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Evaluating young people's listening practices: a public health issue

Valérie Rozec
CidB, French center of noise
12 rue Jules Bourdais 75017 Paris

Antoine Perez-Munoz
Bruitparif
32 boulevard Ornano 93200 Saint-Denis

Charlotte Bedhouche
RIF- Réseau des musiques actuelles en Ile-de-France
221 rue de Belleville 75019 Paris

ABSTRACT

Listening to music through headphones or earphones has become commonplace with the development of new technologies. If this listening is prolonged over long periods and at high noise levels, it exposes young people to risks to their hearing systems. The WHO (2021) indicates that one person in four is expected to have hearing problems by 2050, and 1.1 billion young people worldwide could be at risk of hearing loss due to dangerous listening habits.

Three French organizations (Le RIF, Bruitparif and CidB) have joined forces, with the support of the regional health agency of Ile de France, to coordinate their hearing risk prevention campaign and carry out a study ahead of the campaign to find out about listening practices using headphones or earphones, concert attendance and the precautions taken by teenagers to protect themselves from hearing risks. The results, based on a sample of 2,685 teenagers (secondary school), will provide a snapshot of practices so that prevention messages can be adapted during awareness campaigns.

1. INTRODUCTION

Music is central to the daily lives of young (and not so young) people, and is experienced as a means of relaxation, release or comfort, helping to regulate emotional states. The power of sound encourages immersion in the music, the search for strong sensations and the impression of being able to touch the sounds. Being able to choose the music, to mask certain unwanted sounds and thus to choose the sound environment increases control and enhances the feeling of freedom.

Listening to music through headphones or earphones is a widespread practice around the world. The diversity of music listening media (music platforms, gaming platforms for concert viewing, social networks) means that more and more time is spent with headphones or earphones. Young people can spend many hours a day listening to their favorite artists, or the playlists produced by music platforms (Deezer, Spotify, YouTube, Apple Music, Qobuz, etc.). A survey of 43,000 internet users aged 16 to 64 in different countries around the world [1] revealed that the amount of time spent listening to music has increased worldwide. On average, internet users listen to music for 18.4 hours

a week - the equivalent of 368 three-minute tracks. Among 16–24-year-olds, the time spent on music platforms listening to streaming music has increased by 51% from 2019 to 2021.

Nowadays, this use is combined with playing online video games with headphones for greater immersion in the game and watching episodes of TV series, which can lead to a lot of cumulative daily headphone listening.

Concerts and festivals are also being attended by an increasingly young population. A study conducted by the CidB [2] on a sample of 3,541 primary school pupils showed that 60% of pupils went to concerts or festivals with their parents, and over 55% of them thought the music was too loud.

If music is listened to for long periods at high levels, it exposes people to risks to their hearing.
If the tolerable dose of sound, which depends on the sound level and the duration of listening, is exceeded, the auditory system risks premature wear and tear, which ultimately constitutes a real handicap. This risk is insidious because it appears at sound levels well below the threshold of pain felt by the individual, and the symptoms (tinnitus, reduced hearing, hyperacusis) are often trivialized and not identified as warning signals.
A meta-analysis [3] of 33 studies (19,046 individuals) estimates the prevalence of exposure to dangerous listening from digital players with headphones or earphones at 23.81% (95% CI: 18.99% to 29.42%) in 12–34-year-olds and an estimated prevalence of 48.20% for noisy entertainment venues.
The World Health Organization (WHO) predicts that one in four people will have hearing problems by 2050, and 1.1 billion young people worldwide could be at risk of hearing loss due to unsafe listening habits [4].
The "Global burden of hearing loss" study [5] indicated that hearing loss is the fourth leading cause of disability worldwide, with consequences in terms of communication, social isolation, difficulties in the workplace and reduced quality of life.

Dangerous listening behavior can be avoided by promoting safe practices for young people's hearing during prevention campaigns.

2. THE CONTEXT OF THE STUDY

Three French organizations (RIF, Bruitparif and CidB) have been working together for many years on prevention initiatives aimed at students and have joined forces to study young people's listening practices. Prior to their interventions, a questionnaire common to all three organizations is completed by secondary school pupils to find out about their music-related practices.
This study was supported by the regional health agency of Ile-de-France.

3.OBJECTIVES OF THE STUDY

The objectives are as follows:
- Study the use of headphones and earphones and the use of venues where amplified music is played,
- Assess the precautions taken by schoolchildren to protect themselves from hearing risks,
- find out about symptoms,
- Analyze changes in these practices to enable prevention players to adapt their prevention campaigns and messages to the needs thus identified.

4. DESCRIPTION OF THE SAMPLE

The data provided by secondary school pupils, which is completely anonymous, has been statistically analyzed based on questionnaires collected over two school years (2021-2023).

The sample is made up of 2,685 secondary school students in the Ile-de-France region surveyed between 2021 and 2023. 53% were girls and 47% boys. The average is 13-year-old.

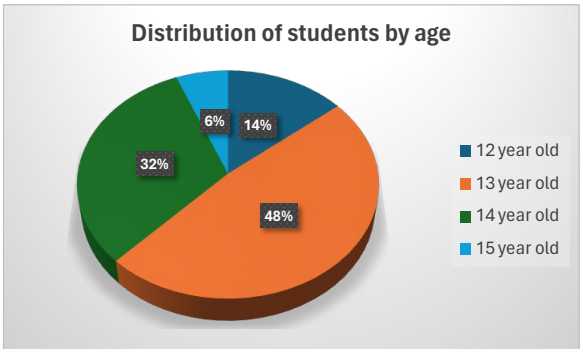


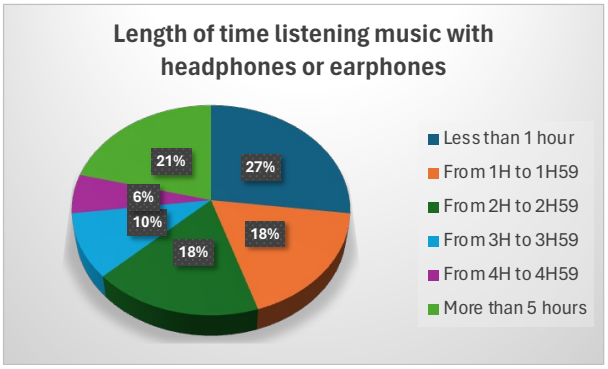
Figure 1: distribution of students by class

Between 2021 and 2023, the largest number of pupils benefiting from the prevention campaigns are 13-year-old.

5. RESULTS

Long periods of listening with headphones or earphones

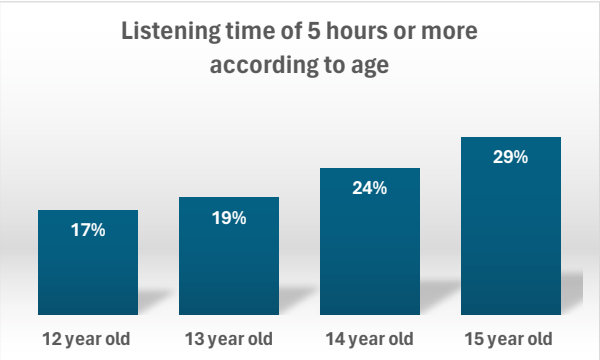
88% of secondary school students listen to music. 35% use headphones and 65% use earphones.



Graph 3: Length of time listening to music with headphones or earphones

73% of secondary school pupils listen to music for more than an hour a day, and this can rise to more than four hours a day for more than one pupil in four (27%). These habits increase with age, as Figure 4 shows: by the age of 15, 29% of pupils are listening to music.
Significant differences were observed in listening time by gender: more girls than boys listen to music for long periods. In fact, 23% of girls listen to music for more than 5 hours a day, compared with 19% of boys ((χ^2= 24.51; ddl=5 p<.001).

Intensive music listening seems to increase with age:

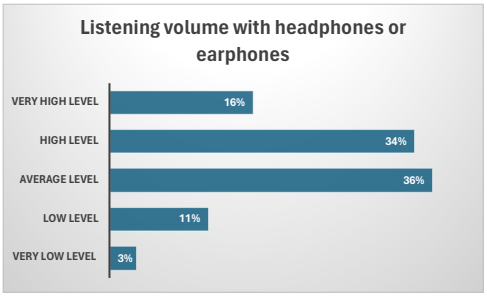


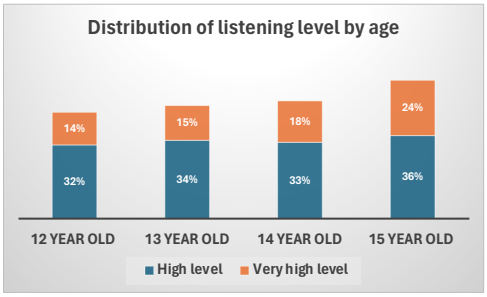
Graph 4: Length of time listening to music for 5 hours or more, by age

Listening to music for long periods increases with age (χ^2= 41.977; ddl=15 p<.001):

At the age of 12, 17% of schoolchildren listen to music for 5 hours a day, and 29% at the age of 15.

In addition to duration, the volume of listening must be taken into account to assess the risks taken by schoolchildren:



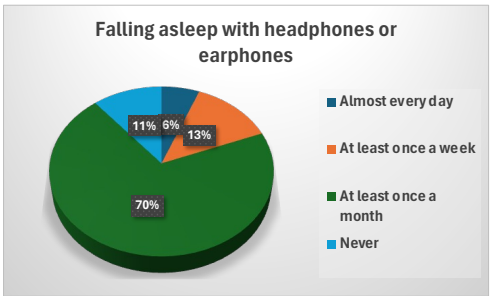


Graph 5: Distribution of secondary school pupils according to listening volume **Graph 6: Reported volume according to age**

47% of the students questioned said that they set the volume at a high or very high level and only 14% at a low or very low level. These listening levels tend to increase with age. 14% of 12-year-olds listen to music very loudly, and 24% of 15-year-olds do so.

What's more, the volume tends to increase as listening time increases. Of all students who listen for 5 hours or more a day, 50% set the volume at a level they consider loud or very loud. Only 39% do so when they listen for less than an hour a day.

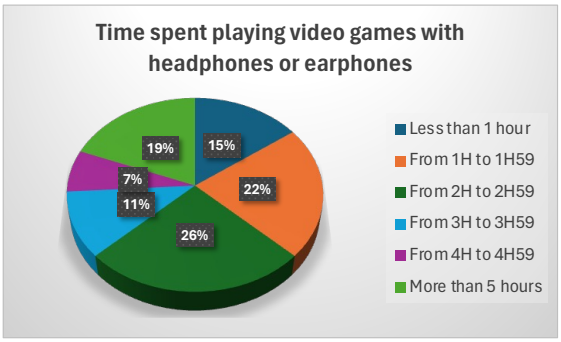
Night-time use increases with age



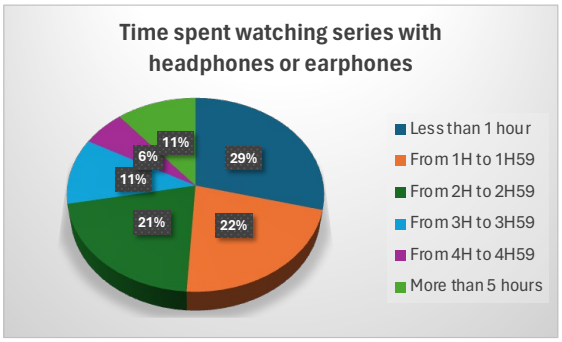
Graph 7: Frequency of falling asleep with headphones or earphones on

Overall, 19% of students say they fall asleep every day or several times a week with headphones on. Prevention must involve all secondary school pupils to reduce the risk of hearing loss and deterioration in sleep quality. Particularly as only 22% of students who listen to music in bed program the end of their listening time before going to sleep.

A combination of leisure activities using headphones/earphones



Graph 8: Length of time spent playing video games



Graph 9: Length of time spent watching series

52% of students play video games with headphones, 26% of them intensively (more than four hours a day). Seventy-one per cent watch TV series and videos, with 17% spending more than four hours a day.

Practices that accumulate over time! Pupils who listen to music for a long time (+5 hours/day) are also those who spend a lot of time playing video games (31%) or watching TV series (25%). These practices considerably increase the amount of time spent listening to music through headphones or earphones for some secondary school pupils. These pathogenic practices on the part of a proportion of secondary school pupils particularly reinforce the need to step up primary prevention even before these practices become established [6].

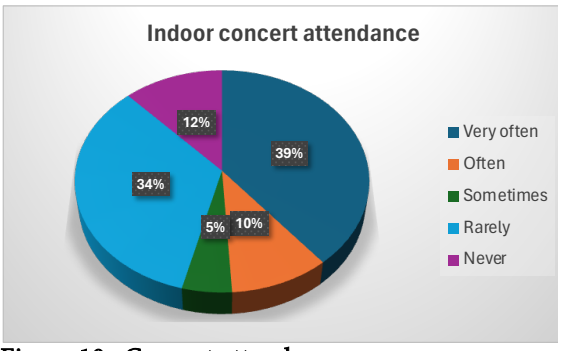


Figure 10 : Concert attendance

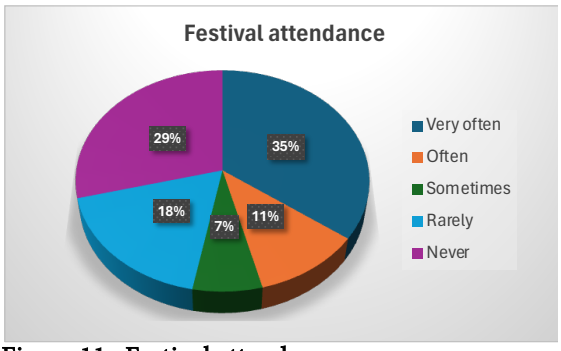


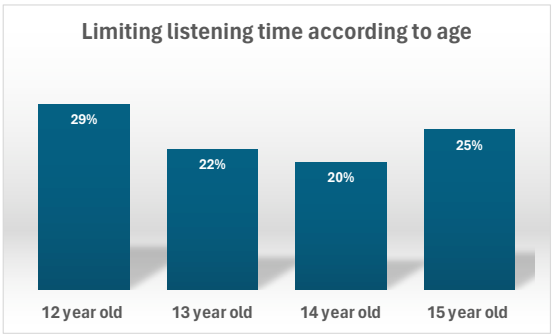
Figure 11 : Festival attendance

Attendance at music venues is not marginal, as almost one in two secondary school pupils attend concert halls (49%) or festivals (46%) often or very often.

How students protect themselves

When listening to music through headphones, 63% of secondary school students are prepared to limit the volume and only 21% to reduce the listening time to limit the risk of hearing damage. We did not observe any significant gender differences in the protective behaviors that students would be prepared to adopt.

However, age seems to play a role in people's intentions to protect themselves.



Graph 12: Limiting listening time by age

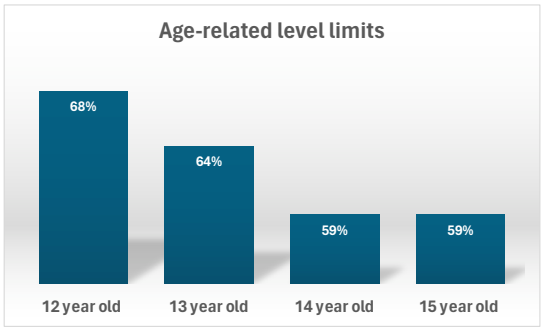


Figure 13: Limiting volume by age

In fact, 68% of 12-year-old pupils are prepared to limit the volume of music they listen to and only 59% of 15-year-olds are prepared to do so (χ^2= 9.633; ddl=3 p<.02). Similarly, 29% of younger people are inclined to limit the amount of time they listen to music to preserve their hearing and only 25% of 15-year-olds (χ^2= 9.884; ddl=3 p<.02). Prevention messages should therefore stress the importance of lowering the volume rather than the duration of listening.

In addition, at concerts and festivals, several precautions can be taken when exposed to amplified music to minimize the risk of hearing loss, such as moving away from loudspeakers, wearing hearing protection (earplugs or headphones) or taking breaks. Are these protective measures popular with young people?

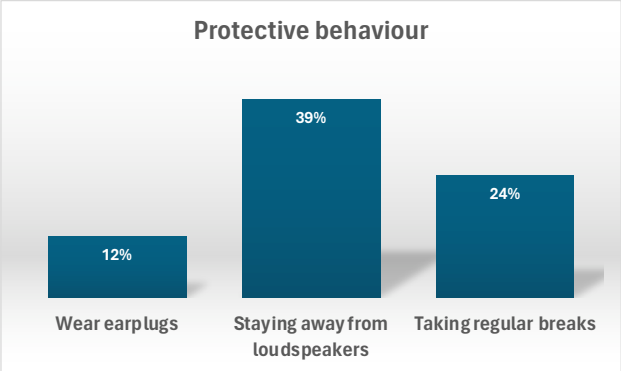


Figure 14: Protective behaviors at concerts and festivals

Some teenagers take precautions to limit their exposure by staying away from loudspeakers (39%), taking regular breaks (24%) and only 12% wear earplugs.

Indeed, young people rarely think about the risks involved when faced with the emotional states they experience. When these are considered, the choice is quickly made between the immediate pleasure of listening at high volume and the need for protection, with the pleasure mitigated by earplugs. In the absence of symptoms, immediate pleasure takes precedence. However, unprotected use of these leisure venues can lead to more or less long-term damage to young people's hearing. The dose of noise received in these amplified music venues is high and constitutes a real risk of hearing damage, especially as this exposure is often combined with other high-volume activities such as listening to music on headphones.

Symptoms that are not perceived as a medical emergency!

However, in these places where amplified music is played, some of the pupils experienced symptoms.

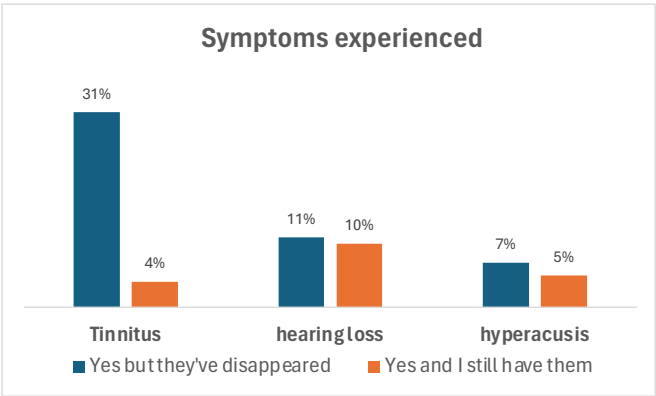


Figure 15: Symptoms experienced after high-volume exposure.

Tinnitus was experienced by 35% of students, hearing loss by 21% and hyperacusis by 12%. In the majority of cases, these symptoms disappeared after a few hours, which can lead schoolchildren to question the irreversible nature of hearing damage and to trivialize these situations.

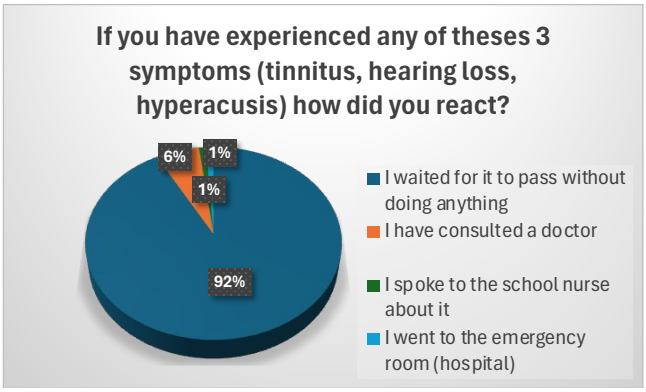


Figure 16: Actions taken in response to symptoms experienced.

The vast majority of secondary school pupils who had experienced an auditory symptom (hearing loss, tinnitus, hyperacusis) had waited for it to pass without doing anything (92%). Only 6% of students consulted a doctor and 1% spoke to the school nurse. Schoolchildren (and probably their parents) have no reflex to go to an ENT emergency in this type of situation (1%). However, in the case of acute noise trauma caused by exposure to high levels of noise, this is a medical emergency in that the ENT doctor only has 48 hours to provide effective treatment to prevent irreversible hearing loss.

Hearing screening also has an important role to play in prevention. Life expectancy is increasing, but that doesn't mean our hearing capacity is increasing! Today, it is vital that young people become aware of the risks very early on to avoid premature wear and tear on their hearing systems. In our sample, only 19% of teenagers remember having their hearing tested at school.

6. DISCUSSION

Unsurprisingly, listening to music and other media through headphones or earphones accounts for a significant proportion of the exposure of schoolchildren, and for extreme use (in terms of duration and intensity) leads to a risk of early hearing loss that can handicap them in their daily lives (difficulties in understanding exchanges, reduced concentration, fatigue, isolation). Risk behaviors (high volume and duration of listening, falling asleep with headphones on) increase with age. Those aged 15 and over are most at risk.

Preventive measures should be offered to teenagers before this age to get them used to virtuous practices (limiting the volume and duration of listening, protective behavior when exposed to high volumes at musical events, reflexes to have in the event of symptoms). Raising awareness of good headphone listening practices is necessary from primary school onwards. As soon as they start secondary school, prevention sessions should inform them of the dangers and teach them to recognize the symptoms that should lead them to alert their parents or health professionals.

More targeted initiatives aimed at older children (aged 14 and 15) also seem necessary, at an age when they can sometimes adopt extreme behaviors, to make them aware of the irreversible effects on their hearing health but also of the harmful consequences for their day-to-day social lives. Parents also tend to trivialize the symptoms experienced by their children. Informing parents is also an important way of relaying prevention messages, adopting good practices themselves and spotting symptoms that should lead them to seek urgent medical attention.

Primary prevention must remain the primary lever for action

Faced with this public health challenge, prevention campaigns should be undertaken from a very early age (practices are increasingly precocious) to promote the advantages of listening to music with appropriate headphones, for reasonable lengths of time and at reasonable levels, and to adopt protective measures in entertainment venues such as concert halls or festivals (distance from loudspeakers, recovery time in quiet areas, wearing earplugs, etc.).

Developing students' skills to protect their hearing health.

The second lever for greater effectiveness is to support and develop pupils' skills so that they can make reasoned choices in favor of their hearing health. The theory of planned behavior seems to have proved effective in promoting positive attitudes towards turning down the volume and listening for reasonable lengths of time [11].

In France, there are a number of school-based schemes (health-promoting schools, educational health pathways…) that encourage pupils to take care of themselves and others, and to become responsible citizens in terms of individual and collective health. A number of hearing screenings are carried out in schools throughout the school career. These screenings, which are a genuine prevention tool, are designed to alert parents if hearing problems are detected and also to make pupils aware of the risks of hearing loss. The role of the school nurse is crucial in raising awareness among pupils of the need to adopt protective behaviors on an individual basis and to make hearing risk prevention a collective part of school projects.

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