



**“There are more important things to worry about”:  
Attitudes and behaviours towards leisure noise and use of  
hearing protection in young adults**

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3 Title: "There are more important things to worry about": Attitudes and behaviours towards  
4  
5 leisure noise and use of hearing protection in young adults  
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3 Key words: Noise-induced hearing problems; tinnitus; leisure noise; attitudes; earplugs  
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7 Acronyms  
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9 BTA: British Tinnitus Association  
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11 NIHL: Noise induced hearing loss  
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13 NIHR: National Institute for Health Research  
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15 NHS: National Health Service.  
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Key words: Noise-induced hearing problems; tinnitus; leisure noise; attitudes; earplugs

Acronyms

BTA: British Tinnitus Association

NIHL: Noise induced hearing loss

NIHR: National Institute for Health Research

NHS: National Health Service.

For Peer Review Only

Hunter: Attitudes towards leisure noise

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## Abstract

Objective: Noise-induced hearing problems among young adults are increasing due to participation in activities where music is played at a loud volume. This study explored attitudes towards leisure noise, hearing protection, and perceived susceptibility to noise damage in young adults with no hearing problems. Understanding attitudes and behaviours will assist with the future development of strategies to improve awareness and use of hearing protection.

Design: A qualitative study.

Study Sample: Four focus groups, with 28 adults aged between 18 and 35 years (6 male; 22 female; mean age 23 years).

Results: Using Framework Analysis, five themes emerged. Earplug use occurred when participants had experienced previous hearing damage. Others chose not to use earplugs because music venues are expected to be loud. Peer behaviours and opinions also had a strong influence over earplug use. A lack of knowledge of hearing related damage resulted in a lack of concern for hearing health and other health conditions taking priority.

Conclusions: The challenge is to present hearing health messages that are relevant and accessible to young adults. Music and entertainment venues must also take greater responsibility to protect the hearing of its customers by at least informing visitors of the dangers of loud music.

Key words: Noise-induced hearing problems; tinnitus; leisure noise; attitudes; earplugs

## Introduction

The World Health Organisation (Hellmuth et al., 2012) states that the adverse health effects of noise pollution include cardiovascular disturbances, cognitive impairment, poor mental

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3 health, and negative social behaviour, as well as hearing impairment and sleep disturbances.

4  
5 This paper will focus on the adverse effect noise pollution has on hearing impairment.

6  
7 Exposure to loud noise can cause noise-induced hearing loss (NIHL), which is a permanent  
8  
9 hearing impairment resulting from prolonged exposure to high levels of noise (Clark, 1991),  
10  
11 and tinnitus; the perception of sounds in the head or ears in the absence of an external noise  
12  
13 (Baguley et al., 2013). In 2015 it was estimated that as many as 1.1 billion people could be at  
14  
15 risk of developing NIHL (World Health Organization, 2015). This is a significant social and  
16  
17 public health problem. Those with hearing problems are more likely to experience reduced  
18  
19 quality of life and social isolation (Dawes et al., 2015), and depression and anxiety  
20  
21 (McCormack et al., 2015) than those without hearing problems, including young people who  
22  
23 have experienced permanent hearing related symptoms as a result of loud music (Vogel et al.,  
24  
25 2014).  
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31 Noise exposure can be through occupational settings, or recreational venues such as concerts  
32  
33 and nightclubs. In the workplace, hearing protection regulations exist in order to protect  
34  
35 employees from noise damage. The Control of Noise at Work Regulations 2005 ensure that  
36  
37 workers' hearing is protected from excessive noise at their place of work, which could cause  
38  
39 them to lose their hearing and/or to suffer from tinnitus. From 2008, this included people  
40  
41 working in the music and entertainment sectors. However, unlike workers, there is no specific  
42  
43 legislation setting noise limits for the audience exposed to noise, only recommendations. The  
44  
45 Health and Safety Executive in the UK recommends that the sound level in any part of the  
46  
47 audience area should not exceed 107 dB. However many venues exceed this with noise levels  
48  
49 reaching up to 112db in nightclubs (Serra et al., 2005) thus posing a significant risk of hearing  
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51 problems (Potier et al., 2009).  
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Hunter: Attitudes towards leisure noise

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3 Most noise exposure among young adults is caused by voluntary participation in activities  
4 where music is played at loud volume (Daniel, 2007). In recent years, there has been an  
5 increase among the younger generation of exposure to loud noise and an increase in noise  
6 induced hearing problems (Henderson et al., 2011; le Clercq et al., 2016; Shargorodsky et al.,  
7 2010). However, among young adults, the risk of hearing loss is not perceived to be of high  
8 personal relevance (Vogel et al., 2008). When young adults have been questioned about  
9 hearing problems that can occur when noise is too loud, only 15% considered tinnitus as a  
10 symptom to be concerned about (Crandell et al., 2004). Furthermore, very few young adults  
11 will take preventative action to reduce the risk of NIHL (Bogoch et al., 2005). The use of  
12 earplugs among young adults in music venues is reported to be low (de Lourdes Quintanilla-  
13 Dieck et al., 2009; Gupta et al., 2014; Gilles et al., 2013). An online survey of 1200 young  
14 Australians found that the majority of participants did not perceive themselves at risk and had  
15 low levels of engagement in noise reduction (Gilliver et al., 2015). It is also likely to be  
16 difficult to achieve voluntary behaviour change because visiting discotheques becomes  
17 habitual for many adolescents (Vogel et al., 2010).

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37 Those who do use earplugs are more likely to have experienced hearing symptoms e.g.  
38 tinnitus, noise sensitivity or temporary hearing loss; and are more likely to be aware of the  
39 risks of noise and the importance of hearing protection (Degeest et al., 2017; Widén, 2013;  
40 Gilliver et al., 2015). Beach et al (2012) concluded that for some people, experiencing hearing  
41 symptoms acted as a 'wake-up call' and was a motivator for protecting their hearing during  
42 concerts. However, other studies have found that even those with NIHL (Hunter, 2017), or  
43 those who are aware of the risks (Beach et al., 2013), do not necessarily take steps to protect  
44 themselves from hearing-related damage.  
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3 The theory of Planned behaviour is often used to understand factors relating to behaviour  
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5 change (Ajzen, 1991). The model states that intention to change a behaviour is related to  
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7 attitudes (positive or negative beliefs about performing the behaviour), subjective norms (the  
8  
9 extent to which an individual's perception about the particular behaviour is influenced by  
10  
11 significant others, e.g. parents, peers, teachers, etc), and perceived behavioural control (the  
12  
13 ease or difficulty of performing the particular behaviour). The question is whether increasing  
14  
15 awareness of the risks of leisure noise exposure, and increasing opportunities for protective  
16  
17 behaviours could have a positive impact on young adults' leisure noise behaviours. In one  
18  
19 recent study (Nielsen et al., 2014), increasing opportunities for protective behaviours had a  
20  
21 positive impact on young adults' behaviours with regards to noise exposure. Regular  
22  
23 nightclub attendees were given earplugs to wear for a 16 week trial and there was a significant  
24  
25 improvement in comfort and music enjoyment, showing that those who have experience with  
26  
27 earplugs can have sustained positive attitudes towards the devices (Nielsen et al., 2014).  
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33 Hearing education campaigns also have the potential for positive behaviour change by  
34  
35 increasing knowledge of the risks of loud music exposure. A governmental preventive  
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37 campaign, focusing on the harmful effects of recreational noise and the use of hearing  
38  
39 protection in Belgium, resulted in a significant change in attitudes (Gilles, 2014). Negative  
40  
41 attitudes toward noise, and positive attitudes toward hearing protection increased in a cohort  
42  
43 of students aged 14-18 years. Keppler et al., (2015b) also found that a hearing education  
44  
45 programme designed for young adults resulted in a decrease in recreational noise exposure,  
46  
47 attitudes towards noise and a modest increase (12%) in use of hearing protection devices,  
48  
49 after six months. However, other studies (Weichbold and Zorowka, 2007) have found no  
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51 difference in music related behaviour one year after a hearing education campaign.  
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Hunter: Attitudes towards leisure noise

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3 Much of the research on attitudes towards leisure noise, hearing loss and hearing protection  
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5 has been conducted in the US (Crandell et al., 2004; de Lourdes Quintanilla-Dieck et al.,  
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7 2009), Australia (Beach et al., 2012; 2013; Nielsen et al., 2014; Gilliver et al., 2015), and  
8  
9 some European countries e.g. Belgium (Gilles, 2014; Keppler et al., 2015a; 2015b), and the  
10  
11 Netherlands (Vogel et al., 2008; 2009a; 2009b; 2010; 2014). Research in the UK is limited.  
12  
13 Besides the Plug'Em Campaign (British Tinnitus Association, 2016), few educational hearing  
14  
15 programs exist in the UK. The culture and social norms of young adults' behaviour with  
16  
17 regards to nightclubs and hearing protection may be different in the UK.  
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21  
22 A better understanding of young adults' attitudes and behaviours will assist with the future  
23  
24 development of strategies to improve awareness and use of hearing protection specifically for  
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26 this population. The aim of the study is to explore attitudes and behaviours towards leisure  
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28 noise and use of hearing protection, specifically earplugs, among young adults with no known  
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30 hearing loss or tinnitus. Using qualitative research methods, the study aimed to address the  
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32 following questions: 1) What attitudes do young adults have towards leisure noise and hearing  
33  
34 damage, 2) and what are the motivating and inhibiting factors for engaging in protective  
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36 hearing behaviours.  
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## 39 40 41 Method

### 42 *Recruitment*

43  
44 Young adults aged between 18 and 35 years with no known hearing impairment or tinnitus  
45  
46 were recruited via advertisements asking for participation in a focus group concerned with  
47  
48 involvement in noisy leisure activities. Participants responded to the advertisement by  
49  
50 contacting the researcher and indicating their preferred focus group session. Informed written  
51  
52 consent was obtained from all participants. The focus groups were conducted in March and  
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3 April 2016. Participants received a £20 inconvenience voucher for taking part. Ethical  
4 approval was received from the University of Nottingham School of Medicine ethics  
5 committee.  
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### 10 11 *Participants*

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13 Four focus groups were conducted with 28 young adults aged between 18 and 35 years (6  
14 male; 22 female; mean age 23 years). Two were members of staff at the University. The  
15 others were undergraduate and postgraduate students. There was one group of five, two  
16 groups of seven, and one group of nine people. None of the participants had hearing loss or  
17 tinnitus, but some did comment they had occasionally experienced temporary tinnitus after a  
18 night out.  
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### 28 29 *Measures*

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31 The focus groups were conducted by the researcher who had experience in facilitating focus  
32 groups and qualitative data analysis. The focus groups lasted between 25 and 45 minutes. All  
33 interviews were recorded and transcribed. The researcher had no personal or professional  
34 relationship with the participants. During the focus groups, the participants discussed the  
35 following issues:  
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- 41 - The reasons for, as well as the frequency and duration of visits to noisy leisure venues.
  - 42 - Attitudes towards the noise levels in leisure venues
  - 43 - The benefits and barriers associated with earplugs
  - 44 - Their perceived risk of noise-induced hearing problems
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### 52 53 *Data analysis*

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Hunter: Attitudes towards leisure noise

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3 The interviews were transcribed verbatim by a professional third party (UK Transcription).  
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5 Transcripts were read carefully and notes taken before analysis began. NVivo qualitative data  
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7 analysis software was used for managing the data coding and analysis process. A  
8  
9 ‘Framework’ analytic approach (Ritchie et al., 2003) was adopted. This is a very systematic  
10  
11 structured data analysis method suitable for research where questions or issues are identified  
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13 in advance and then systematically considered in the analysis, while still retaining flexibility  
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15 for data saturation of patterns or themes that are identified through focus groups (Ritchie et  
16  
17 al., 2003). It is becoming more widely used in health research. The key steps involved are  
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19 familiarisation, identifying a thematic framework, indexing, charting, mapping and  
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21 interpretation. The framework approach resulted in themes that were driven by a combination  
22  
23 of the study aims and other new findings that arose naturally through the focus group  
24  
25 discussions. Demonstrating rigour in qualitative research is challenging because there is no  
26  
27 accepted consensus about the standards by which such research should be judged (Rolfe,  
28  
29 2006). Ideally in qualitative research a second coder also carries out the data analysis in order  
30  
31 to verify the findings and increase validity. However, due to financial constraints we were not  
32  
33 able to have a second coder. Steps were taken to enhance the credibility of the findings: Rich  
34  
35 and thick verbatim extracts from participants have been included to support the findings and  
36  
37 the author repeatedly revisited the data and engaged in constant comparison to verify the  
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39 findings throughout the data analysis. Furthermore, the steps involved in the framework  
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41 approach allow the researcher to maintain an effective and transparent audit trail, and this  
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43 enhances the rigor of the analytical processes and the credibility of the findings.  
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## 50 Results

51  
52 Initially participants were asked to comment on venues they visit where there is loud noise,  
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54 and the duration and frequency of such visits. Participants listed leisure/social venues such as  
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3 bars, clubs, restaurants or the cinema; music orientated venues such as gigs, concerts, festivals  
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5 and using personal stereos; and sporting venues such as football grounds, hockey grounds,  
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7 and the gym. Frequency of visits ranged from 'very occasionally' to 'four times a week'.  
8  
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10  
11 Five over-arching themes emerged from the data in relation to attitudes and behaviours  
12  
13 towards leisure noise and hearing protection: 1) Enjoying loud music; 2) Previous hearing  
14  
15 damage; 3) Peer behaviours and opinions; 4) Lack of knowledge and concern; 5) Hearing is  
16  
17 not a priority. Figure 1 shows how these themes are connected. The participant's discussions  
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19 relating to each of the five themes are presented below. Examples of participant comments are  
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21 included throughout to illustrate the findings.  
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27 INSERT FIGURE 1  
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### 31 **Enjoying loud music**

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33 Many participants had a positive attitude towards noise and enjoyed loud music as it added to  
34  
35 their experience and altered their mood in a positive way. Participants enjoyed loud music in  
36  
37 many different situations e.g. when driving; in a nightclub; listening to live music or personal  
38  
39 stereo; or when exercising because it can "*increase adrenaline and set your mood*". There  
40  
41 was the opinion that loud noise is expected and part of the experience when you go to certain  
42  
43 venues such as concerts, clubs, and festivals, and this adds to the enjoyment and creates a  
44  
45 better atmosphere:  
46  
47

48 *"If you're in a nightclub you expect it to be quite loud because that's the point of it,*  
49  
50 *like to immerse yourself in the music...it's like being in the zone isn't it."*  
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52  
53 Some participants described their 'love' and 'passion' for music, and felt that the benefits of  
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55 loud music were much more important than the potential risks:  
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Hunter: Attitudes towards leisure noise

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3                   *“The benefits outweigh the risks listening to it at a certain volume, it definitely would*  
4                   *compromise the experience having to turn it down.”*  
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7 As there was the expectation that clubs and concerts should be loud, there was the opinion  
8 that wearing earplugs would *“take away from the experience”*.  
9

10  
11                   *“For me when I go to a concert or a club I expect it to be loud so I would never wear*  
12                   *ear protectors because I know it’s going to be loud, that’s part of going.”*  
13  
14

15 People also had the impression that earplugs would have an effect on the quality of the music,  
16 causing it to sound *‘muffled’*, or unclear:  
17

18  
19                   *“I’ve gone to enjoy the gig and the sound, that’s the whole point of the band, I want to*  
20                   *hear it as they would intend me to hear it.”*  
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25  
26 For others, who also enjoyed loud music, earplugs were used in order for them to continue  
27 listening to loud music without the worry that it could be damaging their ears. The earplugs  
28 offered *“safety and protection”*. One person commented that he used earplugs in a particular  
29 venue because it was *“ridiculously loud”* that he knew it must be causing damage to his ears,  
30 so he used earplugs as protection:  
31  
32

33                   *“The advantage is it’s going to help reduce it [hearing damage] ...it’s going to*  
34                   *prolong the hearing.”*  
35  
36

37 He also felt that it made the music sound *“clearer”*:  
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40                   *“You hear better...that bass isn’t in your ears, it’s just pure music and it’s good.”*  
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48 Many participants felt that it is the responsibility of the individual to protect their hearing, and  
49 if somebody finds it too loud then it is up to that person to find a solution rather than limit the  
50 enjoyment for everyone else, because clubs and concerts are expected to be loud.  
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3 *“For me it’s not an issue, but I don’t see why if it was an issue for someone, why my*  
4 *take on the performance or wherever we are should be limited because the person next*  
5 *to me says it’s too loud.”*

6  
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8  
9 *“...it’s that loud because people want it to be that loud...it’s peoples individual*  
10 *responsibility if they decide that it’s too loud they have to do something about it,*  
11 *because the majority of the people at the gig or club would be disappointed if you*  
12 *turned the volume down.”*

### 20 **Previous hearing damage**

21  
22 Some people expressed concern about the potential dangers of noise exposure. On occasion  
23 some participants had negative attitudes towards noise when there were unpleasant physical  
24 consequences such as feeling their body shaking; experiencing pain, temporary hearing loss  
25 or ringing in the ears; and feeling the ground vibrate:

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31 *“When you can feel your body shaking because of the bass, it’s too much.”*

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35 Some people were concerned because *“it’s not normal for your ears to ring”*. Others were  
36 concerned because they had noticed a deterioration in their hearing since being at University  
37 because *“you’re constantly going out”*.

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41  
42 *“I feel like mine’s [hearing] getting worse. I notice it more when I go to a gig, like last*  
43 *night I went somewhere and afterwards my head was hurting, my ears were hurting...I*  
44 *was like, this is happening more, so maybe something is being affected, I don’t know.”*

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49  
50 Despite this concern, very few people actually wore earplugs, and depending on the event or  
51 venue, they would take other precautions such as leaving early or moving to the back, or they  
52 would simply *“put up with it”*. However, the physical effects of the loud noise can impact on  
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Hunter: Attitudes towards leisure noise

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3 the enjoyment of the event and can lead to people leaving early or moving further away. This  
4  
5 can be very disappointing for people who have paid a lot of money to see a band.

6  
7 *“...even just down a little I think you can still really enjoy the bands...It’s this*  
8  
9 *constant extreme loud noise...just too much...it’s a disappointment when you’ve paid*  
10  
11 *a good chunk of money.”*

12  
13  
14  
15 Those that had experienced more severe signs of damage from previous exposure to loud  
16  
17 music, were much more aware of the potential risks and reported using earplugs on a few  
18  
19 occasions:

20  
21  
22 *“I hurt my ears very badly when I was about 20 at a concert ... and thought I never*  
23  
24 *wanted to have ringing for two days in my ears again because I was worried what this*  
25  
26 *will mean for the rest of my life if I keep doing this.”*

27  
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31 *“I was in a concert in Portugal, in a pretty small place and I started bleeding from my*  
32  
33 *right ear...so I freaked out and I left...I now try to wear earplugs in concerts.”*

### 34 35 36 37 **Peer behaviours and opinions**

38  
39 Attitude from others was an important factor when considering whether to wear earplugs.

40  
41 What their peers think and do is an *“important part of the decision”*. They would not want to  
42  
43 be the only person in their circle of friends wearing earplugs.

44  
45  
46 *“If I’m being completely honest about it...I would look at everyone else and if lots of*  
47  
48 *people had them in, I’d probably put them in. if I’m the only person wearing the*  
49  
50 *earplugs I’d stand out a bit.”*

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3           *"...if your friends did it then you would do it...that's just how it goes... You wouldn't*  
4           *want to be the odd one out."*

7 There is still a stigma attached to wearing earplugs. People were concerned about getting  
8  
9 *'funny looks'* from other people if they turned up at a nightclub with earplugs in. They were  
10  
11 concerned that they look *'odd'* on a night out:

13           *"I don't think you want to go to a club and have you're make up, your hair done, your*  
14           *earrings and then have little things popping out of your ears...you want to look good,*  
15           *you want to hang out, you want to socialise."*

19  
20 Participants weren't necessarily against wearing earplugs, but if no one else in their group of  
21  
22 friends did then it meant they would be very unlikely to.

### 26 **Lack of knowledge/ lack of concern**

28 The analysis of these focus groups revealed there is a clear lack of knowledge concerning the  
29  
30 potential damage that noise can do, and therefore individuals own susceptibility to hearing  
31  
32 loss and tinnitus. It was evident that many people did not have good knowledge of hearing  
33  
34 problems. Some people asked *"what is tinnitus?"*; *"is it permanent?"*; *"can you get rid of*  
35  
36 *it?"* Participants were unsure what a safe decibel level is. They were unsure how much  
37  
38 exposure to music can be damaging. This was frustrating for people because they didn't feel  
39  
40 fully informed of what the dangers could be:

43           *"I personally don't have any idea how loud it has to be to have an effect, how many*  
44           *times, how much I'd have to be exposed to it before it started to have an effect."*

48 For other people, as they didn't know enough about the potential implications of noise  
49  
50 damage it wasn't something that really concerned them.

52           *"I don't know enough about would it affect my hearing later on. It's not something*  
53           *people talk about or advertise...so I'll just carry on doing what I'm doing anyway."*



Hunter: Attitudes towards leisure noise

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3 Even though some participants had experienced temporary hearing loss or tinnitus after a  
4  
5 night out, it was not a concern for many people. There was the view that it is expected after a  
6  
7 night out, and something they put up with in order to enjoy loud music.

8  
9 *“You just accept that it [tinnitus] happens after a night out sometimes. It doesn’t*  
10  
11 *happen all the time, it’s just every once in a while it might happen and you accept it.”*

12  
13 Experiencing temporary hearing problems was seen as part of the ‘territory’ of going to these  
14  
15 venues. Noise damage was not viewed as a serious issue for some people because going to  
16  
17 loud venues is not an everyday occurrence. As it is infrequent, there is the perception that it  
18  
19 won’t cause any damage and is nothing to be concerned about.

20  
21  
22 *“I don’t want to be deaf but I don’t think going to a club once a week would make me*  
23  
24 *deaf.”*

25  
26 Without knowing or appreciating what the consequences could be, people are unwilling to  
27  
28 change their behaviours. Putting noise levels into context might help people appreciate what  
29  
30 is “an acceptable level and what becomes a dangerous level”.

31  
32  
33 *“If I knew what it looks like to have bad hearing, or what that would feel like, then I*  
34  
35 *might be more concerned...but I don’t think I know what the consequences would be.”*

### 36 37 38 39 **Hearing problems are not a priority**

40  
41 The participants in this study did not consider hearing problems to be a priority when there  
42  
43 are other more important things to be concerned about

44  
45  
46 *“I’m more concerned about the alcohol that I’m consuming and what that will do to*  
47  
48 *me than the loud music.”*

49  
50 As one person stated:

51  
52 *“There are a lot of things to worry about and that’s [hearing] not high up in a lot of*  
53  
54 *people’s lists”.*

Hunter: Attitudes towards leisure noise

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3 As the risk of noise induced hearing problems was not a priority, people were unwilling to  
4  
5 compromise their lifestyle or sacrifice the enjoyment of loud music:

6  
7 *“I’m aware that it is probably not doing my ears much good but there are a lot of*  
8  
9 *things to worry about and I really enjoy music, so I’m going to choose to put the music*  
10  
11 *on a bit louder and enjoy it...rather than decide that it’s not best for my hearing.”*  
12

13  
14  
15 Additionally, many of the participants had little experience of hearing loss, besides elderly  
16  
17 relatives. Consequently, there was the view that hearing problems are an older person’s illness  
18  
19 and not something to be concerned about at a young age:

20  
21  
22 *“Especially at our age, no one worries about losing their hearing...we think that’s a*  
23  
24 *problem for older people...take it for granted.”*  
25

26  
27 Young people take their hearing for granted, and as they don’t have any peers affected by  
28  
29 hearing problems, it was hard for them to imagine they could be putting themselves at risk.

30  
31 *“I think that’s because you don’t see it around you as well. The people that you spend*  
32  
33 *the most time with, no one is affected...everyone is affected by so many things but not*  
34  
35 *hearing so it’s never something that comes up on your register.”*  
36

37  
38 Furthermore, hearing damage is not immediate, so young people do not think about what  
39  
40 could happen in the future:

41  
42 *“Because it’s not an immediate problem...It’s not like you turn up the music, you go*  
43  
44 *deaf immediately...people are not really thinking about 30 years down the line”*  
45

46  
47 As many of the participants had not experienced any significant hearing symptoms, and had  
48  
49 no peers with hearing problems, it was hard for them to relate to what it would be like to have  
50  
51 hearing problems. As a result they were unlikely to change their behaviour:

52  
53 *“It’s like with anything, until something happens with most people, especially with*  
54  
55 *the young, until something happens you never think about it.”*  
56

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4  
5 Participants considered how noise damage could be prevented or reduced in young adults. It  
6  
7 was evident that there should be an increase in awareness and education around the topic, and  
8  
9 that some legislation or guidelines could be helpful, to increase knowledge. Noise damage is  
10  
11 not given the same focus and attention from the government and media:  
12

13 *“With alcohol...it’s quite well publicised the number of units people should have per*  
14 *week. Even if people don’t adhere to that...they at least have an awareness of how*  
15 *unhealthy their drinking is...but I would have no idea about how much I would have to*  
16 *compromise my lifestyle to prevent potential [hearing] damage.”*  
17  
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22 If a similar approach is given to hearing health then people will be in a better position to  
23  
24 understand the risks and how to protect their hearing. Participants said they would welcome  
25  
26 *“more education”* on the risks of noise exposure so they could be *“more informed”*. Being  
27  
28 better informed would mean people can decide for themselves what action to take:  
29

30 *“It certainly would raise people’s awareness of what they’re being exposed to and*  
31 *they can choose for themselves with more knowledge what they’d like to do.”*  
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37 With greater awareness over the dangers of noise exposure, people will start to see their  
38  
39 hearing as a priority and will be able to make better educated informed decisions regarding  
40  
41 their hearing health. If there is increased awareness, then attitudes might change, and there  
42  
43 may be less stigma attached to wearing earplugs:  
44

45 *“Maybe if more people were doing it and maybe if more people realised the*  
46 *consequences of loud music, then maybe we would pay more attention and maybe*  
47 *wearing earplugs in a nightclub wouldn’t be such a thing.”*  
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## 54 Discussion

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3 The aim of this study was to explore attitudes and behaviours towards leisure noise and use of  
4 hearing protection among young adults with no known hearing loss or tinnitus. Focus groups  
5 provided a rich setting for participants to share their opinions.  
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10  
11 The participants generally had positive attitudes towards noise, in that they enjoyed loud  
12 music and considered themselves music lovers. Many young people believe music is  
13 enhanced when played very loudly (Mercier and Hohmann, 2002). The participants shared the  
14 opinion that there is an expectation that clubs and concerts will be loud and this is part of the  
15 experience. This finding is similar to a study in the US with 700 young adults in which the  
16 majority were regular attenders of discotheques and rock concerts and did not consider the  
17 noise to be too loud (Mercier and Hohmann, 2002).  
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28 Participants were concerned that earplugs would have an effect on music quality by reducing  
29 the clarity of the music. As participants considered themselves music lovers they placed more  
30 importance on their lifestyle, enjoyment and love of loud music, than on their hearing.  
31  
32  
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35 However, a love of music was also a motivating factor for earplug use for some participants  
36 who had experienced injury from noise, in order to prevent further damage. This is consistent  
37 with other research (Beach et al., 2012). Those who have experienced hearing problems as a  
38 result of noise are more likely to use earplugs (Bogoch et al., 2005; Laitinen, 2005; Hunter,  
39 2017).  
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48 On occasion participants reported having negative attitudes towards noise in a particular  
49 venue that is very loud or when they experienced temporary hearing problems. This  
50 sometimes resulted in protective behaviours such as moving to the back, leaving early, or  
51 taking breaks. However, few people actually wore earplugs. Many young people have little  
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3 experience with earplugs because there is still a stigma attached to wearing them; and they did  
4  
5 not have any friends who wore them. Peer norms and behaviours were a significant factor in  
6  
7 the decision to not wear earplugs as they wouldn't want to be the only person in their peer  
8  
9 group wearing them, for fear of looking odd and getting teased. This finding is in line with  
10  
11 Widén (2013) who suggested that social norms were more important than attitudes in relation  
12  
13 to using hearing protection. It has been shown consistently that those who are concerned  
14  
15 about their appearance are significantly less likely to wear earplugs, even if provided free  
16  
17 (Bogoch et al., 2005).  
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21  
22 The analysis of these focus groups also revealed that although there was recognition that loud  
23  
24 noise could potentially cause damage, there was a clear lack of knowledge concerning the  
25  
26 potential damage that noise can do and their own susceptibility to hearing loss and tinnitus.  
27  
28 Many people did not understand what tinnitus is, or what exposure levels could cause  
29  
30 damage, or how those symptoms might present themselves. They felt their personal risk of  
31  
32 hearing damage was low due to the infrequency of exposure. There was the view that going  
33  
34 out once or twice a week would not cause any damage and hearing loss was considered an old  
35  
36 persons illness and not something to worry about at a young age. For people who have never  
37  
38 experienced tinnitus or hearing loss and have no peers with hearing problems it can be hard to  
39  
40 appreciate the risk to self of developing hearing problems. In the current study, exposure to  
41  
42 loud noise was not viewed as something to be concerned about, perhaps due to their limited  
43  
44 experience of hearing problems. Where people have experienced permanent signs of damage  
45  
46 after previous exposure to loud music, they are more likely to be aware that noise damage is  
47  
48 irreversible and permanent, and to be concerned about hearing damage and wear earplugs  
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51 (Beach et al., 2012).  
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3 Because of a lack of knowledge and concern over the consequences of noise damage and  
4  
5 hearing problems, many young people felt there were more important things to worry about.  
6  
7 Hearing problems were not viewed as a priority when there are other behaviours such as  
8  
9 smoking, alcohol and drug use that are given much more attention and focus in society. In the  
10  
11 United States, a study found that potential hearing loss as a result of loud music is low in  
12  
13 priority compared to other general health issues (de Lourdes Quintanilla-Dieck et al., 2009).  
14  
15 A survey conducted online with over 9,000 responses also found that most young people did  
16  
17 not consider hearing loss a major concern (Chung et al., 2005), and prioritised other health  
18  
19 issues such as sexually transmitted diseases, alcohol intake, drug use, depression, smoking,  
20  
21 and nutrition and weight issues.  
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26 This study is not without its limitations. Focus groups have the potential to involve self-  
27  
28 presentation biases, and the influence of peers opinions can lead to conformity of views.  
29  
30 However there was disagreement within the focus groups, so it is probable that participants  
31  
32 did actually discuss their true opinions. Additionally, due to the nature of focus groups, it was  
33  
34 not possible to compare the attitudes and behaviours of those with low attendance with those  
35  
36 with frequent attendance of loud leisure venues. Although many participants stated how  
37  
38 frequently they visit loud venues, focus group data is analysed as a whole and not  
39  
40 individually. A further limitation is that the sample was drawn from one University and these  
41  
42 participants are therefore not representative of young adults in general. However, the goal of  
43  
44 qualitative research is not to collect a representative sample, but rather to describe  
45  
46 participant's experiences. Although key attitudes and behaviours towards leisure noise and  
47  
48 earplugs have emerged from the data, generalisations cannot be made as this is a relatively  
49  
50 small qualitative study. A further limitation is the lack of a second coder during data analysis.  
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3 However steps were taken to enhance the credibility of the findings (as mentioned in the  
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5 methodology).

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9 Nonetheless, these findings have important implications for hearing education programmes  
10 among young adults. First and foremost, knowledge and awareness about the damaging  
11 effects of leisure noise needs to increase among young adults. With increased awareness and  
12 knowledge, people will be better informed, and in a better position to consider how best to  
13 protect themselves from noise damage. As hearing problems are irreversible, it is essential for  
14 people to take steps to protect their hearing before they experience any symptoms. As  
15 earplugs have been found to be effective in preventing temporary hearing loss after loud  
16 music exposure (Ramakers et al., 2016), it is imperative that earplug use is promoted in young  
17 adults, and people who attend loud music events. Such information could be circulated at  
18 schools and Universities offering the opportunity to reach large numbers of people. Music  
19 venues could also do much more to protect the hearing of its customers, including ensuring  
20 loudspeakers are placed away from visitors, and have separate spaces away from the noise to  
21 allow people to give their ears 'a break' (Vogel et al., 2009a). As a minimum, venues should  
22 inform their visitors of the potential risks for hearing loss and/or tinnitus, and warn visitors  
23 about the dangers of being exposed to loud volume music (Vogel et al., 2009b).

24  
25  
26  
27 Educational programmes may also be beneficial if tailored to specific age and ethnic groups  
28 (Crandell et al., 2004). It has also been suggested that hearing health promotion should be  
29 tailored to best suit the stage of change of individuals (Gilliver et al., 2015). For example,  
30 those who are ready to begin considering looking after their hearing will require different  
31 information and support to motivate them, than those who are not concerned about damage  
32 and are not ready to change their behaviours. Hearing protection campaigns such as Adopt-a-

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3 band (Auchter and Le Prell, 2014), Dangerous Decibels (Martin et al., 2006) and The Sound  
4  
5 Sense (Neufeld et al., 2011), all in the US, can increase knowledge of the association between  
6  
7 leisure noise exposure and hearing damage, and promote the use of hearing protective  
8  
9 devices. However, it is worth noting that increased awareness, through educational hearing  
10  
11 campaigns, does not necessarily increase the use of hearing protection devices (Keppler et al.,  
12  
13 2015a). Considering even those with noise-induced hearing problems do not always recognise  
14  
15 the importance of protecting their hearing (Hunter, 2017), the challenge for hearing health  
16  
17 promoters to increase protective behaviours regarding hearing remains difficult. In order to  
18  
19 achieve any significant long lasting change in young adults' leisure noise behaviour, it is  
20  
21 imperative that preventive work also tackles societal norms and regulations, as well as  
22  
23 individual behaviour change through increasing awareness and knowledge of the risks of loud  
24  
25 music exposure.  
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36  
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### 42 Declaration of conflicting interests

43  
44 The Author declares that there is no conflict of interest  
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Figure 1: Overarching themes related to attitudes and behaviours towards leisure noise and use of hearing protection

