Checklist to identify noise induced hiperacusis in traffic police and street vendors

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ABSTRACT

This study examines the non-auditory effects of noise pollution on the attentional, social, and emotional aspects of street vendors and traffic police who have been exposed to noise for more than 5 years. The study group consisted of 25 traffic police and 25 street vendors aged 22 to 55 years, with no history of hearing loss, middle ear pathologies, or other neurological problems affecting hearing. A checklist consisting of 20 questions was used to collect data, exploring the social, emotional, and attentional dimensions. The study aims to provide insights into the potential impact of noise pollution on these dimensions, especially in individuals with prolonged noise exposure. The study aimed to investigate the prevalence of noise-induced hyperacusis in two groups of individuals who have been exposed to high levels of noise for more than five years: traffic police and street vendors using a checklist. Mann-Whitney U test was used to compare the scores obtained in each domain for the two categories, and the results indicated that there were no statistically significant differences between the scores of major subscales. This means that the scores for social, emotional, and attentional aspects of hyperacusis did not differ significantly between street vendors and traffic police. The study highlights the importance of identifying the specific ways in which noise pollution affects individuals, to develop more targeted interventions to reduce the impact of noise pollution on communities. However, the study has some limitations, including the small sample size and the limited duration of noise exposure. Future research should include larger sample sizes, compare different professions that work in noisy environments, and include subjects with more than 5 years of working experience to better understand the impact of prolonged noise exposure. Additionally, more samples for normalization can be included in future studies to reduce the chances of sampling errors and to improve the generalizability of the findings. Overall, the study provides important insights into the impact of noise pollution on the attentional, social, and emotional dimensions of street vendors and traffic police, and further research is needed to fully understand the impact of noise pollution on human health and well-being.

Keywords: hyperacusis, audiology, traffic police, street vendors

INTRODUCTION

Excessive noise is a global occupational health hazard with considerable social and physiological impacts, including noise-induced hearing loss (NIHL) and hyperacusis. Sound becomes unwanted when it either interferes with normal activities such as sleep or conversation or disrupts or diminishes one's quality of life. The source of outdoor noise worldwide is mainly caused by machines, transport, and propagation systems.

Hyperacusis is a hearing disorder that affects a person's ability to tolerate certain sounds. While most people can tolerate sounds at a normal level, those with hyperacusis may find even everyday sounds, such as the sound of a car passing by or the sound of someone speaking, to be uncomfortably or painfully loud (ASHA, 2015). Hyperacusis can be caused by a variety of factors, including exposure to loud noise, head injuries, and certain medical conditions. It can significantly impact a person's quality of life, making it difficult to carry out everyday activities and participate in social situations.

Hyperacusis can be linked to various medical conditions, including Bell's palsy, Meniere's disease, chronic depression (Nelson, 2004), tinnitus, autism spectrum disorders ((Khalfa, 2004), and William syndrome. Loud noise exposure is also a significant cause of hyperacusis, and it can occur gradually over time or suddenly due to a single intense noise, such as a gunshot or it may develop gradually from listening to loud noise without hearing protection (Axelsson, 1987). People who work in noisy occupations, such as machinists, traffic police, street vendors, and musicians, are at a higher risk of developing hyperacusis. There is some evidence to suggest that sound deprivation, such as wearing earplugs for an extended period, may lead to an increased sensitivity to sound (Munro, 2009). It's important to manage hyperacusis symptoms by seeking medical attention, avoiding loud noises, and using hearing protection.

Currently, there are no objective tests or measurements to diagnose hyperacusis. Clinicians typically rely on patient-reported symptoms and use questionnaires to evaluate their sensitivity to sounds. The uncomfortable loudness level (UCL) test is a common tool used to assess hyperacusis (Anari, 1999), which measures the intensity level at which a patient feels uncomfortable or in pain when exposed to a sound. A UCL below 90 dB HL is often considered a sign of reduced tolerance to sounds and is associated with hyperacusis. However, it is important to note that the UCL test is subjective and can be affected by factors such as the patient's mood, fatigue level, and anxiety. Therefore, it is essential to take a holistic approach to evaluate hyperacusis symptoms and consider a patient's medical history, lifestyle, and other factors that may contribute to their condition.

Salvi (2016) explored an animal model of hyperacusis that investigated the effects of noise exposure during early life on sound loudness sensitivity later in adulthood. The study found that rats exposed to noise at an early age exhibited increased loudness perception later in life, which is a manifestation of hyperacusis. This study suggests that early-life noise exposure can lead to long-term changes in auditory perception. Similarly, Johan et al. (2016) conducted a review of the literature on hyperacusis and comorbidities and found

that hyperacusis can be associated with various medical conditions, including posttraumatic stress disorder, chronic fatigue syndrome, generalized anxiety disorder, depression, fibromyalgia, irritable bowel syndrome, migraine, hearing impairment, tinnitus, and back/joint/muscle disorders. The study highlights the complex nature of hyperacusis and the importance of taking a holistic approach to evaluate and manage the condition.

As already mentioned, excessive noise exposure is a global occupational health hazard with significant social and physiological impacts, including noise-induced hearing loss and hyperacusis. Hyperacusis can have a significant impact on an individual's quality of life, making it difficult to carry out normal activities and causing discomfort and pain. In India, hyperacusis is often misunderstood or misdiagnosed as tinnitus, which can make it challenging to identify and manage. The present study aims to identify noise-induced hyperacusis in specific populations, such as traffic police and street vendors, who are at high risk of noise exposure due to their occupation.

Identifying individuals who are at risk of developing hyperacusis due to noise exposure is crucial for early intervention and management. By raising awareness of the potential risks of noise exposure and identifying those who may be at higher risk, appropriate preventive measures and interventions can be implemented to minimize the impact on their quality of life. This could include measures such as providing hearing protection devices, implementing noise control measures in the workplace, and educating individuals on the importance of safe noise exposure levels. Early identification and management of hyperacusis can also help to prevent the development of more severe symptoms and improve long-term outcomes for affected individuals. Overall, research in this area is essential for promoting public health and improving the quality of life for those affected by noise-induced hyperacusis. Hence, the present study focusses on identifying noise induced hyperacusis in traffic police and street vendors.

REVIEW OF LITERATURE

Noise can be defined as an "unwanted sound" or a wrong sound in the wrong place at wrong time. Occupational noise exposure is defined as any type of noise produced in a workplace that is 85dB (A) in intensity over and above an 8 hours' work shift for a 40 hour per week time weighted average leads to occupational noise hazard. Excessive noise is a global occupational health hazard with considerable social and physiological impacts, including noise-induced hearing loss (NIHL) and hyperacusis.

The specific term hyperacusis was first mentioned in the literature by Perlman (1938), who described similar problems, which include "decreased sound tolerance" and "hypersensitivity to sounds". Hyperacusis can also be defined as a condition characterized by a reduced tolerance to sound levels that are considered normal or even mildly loud by most people. It is often described as an abnormal sensitivity to sound, and it can significantly affect a person's quality of life. Some people with hyperacusis experience pain, discomfort, or even fear in response to certain sounds. It can be a very challenging condition to live with, and it requires

appropriate management to alleviate the symptoms and improve the individual's quality of life.

Histopathological changes

Hickox and Liberman (2013) found that acoustic over exposure can cause permanent threshold elevation. Their recent study in mice showed that a neuropathic noise exposure can cause immediate, permanent degeneration of the cochlear nerve despite complete threshold recovery and lack of hair cell damage. Ison et al. (2007) suggest that the non-frequency-specific slow time course of hearing loss results from pathology in the lateral wall of the cochlea, whereas the stimulus-specific hearing loss with a rapid time course results from hair cell loss. Delayed exaggeration of the ASR with hearing loss reveals a deficit in centrifugal inhibitory control over the afferent reflex pathways after central neural reorganization. Coordes et al. (2012) found that noise exposure induces apoptosis-related pathophysiological changes within the central auditory pathway in a time-dependent manner, which leads to hyperacusis and tinnitus.

Prevalence of hyperacusis

Fabijanska (1999) conducted a questionnaire-based study on tinnitus in Poland and found that 15.2% of the 10349 respondents reported hyperacusis, with regional differences reported. Andreson et al. (2002) investigated the Swedish population and reported a prevalence of 40% of hyperacusis in individuals with primary complaint of tinnitus, while in patients with primary complaint of hyperacusis, the prevalence of tinnitus was 86%. Skarzynski et al. (2000) conducted a study among the Polish population and found that 15% had no hearing loss and 17% had hearing loss and hyperacusis. Hannula et al. (2011) conducted a study in Finland and reported a prevalence of 17% of self-reported hyperacusis.

Pathophysiology of Hyperacusis

Hyperacusis has many known causes and associations, although most cases have no known cause. There are a few diseases and syndromes that are associated with hyperacusis, namely: intense noise exposure, migraine, depression, posttraumatic stress disorder, head injury, Lyme disease, Williams syndrome, multiple sclerosis, Meniere's disease, fibromyalgia, Addison's disease, autism spectrum disorders, myasthenia gravis, and middle cerebral aneurysm (Baguley et al., 2013). Athri and Nagarkar (2009) found that both depression and hyperacusis can be caused by 5-hydroxytryptamine (5-HT; also known as serotonin) hypoactivity in the brain and enhancement of 5-HT activity, due to lithium prescribed for depression, may also play a role in alleviating hyperacusis symptoms. The present study mainly focuses on hyperacusis disorder due to excessive noise exposure.

Noise exposure related hyperacusis

While noise exposure is likely the most common cause of hyperacusis, data on the association between occupational noise exposure and hyperacusis are limited (Baguley et al., 2013). However, it has been reported in several studies that recreational noise exposure, such as exposure to loud music, is associated with hyperacusis (Anari et al., 1999; Kähärit et al., 2004; Kähärit et al., 2003). In addition, genetic factors may also play a role in an individual's

susceptibility to noise-induced hearing loss, tinnitus, and hyperacusis, as some individuals may have a genetic predisposition to hearing loss, which can make them more vulnerable to the effects of noise exposure (Konings et al., 2009).

Research has shown that national standards for the protection of hearing are an important consideration in preventing hyperacusis and other hearing-related disorders. The National Institute for Occupational Safety and Health (NIOSH) has established guidelines for safe noise exposure levels in the workplace; however, these guidelines are not always followed or enforced. Consequently, individuals may be exposed to dangerous levels of noise in their workplaces, leading to hearing loss, tinnitus, and hyperacusis. To prevent these outcomes, individuals should be informed about the potential risks associated with noise exposure and should take measures to safeguard their hearing. Such measures might include wearing hearing protection devices, limiting exposure to loud noise, and seeking medical attention if symptoms of hearing loss, tinnitus, or hyperacusis arise. Employers and policymakers also play a role in reducing noise pollution in the workplace and community, as well as enforcing national standards for hearing protection.

The guidelines set by the Occupational Safety and Health Administration (OSHA) in 2002 to prevent hearing loss and hyperacusis may be inadequate. Furthermore, recent evidence suggests that the effects of noise exposure extend beyond the duration of exposure leading to hyperacusis. Kujawa and Liberman (2009) demonstrated in mice that even a single noise exposure causing temporary threshold shifts can lead to destruction of inner hair cell synapses, resulting in slow degeneration of the denervated auditory nerve fibers. Additionally, Mrena et al. (2004) reported that unexpected intense sound, referred to as an acoustic shock, can result in hyperacusis. Hyperacusis has also been reported among musicians by Litinen and Poulsen (2008) and Toppila and Koskinen (2011). These studies suggest that loud noise exposure can result in serious damage to the auditory system, leading to hyperacusis disorder.

Categories of hyperacusis

Hyperacusis can be classified into different types based on physiological and psychological factors, including recruitment, hypersensitivity to specific frequencies, and phonophobia/misophonia. Recruitment refers to the rapid increase in perceived loudness for sounds in the pitch region of an individual with hearing loss. This phenomenon occurs because at a certain decibel level, the normal hair cells adjacent to the damaged hair cells corresponding to the frequency of hearing loss are “recruited”. This sudden increase in perceived loudness can cause discomfort to the individual.

In hypersensitivity to specific frequencies, individuals are sensitive to only certain frequencies, which are heard at loud levels. These frequencies are often referred to as problem frequencies, and this phenomenon is commonly seen in autistic children. Misophonia, or dislike of sound, is an adverse response to sound regardless of the volume. Typically, individuals with misophonia react strongly to soft sounds and are often further triggered by seeing the source of the offending sound. Common examples include the sound of people eating, smacking their lips, and repetitive sounds.

Hasson et al. (2013) conducted a study on acute stress-induced hyperacusis in women with high levels of emotional exhaustion and found that these women become more sensitive to sound after an acute stress task. It is important to consider both physiological and psychological factors when diagnosing and treating hyperacusis.

Subjective Questionnaires

Subjective patient questionnaires can be used in the identification, assessment, and management of hyperacusis. Different questionnaires will address different measures (e.g., disability, functional impact, psychological factors, and quality of life. The questionnaires that are used for the assessment of hyperacusis are the follows.

- German Questionnaire on Hypersensitivity to Sound (GUF; Blasing et al., (2010)
- Modified Khalfa Hyperacusis Questionnaire (Khalfa, 2002)
- Multiple Activity Scale for Hyperacusis (MASH; Dauman et al. 2005)

The modified Khalfa Hyperacusis Questionnaire (Khalfa, 2002), which was used in this study, focuses on three main dimensions: attentional, emotional, and social. The attentional dimension includes questions that explore attentional deficits caused by noise, such as whether the person uses earplugs or earmuffs to reduce noise. This dimension can be useful in detecting attentional deficits due to noise disturbance. The emotional dimension reflects the emotional aspect of hyperacusis, which is often reported in pathologies including emotional disorders like anxiety or autism. This dimension will be particularly beneficial in studying patients with psychiatric disorders. The social dimension reflects the social and behavioral consequences of hyperacusis, such as altered lifestyles and avoiding social interactions. Scores obtained along this dimension can contribute to understanding the distress and isolation experienced by hyperacusis patients in social interactions.

Need of the study

Noise pollution is a significant problem in many parts of the world, including India. It is a major occupational health hazard that can cause a range of negative social and physiological impacts. One of these impacts is noise-induced hearing loss (NIHL), which is a permanent hearing loss caused by exposure to loud noise. Another impact is hyperacusis, which is a condition where an individual experiences increased sensitivity to sound, and normal environmental sounds can become intolerable or even painful. Therefore, it is important to identify hyperacusis in individuals who have been exposed to loud noise, such as traffic police and street vendors, to provide appropriate treatment and support.

Traffic police and street vendors are two groups in India who are particularly susceptible to noise pollution. They work in environments where they are exposed to loud noise for extended periods, which can increase their risk of developing NIHL and hyperacusis. This study aims to identify hyperacusis in these populations using a checklist that explores the attentional, social, and emotional aspects of the condition. The study also includes a detailed case history to identify factors that may contribute to hyperacusis, such as the duration and intensity of noise exposure.

By identifying hyperacusis in these populations, the study can provide valuable insights into the impact of noise pollution on human health and well-being. This information can then be used to inform future interventions to reduce the impact of noise pollution, such as implementing noise control measures in workplaces or providing education and training on the importance of hearing protection.

Aim of the study

The study aimed to identify hyperacusis in traffic police and street vendors with more than 5 years of noise exposure, using a checklist.

METHODS

In this study, the researchers aimed to investigate the prevalence of noise-induced hyperacusis in two groups of individuals who have been exposed to high levels of noise for more than five years: traffic police and street vendors. To achieve this aim, the researchers used a checklist to explore the attentional, social, and emotional aspects of hyperacusis and gathered detailed case histories to identify factors that may contribute to hyperacusis.

Participants

A total of 50 participants (25 traffic and 25 street vendors) in the age range of 22 – 55 years with more than 5 years of noise exposure with no history of speech and hearing, diabetes, hypertension, neurological problems, and other form of medical issues were excluded from the study. All the participants were informed about the study and consent was obtained. A brief case history was done by the researcher to rule out any issues with respect to hyperacusis.

Checklist preparation

The Modified Khalfa questionnaire (Khalfa, 2002) was translated into Kannada to suit the local language, by a Kannada native speaker who was fluent in Kannada and English. The questionnaire was then validated by an audiologist and speech language pathologist. The validated questionnaire consists of 20 questions, each analyzed using a 5-point rating scale: (a) never, (b) seldom, (c) sometimes, (d) frequently, and (e) always.

Procedure

The demographic data and other information were obtained using a Performa. After the participants were explained regarding the procedure of the study, and the questionnaire was distributed. The instructions given to the participants were as follows: (i) these are statements that many people have used to describe hyperacusis and the effects on your life; (ii) circle the response that indicates how frequently you have the same experience. Once it was filled, the questionnaire was collected, and the total score and subscale score was tabulated.

Analysis

The analysis was done using SPSS version 23. A descriptive analysis was used to analyze the impact of hyperacusis due to noise in traffic police and street vendors. The risk factors were analyzed based on the type of variables (categorical and continuous). The Mann Whitney test was used to find out the significant difference across the variables.

RESULTS

The study aims to investigate the prevalence of noise-induced hyperacusis in two groups of individuals who have been exposed to high levels of noise for more than five years: traffic police and street vendors. The researchers used a checklist to explore the attentional, social, and emotional aspects of hyperacusis and gathered detailed case histories to identify factors that may contribute to hyperacusis.

The study compared the scores obtained from two different categories (street vendors and traffic police) in various domains, such as social, emotional, and attention scores. The mean, standard deviations, and range of the scores for each domain among traffic police and street vendors are given in Table 1.

Participants		Attention	Emotiona	Social
Traffic police	Mean	10.56	7.92	5.12
	N	25	25	25
	Std. Deviation	7.473	7.405	5.069
	Range	28	25	18
Street vendor	Mean	14.40	13.08	8.00
	N	25	25	25
	Std. Deviation	8.520	11.011	7.741
	Range	28	32	20

Table 1. Mean, Standard Deviation (S.D) and range of scores obtained by both traffic police and street vendor categories.

From Table 1, it can be noted that the mean values for attention, emotional, and social are all higher for the street vendors than for the traffic police. This suggests that the street vendors may have better attention and emotional regulation abilities, as well as stronger social skills, than the traffic police. The standard deviations and ranges for each variable are also larger for the street vendors, indicating that there is more variability in their responses compared to the traffic police. This could be due to a variety of factors, such as differences in individual characteristics or environmental factors.

The Mann-Whitney U test was used to compare the scores obtained in each domain for the two categories. The results of this test indicated that there were no statistically significant differences between the scores of major subscales. However, the results showed that street vendors were rated better than traffic police in terms of social, emotional, and attention scores. The result are displayed in Table 2.

	Attention	Social	Emotional
Mann-Whitney U	228	265	244
Wilcoxon W	553	590	569
Z score	-1.644	-929	-1.337
Asymp. Sig. (2-tailed)	100	353	181

Table 2. Mann– Whitney U test comparing the scores of traffic police and street vendors across all three domains.

DISCUSSION

The present study attempted to identify the self-perception of street vendors and traffic police on noise induced hyperacusis problems using checklist Khalfa (2002). Hyperacusis is a condition in which an individual's sensitivity to certain sounds is increased, causing them to experience discomfort or pain in response to sounds that would not bother others. Noise-induced hyperacusis is a specific type of hyperacusis that can occur because of exposure to loud noise over time.

Research has shown that noise-induced hyperacusis can have a significant impact on an individual's ability to attend to tasks and focus their attention. This can be particularly problematic for individuals in professions that require sustained attention, such as traffic police and street vendors. Individuals with noise-induced hyperacusis may have trouble filtering out irrelevant sounds and focusing on important information, which can lead to reduced job performance and increased stress. It is important for individuals in these professions to take measures to protect their hearing and prevent the development of noise-induced hyperacusis, such as wearing hearing protection and minimizing exposure to loud noise whenever possible.

If an individual already has noise-induced hyperacusis, they may benefit from seeking treatment, such as sound therapy or cognitive-behavioral therapy, to help them manage their symptoms and improve their attentional abilities.

The result obtained with respect to attentional, social, and emotional dimension are detailed below.

Attentional dimension

The attentional dimension of the study explores the effects of noise on attentional deficits. The study found that certain questions related to attention, such as concentration in noise, reading, speaker announcements, and earplug usage in noisy situations did not show any significant difference between the groups of traffic police and street vendors. However, questions related to street noise, fear of loud sound, and difficulty ignoring noise showed significant differences between the two groups.

These findings are consistent with previous research that suggests noise can affect different types of tasks requiring focused attention or categorical search and can affect an individual's overall performance. For instance, a study by Banbury and Berry (1998) found that noise can interfere with reading comprehension and recall. Another study by Jones and Broadbent (1991) found that noise can impair performance on tasks that require sustained attention.

Moreover, the study also aligns with previous research by Ljungberg et al. (2007) that showed that noise-induced stress can lead to impairments in cognitive functioning, including attention and memory. Another study by Kim et al. (2016) found that exposure to occupational noise can lead to cognitive impairments, including attentional deficits and memory problems.

In conclusion, the study highlights the importance of understanding the impact of noise on attention and performance in different professions and contexts. Future studies should continue to explore the effects of noise on cognitive functioning, including attentional deficits, and work towards developing interventions to minimize the negative effects of noise exposure.

Social dimension

Research has highlighted that hyperacusis can significantly impact an individual's social life, leading to social isolation, decreased quality of life, and even depression or anxiety due to the fear of noise or discomfort caused by certain sounds. Studies have consistently shown that individuals with hyperacusis tend to avoid social situations more frequently than those without the condition.

However, a study that explored the social consequences of hyperacusis found that there were no significant differences in questions that explored fear of social situations and tolerance of noise across groups. The only question that showed a significant difference was fear of noise in social situations.

These findings are in line with previous research by Paulin et al. (2016), who suggested that individuals with hyperacusis tend to avoid social situations due to their fear of noise. Another study by Omidavari and Nouri (2009) found that traffic police officers who are exposed to loud noise on the job may experience social consequences with family members and relatives.

Therefore, it is important for individuals with hyperacusis to seek treatment, such as sound therapy or cognitive-behavioral therapy, to manage their symptoms and improve their social and emotional well-being. It is also crucial to raise awareness of hyperacusis and its potential social consequences to reduce stigma and provide support to those affected.

Emotional dimension

The emotional dimension of hyperacusis refers to the impact of hyperacusis on an individual's emotional state, including anxiety, depression, emotional outbursts, and other negative emotional states. Research has shown that loudness tolerance is correlated with the emotional state of anxiety, indicating the importance of studying the emotional dimension of hyperacusis.

However, the results of the study you mentioned showed no significant difference across traffic police and street vendors in questions related to the emotional dimension of noise effect, influence of stress, fear, emotional impact, and family relationship. Only questions that focused on diurnal effect and emotional discomfort showed high significance across traffic police and street vendors.

These findings are supported by previous research by Kavana et al., (2012) which suggests that traffic police may be more prone to depression, anxiety, and emotional outbursts due to their exposure to loud noise on the job. Similarly, Chemtob et al., (1988) explored sensory hypersensitivity in US military veterans suffering from post-traumatic stress disorder and found that hyperacusis is entirely emotional.

Individuals with hyperacusis should seek treatment to manage their emotional symptoms and improve their overall well-being. Treatment options may include cognitive-behavioral therapy, medication, or a combination of both. Additionally, it is important to address the root causes of hyperacusis, such as exposure to loud noise, to prevent the development or worsening of emotional symptoms.

However, there are some limitations to the study that need to be considered. One of the main limitations of the study is the small sample size. The study only included 25 street vendors and 25 traffic police officers, which may not be representative of the larger population of these professions in metropolitan cities. Thus, it is important to consider larger sample sizes in future studies to ensure more accurate and reliable results. Another limitation of the study is that the subjects only had 5 years of noise exposure. It would be interesting to compare the results of this study with those of individuals who have been exposed to noise for longer periods. This could provide further insights into the long-term effects of noise exposure

on attentional, social, and emotional dimensions.

In future studies, it would be useful to compare different professions that work in noisy environments to gain a better understanding of the impact of noise pollution across different professions. Additionally, it would be beneficial to include subjects with more than 5 years of working experience to better understand the impact of prolonged noise exposure. Lastly, more samples for normalization can be included in future studies to reduce the chances of sampling errors and to improve the generalizability of the findings.

SUMMARY AND CONCLUSION

The present study focuses on assessing the impact of noise pollution on the attentional, social, and emotional aspects of street vendors and traffic police who have been exposed to noise for more than 5 years. The study group consisted of 25 traffic police and 25 street vendors who were selected based on their age range of 22 to 55 years and had no history of hearing loss, middle ear pathologies, or other neurological problems affecting hearing. The data collection for the study was done through a checklist, which was translated into Kannada and consisted of 20 questions exploring the social, emotional, and attentional dimensions. Each question had a 5-point rating scale, and the subjects were asked to circle the appropriate answer. Before administering the checklist, a detailed case history was taken, which focused on the noise exposure history and family history of the subject.

The present study aims to shed light on the non-auditory effects of noise pollution, particularly on the development of noise-induced hyperacusis, which can significantly impact one's daily living and quality of life. By using a checklist to assess the social, emotional, and attentional aspects of noise-induced hyperacusis, this study hopes to provide insights into the potential impact of noise pollution on these dimensions, especially in individuals with prolonged noise exposure. The study is a valuable contribution to the growing body of research on the harmful effects of noise pollution on human health and well-being. By identifying the specific ways in which noise pollution affects individuals, policymakers and public health professionals can develop more targeted interventions to reduce the impact of noise pollution on communities.

Overall, the study provides important insights into the impact of noise pollution on the attentional, social, and emotional dimensions of street vendors and traffic police. Further research is needed to fully understand the impact of noise pollution across different professions and to develop effective interventions to reduce the impact of noise pollution on human health and well-being.

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