ISSN:3048-7722

International Journal for Novel Research in Economics , Finance and Management
www.ijnrefm.com
Volume 4, Issue 2, Mar-Apr-2026, PP: 01-04

Assessment of Occupational Health Hazards & Preventive Practices Among Health Care Workers at Chennai Port Trust Authority Hospital

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***Abstract* – Occupational health hazards remain a significant concern among healthcare workers due to their continuous exposure to biological, chemical, physical, ergonomic, and psychosocial risks. This study assesses the level of occupational hazards and the preventive practices adopted by healthcare workers in a Port Trust Authority Hospital using a descriptive research design with a sample of 120 respondents selected through purposive sampling. Data were collected through a structured questionnaire and analyzed using statistical tools such as percentage analysis, ANOVA, chi-square, and correlation tests. The findings reveal that healthcare workers are highly exposed to biological hazards, ergonomic issues, and workrelated stress; however, most respondents demonstrate good awareness and adherence to preventive practices, including the use of personal protective equipment (PPE), proper waste management, and participation in safety training programs. Furthermore, statistical analysis indicates significant associations between demographic factors and exposure to certain hazards. The study concludes that although preventive measures are widely practiced, continuous training, effective policy implementation, and regular monitoring are essential to further reduce occupational risks and enhance workplace safety.**

***Keywords* – Occupational Health Hazards, Healthcare Workers, Preventive Practices, Risk Assessment, Safety Measures.**

I. INTRODUCTION

Occupational health and safety (OHS) is a critical aspect of workplace management, particularly in the healthcare sector where workers are exposed to a wide range of hazards. Healthcare professionals, including doctors, nurses, laboratory technicians, pharmacists, and support staff, play a vital role in patient care but are frequently exposed to biological, chemical, physical, and ergonomic risks that can adversely affect their physical, psychological, and social well-being. Among these, biological hazards such as exposure to blood, body fluids, and infectious agents are common, with needle-stick injuries and improper handling of contaminated materials increasing the risk of infections like hepatitis B and C. Additionally, healthcare workers encounter chemical hazards from disinfectants, medications, and laboratory substances, which may lead to respiratory and skin-related issues, as well as physical risks such as radiation exposure, workplace injuries, and accidents. Ergonomic issues, including prolonged standing and patient handling, further contribute to occupational health problems. To minimize these risks, preventive practices such as the use of personal protective equipment (PPE), safe waste disposal, vaccination, and adherence to infection control protocols are essential, supported by training and awareness programs that promote safe work practices. Healthcare institutions must implement effective safety policies, conduct regular risk assessments, and foster a culture of safety to protect their workforce. The Chennai Port Trust Authority Hospital serves as a key healthcare provider where workers are exposed to various occupational hazards, making it important to assess these risks and evaluate preventive practices. This study therefore aims to assess occupational health hazards and preventive practices among healthcare workers, identify key risk factors, and evaluate the effectiveness of existing safety measures, with the goal of enhancing occupational safety standards and ensuring a safer working environment that ultimately contributes to improved healthcare delivery.

Objectives

Primary objectives

- To assess the various occupational health hazards (biological, chemical, physical, ergonomic, and psychosocial) faced by healthcare workers.

Secondary Objectives

- To evaluate the level of exposure to occupational health hazards among healthcare workers.
- To examine the preventive practices adopted to reduce occupational risks.
- To assess the availability and utilization of personal protective equipment (PPE). To identify gaps in occupational health and safety practices within the hospital setting.

II. REVIEW OF LITERATURE

Occupational health hazards among healthcare workers have been widely studied due to their significant impact on employee safety and overall healthcare quality. Various researchers have explored different dimensions of these hazards, including biological, physical, psychological, and organizational risks, along with preventive strategies.

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Alnassry (2025) conducted a comprehensive review to synthesize existing literature on occupational hazards faced by healthcare workers. The study primarily focused on identifying major risks, with particular emphasis on psychological and mental health challenges. It also evaluated various interventions and strategies aimed at minimizing these hazards and highlighted the importance of effective policies and preventive measures in enhancing worker safety and well-being.

Similarly, Awudu (2018) examined occupational health and safety hazards among healthcare workers in selected hospitals. The study identified both biological and nonbiological risks affecting clinical and non-clinical staff. Using statistical analysis, it explored factors associated with these hazards and recommended the implementation of safety policies and training programs to mitigate workplace risks and improve employee wellbeing.

Badida (2022) focused on identifying and evaluating occupational health hazards among healthcare workers in hospital settings. The study applied analytical methods to prioritize hazards based on their severity and impact. Furthermore, it proposed appropriate control measures to prevent accidents and improve workplace safety, thereby contributing to a safer healthcare environment.

In another study, Huei (2020) analyzed existing research on occupational health and safety hazards faced by healthcare professionals. The study identified a wide range of risks, including physical, biological, chemical, ergonomic, and psychosocial hazards. It also provided evidence-based strategies to control and reduce these risks, aiming to guide policymakers in improving occupational safety practices.

Finally, Karki (2018) assessed the level of knowledge and preventive practices related to occupational health hazards among nurses. The study evaluated nurses' awareness of workplace risks and their ability to implement safety measures. It also examined factors influencing knowledge and practices, stressing the importance of effective training programs to enhance safety compliance among healthcare professionals.

III. RESEARCH METHODOLOGY

This study adopts a descriptive research design to analyze occupational health hazards and preventive practices among healthcare workers in hospital settings, enabling the systematic identification of risks such as biological, chemical, physical, ergonomic, and psychosocial hazards while evaluating the effectiveness of safety measures without manipulating variables; it focuses on understanding existing working conditions, exposure levels, and preventive practices followed by healthcare professionals. The study is based on both primary and secondary data, where primary data were collected from 120 healthcare workers—including doctors, nurses, technicians, and support staff—through structured questionnaires using a purposive sampling technique, with respondents selected based on their experience, exposure to occupational hazards, and involvement in patient care, while secondary data were obtained from research articles, journals, books, and prior studies conducted by Alnassry (2025), Awudu (2018), Badida (2022), Huei (2020), Khalfan (2024), and Karki (2018), providing theoretical support and insights into occupational health risks and safety practices.

The study considers occupational health hazards and preventive practices as dependent variables, with independent variables including demographic and work-related factors such as age, gender, designation, years of experience, and working conditions, and also examines various types of hazards including biological, chemical, physical, ergonomic, and psychosocial risks affecting healthcare workers. Data analysis was performed using statistical tools such as percentage analysis, Chi-square test, One Way

ANOVA, and correlation analysis, where percentage analysis was used to present data in a simplified form, the Chi-square test to identify associations between variables like gender and hazard exposure, ANOVA to examine differences among groups such as experience levels and job roles, and correlation analysis to determine relationships between factors such as stress levels and working conditions.

IV. HYPOTHESIS FRAMED FOR THE STUDY

Years of Experience vs Ergonomic Hazards (ANOVA Analysis): Since the significance value ($p = 0.182$) is greater than 0.05, H_{01}: There is no significant difference in ergonomic hazards among healthcare workers based on years of experience. H_{11}: There is a significant difference in ergonomic hazards among healthcare workers based on years of experience.

Gender vs Psychosocial Hazards (Chi-Square Analysis): Since the significance value ($p = 0.584$) is greater than 0.05, There is no significant association between gender and psychosocial hazards among healthcare workers.H_{12}: There is a significant association between gender and psychosocial hazards among healthcare workers.

Psychosocial Hazards (Response Variation): Since the significance value ($p = 0.000$) is less than 0.05, There is no significant difference in psychosocial hazards among healthcare workers. H_{13}: There is a significant difference in psychosocial hazards among healthcare workers.

Designation vs Training for Disposal Practices (Correlation Analysis): Since the significance value ($p = 0.352$) is greater than 0.05, There is no significant relationship between designation and training for disposal practices among healthcare workers.H_{14}: There is a significant relationship between designation and training for disposal practices among healthcare workers.

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V. DATA ANALYSIS AND INTERPRETATION

Profile of the respondent

Percentage analysis was used to summarize the demographic distribution of the respondent age, Gender, designation, years of experience

Particulars	Classification	N	Percentage
Age	25-30 Years	28	23.3
	31-40 Years	18	15.0
	41-50 Years	33	27.5
	51-55 Years	14	11.7
	56-60 Years	27	22.5
Gender	Male	57	47.5
	Female	63	52.5
Designation	Doctor	20	16.7
	Nurse	12	10.0
	Lab Technician	36	30.0
	Pharmacist	7	5.8
	House Keeping Staff	22	18.3
	Others	23	19.2
Years Of Experience	<1 Year	18	15.0
	1-5 Years	38	31.7
	6-10 Years	27	22.5
	>10 Years	37	30.8

The table represents the demographic profile of the respondents in the study, showing that the majority belong to the 41–50 years age group (27.5%), followed by 25–30 years (23.3%) and 56–60 years (22.5%), while respondents aged 31–40 years account for 15.0% and those in the 51–55 years category represent the smallest proportion (11.7%). In terms of gender, female respondents (52.5%) slightly outnumber male respondents (47.5%), indicating a relatively balanced participation with a marginal predominance of females.

Regarding designation, Lab Technicians constitute the highest proportion (30.0%), followed by Others (19.2%) and Housekeeping Staff (18.3%), while Doctors account for 16.7%, Nurses for 10.0%, and Pharmacists represent the smallest group at 5.8%. With respect to years of experience, the majority of respondents have 1–5 years of experience (31.7%), followed closely by those with more than 10 years of experience (30.8%), while respondents with 6– 10 years account for 22.5% and those with less than 1 year represent 15.0% of the sample.

ANOVA ANALYSIS OF YEARS OF EXPERIENCE AND EXPOSURE TO ERGONOMIC HAZARDS AMONG HEALTHCARE WORKERS

Years of Experience VS Ergonomic Hazards					
Difference	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.919	3	1.973	1.651	.182
Within Groups	138.672	116	1.195		
Total	144.592	119			

The ANOVA results show that the significance value (p = 0.182) is greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted, indicating that there is no statistically significant difference in ergonomic hazards among healthcare workers with different years of experience. This suggests that years of experience do not significantly influence the occurrence of ergonomic hazards. Hence, ergonomic issues such as back pain and physical strain are commonly experienced across all experience levels, implying that healthcare workers are equally exposed to ergonomic risks irrespective of their experience.

CHI-SQUARE ANALYSIS OF GENDER AND PSYCHOSOCIAL HAZARDS AMONG HEALTHCARE WORKERS

Test Statistics		
Difference	Gender	Receive support from supervisors
Chi-Square	.300a	57.250b
df	1	4
Asymp. Sig.	.584	.000

The Chi-square test shows that the p-value for gender (p = 0.584) is greater than the 0.05 level of significance. Therefore, the null hypothesis is accepted, indicating that there is no statistically significant association between gender and psychosocial hazards. This suggests that psychosocial hazards are experienced similarly by both male and female healthcare workers, and gender does not significantly influence their occurrence.

For the variable related to psychosocial hazards, the p-value (p = 0.000) is less than the 0.05 level of significance. Therefore, the null hypothesis is rejected, indicating that there is a statistically significant association. This suggests that factors such as stress, workload, and mental health risks significantly affect healthcare workers, and responses related to psychosocial hazards vary considerably.

CORRELATION ANALYSIS OF DESIGNATION AND PREVENTIVE MEASURES AMONG HEALTHCARE WORKERS

Correlation Analysis			
Analysis of designation and preventive measures among healthcare workers		Designation	Proper training provided for disposal practices
Designation	Pearson Correlation	1	-.086

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Proper training provided for disposal practices	Pearson Correlation	-.086	1

Pearson correlation analysis reveals that the correlation coefficient indicates a very weak negative relationship between designation and proper training for disposal practices. The pvalue (p = 0.352) is greater than the 0.05 level of significance, which shows that the relationship is not statistically significant. Therefore, the null hypothesis is accepted and the alternative hypothesis is rejected. This implies that designation does not significantly influence the provision of training among healthcare workers. Hence, employees across all roles receive similar levels of training for disposal practices, indicating that training practices are uniformly implemented irrespective of designation.

VI. RESULTS AND DISCUSSION

The study reveals that healthcare workers are exposed to various occupational hazards, including biological, ergonomic, and psychosocial risks. Biological hazards are significant, with younger workers being more vulnerable, while ergonomic issues such as back pain are common across all experience levels. Psychosocial hazards like stress affect employees uniformly, with no significant gender differences, and supervisor support plays an important role in well-being. Training and PPE availability are generally adequate across all designations, though gaps exist in proper utilization. Overall, while awareness and preventive practices are in place, improvements in consistency, monitoring, training, and policy implementation are needed to enhance workplace safety.

VII. CONCLUSION

The study concludes that occupational hazards are a major concern among healthcare workers due to their exposure to various risks in daily activities, with biological hazards significantly influenced by age, indicating greater vulnerability among certain groups, while ergonomic hazards are common across all experience levels and require continuous attention. Psychosocial hazards also significantly impact mental well-being, although gender does not influence their occurrence. The findings show that training and preventive practices are generally well implemented across all designations, and while personal protective equipment (PPE) is adequately available, its proper usage requires reinforcement. Supervisor support plays a crucial role in maintaining workplace safety, and although preventive measures are in place, they need continuous monitoring and improvement. Enhancing awareness, education, and occupational health practices is essential for reducing risks, improving employee performance, and ensuring better patient care, ultimately leading to a safer and more efficient healthcare system.

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