Short Communication

Assessment of Workplace Hygiene among Contractual Workers in the Steel and Power Industry of Odisha, India

Parthsarathi Dehury, K. Anil Kumar, Ranjit Kumar Dehury[1]

School of Health System Studies, Tata Institute of Social Sciences, Mumbai, Maharashtra, [1]School of Management Studies, University of Hyderabad, Hyderabad, Telengana, India

Abstract

Background: Workplace hygiene is vital in controlling infectious diseases in industries. The factors like unhealthy environment, unhygienic workplace, and contact between healthy and disease-affected employees cause industrial hazards in workplaces. **Objectives:** This study assessed various components of workplace hygiene among industrial workers. **Materials and Methods:** A quantitative survey has been conducted in a steel, and power industry limited in Odisha. The study surveyed 425 male contractual workers for primary data on workplace hygiene. Probability proportion to sample technique adopted for justification of the sample. The univariate and bivariate analysis models have been done according to the study's objective. **Results:** Nearly 92% of respondents reported proper use of washing facilities, and 97% used toilet and urinal appropriately. One-fourth of respondents use personal disinfected clothing, and 92.2% have access to safe drinking water. The factors such as education, technical education, and occupation are significantly associated with respondents' use of washing facilities, dining hall, personal protective clothing, safe drinking water, proper cleaning, and sanitation at the workplace. **Conclusion:** Workplace hygiene strengthens the safety measures at the workplace and reduces the incidences of occupational hazards.

Keywords: Industrial hygiene, personal hygiene, personal protective clothing, workplace environment

Introduction

Workplace hygiene is essential to recognize, anticipate, control, and evaluate the health and hazards at the workplace. The objectives of maintaining workplace hygiene have to protect and prevent workers from un healthy conditions and diseases. The bigger goals of workplace hygiene are to safeguard community health and contribute to overall industrial health.[1] Workplace hygiene is closely related to personal hygiene, which ensures the cleanliness and health of individuals.[2] The maintenance of good workplace and personal hygiene of workers help in creating a hazard-free industry.

The factors like workplace environment, employee health, and well-being are the prime focus for industry management. A decent workplace is required for the industry to foster the productive engagement of the employees. A healthy environment protects the employee and avoids infectious agents.[3] The workplace is found to be a route for the transmission of occupational health hazards. The determinants such as hand hygiene, sanitation, and disinfected personal clothing are the most effective measures to control and prevent infections at the workplace. A well-maintained hygienic workplace helps in reducing both infectious and airborne exposure agents.[4]

The factors like employment in an unhygienic workplace and exposure to various chemicals cause neurological, respiratory, and psychosomatic disorders.[5] A study observed that unhygienic clothing and gloves increase the risk of skin cancer in a dirty workplace.[6] The study also confirms that the condition of toilets, urinals, and the commonplace influences health and well-being of employees.[6] Employee health is associated with workplace hygiene and washing facilities because the bacteria and viruses can be survived in

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Address for correspondence: Dr. Parthsarathi Dehury, School of Health System Studies, Tata Institute of Social Sciences, Mumbai, Maharashtra, India.
E-mail: parthsari@gmail.com

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the workplace surface, tools, and equipment. There is a strong association between workplace hygiene and factors such as frequency of cleaning, disinfected clothing, and other personal hygienic practices of workers.[7]

Evidence found that hygienic practice at the workplace helped significantly in controlling airborne diseases.[8] The industrial hygienists recommended installing the washing facilities at the workplace to disinfect the personal protective equipment. The study also found clean common rooms, work clothing disposable systems, and a clean dining area for good hygiene at the workplace.[9] An unhygienic workplace propagates infectious diseases and rapid transmission in the whole work area. Sharing tools and equipment without proper hand hygiene is the prime cause of infectious diseases at the workplace.[10] A study found that very few employees know about hand hygiene. The continuous nature of work hardly encourages the workers to practice hand hygiene in an industrial setup.[11]

The ultimate goal of the study is to assess the occupational health risk of industrial workers. This paper attempts to assess industrial workers' workplace hygiene and personal hygiene. The study evaluates various components such as washing facilities, toilet, and urinal facilities, dining room, personal clothing, safe drinking water, and cleaning and sanitation at the workplace.

Materials and Methods

A quantitative survey method has been used to assess industrial workers' workplace hygiene and practices. The survey was conducted among 1 or more industries ?. The semi-structured interview schedule was used to assess workplace hygiene. The interview schedule identifies various components of workplace hygiene such as washing facilities, toilet and urinal facilities, dining space, cleaning, and sanitation at the workplace. Clearance from the Institutional Review Board of Tata Institute of Social Sciences, Mumbai (Sl No 2018-19/19) was taken to conduct this study. Informed consent is also taken from the respondents.

This study has been carried out at the steel and power plant industrial pockets of Angul district in Odisha. The data was collected from male workers considered contractual and cheap laborers. Contractual workers, informal laborers, riggers, fitters, welders, helpers, and support staff were included in the study. They perform risk and dangerous work in the steel and power industries, regularly contacting various hazardous agents. Lack of workplace hygiene leads to various industrial infections and occupational hazards among the working population. They are more exposed to different occupational health hazards, which are prominent among the contractual workers. Various worksites such as power plant, bar mill, process broiler, coal gas plant, direct reduction plant, switch word, washery, rolling mills, and plate mill was visited for data collection.

The study calculated 425 male workers as per the 60% prevalence of work-related morbidity of central India's steel and power industries.[12] Probability proportion to size technique used to select sampled respondents. In the first stage, industrial workers and their houses have been identified from different workforce supply agencies, labor welfare departments, and site contractors. According to the probability proportion of the respected clusters, industrial workers have been chosen.

The data collected from the industrial workers have been subjected to verification, quantification, and coding by referring to a coding key. The coded data were entered in the IBM SPSS version 25, USA software and computed for data processing and analysis. Univariate and Bivariate data analysis has been done to justify the study objectives.

Results

Does this make sense?. Nearly 92% of respondents reported that the industry provides washing facilities at the workplace. It was observed that the workplace provided adequate hot and cool water and washbasin for the workers. At the same time, the cleaning material (soaps, detergents, hand wash, sanitizer, etc.) and drying materials (towels and clothes) were insufficient at the workplace. Above 97% of respondents replied about using the proper toilet and urinal facilities and 29.2% have a dining hall for eating. Nearly one-fourth of respondents have personal protective clothing, 92.2% have safe drinking water, and 29% reported having proper cleaning and sanitation.

The age-wise distribution shows that 97.2% of respondents from 35 to 39 years reported having washing facilities at the workplace. More respondents above 40 years have more personal hygiene facilities at the workplace than other age group categories. Respondents with primary education and are illiterate have fewer personal hygiene facilities than respondents with secondary and above educational backgrounds. More respondents from the skilled workers reported having more facilities about personal hygiene at the workplace than unskilled workers. Nearly 99% of respondents have washing facilities, hygienic toilets, and urinals at their workplace. Chi-square analysis shows that education, technical education, and occupation are highly associated with respondents having washing facilities, dining hall, personal protective clothing, safe drinking water, proper cleaning, and sanitation at the workplace.

The household characteristics are also associated with the workplace hygiene of workers. Table 2 shows workplace hygiene distribution as per the respondent's household characteristics. All respondents living in urban areas have hygienic toilets and urinal facilities at the workplace. One-fifth of the respondents from rural areas have personal protective clothing, and one-fourth have proper cleaning and sanitation at the workplace. All respondents from the rental and housing colonies have hygienic toilets and urinals at the workplace.

Table 1: Individual characteristics associated with workplace and personal hygiene

Individual characteristics	Percentage of workplace and personal hygiene at workplace						
	Washing facilities	Toilets and urinal facilities	Eating place (dining hall)	Personal protective clothing	Safe drinking water	Proper cleaning and sanitation	Total (*n*)
Age group (years)							
>29	83.3**	100.0	21.4	17.9**	91.7	10.7***	84
30-34	90.8	96.6	23.5	16.0	93.3	26.1	119
35-39	97.2	93.6	33.0	30.3	95.4	40.4	109
<40	93.8	99.1	37.2	32.7	88.5	34.5	113
Education							
Illiterate and primary	54.3***	100.0	5.7***	0.0***	71.4***	0.0***	35
Secondary	91.0	95.3	7.5	7.1	89.2	9.0	212
Higher secondary	100.0	98.5	47.4	35.0	100.0	47.4	137
Graduation and above	100.0	100.0	100.0	100.0	100.0	95.1	41
Technical education							
Not getting	81.6***	94.7	2.6***	4.7***	83.7***	4.7***	190
Engineering	100.0	100.0	100.0	92.3	100.0	100.0	26
Diploma	100.0	100.0	85.7	67.9	100.0	66.1	56
ITI	100.0	99.1	19.7	12.8	98.3	26.5	117
Certificate course	100.0	97.2	61.1	50.0	100.0	55.6	36
Occupation							
Skilled	100.0***	100.0	89.0***	78.0***	100.0***	85.0***	100
Semi-skilled	100.0	98.3	27.0	17.4	100.0	27.8	115
Unskilled	83.3	95.2	1.9	2.9	84.3	2.9	210
Total	91.8	97.2	29.2	24.5	92.2	28.9	425

**P<0.05, ***P<0.01, significance level[7]

More respondents staying in the pucca house reported having more personal hygiene facilities at the workplace than respondents staying in semi-pucca and kaccha houses. All respondents belonging to high-income level have washing facilities, proper toilet, urinal facilities, dining hall, and safe drinking water at the workplace. As per the univariate analysis, housing, infrastructures, and household income are strongly associated with washing facilities, dining hall, personal protective clothing, proper cleaning, and sanitation. The current place of respondents is also associated with washing facilities and personal protective clothing.

Discussion

The major findings related to workplace hygiene are discussed in this section. Workplace hygiene is one of the key factors influencing the health of workers and the productivity of the industry.[13] The current study assesses various components of workplace hygiene and the factors associated with workers' health and hygiene. The previous studies proved that workplace hygiene is responsible for occupational hazards and results in industrial infection workers' health.[7] The study found that the washing facilities and safe drinking water at the workplace are significantly associated with respondents' characteristics. Proper cleaning and housekeeping of the workplace are found positively associated with workplace hygiene. The evidence supported that housekeeping has a significant role in controlling workplace hazards.[14] In addition, the current study also confirmed the previous findings of a hygienic workplace in reducing viral exposures and occupational hazards.[15] Nearly 29% of respondents have reported about proper cleaning and sanitation of the workplace in this study. Sanitation and personal hygiene are the best preventive measures of hazards control. The study result shows that workplace surface sanitation, hand and object disinfection are vital factors in controlling diseases at the workplace.[15] The current study observed that education is significantly associated with workplace hygiene practices. Similarly, the study results found a significant relationship between educational qualification and workplace hygiene among workers.[16]

Conclusion

The study found that workplace hygiene is the key factor for occupational hazards. The facilities like hygiene of dining hall, personal disinfected clothing, cleanness, and sanitation need to be improved to maintain workplace hygiene. The study shows that education, technical education, occupation, and several working hours are highly associated with respondents having washing facilities, dining hall, personal protective clothing, safe drinking water, and proper cleaning and sanitation at the workplace. Workplace hygiene strengthens the safety measures of the workplace and reduces the incidences of occupational hazards.

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Table 2: Household characteristic associated with the workplace and personal hygiene

Household characteristic	Percentage of workplace and personal hygiene at workplace						Total (*n*)
	Washing facilities	Toilets and urinal facilities	Eating place (dining hall)	Personal protective clothing	Safe drinking water	Proper cleaning	
Current place							
Urban	83.9***	100.0	41.1**	37.5***	92.9	39.3	112
Rural	94.6	96.2	24.9	19.8	92.0	25.2	313
Housing							
Own	95.9***	96.7	21.2**	16.2**	90.5	21.2**	241
Rental	96.7	100.0	77.2	68.5	95.7	69.6	92
Labour camp	78.9	93.0	3.5	3.5	96.5	10.5	57
Housing colony	71.4	100.0	0.0	0.0	88.6	5.7	35
Infrastructure							
Kachcha	75.4***	100.0	12.3***	3.5***	86.0	7.0***	57
Semi-pacca	91.6	95.8	4.2	5.6	85.3	4.2	143
Pacca	96.0	97.3	49.3	41.8	98.2	50.2	225
Household income							
Low level (7000-14,000 INR)	86.4***	96.1	8.1***	6.2***	87.2***	3.1***	258
Average level (14,001-24,000 INR)	100.0	98.6	53.6	44.2	100.0	63.8	138
High level (24,001 and above INR)	100.0	100.0	100.0	93.1	100.0	93.1	29
Total	91.8	97.2	29.2	24.5	92.2	28.9	425

**$P<0.05$, ***$P<0.01$, significance level.[7] INR: Indian Rupee

Conflicts of interest

There are no conflicts of interest.

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