified by Participants

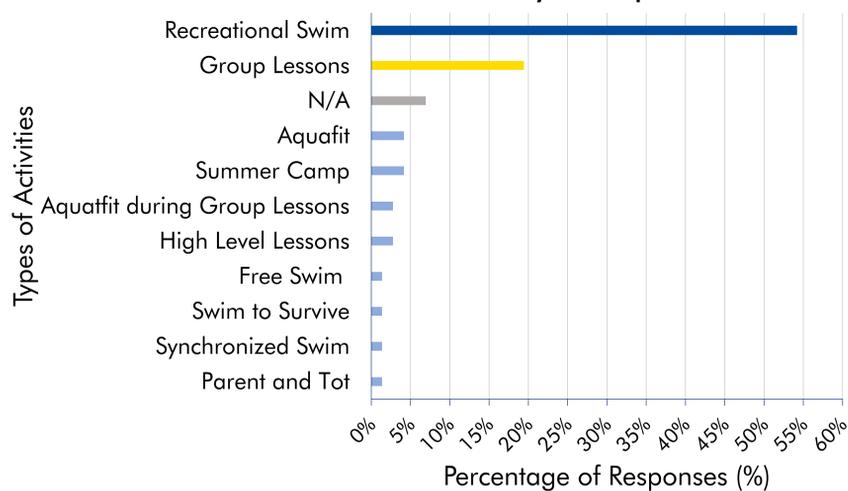


Figure 3. Significant number of participants (n=23) identified recreational swim and group lessons as the top two noisiest activity.

Comparison of average noise exposure during lane swim, recreational swim, and lesson

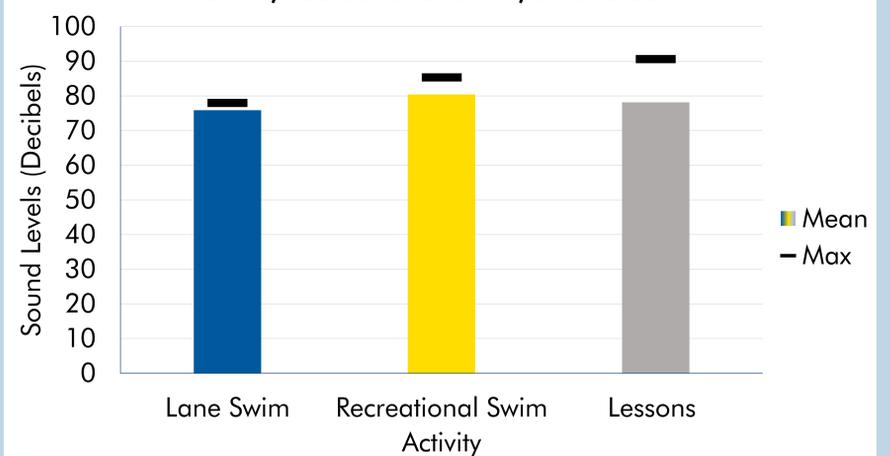


Figure 4. Recreational swim has the highest sound levels compared to lane swim and group lessons. This matches with participant perception of noise in figure 3.

## Discussion

The results of the study show 65% of the samples (n=23) were not exposed to noise over 85dB (Figure 1). However, 35% of the aquatic staff was exposed to more than 85dB. These workers are more at risk to developing noise induced hearing loss later in life as they were exposed to noise over the legislated limited of 85dB. 54.2% of the staff (n=72) identified recreational swim as the loudest activity and 19.4% identified group lessons as the second noisiest (Figure 3). The staff perception is in line with the findings. On average, recreational swim was noisier than lane swim and lessons (Figure 4). Six out of the eight excessive noise exposures occurred during recreational swim. This suggests employees who work during recreational swim are more at risk for NIHL than if they worked during lane swim or taught lessons. Even though more than half of the personal noise exposure samples suggests the noise is within the legislated limit, 71% of the worker has had a difficult time hearing other staff or visitors due to the noise (Figure 2). This demonstrates the noise level is loud enough that it has begun to affect the workers’ ability to work effectively. Staff are more likely to miscommunicate during recreational swim (the loudest activity), which may impede the worker’s ability to save lives.

This pilot study is not representative as it sampled only at one point in time. Additional sampling is recommended for a more appropriate interpretation of the worker’s exposure to noise. Aquatic facilities should look to decrease their noise level as much as possible as best practice in the interim.

### Acknowledgements

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### Contacts

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