International Journal of Institution of Safety Engineers (India)
"Published by Institution of Safety Engineers (India)"
Volume 8, Issue 4, October-December 2025 Available online at www.ijournal.iseindia.in

[3]OCCUPATIONAL HEALTH HAZARDS IN MANUFACTURING INDUSTRIES: A SURVEY OF WORKER AWARENESS AND SAFETY PRACTICES

Dr. Shahnawaz Rampuri, Senior Member of Institution of Safety Engineers (India)
Email id: shahnawaz.rampuri2@gmail.com

Abstract

Occupational health hazards in manufacturing industries pose significant risks to worker safety and well-being. These hazards include physical risks such as machinery accidents, chemical exposure, ergonomic issues, and psychosocial stressors like high work demands. Despite existing safety regulations, many workers in manufacturing industries remain unaware of the health risks they face, and safety practices are often not effectively implemented. This paper examines the awareness of workers regarding occupational health hazards and evaluates the effectiveness of safety practices in manufacturing industries. A survey was conducted across multiple manufacturing sectors to assess worker knowledge about hazards, safety training, and the use of personal protective equipment (PPE). The findings highlight critical gaps in awareness, especially regarding chemical hazards and ergonomic risks, and emphasize the need for more comprehensive safety training and enforcement of PPE usage. The study concludes with recommendations to improve safety protocols, including regular training, risk assessments, and promoting a culture of safety within workplaces. These measures will help reduce accidents and enhance worker health and productivity in manufacturing environments.

Keywords

Occupational Health Hazards, Manufacturing Industries, Worker Awareness, Safety Practices, Musculoskeletal Disorders, Chemical Exposure, Ergonomics, Personal Protective Equipment (PPE), Safety Training, Workplace Safety, Risk Assessment, Manufacturing Safety Regulations.

1. Introduction

The manufacturing industry plays a crucial role in the global economy, contributing significantly to the production of goods across various sectors. However, workers in these industries are frequently exposed to a range of occupational health hazards, which can result in serious health conditions and

safety risks. These hazards include physical risks like machinery accidents, chemical exposures, ergonomic issues, and environmental factors such as noise, heat, and poor ventilation. Ensuring worker safety and health in manufacturing industries is vital, as these hazards can lead to long-term illnesses, injuries, and even fatalities.

The main objective of this study is to examine worker awareness of occupational health hazards and evaluate the effectiveness of existing safety practices within manufacturing industries. This research aims to identify common safety practices, assess the level of awareness among workers regarding the risks they face, and provide recommendations for improving safety protocols in these industries. This paper also investigates how different industries prioritize worker safety and the extent to which safety regulations are enforced.

2. Types of Occupational Health Hazards in Manufacturing Industries

Physical Hazards

Physical hazards are among the most common types of risks faced by workers in manufacturing settings. These include exposure to loud noise, vibrations, extreme temperatures, and radiation. Continuous exposure to high noise levels, for example, can lead to hearing loss, while extreme heat can cause heat stress or heat stroke. Inadequate machine guarding and mechanical failures can result in accidents such as amputations or crushing injuries (Pahwa et al., 2022).

Chemical Hazards

Chemical hazards in manufacturing industries are significant, particularly in sectors dealing with paints, solvents, oils, and various industrial chemicals. Long-term exposure to toxic substances such as asbestos, lead, or benzene can result in chronic health conditions like respiratory diseases, cancers, and neurological damage (Mossman & Gee, 2023). Workers may be exposed to these chemicals via inhalation, skin contact, or ingestion, which makes it essential for safety protocols to include proper storage, handling, and personal protective equipment (PPE) use.

Ergonomic Hazards

Ergonomic hazards result from poorly designed workstations, repetitive motion tasks, and improper lifting techniques. These hazards can cause musculoskeletal disorders (MSDs), which include back pain, carpal tunnel syndrome, and tendonitis. Ergonomic-related health issues are prevalent in

industries that require workers to perform repetitive manual tasks or maintain awkward postures for extended periods (Krause et al., 2022). These injuries can significantly impact workers' quality of life and lead to long-term disabilities if not addressed.

Psychosocial Hazards

Psychosocial hazards refer to stressors that arise from the work environment, such as high work demands, job insecurity, harassment, and long working hours. These factors can lead to mental health problems, including anxiety, depression, and burnout. In some industries, the pressure to meet deadlines or the absence of sufficient breaks contributes to stress-related illnesses (Zhao et al., 2023). Addressing psychosocial hazards is crucial for maintaining workers' overall well-being and ensuring a productive work environment.

3. Worker Awareness and Knowledge of Safety Practices

Awareness of Health Hazards

A major issue in many manufacturing industries is the lack of worker awareness regarding the specific health hazards they face on the job. Many workers are unaware of the long-term effects of chemical exposures, the proper use of PPE, and the significance of maintaining ergonomic work practices. According to a study by Gupta et al. (2023), only 55% of workers in a surveyed textile factory knew the dangers of chemical solvents they worked with daily. This lack of awareness highlights the need for better training and education on occupational health risks and the importance of safety measures.

Safety Training and Education

Safety training is a critical component of any workplace safety program. In manufacturing industries, safety training often focuses on hazard identification, proper use of PPE, and emergency procedures. However, studies indicate that many workers still do not receive adequate or regular safety training. According to a survey by Singh & Kumar (2024), 30% of workers in the surveyed factories reported that they had never received formal safety training, which can lead to improper handling of hazardous materials and unsafe work practices.

Use of Personal Protective Equipment (PPE)

Personal protective equipment (PPE) is one of the most commonly recommended safety measures in manufacturing environments. PPE such as gloves, goggles, ear protection, and respirators help reduce exposure to various hazards. However, studies indicate that while PPE usage is mandated, compliance is often poor due to discomfort, improper fit, or lack of training on its correct use (Anderson et al., 2024). A survey conducted in an automobile manufacturing unit revealed that only 65% of workers consistently wore ear protection despite high noise levels in the production area.

4. Safety Practices and Regulations in Manufacturing Industries

Safety Protocols and Regulations

In many countries, manufacturing industries are governed by strict safety regulations, such as OSHA (Occupational Safety and Health Administration) guidelines in the U.S., which require businesses to implement safety programs, provide training, and monitor workers' health regularly. Compliance with these regulations is essential to reducing workplace injuries and illnesses. However, enforcement of these regulations can vary significantly across industries and regions. Some industries, such as pharmaceuticals, tend to have stringent safety measures, while others, like construction, often struggle with inconsistent safety protocols (Kumar et al., 2024).

Inspection and Risk Assessment

Risk assessments and regular inspections are essential in identifying potential hazards before they cause harm. Safety officers or teams typically conduct these inspections to ensure compliance with safety standards. Studies suggest that regular risk assessments can significantly reduce workplace accidents. In a manufacturing plant where regular safety audits were conducted, the frequency of workplace injuries decreased by 40% over two years (Hassan et al., 2023).

Emergency Response Plans

Effective emergency response plans are vital for minimizing the impact of accidents when they occur. These plans should include clear evacuation procedures, first aid stations, and immediate response protocols for chemical spills or fires. Research has shown that workplaces with well-structured emergency plans are better prepared to handle accidents and reduce fatalities. However, many workers

still report feeling unprepared for emergencies due to lack of drills or unclear procedures (Sinha et al., 2024).

SUMMARY

The manufacturing industry remains one of the most hazardous sectors for workers, with a wide array of occupational health risks. Despite regulations and safety protocols, workers' awareness of these risks and the implementation of safety practices remain inconsistent. Key issues include lack of awareness about health hazards, inadequate safety training, and poor adherence to PPE guidelines. To improve worker safety, it is crucial for manufacturing industries to invest in regular and comprehensive safety training, enforce the use of PPE, and conduct regular risk assessments and inspections. Moreover, fostering a safety-conscious culture where workers are empowered to report hazards and suggest improvements can help in reducing accidents and enhancing overall workplace safety.

References:

- Anderson, T., et al. (2024). *The impact of PPE compliance on occupational health in manufacturing industries*. Journal of Occupational Health and Safety, 61(2), 34-40.
- Gupta, S., et al. (2023). *Chemical exposure awareness in textile industries: A survey of worker knowledge*. Environmental Health Perspectives, 131(4), 487-495.
- Hassan, F., et al. (2023). *Reducing workplace injuries through regular safety audits in manufacturing plants*. Occupational Medicine, 73(1), 24-30.
- Kumar, R., et al. (2024). *Comparison of safety practices across different manufacturing sectors*. Safety Science, 124, 112-120.
- Mossman, B. T., & Gee, J. (2023). *The health risks of chemical exposure in manufacturing: An overview*. Journal of Environmental Health, 48(6), 332-339.
- Pahwa, P., et al. (2022). *Physical hazards in manufacturing workplaces: Identifying risks and control measures*. Journal of Workplace Safety, 37(4), 226-235.
- Sinha, A., et al. (2024). *Emergency response preparedness in manufacturing industries: A survey of workplace safety measures*. Industrial Safety Journal, 15(1), 48-56.
- Singh, V., & Kumar, R. (2024). *Worker safety training and awareness in Indian manufacturing industries: A case study*. Journal of Safety and Health Management, 10(3), 119-126.

Zhao, X., et al. (2023). *Psychosocial hazards and mental health in manufacturing workplaces*. Occupational Psychology Review, 22(5), 380-389.