Acta Scientific Otolaryngology (ISSN: 2582-5550)

Volume 7 Issue 8 August 2025

Research Article

Awareness About Noise and its Effects Among Industrial Workers in Hyderabad

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Received: June 24, 2025

Published: July 13, 2025

Abstract

Purpose: This study investigated awareness and experiences related to occupational noise-induced hearing loss (NIHL) among 60 industrial workers in Hyderabad, drawn equally from large-scale, small-scale, and construction industries.

Methodology: Participants, aged 25 to 60 with over five years of work experience, completed a validated questionnaire assessing knowledge of noise, hearing conservation practices, and the auditory and non-auditory effects of noise exposure.

Result: Findings revealed that while all workers understood what noise is and 95% were exposed to high noise levels for at least 8 hours daily, less than 50% underwent regular hearing evaluations. Awareness of hearing conservation measures and ear protective devices (EPDs) was moderate, but consistent use remained limited. Only 68.33% used EPDs regularly, despite 80% being aware of them and 73.33% being encouraged to wear them. Auditory effects were commonly reported, with 83.33% experiencing hearing changes after work and only 51.66% reporting recovery after rest. Tinnitus was reported by 10% of workers. Construction workers were the least aware and least protected, while large- and small-scale industry workers showed similar, higher levels of awareness and practice. Non-auditory effects such as sleep disturbance, heart rate and breathing changes, irritation, and reduced performance were rare across all industries.

Conclusion: The study emphasizes the need for stronger awareness programs, consistent use of hearing protection, regular screenings, and effective enforcement of noise safety regulations to reduce the impact of NIHL in industrial settings.

Keywords: NIHL; Questionnaire; Awareness; Industrial Workers, Auditory Effects; Non-Auditory Effects; EPDs

Abbreviations

NIHL: Noise Induced Hearing Loss; EPDs: Ear Protection Devices; HCPs: Hearing Conservation Programme

Introduction

Sound is an integral component of the environment and plays a very important role in our normal development and survival by providing a valuable channel of sensory- environment contact. Noise has been described as a sound undesired by the recipient. Sound becomes noise only when it is physiologically or psychologically defined as unwanted [1]. Noise would be defined as an audible acoustic energy or sound that is unwanted because it has adverse auditory and non- auditory physiological effects on humans [2]. Noise refers to the sounds which are harmful or which interfere with normal activities, particularly with communication and work efficiency [3].

Prolonged and consistent exposure to noise levels of 85 decibels (dB) or higher for 8 hours a day or 40 hours a week can lead to occupational noise-induced hearing loss (NIHL). At this threshold, it becomes mandatory for the employer to monitor both the noise levels and the hearing health of employees. If the noise exposure reaches or exceeds 90 dB, the employer is required to implement a hearing conservation program (HCP) [4].

Need of the study

The prevalence and Incidence of noise-induced hearing loss in industrial populations are increasing over the years, and it has a significant impact on hearing sensitivity and the functioning of outer hair cells in the ear [5]. There is limited study on the awareness about the effect of noise and its consequences among industrial workers in Indian scenarios.

Noise Induced Hearing Loss (NIHL) among industrial workers and construction workers has long been recognized. Results of such studies have been used to derive models of NIHL that estimate the distribution of hearing levels in population exposed to continuous noise by noise intensity. Not much investigation is done on the effect of noise on the hearing ability of small scale enterprise work in welding and spice grinding facilities in India scenario.

So, it is highly essential to know the level of awareness about the effect of noise and its consequences among industrial workers in Indian scenarios and develop respective management strategies to control it and conserve their essential sense of hearing.

Aim of the study

The aim of this study is to know the awareness about the effect of noise and its consequences among industrial workers in Hyderabad.

Objectives

- To develop a questionnaire to evaluate the awareness of noise and its consequences among industrial workers.
- To administer the developed questionnaire on industrial workers and evaluate the awareness on noise and its effects.

Materials and Methods

The objective of the current study was to develop a questionnaire and evaluate the awareness of noise and its consequences in industrial workers.

Research design

Cross-sectional research design was used to fulfill the aim of the present study.

Research sample

Participants

A total of 60 individual in the age range of 25 to 60 years participated in the study.

The participants would be drawn from three different Type of industries. The three industrial working situation include-construction factory, Small scale manufacturing industries and large-scale manufacturing industries.

Participant selection criteria

Industrial workers with a working experience of at least 5 year in the same factory.

Tools

Questionnaire

- A questionnaire containing 20 questions related to various aspects of noise induced hearing loss was prepared by going through literature.
- The questionnaire was given to 5 audiologists they were informed about the purpose of the test procedure and asked to respond whether the questionnaire fulfills the purpose. They were asked to rate the questions in a 5-pt rating scale, The questions rated between 2 to 4 were selected.
- The final questionnaire had 10 questions related to awareness of noise and hearing conservation program and 10 questions related to auditory and non- auditory effects of noise.

Among them 3 questions were about noise and 7 questions were related to hearing conservation program.

It has 4 questions about auditory effects of noise and 6 for non-auditory effects of noise.

Administration of questionnaire in three types of industry in Hyderabad

The developed questionnaire was administered on 60 industrial workers. The 60 participants were divided into three types of 20 people each based on the type of industry they worked in- large scale industry, small scale industry and construction company. They were working for 5 years or more in the same industry. They were in the age range of 25 to 60 years.

All the participants of large scale and small-scale industry were undergraduates. The maximum qualification of construction company worker was 10^{th} standard or less.

The large- scale industry was an ordinance factory. The small-scale industry was a pharmaceutical company which manufactured

medicines. The third company was a private construction company named "Oorjita Builders & Developers Pvt. Ltd". All the three industries were located in Hyderabad.

Each participant was given a questionnaire and they had to tick against the correct option for each question.

Scoring

For yes or no questions a score of 1 and 0 was given respectively. For the questions with 5- point scale rating it was rated as follows**:** Very often/Very heavy exposure/Very significant = 1.

Often/Heavy exposure/Significant = 2 Sometimes/Moderate exposure/Slight = 3 Rarely/below moderate exposure/Very slight = 4 Very rarely/Normal exposure/No = 5.

Results and Discussion

The questionnaire was administered on 60 industrial workers where 20 individuals were working in the small scale industry, 20 in Construction Company and 20 in large scale industry. They had a working experience of 5 years or more. Descriptive statistics was used to find the mean and standard deviation of the 10 questions related to awareness about noise and its consequences.

Results of the present study are described and reported under the following heading:

- Awareness about noise and hearing conservation program.
- Percentage of workers showing auditory effects of noise
- Percentage of workers showing non- auditory effects of noise

Table 1: Awareness about Noise and Hearing Conservation among Industrial Workers.

Category	Percentage
Noise Awareness	100.0
Heavy Noise Exposure	95.0
8hr Daily Exposure	100.0
Annual Hearing Eval	50.0
Awareness of HCP	68.33
EPD Awareness	80.0
EPD Usage	68.33
EPD Importance	70.0
Encouraged to Use EPD	73.33
Aware of Hearing Loss	75.0
Hearing Change After Work	83.33
Hearing Normal After Rest	51.66
Tinnitus	10.0
Non-Auditory Effects	10.0

Table 1 summarizes workers' awareness about noise and hearing conservation measures across all three industries. It shows that while 100% of workers knew what noise is, only 48.33% had annual hearing tests. Awareness about hearing conservation measures (63.33%), permissible noise levels (66.66%), and ear protective devices (EPDs) (80%) was moderate. However, only 68.33% used EPDs regularly, and 73.33% were encouraged to wear them, indicating a gap between awareness and consistent protective practices. Overall, the data suggests good basic awareness but limited follow-through in preventive actions.

It can be clearly seen that workers from Construction Company had the least awareness about noise and hearing conservation program. Workers from large scale and small scale industry had almost similar responses. They were equally aware about noise, its consequences and hearing conservation measures.

Table 3 highlights workers' awareness and experience of auditory effects due to occupational noise. While 75% were aware that excessive noise can cause permanent hearing loss, 83.33% experienced hearing changes after a full day's work. However, only

Parameter	Large-scale industry	Small-scale industry	Construction industry
Knowledge of what noise is	100%	100%	100%
Heavy noise exposure	100%	85%	80%
Below to normal noise exposure	0%	15%	5%
Work ≥ 8 hrs/day	100%	100%	100%
Annual hearing test	65%	60%	20%
Awareness of hearing conservation measures	65%	60%	20%
Awareness of permissible noise levels	90% (18/20 workers)	95% (19/20 workers)	15% (3/20 workers)
Awareness of EPDs	95%	95%	Not specified
Regular use of EPDs	85%	90%	Not specified
Awareness about importance of EPDs	>90%	>90%	25%
Encouraged to wear EPDs	90%	90%	40% (often), 45% (sometimes), 10% (rarely)
Frequency of wearing EPDs (within encouraged group)	55% very often, 30% often, 10% sometimes	75% very often, 15% often, 10% sometimes	Not specified

Table 2: Industry-Wise Comparison of Awareness and Practices Related to Occupational Noise.

Auditory Effect Evaluated	Percentage of Workers	Remarks
Awareness about permanent hearing loss due to excessive noise	75%	Indicates good general awareness
Experienced change in hearing after a full day's work	83.33%	Significant variation across industries
Hearing returned to normal after a period of rest	51.66%	Significant variation across industries
Complained of tinnitus after exposure to loud noise	10%	Very few workers reported tinnitus symptoms

Table 3: Awareness and Experience of Auditory Effects Due to Occupational Noise.

51.66% felt their hearing returned to normal after rest, and just 10% reported tinnitus, indicating that although awareness is relatively high, a significant number of workers still experience temporary auditory issues.

Table 4 compares auditory effects of noise across industries. Workers in the large- scale industry showed the highest awareness (100%) of permanent hearing loss, while construction workers had the lowest (40%). Hearing changes after work were most commonly reported by construction workers (95%), but only 20% of them experienced recovery after rest, indicating poor hearing resilience. Tinnitus was rarely reported by workers in both the large scale and construction industries, while it was more common in the small- scale sector.

Table 4: Industry-wise Comparison of Awareness and Experience of Auditory Effects of Noise.

Parameter	Large Scale (%)	Small Scale (%)	Construction (%)	Remarks
Awareness of permanent hearing loss due to noise	100	85	40	Highest in large scale; lowest in construction industry
Experienced hearing change after full day of work	85	85	95	Most construction workers reported this effect
Hearing improved after a period of rest	65	70	20	Least recovery reported in construction sector
Rare complaints of tinnitus after noise exposure	80	45	80	Tinnitus was least reported by large scale and construction workers

Table 5: Percentage of Workers Showing Non-Auditory Effects of Noise.

Non-Auditory Effect	Percentage of Workers	Remarks
Sleeping disturbance	1.6%	Very few workers reported this issue
Change in heartbeat rate	3.33%	Minimal reported impact
Irritation or anger due to loud noise	6%	No significant difference across industries
Change in breathing pattern	3.33%	No significant difference across industries

Table 5 presents the percentage of workers experiencing non-auditory effects of noise. The results show that these effects were reported by less than 10% of the population. Specifically, very few workers experienced sleep disturbances (1.6%), changes in heartbeat or breathing (3.33%), irritation or anger (6%), or reduced performance (3.33%), and none reported dizziness. Overall, non-auditory effects were minimal and showed no significant differences across the three industries.

Table 6: Non-Auditory Effects of Noise on Workers Across Industries.

Non-Auditory Effect	Response Category	Large Scale Industry (%)	Small Scale Industry (%)	Construction Company (%)
Disturbed Sleep	Very Rarely	91%	90%-95%	100%
	No Complaint	90%-95%	90%-95%	100%
Change in Heartbeat Rate	Very Rarely	70%	70%	100%
	Rarely	5%	10%	0%
	Sometimes	15%	20%	0%
Change in Breathing Pattern	Very Rarely	60%	70%	90%
	Sometimes	20%	15%	5%
	Rarely	10%	10%	5%
	Often	10%	5%	0%
Irritation/Anger	Very Rarely	65%	55%	40%
	Rarely	10%	10%	0%
	Sometimes	25%	30%	45%
	Very Often	0%	5%	0%
	Often	0%	0%	15%
Dizziness	Very Rarely	100%	90%	100%
	Rarely	0%	10%	0%
Reduced Performance	Very Rarely	80%	90%	100%
	Sometimes	10%	5%	0%
	Rarely	10%	0%	0%
	Often	0%	5%	0%

Table 6 shows that non-auditory effects of noise were generally minimal across all industries, with construction workers reporting the least physical complaints. Disturbed sleep and dizziness were almost nonexistent, especially in the construction sector where no cases were reported. Changes in heartbeat and breathing patterns were reported very rarely, with slightly more frequent occurrences in large and small scale industries. Feelings of irritation or anger were more common among construction workers, with a notable portion experiencing these emotions sometimes or often. Reduced performance was mostly reported as very rare, with occasional complaints in the large and small scale sectors. Overall, non-auditory effects were infrequent and varied slightly by industry.

Conclusion

The study found that all industrial workers were aware of what noise is, with 95% exposed to heavy noise for at least 8 hours daily [6]. However, less than 50% underwent annual hearing evaluations. While 68.33% were aware of hearing conservation measures, only 68.33% used ear protective devices (EPDs) despite 80% being aware of them and 70% understanding their importance [6]. About 73.33% were encouraged to wear EPDs.

Regarding auditory effects, 75% were aware that noise can cause permanent hearing loss [7]. 83.33% noticed hearing changes after a workday, but only 51.66% felt their hearing normalized after rest. Just 10% reported tinnitus [8].

Non-auditory effects like sleep disturbances, heartbeat or breathing changes, irritation, dizziness, and reduced work performance were reported by fewer than 10% of workers.

The results indicate that construction company workers were the least aware of noise and hearing conservation programs, with less than 50% demonstrating awareness. They also had the lowest understanding of the consequences of prolonged noise exposure and were the least likely to undergo regular hearing evaluations [9]. In contrast, workers from both large and small- scale industries showed similar levels of awareness, with over 60% being informed about noise hazards and related conservation measures. When assessing auditory and non-auditory effects of noise, all three industrial groups performed similarly, with no significant differences observed among them.

This study highlights that occupational noise-induced hearing loss (NIHL) remains widespread, despite longstanding awareness and efforts to control workplace noise [10]. In many developing and underdeveloped countries, access to advanced machinery is limited, and even modern equipment may not prevent harm without proper awareness and preventive practices. The study emphasizes the urgent need for health education, use of protective devices like earplugs and earmuffs, regular hearing screenings, and strict enforcement of noise exposure regulations.

These results indicate that proper measures should be taken to prevent the auditory effects in the industrial workers.

Conflict of Interest

There are no conflicts of interest.

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