

Attitudes, rewards, and listening-habits in Danish youth

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This study surveyed more than 1,800 Danish teenagers' habits and attitudes towards MP3 listening. The questionnaire registered self-reported sound exposure, listening behavior, perceived rewards of listening and the effect and media preferred for prophylactic information. A 'risk group' of approx. 10% of respondents was defined, which in terms of relative size corresponds well to other recent studies. In general, the risk group indicated more reasons for listening to loud music. However, the three most popular reasons, independent of risk categorization, were: "I can better feel/enjoy music when it is loud", "I can lose myself in loud music", and "I get energy from listening to loud music". More than 40% of the risk group indicated "I relax better with loud music" and "I get a pleasant bodily effect with loud music". Not surprisingly, the pattern of use revealed that the risk group use their MP3-player in more situations, and for notably longer periods of time, such as reading, sleeping, and by the computer. The respondents indicated that information on potential hearing risks from MP3-usage is preferably received via television and commercials or from nurses and doctors. The most effective examples seen in the survey were actual case stories, medical argumentations, or the experience of hearing-loss symptoms.

BACKGROUND

The MP3 player is often criticized for exposing younger generations to music at excessive sound levels, increasing the risk of noise-induced hearing loss later in life. Unlike previous sound systems, the MP3 players are easy to carry and capable of delivering uninterrupted music for prolonged periods at high listening levels, which notably increases the possible exposure. This observation is based on the general assumption that sound energy (product of time and level) is the cause of noise-induced hearing loss. To prevent such hearing damage in the younger generations the European Union has issued a regulation which prohibits MP3 players from delivering more than 100 dB SPL (SCENHIR, 2008). However, it seems that the information campaigns on the hazardous effects of MP3-listening had a small impact on the MP3-users' behaviour. The hypothesis behind this study is that the limited effect might stem from the rewards experienced when listening to (loud) music,

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exceeding the perceived risk from the sound exposure. To develop effective prevention strategies, this study was designed to investigate the listening behaviour among teenagers and the experienced effects from listening to (loud) music, as well as their self-reported music exposure.

DEVELOPING THE QUESTIONNAIRE

A 25-item web-based questionnaire was developed with inspiration from the thoughts of Barry Blesser that the instant rewards from loud music might outweigh the long-time negative effects to hearing (Blesser and Salter, 2008). As there were no existing questionnaires with this exact focus, a new one was developed. It was assumed that assessing the listening habits and the rewards from listening could not be extracted from an 'open' questionnaire. Therefore, a predetermined or 'closed' set of answers was developed. The respondents could respond to the questions by selecting the appropriate option or selecting their degree of agreement with a statement, allowing their attitude, behavior, and habits to MP3-player usage to be determined. The closed sets of answers were adjusted through pretests, which aimed to locate the largest set of realistic situations and rewards. The questionnaire was developed to be administered online through Analyzer.com. The questionnaire items were divided into six main categories: 'Demographic information', 'Listening habits', 'Rewards', 'Symptoms of hearing loss', 'Knowledge and attitudes towards MP3 loud music listening', and 'The effect of media and prophylactic information'.

Statistical analyses

The data were extracted in pivot tables in Excel, and the risk and non-risk groups were tested for differences compared to the population using the Chi-square statistics. A probability level of $p < 0.05$ was used to determine the statistical significance of the results.

REWARDS FROM LOUD MUSIC

Since ancient times, music has been used as a tool to change the emotional state of the listener; raising the spirit, calming or soothing the mind, as well as experiencing physical effects such as relaxation or as an energy booster (Blesser, 2007). Loud music drowns out fainter sounds, which enables some kind of territorial dominance. Since non-amplified music requires much effort to be played out loud, the loud played music represents more strength and power. If the music is kept in headphones, it offers the listener the possibility of getting lost in the music and mask unpleasant sounds from the outside surroundings. Louder music is more effective in the masking. Also, MP3 music can provide the listener with physical pleasure, improve his/her mood and concentration level Vogel *et al.* (2011). Salimpoor *et al.* (2011) showed that music can trigger dopamine and thus activate the reward center of the brain. This provides a neurologic explanation as to why music can act as a mood agent. Music is simply a stimulant, like sugar, caffeine, exercise, sex, etc. Florentine *et al.* (1998) questioned 90 young people in their musical behavior, based upon the 'Michigan Alcoholism Screening Test', and concluded that 9% of the

questioned scored high enough to be qualified as ‘music alcoholics’. They indicated a behavior corresponding to alcoholics, as they felt the necessity of loud music, as a way of releasing tension. They ignored negative consequences (i.e., tinnitus) and they even showed withdrawal symptoms when deprived of loud music.

DEFINITION OF RISK GROUP

To investigate the behavior of teenagers’ risky MP3-player listening, compared to a control group not at risk of hearing damage, a so-called ‘risk group’, based on self-reported data, was defined. Portnuff *et al.* (2011) reports the average maximum outputs in dB(A) of three different types of headphones across all MP3 players and all music signals. In this way, self-reported volume settings can be converted to listening levels, and combined with listening time an exposure value can be calculated and compared with 50% daily noise dose limits from MP3 alone (cf. Table 1 and Fig. 1), given that a person may be exposed to other intense noise during the day. Based on this a risk group of about 10% of the respondents was constructed. The relative size of the risk group corresponds well to earlier studies (Degn, 2009; SCENHIR, 2008).

Maximum listening time per day depending on headphone type and volume control setting			
% of VC	Earbud	Isolator	Supra-aural
10-50%	No limit	No limit	No limit
60%	No limit	14 h	No limit
70%	6 h	3.4 h	19 h
80%	90 min	50 min	4.6 h
90%	22 min	12 min	66 min
100%	5 min	3 min	16 min

Table 1: The table shows an average listening time to 50% noise dose (8 hours 85 dB LAeq) using the criteria for a noise risk from the National Institute for Occupational Safety and Health (NIOSH) (Portnuff *et al.*, 2011:669).

MAIN RESULTS

The main results are presented with five headlines ‘Demographic data’, ‘Listening habits’, ‘Rewards’, ‘Knowledge and attitudes’, and ‘The effect of media and prophylactic information’, and correspond roughly to the six dimensions defined in the construction of the questionnaire.

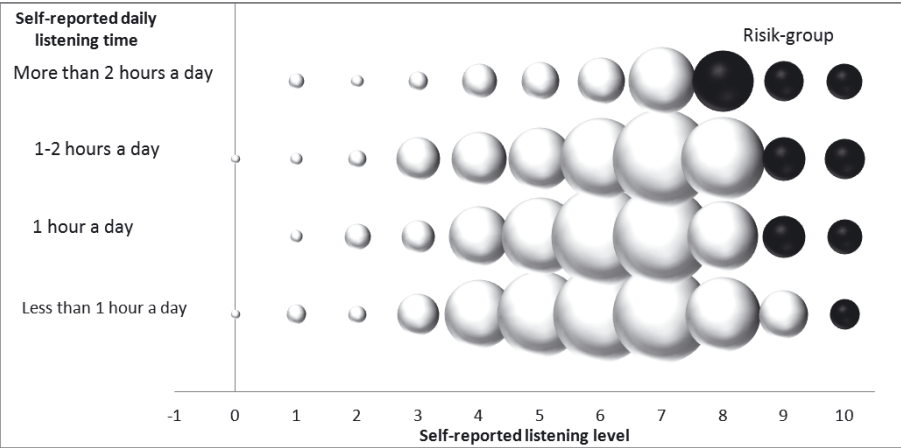


Fig. 1: The figure shows the distribution of self-reported listening time and MP3-player volume setting. The black balls indicate the people in the risk-group defined as too loud and/or to long listening sessions.

Demographic data

Although 1,828 completed the questionnaire, the distribution of education and gender of the received answers were not representative for the population. The answers showed that women attending the Danish secondary school, ‘Gymnasium (Stx)’ were more prevalent than in the population. Normally around 30% of the whole population attends gymnasium, and among the respondents of this questionnaire there were more than 80%. Furthermore, 66% of the questionnaires were answered by girls, and 34% by boys. Via the homepages of a number of gymnasiums, it was possible to distribute the questionnaires, which explains the higher prevalence from this education, and possibly also the gender effect, since there are probably more females attending gymnasium. Furthermore, a geographical bias in the respondents was uncovered. These factors must be kept in mind when interpreting the results from the questionnaire. It is easy to imagine a profile of a young male who has a practical education (perhaps operating a noisy machinery) having more loud listening habits, compared to a young woman attending classes most of the day. Nevertheless, the risk group also included a significant share of secondary school attendants.

Listening habits

One main question to be asked was of course: Do you listen to music at a volume level that might affect your hearing? The pie-charts in Fig. 2 indicate the distribution of answers in the risk and the non-risk group respectively. Clearly the risk-group is aware of its own risky behavior.

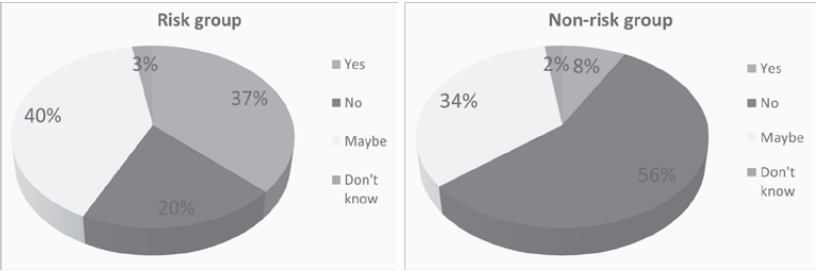


Fig. 2: Distribution of the answers to the question ‘Do you listen to music at a volume level that might affect your hearing?’ in the risk and in the non-risk group.

A supplementary question on the users’ own evaluation of the volume setting on their MP3 player indicated that 31% in the non-risk group considered their typical volume setting to be ‘high’ or ‘very high’, whereas 81% in the risk group were of the same opinion. The most commonly reported reasons for not listening at louder volume levels were to protect the hearing and not to bother others with their music in the non-risk group. The most reported reason in the risk group was also not to bother others with their music, but the second most common reason was that their MP3 players were unable to play louder, as shown in Fig. 3. Another question reveals that more than 1/3 in the non-risk group were often, or constantly, having trouble hearing their surroundings while listening to MP3 music, whereas in the risk group the corresponding number was 2/3.

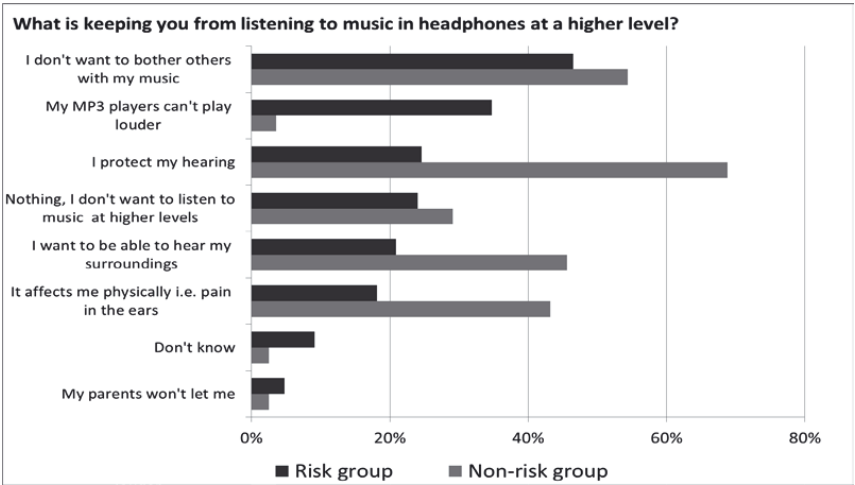


Fig. 3: Factors prohibiting music listening at louder levels, and how often they were chosen as answers respectively in the risk and the non-risk group.

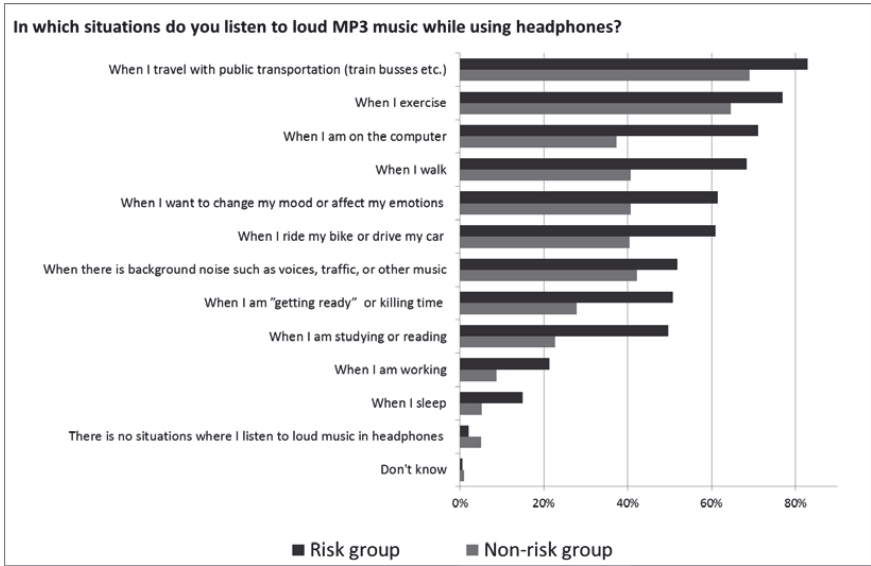


Fig 4: Situations of MP3-listening sorted after percentage of answers relatively to population.

Rewards from listening at high levels

The highest percentage (34%) in the non-risk group indicated that they enjoy listening to loud music on their MP3 player, while the majority of the risk group (62%) indicated that they *really* enjoy this. Figure 4 shows the settings for music listening. The most popular in both groups was during transportation and physical exercise. The risk-group uses the MP3 player far more in situations like ‘walking’, ‘at the computer (71% vs. 37%)’, ‘studying/reading’, and even ‘sleeping’. An average person from the risk group indicated more reasons for listening to loud music than the non-risk group. This indicates that the risk group persons are rewarded far more for their listening than the non-risk group.

More than half of the risk group indicated that they get in better mood with loud music and that they feel a pleasant effect in the body. A large percentage compared to the non-risk group also indicated that they were able to relax better while listening to loud music. All the possible reasons and their frequency of selection can be seen in Fig. 5.

Knowledge and attitudes

More than 3/4 of the respondents were knowledgeable as to how to protect their hearing, if the music was played at a moderate level. Knowledge on protection methods were considerably smaller in the risk group compared to the non-risk group. In the non-risk group, 42% reported concern about the potential damaging effects of loud music, compared to 28 % in the risk group.

The effect of media and prophylactic information

A series of questions showed the effect of prophylactic information and the way it is

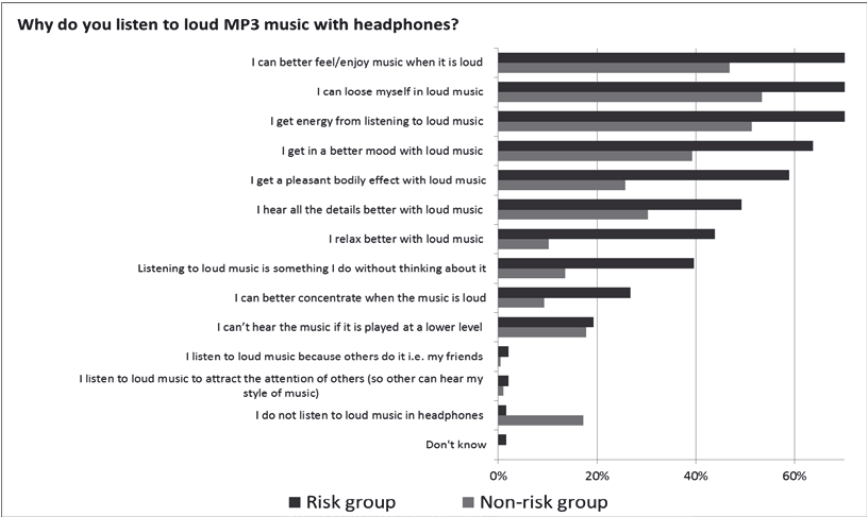


Fig. 5: Reported reasons for listening to loud music respectively for the risk and the non-risk group.

preferably received. Both groups indicated that information on potential hearing risks from MP3 listening are preferably brought to them by television and commercials or by nurses and doctors. Information received from newspapers, friends and family were reported to have an effect of less than 30% for both groups. Finally, the three most effective ways of prophylaxis, according to the respondents, were medical argumentations like doctors and nurses advice on volume levels, if they themselves experienced symptoms of hearing loss, or case stories like being exposed to examples of other young people with damaged hearing (cf. Fig. 6).

SUMMARY

Data showed that a considerably large number of teenagers have a behavior and an attitude towards loud music listening from MP3 players, which pose a threat of hearing loss later in life. Interestingly, the results clearly indicate that these teenagers are fully aware of their behavior, and actually do it for a kick, despite the risk of hearing loss. It seems that the teenagers who experience a greater emotional reward from listening to loud portable music use the players in several situations and in longer periods of time, which then increases the exposure time.

PERSPECTIVE

Most experts agree on the clear benefits of protecting the ears from music played too loud for too long. However, most young people seem not to act on the warning in due time. The results of this survey seem to support this observation, whilst at least some of the explanation of this phenomenon is that the positive effects from listening to loud music are felt to outweigh the long term negative effects for the individual. In this respect, listening to loud music might not be so different from

other unhealthy lifestyle issues such as obesity, alcohol, stress, smoking, etc., and consequently campaigns directed at lowering exposure to loud music should take this factor of pleasure/addiction into account when designed.

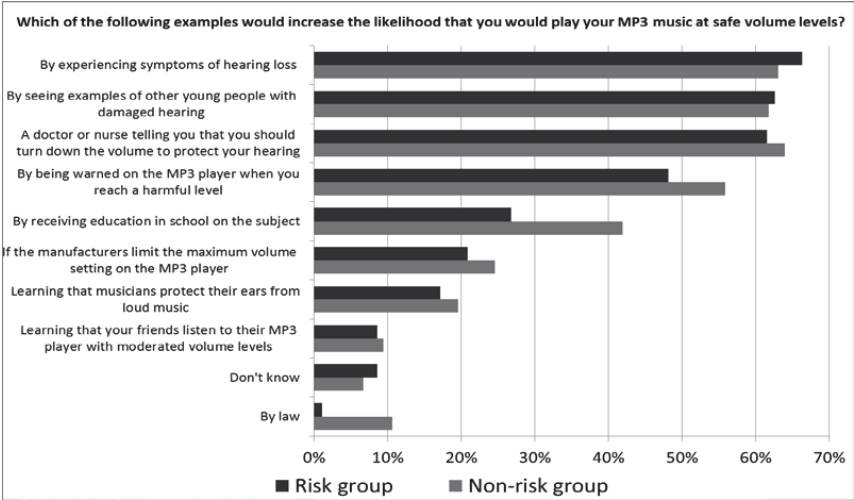


Fig. 6: The most effective ways of prophylaxis.

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