

# A SURVEY OF THE USE OF PORTABLE AUDIO DEVICES BY UNIVERSITY STUDENTS

Shazia Ahmed, Matthew King, Timothy W. Morrish, Ewelina Zaszewska, and Kathy Pichora-Fuller

University of Toronto at Mississauga, Department of Psychology, 3359 Mississauga Rd N, Mississauga, Ontario L5L 1C6

## 1. INTRODUCTION

As our environment becomes more complicated, people are continuously bombarded with noise that is potentially detrimental to hearing health. Portable audio devices are increasingly popular among today's adolescents and young adults. Many fear that the use of these devices has become excessive and dangerous to hearing health. It is widely held that constant exposure to noise in recreational activities could affect hearing health (Williams, 2005; Chung, 2005). In particular, a recent telephone-based survey found that high school students are most likely to listen to their audio devices for longer periods at higher settings compare to adults. Furthermore, these students are much more likely to report experiencing symptoms of hearing loss, including turning up the volume of the TV, tinnitus, and difficulty understanding speech (Zogby, 2006). In most previous studies on the use of audio devices, factors that resurfaced were the low level of awareness of the risk to hearing health, and the low level of concern about hearing health, at least in the case of those who were not educated about hearing loss (Williams, 2005; Chung, 2005; Zogby 2006).

The current study is part of a larger study which aims to determine the relationship between the sustained use of portable audio devices and hearing health in university students. This part of the study focuses on the administration of a survey, with the goal of determining how portable audio devices are used by university students, how their use interacts with other sources of noise exposure, and whether their patterns of use raise concerns for hearing health. An additional goal of the project was to increase awareness about noise-induced hearing loss by providing an information session to those who completed the survey.

## 2. METHOD

### 2.1 Participants

There were 150 participants in the study, 126 of whom were undergraduate students who received a credit towards their Psychology 100 course at the University of Toronto at Mississauga. The rest were other undergraduate students who volunteered to complete the study with no monetary compensation. All participants provided informed consent. Participants from Psychology 100 were recruited using the course website and they were tested in groups in a computer lab at the university that was reserved for the study. The survey took less than 30 minutes to complete and it was followed by an information session. All participants were

young adults: 71.3% of the participants were in the 18-20 year age range; 56.7% were male and 43.3% female.

### 2.2 The Survey

A 124-item online survey was designed to probe items that would provide information on users of portable audio devices in the university student population. Items were designed to investigate a number of topics, including: demographic characteristics, transportation usage patterns, work environments, hearing history, family hearing history, recreational activities (including noisy hobbies, frequency of attendance at bars, concerts and sporting events), as well as questions on the use of portable devices.

Other parts of the project were conducted to examine audiometric thresholds in users and non-users of portable audio devices as well as to obtain acoustical measurements to quantify how listeners use a typical device in different noise environments. To satisfy the overall purposes of the larger study, a number of items in the survey were created to enable correlations between the findings. Among others, these items related to the participants' subjective estimations of the volume levels that they set on their own devices, and subjective perceptions of their hearing abilities. Thus, the survey was intended to aid in establishing trends relating hearing loss to excessive use of portable audio devices.

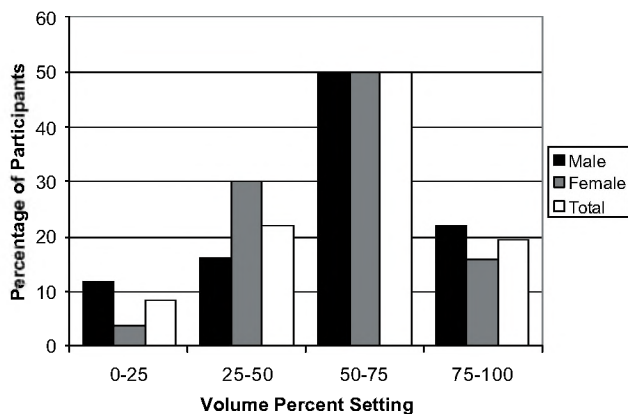
### 2.3 The Information Session

Following the completion of the online survey, participants received a 15-minute information session presented in PowerPoint. The goal of this information session was to educate those involved with the study about hearing health and hearing loss. During the session the participants were also debriefed regarding the hypotheses and goals of the study, and they were able to ask the researchers additional questions about hearing and their participation in the study.

## 3. RESULTS

Most (82.7%) of the participants owned a portable audio device. On average, 46% of the participants reported using their portable audio device for 5 to 7 days per week, for the average duration of 2 hours per listening session. However, there were 35 students that reported listening to their devices as frequently as seven days a week, and seven students listened to their devices for as long as 4 to 8 hours

in a typical single session. As for the volume, the mean level at which the students set their devices was 60% on a scale from 0 to 100% with 100% being the maximum volume. However, there were 21 individuals who reported setting the sound level in the 80-100% range. This initial evidence suggests that the majority of students use their devices frequently, but in safe volume ranges; however, there is a minority of university students who may use their portable audio devices excessively and at dangerous volumes. Gender differences were observed (see Figure 1). More females than males reported setting the volume in the 25-50% range. Curiously, more males than females preferred the highest ranges, but of those who preferred the lowest volume, more were males.



**Figure 1.** Percentage of male and female users of portable audio devices and their volume preferences; volume divided into quadrants.

Self-reports on hearing health indicated that 31% of the students thought their hearing was worse than five years ago. Also, 13% believed they had a hearing loss and 13% believed it was noise related. Importantly, these reports on hearing health did not differ between the users and non-users of portable audio devices. In other words, there was no indication that more users than non-users of portable audio devices reported hearing concerns. In addition, close to 90% of students did not wear ear protection, even though over half enjoyed listening to loud music.

Comparing the present results those by Zogby (2006) who conducted a survey on high school students and adults, we found a number of commonalities even though there was on average a 3 year age difference between our sample and Zogby's high school sample. About a third (30%) of the university sample reported turning up the TV volume more than they used to (compared to 27% of high school students). Tinnitus was experienced by 17% of high school students in the Zogby (2006) study. In the present survey, although few university students reported having persistent ringing in the ears, all but 30% had experienced it after exposure to a loud sound.

## 4. DISCUSSION

Our data show that the majority of university students own a portable audio device. This may mean that noise-induced hearing loss may be a larger concern now than ever before, if the use of portable audio devices is excessive and /or if it is combined with exposure to other noise sources. However, the majority of respondents reported setting their devices in the middle volume ranges, and only a minority of students reported their work/volunteer places to be loud.

Cause for concern is raised by the finding that a third of the participants felt that their hearing had worsened in the past five years, and only 12% of participants used hearing protection compared to the 31% who felt that their hearing was deteriorating. Thus, our data suggests that although most students tend not to expose themselves to excessive noise (recreational noise, noise at work, or music noise while listening to portable audio devices), at the same time they do not recognize the possibility of losing their hearing and the importance of protecting it from noise. Also, they may simply be not aware that exposure to loud music can result in hearing loss. This assumption was also stated by Chung, Roches, Des Meunier, and Eavey (2005) who conducted an online survey on views on health issues including hearing loss in adolescents and young adults. They concluded that some types of education may be crucial to motivating young people to change their listening habits. Moreover, in the study by Zogby (2006), the respondents indicated that school classes, teen magazines, and TV programs may be effective means for educating young people about hearing. Thus, it seems that, with such widespread use of portable audio devices among young adults, increasing awareness about hearing and early noise-induced hearing loss is essential, and boosting young people's motivation to protect their hearing may likely protect this generation from widespread hearing problems in years to come.

## 5. REFERENCES

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