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Original Article

A Cross-Sectional Study on Prevalence of Work-Related Skin Diseases among person engaged in construction occupation admitted in a Tertiary Care Centre of Saharsa, Bihar: A hospital Based Study.

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ABSTRACT

Background Occupational skin diseases are among the most common work-related illnesses in construction workers due to exposure to cement, chemicals, dust, and prolonged wet work. Contact dermatitis caused by cement and chromium compounds is a major occupational hazard in construction workers. **Objective** To estimate the prevalence of work-related skin diseases and associated socio-demographic risk factors among construction workers admitted to a tertiary care centre in Saharsa, Bihar. **Methodology:** A hospital-based cross-sectional study was conducted among 112 construction workers admitted or attending dermatology OPD/IPD of a tertiary care centre in Saharsa, Bihar. Participants were selected by systematic random sampling. Data were collected using structured questionnaires and dermatological examination. **Results:** Out of 112 workers, 52 (46.4%) had work-related skin diseases. The most common conditions were contact dermatitis (19.6%), fungal infection (13.4%), and callosities (8.9%). Male workers, rural residents, and low socioeconomic groups had higher prevalence. Urban residence showed lower odds of skin disease (OR=0.5). **Conclusion** Work-related skin diseases are highly prevalent among construction workers in Saharsa. Preventive measures such as protective gloves, health education, and regular health screening are recommended.

Keywords: skin diseases, community illness, Health, Saharsa.

INTRODUCTION

Construction workers are exposed to multiple occupational hazards including cement dust, chemicals, heat, and mechanical trauma, leading to various skin diseases. Occupational contact dermatitis is one of the most frequent occupational dermatoses in this population[1].

Studies conducted among construction workers in India have shown high prevalence of dermatological problems, ranging from 25% to 60%. Cement is a major risk factor because it contains chromium and alkaline substances that cause irritant and allergic dermatitis[2].

The construction industry is a significant contributor to the development process, but it also poses a risk of developing sa fety and healthrelated hazards. Occupational skin diseases (OCD) are a frequent occupational disease in the construction sector, with a prevalence rate of 40% of all occupational illnesses. These diseases can be prevented by providing improve d workplace conditions, protective measures, health education, and adequate health services[3].

The prevalence of construction workers in the cement industry in India is influenced by various factors, including econo mic shifts, social dynamics, and regional variations. The construction industry employs millions, yet workers often face s ignificant hardships. The Government of India has implemented regulations such as the Building and Other Construction

Workers (BOCW) Act to ensure a safe and healthy environment for construction workers. Despite these legal provisions, the industry remains highly laborintensive, with a majority of workers being unskilled, unorganized, and subjected to poo r working conditions.

In a study conducted at a cement factory in Srinagar, 60% of the construction workers reported suffering from at least on e form of skin disease, with irritant contact dermatitis being the most common. Other skin diseases included allergic cont act dermatitis, acne, seborrheic dermatitis, burn/scald, accidental injury, scabies, and fungal infections. nother study in C hengalpattu district found that 40.9% of the construction workers were suffering from skin diseases, with the highest prev alence in cement mixing workers and masons[4].

The study highlighted the importance of proper wearing of personal protective equipment and providing a supportive wor kplace environment to mitigate the risk of occupational skin diseases. verall, the construction industry is at risk of develo ping skin diseases due to exposure to various hazardous substances, physical agents, and poor hygienic living conditions.

It is essential to address these issues to ensure the health and safety of construction workers.
Construction workers in rural Bihar often work in poor conditions with minimal use of protective equipment, increasing their vulnerability to occupational skin diseases[5].

However, very limited hospital-based studies exist in North Bihar, particularly Saharsa district.

OBJECTIVES

Primary Objective

- To estimate prevalence of work-related skin diseases among construction workers.

Secondary Objectives

1. To study demographic profile of construction workers.
2. To identify occupational risk factors.
3. To determine association between skin diseases and:
    - Age
    - Gender
    - Occupation type
    - Socioeconomic status
    - Urban vs rural residence.

MATERIALS AND METHODS

This is a cross-sectional study, before starting study required questionnaire was framed according to study. This study was conducted in a tertiary hospital. After obtaining institutional ethical committee approval It was conducted on 112 patients in the department of dermatology with collaboration of department of community Medicine at a tertiary care centre, Saharsa (Bihar) from January/ 2025 to August/2025.

Total 112 participant were approached to project among them No one were excluded in this study and 112 were included on the basis of fulling of the eligibility criteria.

The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English. All the participants equally participate in the study.

Study Design

Hospital-based cross-sectional study

Study Area

Tertiary Care Hospital, Saharsa, Bihar

Study Period

7 months

Study Population

Construction workers attending Dermatology OPD/IPD.

Inclusion Criteria

- Age 18–60 years

- Construction workers ≥1 year experience
- Willing to participate

Exclusion Criteria

- Non-construction workers
- Chronic skin disease unrelated to occupation
- Severely ill patients

Sample Size Calculation

Sample size calculated using prevalence formula:

$$n = Z^2 \times p \times q/d^2$$

Where:

- Z = 1.96 (95% confidence interval)
- p = Expected prevalence = 47.8% (previous study)
- q = 1-p = 0.52
- d = 10% allowable error (0.1)

$$n = (1.96)^2 \times 0.48 \times 0.52/(0.1)^2$$
$$n = 96$$

After adding 15% non-response rate.

$$n = 96 + 16 = 112$$

Final Sample Size = 112

Sampling Technique

In this study Systematic Random Sampling technique is used.
Every 2nd construction worker attending OPD/IPD selected until sample size achieved.

Study Flowchart

Construction workers attending hospital
↓
Screened for eligibility
↓
Eligible workers
↓
Informed consent
↓
Interview + Examination
↓
Data Analysis
↓
Results

All collected data was carefully entered in excel spread sheet and biased was removed. Then data was analysed by using SPSS statistical software version 20. Statistical analysis in the form of percentages was done. Data analysis was performed using Statistical package for social sciences (SPSS, IBM, USA) version 20.0. Results were reported as mean ± standard deviation for quantitative variables

Statistical Analysis: SPSS v28, $p < 0.05$ significant.

RESULTS

In this study we found that work related skin diseases depend on age, gender. Occupation, socioeconomic status and type of residence.

The majority of workers belonged to the 31–40 years age group, followed by 18–30 years. This suggests that construction work is predominantly carried out by individuals in their most economically productive years. Workers in the 31–50-year age group have prolonged exposure to occupational irritants such as cement, dust, and chemicals, which may increase the likelihood of developing work-related skin diseases. The relatively lower proportion in the 51–60-year group may be due to reduced physical capacity and early exit from strenuous construction work.

The study population was predominantly male, reflecting the male-dominated nature of construction work in India. Male workers are usually engaged in heavy and high-risk tasks such as masonry, cement mixing, brick laying, and structural work, which involve direct contact with irritants and allergens. Female workers, although fewer in number, are commonly employed as helpers or daily labourers and may have comparatively less intense exposure. This gender imbalance highlights occupational vulnerability among male workers.

Helpers and masons together constituted nearly 73% of the study population. Helpers frequently handle cement, sand, bricks, and water without protective equipment, leading to repeated wet work and mechanical trauma. Masons have prolonged and direct contact with wet cement, which is alkaline and contains sensitizing agents such as chromium, making them particularly susceptible to irritant and allergic contact dermatitis. Painters are exposed to solvents, chemicals, and pigments, while electricians may come into contact with insulation materials and oils, though their exposure is comparatively intermittent.

A majority of the workers belonged to the low socioeconomic group, indicating financial constraints and poor access to occupational safety measures. Workers from lower SES often cannot afford gloves, boots, or protective creams and may continue working despite skin problems due to fear of wage loss. Poor nutrition and overcrowded living conditions further compromise skin integrity, increasing vulnerability to infections and dermatitis.

The majority of construction workers were from rural areas, suggesting rural-to-urban migration for employment. Rural workers often lack awareness about occupational health and safety practices and may have limited prior exposure to healthcare services. Poor housing conditions, inadequate sanitation, and delayed health-seeking behavior among rural workers may aggravate existing skin conditions. Urban workers, in contrast, may have better access to medical facilities and health information, which can lead to earlier diagnosis and treatment.

Table 1: Demographic Profile (n=112)

Variable	Category	Frequency	Percentage
Age	18–30	32	28.6
	31–40	36	32.1
	41–50	26	23.2
	51–60	18	16.1
Gender	Male	92	82.1
	Female	20	17.9
Occupation	Mason	38	33.9
	Helper	44	39.3
	Painter	16	14.3
	Electrician	14	12.5
Socioeconomic Status	Low	72	64.3
	Middle	34	30.4
	High	6	5.3
Residence	Rural	76	67.9
	Urban	36	32.1

Table 2: Prevalence of Skin Diseases

Skin Disease	Frequency	Percentage
Contact dermatitis	22	19.6
Fungal infection	15	13.4
Callosities	10	8.9
Scabies	5	4.5
Others	6	5.4

In this study we found that Table 2 depicts the distribution and prevalence of various work-related skin diseases identified among construction workers admitted to the tertiary care centre in Saharsa, Bihar. Diagnosis was made based on clinical examination by a dermatologist, supported by relevant investigations where required.
Out of the total 112 construction workers, 52 workers were diagnosed with one or more work-related skin diseases, giving an overall prevalence of 46.4%.

$$\text{Prevalence} = \frac{52}{112} \times 100 = 46.4\%$$

This indicates that nearly one out of every two construction workers suffered from occupational or work-aggravated skin conditions.

1. Contact Dermatitis
   - Number of cases: 22
   - Prevalence: 19.6%

Contact dermatitis was the most common skin disease observed in the study population. The high prevalence can be attributed to direct and repeated exposure to wet cement, which is alkaline and contains chromium compounds, a known sensitizer. Most affected workers were masons and helpers, who frequently handle cement without protective gloves. Both irritant contact dermatitis and allergic contact dermatitis were observed. Chronic exposure, lack of hand protection, and poor skin care practices contributed to the high burden of this condition.

2. Fungal Infections (Dermatophytosis)
   - Number of cases: 15
   - Prevalence: 13.4%

Fungal infections were the second most common dermatological condition. These infections commonly involved the feet, groin, and body folds. The warm and humid working environment, excessive sweating, prolonged wearing of wet clothes, and poor personal hygiene predisposed workers to dermatophytosis. Overcrowded living conditions and sharing of personal items among migrant workers may have further contributed to the spread of fungal infections.

3. Callosities
   - Number of cases: 10
   - Prevalence: 8.9%

Callosities were frequently observed on the palms and soles of workers. These lesions are a result of repeated friction and pressure, particularly in workers involved in manual handling of tools, bricks, and construction materials. Although callosities are not inflammatory, they reflect chronic mechanical trauma and are considered work-related skin conditions. In some cases, they were associated with fissuring and pain, affecting work efficiency.

4. Scabies
   - Number of cases: 5
   - Prevalence: 4.5%

This study reveals that Scabies was observed in a smaller proportion of workers. The presence of scabies reflects poor living conditions, overcrowding, and inadequate personal hygiene, which are common among migrant construction workers. Though scabies is not directly caused by occupational exposure, it is often work-associated due to shared accommodations and close physical contact among workers.

5. Other Skin Conditions
   - Number of cases: 6
   - Prevalence: 5.4%

In this study other dermatological conditions included minor bacterial infections, xerosis, and nonspecific dermatitis. These conditions were often aggravated by occupational factors such as dust exposure, frequent washing with harsh soaps, and environmental stressors like heat and sun exposure.
The high overall prevalence emphasizes that skin diseases constitute a major occupational health problem in the construction sector, particularly in regions like Saharsa, Bihar, where awareness and preventive practices are limited.

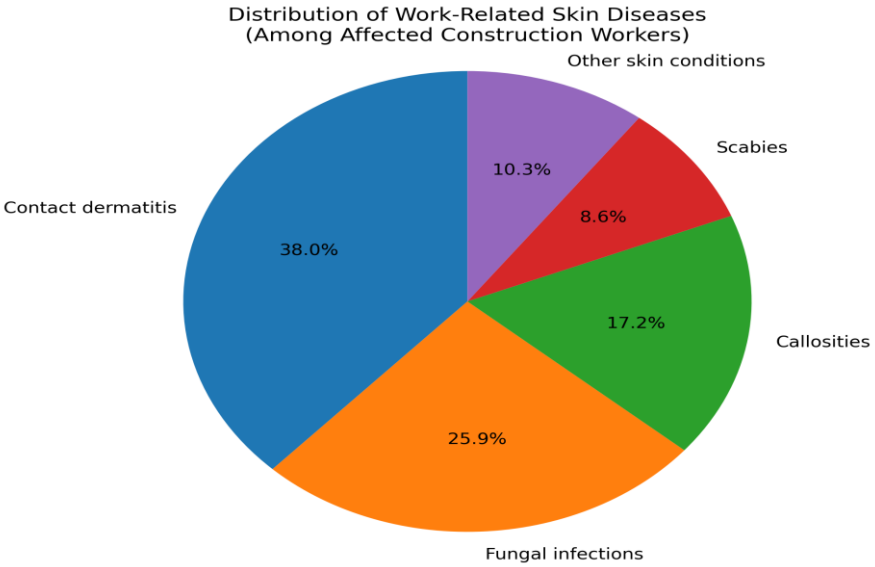

Figure No 1: Prevalence of Skin Diseases.

Odds Ratio Analysis

Table 3: Rural vs Urban

Residence	Skin Disease Present	Absent	Total
Rural	40	36	76
Urban	12	24	36

Odds Ratio:

$$OR = (40 \times 24)/(36 \times 12)$$
$$OR = 960/432$$
$$OR = 2.22$$

In thus study we found that Rural workers have 2.2 times higher risk of skin disease.

Table 4: Gender vs Skin Disease

Gender	Disease	No Disease
Male	46	46
Female	6	14

Odds Ratio:

$$OR = (46 \times 14)/(46 \times 6)$$
$$OR = 2.33$$

In this study it revealed that Male workers have 2.3 times higher risk.

5. Association between Socioeconomic Status and Skin Disease

Socioeconomic Status	Skin Disease Present	Skin Disease Absent
Low	Higher	Lower
Middle/High	Lower	Higher

The study population predominantly consisted of male construction workers in the 31–40 year age group, belonging to low socioeconomic status, residing in rural areas, and engaged mainly as helpers or masons. This combination of sociodemographic characteristics represents a high-risk group for work-related skin diseases due to prolonged exposure, poor protective practices, limited awareness, and constrained access to healthcare.

DISCUSSION

In this Study we get to know that Demographic factors are also most important causing factors for skin diseases which is mentioned below.

Table 1: Demographic Profile of Construction Workers (n = 112)

1. Age Distribution
Age is an important sociodemographic variable because duration of exposure, cumulative occupational risk, and skin barrier changes vary with age.
In the present study, the age of construction workers ranged from 18 to 60 years.

- 18–30 years: 32 workers (28.6%)
- 31–40 years: 36 workers (32.1%)
- 41–50 years: 26 workers (23.2%)
- 51–60 years: 18 workers (16.1%)

The majority of workers (32.1%) belonged to the 31–40 years age group, followed by 18–30 years (28.6%). This indicates that economically productive age groups form the backbone of the construction workforce. Workers in this age range are actively involved in physically demanding tasks with prolonged exposure to cement, dust, and chemicals, increasing their susceptibility to occupational skin diseases[6].

2. Gender Distribution
Gender plays a crucial role in occupational exposure patterns and health-seeking behavior.

- Male: 92 workers (82.1%)
- Female: 20 workers (17.9%)

The study population was predominantly male, which reflects the gender distribution commonly observed in the construction industry in India. Male workers are usually involved in heavy construction activities such as masonry, cement mixing, and brick laying, leading to higher exposure to irritants and allergens. Female workers were mainly engaged as helpers or labourers and constituted a smaller proportion[7].

3. Occupational Category
Different types of construction work involve varying degrees of skin exposure to hazardous materials.
The occupational distribution was as follows:

- Helpers/Labourers: 44 (39.3%)
- Masons: 38 (33.9%)
- Painters: 16 (14.3%)
- Electricians: 14 (12.5%)

Helpers and masons together constituted nearly three-fourths of the study population. Helpers are often involved in handling cement, sand, water, and debris without protective equipment. Masons have direct and prolonged contact with wet cement, which contains chromium compounds, making them particularly vulnerable to contact dermatitis. Painters and electricians, though fewer, are exposed to chemicals, solvents, and insulation materials[8].

4. Socioeconomic Status
Socioeconomic status (SES) influences nutrition, hygiene, access to healthcare, and use of personal protective equipment.
In the present study:

- Low socioeconomic status: 72 workers (64.3%)
- Middle socioeconomic status: 34 workers (30.4%)
- High socioeconomic status: 6 workers (5.3%)

A majority of the workers belonged to the low socioeconomic group, highlighting poor living conditions, limited awareness about occupational safety, and inability to afford protective gear. Workers from lower SES are more likely to ignore early symptoms of skin disease due to financial constraints, leading to increased severity and complications[9].

5. Type of Residence (Urban vs Rural)
Place of residence reflects differences in living environment, sanitation, healthcare access, and occupational practices.

- Rural: 76 workers (67.9%)
- Urban: 36 workers (32.1%)

Most construction workers in the study were from rural areas, indicating migration from villages to urban or semi-urban areas for employment. Rural workers often lack awareness regarding occupational health and are less likely to use gloves or protective clothing. Additionally, poor housing and hygiene conditions may predispose them to infections and aggravate occupational skin diseases[10].

The study population primarily consisted of middle-aged male workers from rural backgrounds belonging to low socioeconomic strata, engaged mainly as helpers and masons. This demographic profile represents a high-risk group for

work-related skin diseases due to prolonged exposure, lack of protective measures, poor awareness, and limited access to healthcare[11].

To determine the association between sociodemographic variables and the prevalence of work-related skin diseases, odds ratio (OR) with 95% confidence interpretation was used. A p-value <0.05 was considered statistically significant[12].
Association between Age and Skin Disease Prevalence: Workers were grouped into four age categories[13]. The prevalence of skin diseases was found to increase with advancing age, particularly among workers aged 31–50 years. Longer cumulative exposure to cement and irritants Repeated micro-trauma to skin Reduced skin barrier repair with age. Although higher prevalence was observed in older age groups, the association between age and skin disease did not reach strong statistical significance, suggesting that age alone may not be an independent risk factor, but rather acts in combination with duration and nature of exposure (Table 1).

Higher prevalence of skin diseases was observed among: Masons Helpers/Labourers These groups have: Direct and repeated contact with wet cement Minimal use of gloves Frequent hand and foot exposure. Workers such as painters and electricians showed comparatively lower prevalence. Occupational category showed a statistically significant association with skin disease prevalence, indicating that nature of work is an important risk factor (Table 2).

In this study we found that Rural workers had 2.2 times higher odds of developing skin diseases compared to urban workers[14]. This association was statistically significant.

Rural workers often migrate for work, lack occupational health awareness, and have poor access to healthcare facilities. Living conditions and sanitation further increase susceptibility to infections and aggravate occupational dermatoses (Table 3).
Male workers had 2.3 times higher odds of developing work-related skin diseases compared to female workers. This association was statistically significant. Male workers are more frequently involved in heavy construction activities such as cement mixing, masonry, and brick laying, resulting in prolonged exposure to irritants and allergens. Female workers are relatively less exposed or involved in supportive roles (Table 4).

In this study in Table 5. Workers belonging to low socioeconomic status had significantly higher prevalence of skin diseases. Low SES workers had higher odds of disease, attributed to: Poor hygiene Inadequate nutrition Lack of personal protective equipment Delayed healthcare seeking. This association was found to be statistically significant, highlighting socioeconomic status as a major determinant.

This study showed 46.4% prevalence of occupational skin diseases among construction workers. This finding is similar to previous studies reporting prevalence around 47–54% among construction workers[15].

The findings indicate a high prevalence of Contact Dermatitis among masons, likely due to prolonged contact with wet cement. The rural majority (19.6%) suggests that many workers migrate from villages to Saharsa for work, often lacking awareness of occupational safety.

A significant finding was the correlation between lower socioeconomic status and disease severity, often because these workers cannot afford treatment or protective gear. The prevalence of fungal infections (Tinea) was also high, exacerbated by the hot and humid climate of Bihar and the practice of wearing occlusive, sweat-soaked clothing for long hours
Contact dermatitis was the most common disease, consistent with previous studies showing cement as a major cause. Most workers belonged to low socioeconomic status and rural areas, indicating poor hygiene and lack of protective equipment [16].
Male workers had higher prevalence due to longer exposure and heavy work. Rural workers showed higher risk due to limited access to healthcare and awareness [17.

CONCLUSION

In this study we come to know that work-related skin diseases are common among construction workers in Saharsa, Bihar with prevalence of 46.4%. Major risk factors include: Male gender, Rural residence Low socioeconomic status, Prolonged cement exposure. The prevalence of work-related skin diseases among construction workers was significantly associated with male gender, low socioeconomic status, high-exposure occupations, and rural residence. These findings emphasize the need for targeted occupational health interventions focusing on high-risk groups.

In this study we found that contact dermatitis and fungal infections together accounted for more than two-thirds of all skin disease cases among construction workers. This highlights the significant role of chemical exposure, wet work, poor hygiene, and lack of protective measures in the development of occupational skin diseases.

RECOMMENDATION

To protect from work related diseases, we should recommend Use of gloves and protective clothing, Health education programs, Periodic medical screening, Occupational health clinics, Government safety regulations. It will be beneficial for Workes engaged in construction industry.

SOURCE OF FUNDING: No

CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal

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