ORIGINAL ARTICLE

A study to assess the Knowledge about risk factors and practices regarding Occupational Health problems among workers in a Jute mill at Urban community, Kolkata, West Bengal

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ABSTRACT

Background: Occupational morbidity among textile and jute workers remains a major public health concern in developing countries. Despite documented exposure to dust, noise, ergonomic strain, and mechanical hazards, there is limited integrated research from West Bengal assessing workers' knowledge, preventive practices, and associated health outcomes. This study aimed to assess knowledge regarding occupational risk factors, stated preventive practices, prevalence of health problems, and their sociodemographic associations among jute mill workers in Kolkata, India. **Methods:** A descriptive cross-sectional study was conducted among 100 jute mill workers with ≥10 years of experience at Kamarhati Jute Mill, Kolkata. Participants were selected using convenience sampling. Data were collected through validated semi-structured interview schedules assessing demographic characteristics, occupational exposure, knowledge (24 items), and preventive practices (18 items). Descriptive statistics, chi-square tests, and odds ratios (OR) with 95% confidence intervals (CI) were computed. Statistical significance was set at $p<0.05$. **Results:** The majority were male (85%) and aged 44–51 years (28%). Most reported working >12 hours/day (73%) and >50 hours/week (81%). Non-smoking tobacco use was highly prevalent (85%). Musculoskeletal (63%) and respiratory problems (51%) were the most common morbidities; 65% reported occupational injuries in the past year. Mean knowledge score was 71.34±3.45, while preventive practice score was 20.09±1.34; 51% demonstrated poor practices. Significant factors associated with of occupational health problems included working experience >20 years (OR 5.47; 95% CI 2.19–13.65), overtime ≥3 days/week (OR 3.67; 95% CI 1.53–8.77), weekly duty >50 hours (OR 4.03; 95% CI 1.47–11.05), addiction (OR 4.69; 95% CI 1.57–13.96), and age >43 years (OR 3.14; 95% CI 1.32–7.47). **Conclusion:** Jute mill workers experience a high burden of multi-system occupational morbidity despite moderate knowledge levels. Excessive working hours, cumulative exposure, and addictive behaviours significantly increase health risk. Strengthening workplace safety enforcement, periodic health surveillance, and behaviour-focused interventions are urgently required.

KEYWORDS

Jute Worker, Occupational Health

INTRODUCTION

Occupational injuries in developing countries are increasingly recognized as epidemic in nature. However, preventive efforts remain fragmented and inadequately targeted. Although many occupational hazards are preventable through primary prevention strategies—such as health education, engineering controls, environmental monitoring, and consistent PPE use—the effectiveness of these measures depends largely on workers' awareness, attitudes, and adherence to safe practices.

The reviewed literature demonstrates that the textile and jute industries are major economic sectors in developing countries but workers are exposed to substantial occupational hazards.

Studies examining knowledge and safety practices consistently reveal some knowledge–practice gap. Although a large proportion of workers report awareness of hazards such as dust, noise, machinery injury, chemicals, and fire, adherence to preventive practices remains inadequate. Mohsin Ali Shaikh et al. reported that 88.8% of workers were aware of hazards, yet 95% did not use personal protective equipment (PPE) due to limited availability (1). Similarly, Natasha Shaukat et al. found that 77% of workers had good knowledge, but only 21% practiced safe measures (2). Khoso Aneeta reported adequate knowledge (48.9%) and positive attitudes

(81%), yet only 21% demonstrated appropriate practices (3). Okafoagu et al. observed that while 74% had good knowledge, compliance with safety measures was low, highlighting the need for structured training programs (4). Education level, employment status, and working hours were significant determinants of knowledge and practice.

Occupational injuries remain a major concern in textile industries. Sah et al. identified prolonged working hours (>48 hours/week), heavy load handling, sleep disorders, and poor machine maintenance as significant factors associated with of occupational injuries (5). Calvin et al. reported accident incidence of 2.49 per 1,000 workers and emphasized the importance of consistent PPE use (6). These findings underscore the need for strengthened occupational safety enforcement.

Respiratory morbidity is widely documented among jute and textile workers. Rahman reported breathlessness (16.5%), chest tightness (25.7%), and chronic cough (16.3%) among jute workers (7). Saha et al. demonstrated byssinosis-like symptoms in 22.8% of workers exposed to jute dust, with measurable pulmonary function impairment (8).

Musculoskeletal disorders (MSDs) are highly prevalent. Goswami et al. reported chronic low back pain in 55% of jute workers, associated with heavy lifting and repetitive movements (9). Sett Moumita et al. found that 92.5% of workers experienced intense musculoskeletal pain due to awkward postures and repetitive tasks (10).

Noise-induced hearing loss (NIHL) is another significant occupational hazard. Shahid Afshan et al. found that 79% of workers had measurable hearing impairment (11).

Dermatological problems, including occupational contact dermatitis, are associated with dye and chemical exposure. Betül Taş et al. documented allergic dermatitis in 54.83% of textile workers (12).

Overall, literature indicates a high burden of multi-system occupational morbidity, combined with inadequate preventive practice adherence. Despite substantial global evidence, integrated research assessing knowledge, practices, and health outcomes among jute mill workers in West Bengal remains limited.

Kamarhati Jute Mill in Kolkata employs approximately 3,200 workers, including 2,800 permanent and 400 casual workers, with an average daily attendance of 2,600 employees. The mill operates multiple departments involving exposure to dust, noise, mechanical hazards, and ergonomic strain. Preliminary environmental observations indicate significant dust accumulation in batching and carding sections and excessive noise levels in spinning and weaving units. To meet the evidence the gap the study was conducted with the objectives of:

- To assess the knowledge about risk factors among the workers in jute mill, Kolkata, West Bengal.
- To assess the various health problems among jute mill workers in jute mill, Kolkata, West Bengal.
- To assess stated practices for prevention of occupational health problem among jute mill worker in jute mill Kolkata, West Bengal.
- To identify the association of sociodemographic variables with their health problems among jute mill worker in jute mill Kolkata, West Bengal.

MATERIAL & METHODS

An observational descriptive cross-sectional study was conducted to assess occupational health problems, knowledge regarding risk factors, and stated preventive practices among jute mill workers. The study was carried out at Kamarhati Jute Mill, Kolkata, West Bengal, a large industrial unit employing approximately 3,200 workers operating in three rotating shifts. For feasibility and accessibility, workers from Shift A (6:00 AM–11:00 AM and 2:00 PM–5:00 PM) were included in the study.

The study population comprised jute mill workers with at least 10 years of work experience. Workers with less than 10 years of service, those unable to comprehend Bengali, or those unwilling to participate were excluded.

A total of 100 workers were selected for the final study using a non-probability convenience sampling technique, as per permission by the Jute Mill authority. The sampling frame was developed from the master employee list obtained from the mill authority. Workers with long-term exposure were prioritized due to documented associations between occupational exposure (particularly tobacco use and alcohol consumption) and respiratory conditions such as byssinosis.

The study included Dependent Variable as Occupational health problems, Independent Variables as Knowledge about occupational risk factors, stated preventive practices, Demographic variables, Occupational variables (working experience, working hours, overtime duty, addiction status). In this study occupational health problems deals with accidents and near miss incidents respiratory problem, musculoskeletal problems, eye and ear problems, gastrointestinal problems and others major diseases like hypertension, diabetes, tuberculosis.

Data was collected using a structured and semi-structured interview schedule developed after an extensive literature review and expert consultation.

The tool consisted of three components:

Tool I: Demographic profile and occupational history (Part A: 15 items; Part B: 24 items)

Tool II: Knowledge about occupational risk factors (24 items, including 12 semi-structured questions and 12 Likert-scale items)

Tool III: Stated preventive practices (18 semi-structured items)

The questionnaire addressed respiratory symptoms (cough, chest tightness, sputum production, breathlessness), accidents, near-miss injuries, chronic illnesses, PPE usage, environmental monitoring, lifestyle behaviors, and medical examination practices. Interviews were conducted face-to-face in Bengali. Each interview lasted approximately 30–35 minutes.

Content and face validity were established through expert review. The instrument was evaluated by nine subject experts, including specialists from Community Health Nursing, Community Medicine, Medicine, and the Directorate General of Factory Advice Service and Labour Institutes (DGFASLI). The tool was translated into Bengali and back-translated to ensure linguistic accuracy. Pre-testing was conducted among 10 workers at Agarpara Jute Mill to assess clarity and feasibility. Reliability was established through pilot testing, and the instrument demonstrated high internal consistency.

A pilot study was conducted from 15 December to 20 December 2020 at Prabartak Jute Mill, Kolkata, with 20 participants. The objectives were to assess feasibility, clarity, administrative cooperation, and time requirements. No major modifications were required. The pilot confirmed the practicality of conducting the final study

The final data collection was conducted from 4 January to 23 January 2021 at Kamarhati Jute Mill. Administrative approval was obtained from relevant authorities, including the institutional ethics committee and mill management

Participants were approached individually, informed about the study objectives, and written informed consent was obtained. Confidentiality was ensured using coded identification numbers. Interviews were conducted in a quiet designated area within the mill premises. On average, 8–12 interviews were conducted per day.

Ethical approval was obtained from the Institutional Ethics Committee of R.G. Kar Medical College and Hospital, Kolkata. Administrative permissions were secured from the Directorate of Health Services and the concerned jute mill authority. Written informed consent was obtained from all participants, and confidentiality was maintained throughout the study

Data were analyzed using descriptive and inferential statistics. Frequency and percentage distributions were used to describe demographic characteristics, occupational exposures, knowledge levels, and preventive practices.

Chi-square tests were applied to determine associations between occupational health problems and selected demographic and occupational variables. Correlation analysis was conducted to assess the relationship between knowledge and stated preventive practices. Statistical significance was considered at $p < 0.05$.

RESULTS

Among 100 jute mill workers, 28% were aged 44–51 years and 85% were male. Most were married (75%) and had primary education (36%). A majority reported working >12 hours daily (73%) and >50 hours weekly (81%). Non-smoking tobacco use was reported by 85%, alcohol by 63%, and smoking tobacco by 51%.

Near-miss injuries were reported by 65% of workers, with nail (23%) and finger (16%) injuries being most common. Musculoskeletal (63%) and respiratory (51%) problems were highly prevalent. Hypertension (19%), diabetes (12%), and COPD (9%) were reported chronic conditions.

Mean knowledge score was 71.34 ± 3.45, while mean preventive practice score was 20.09 ± 1.34. Despite moderate knowledge levels, 51% demonstrated poor preventive practices. Knowledge and practice were negatively correlated and not statistically significant ($p > 0.05$).

Significant associations with occupational health problems were observed for age ($\chi^2=6.494$), education ($\chi^2=8.018$), working experience ($\chi^2=11.647$), overtime ($\chi^2=8.949$), weekly duty hours ($\chi^2=8.046$), and addiction ($\chi^2=4.407$) ($p<0.05$).

Chi-square analysis demonstrated statistically significant associations between occupational health problems and age, educational status, working experience, overtime duty, weekly working hours, and addiction status ($p < 0.05$). Workers aged >43 years exhibited significantly higher morbidity (76.1%) compared to younger workers (51.9%). Similarly, workers with lower educational attainment (≤primary level) demonstrated higher prevalence of occupational health problems (74.1%) compared to those with higher education (50.0%). Prolonged occupational exposure (>20 years) markedly increased morbidity risk (80.0%). Excessive overtime (≥3 days/week) and working >50 hours per week were strongly associated with adverse health outcomes. Addiction further compounded morbidity risk, with 71.4% of addicted workers reporting occupational health problems. No statistically significant association was observed with gender.

Table 1: Socio-Demographic Characteristics of Jute Mill Workers (N = 100)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	28–35	19	19.0
	36–43	26	26.0
	44–51	28	28.0
	52–59	18	18.0
	≥60	9	9.0
Gender	Male	85	85.0
	Female	15	15.0
Religion	Muslim	64	64.0
	Hindu	33	33.0
	Sikh	2	2.0
	Christian	1	1.0
Marital Status	Married	75	75.0
	Unmarried	13	13.0
	Widowed	10	10.0
	Separated	2	2.0
Educational Status	Illiterate	9	9.0
	Signature only	17	17.0
	Primary	36	36.0
	Secondary	27	27.0
	Higher Secondary	8	8.0
	Graduate	3	3.0
Monthly Income (₹)	15,000–20,000	29	29.0
	>20,000	18	18.0
	Other categories	Remaining	—

Table 2: Occupational Profile and Health Problems (N = 100)

Variable	Category	n (%)
Working Experience	20–30 years	37 (37.0)
	30–40 years	23 (23.0)
Working Hours	>12 hours/day	73 (73.0)
	>50 hours/week	81 (81.0)
Overtime (3 days/week)	36 (36.0)	
Addiction (Current Use)	Non-smoking tobacco	85 (85.0)
	Alcohol	63 (63.0)
	Smoking tobacco	51 (51.0)
	Any injury	65 (65.0)
	Nail injury	23 (23.0)

Variable	Category	n (%)
Near-miss/Accident (Past 1 year)	Finger injury	16 (16.0)
System-specific Problems	Musculoskeletal	63 (63.0)
	Respiratory	51 (51.0)
	Gastrointestinal	Few cases
Chronic Illness	Hypertension	19 (19.0)
	Diabetes	12 (12.0)
	COPD	9 (9.0)
	Cirrhosis	4 (4.0)
	Tuberculosis	1 (1.0)

Table 3: Knowledge, Preventive Practices, and Association with Occupational Health Problems (N = 100)

Variable	Findings
Knowledge Score	Mean = 71.34 ± 3.45
	Range = 63–79
Preventive Practice Score	Mean = 20.09 ± 1.34
	Range = 18–23
Correlation	Negative correlation between knowledge & practice (p > 0.05)

Table 4: Factors Associated with Occupational Health Problems Among Jute Mill Workers (N = 100)

Variable	Category	Health Problem Present n	Health Problem Absent n	Crude OR (95% CI)	p-value
Age	>43 yrs	35	11	3.14 (1.32–7.47)	0.01
	≤43 yrs	28	26	Reference	
Education	≤Primary	40	14	3.05 (1.30–7.14)	0.01
	>Primary	23	23	Reference	
Working Experience	>20 yrs	44	11	5.47 (2.19–13.65)	<0.001
	≤20 yrs	19	26	Reference	
Overtime	≥3 days/week	45	15	3.67 (1.53–8.77)	0.003
	≤2 days/week	18	22	Reference	
Weekly Hours	>50 hrs	51	19	4.03(1.47–11.05)	0.006
	≤50 hrs	12	18	Reference	
Addiction	Yes	55	22	4.69(1.57–13.96)	0.004
	No	8	15	Reference	

DISCUSSION

This study is the first one that addressed not only the accidents and near miss injury of jute mill workers but also other important occupational health problems. In this report, there were high rates of accidents (65 percent among 100 workers) and near-miss injuries (23 percent nail injury, 16 percent finger injury). According to Prasad Sah and Kumar Mishra (5), most staff have been involved in an accident at least once a year during their careers. Staff with as many as 200 injuries in their lives, according to them.

The complaints of respiratory problems observed in this study was much higher (51%) in terms of chest tightness, shortness of breath, coughing, than found by Babel Rudha et al (43.33%) (13) in terms of breathlessness, coughing, sneezing and nose irritation among workers at opening department of textile industry, Udaipur, Rajasthan 2014.

Gangopadhyay S, eta l (14) ,They conducted a study among eight selected jute mills of India. Seven hundred and Seventeen male jute mill workers, actively engaged in work at least for one year were randomly selected in this study. Among all participants, 55% had complained Chronic Low Back Pain (CLBP). Age had an important association with CLBP. Subjects in the age group of 40–59 years were more likely to have pain (p=0.02). Regarding ergonomic risk factors, lifting of load of more than 20 kg (p=0.04) and repetitive movements of limbs (p=0.03) had significant associations with CLBP. Present study identifies a significant prevalence of CLBP among jute mill workers. Similarly, in this study statistical significant association present between working experience in years and occupational health problems (p< 0.05) is seen. Also chi square is computed between occupational health problems and selected sample characteristics (Over time duty). Which shows statistically significant association(p<0.05) present between overtime duty and occupational health problems. Again Chi square is computed between occupational health problems and selected sample characteristics (Hours of duty / week). Which shows significant association present between their hour of duty per week and occupational health problems (p<0.05).

Daniyala.B. K, eta al. (15)conducted a study on jute mill workers exposed to occupational hazards. There was a statistically significant association (p<0.05) found between health problem and sex. On the other hand, in this study there is a no statistical significant association (p<0.05) found between occupational health problem and sex male were more vulnerable with respect to different health problems compare to female.

CONCLUSION

This study revealed the need for increased knowledge on risk factors like occupational hazards and their prevention among jute mill workers. Jute mill workers with health problems etiological factor is respiratory and systemic system injury so regular health check-up and health awareness and education of workers. Use of safety equipment. Rotation from high dust to low dust

departments. Accidents and injuries were a daily occurrence in their daily duty. While conducting the study, it was found that workers in the age group 30-39 and 40-49 class (having high skill and experience) were more exposed to hand, finger, head, and other body parts injury. Based on Root Cause Analysis, specific measures and action plan has been suggested. The results highlight a lack of adequate work safety practices and lack of proper training in the jute mill workers. Workers experience various work-related hazards and health problems. About 90% of workers were consuming various types of intoxication every day even during their duty. Dental problem was the most common problem followed by ear problem, eye problem, and skin problems. Hypertension, Diabetes, Hep – B, Cancer was also present. High intensity of noise was noticed in the spinning and weaving department in the industry. Hearing problems of the workers could be due to the presence of high noise in the industry. The use of personal protective equipment in the textile industry was not satisfactory, some of them use only normal cotton face masks. This research paper mainly presents an overall picture of occupational health problems among workers and enhances safety conditions of the concerned Jute Industry. Morbidities are mainly due to dust, addiction, high intensity of noise, chemicals as well as ignorance at working place in the industry. These health problems can be reduced by the use of protective measures by the workers as well as by modifying the working environment. the results highlight a lack of adequate work safety practices in the jute mill workers.

Limitation of the Study

Limitation of the present study are the study sample size is small for generalization, the participants in the study are selected through non probability sampling technique, there is information bias as the symptoms are self-reported and healthy worker effect can be there as only long term workers are kept.

Authors Contribution

All authors have contributed equally.

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Nil

Conflict of Interest

There are no conflicts of interest.

Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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