



## Pattern of Health Problems among Tea Garden Workers of Malnicherra Tea Estate in Sylhet District of Bangladesh



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### Abstract

**Background:** Tea plantation workers form an important but underrepresented minority in Bangladesh, often exposed to occupational hazards, poor living conditions and limited access to healthcare. **Objectives:** This study was aimed to assess the pattern of health problems and associated socio-demographic and occupational factors among tea workers in Malnicherra Tea Estate, Sylhet. **Methodology:** This descriptive cross-sectional study was conducted using a semi-structured questionnaire covering socio-demographic data, occupational information and health status. Data were collected from 150 respondents selected through convenient sampling. **Results:** The findings revealed that the majority of workers were female 102 (68%) and 81(54.0%) were aged between 25 to 45 years. A total of 105(70.0%) of households income  $\leq$ 15,000 BDT/month and 96(64.0%) lived in kutcha houses, reflecting poor living conditions among their community. The most commonly found health problems were musculoskeletal pain 87 (58.0%), skin diseases 62(41.0%), respiratory symptoms 51(34.0%) and gastrointestinal problems 44 (29.0%). About one-third 48 (32.0%) of workers reported having chronic diseases such as hypertension and asthma. Regarding healthcare-seeking behavior, more than half 80(53.0%) were dependent on tea garden clinics, followed by traditional healers 31(21.0%) and government hospitals 22(15.0%). Preventive health practices were sufficient, with 108(72.0%) using safe water and 98(65.0%) using sanitary latrines, though only 57(38.0%) had received health education and 83(55.0%) reported being vaccinated under the EPI program. Chi-square analysis revealed significant associations between gender and specific illnesses. **Conclusion:** The study concludes that tea workers face significant occupational and health-related challenges linked to poverty, poor working conditions and limited health awareness. Improving access to healthcare, occupational safety and health education is essential to promote their health and well-being. [Bangladesh Journal of Infectious Diseases, December 2025;12(2):267-272]

**Keywords:** Tea workers; occupational health; health problems; health-seeking behavior; Malnicherra tea estate; Bangladesh

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## Introduction

The tea industry is one of the oldest and most significant agro-based sectors in Bangladesh, contributing substantially to national revenue, employment, and export earnings. Sylhet, in particular, holds historical importance as the birthplace of tea cultivation in the Indian subcontinent and remains a major hub for tea production. Despite their crucial role in sustaining this industry, tea garden workers—most of whom are descendants of laborers brought during the colonial period—continue to live in conditions that pose serious risks to their health and overall well-being<sup>1</sup>.

Tea workers typically belong to marginalized and economically deprived communities, often characterized by poor literacy levels, overcrowded housing, and limited access to essential services such as healthcare, sanitation, safe drinking water, and education<sup>2</sup>. These socio-economic constraints exacerbate their vulnerability to disease and restrict their ability to seek timely medical care.

Moreover, the nature of tea cultivation exposes workers to a variety of occupational hazards. Regular use of pesticides, prolonged periods of bending and standing, repetitive hand movements during plucking, and inadequate protective equipment contribute to a high prevalence of work-related health issues. Studies have reported elevated rates of musculoskeletal disorders, dermatological conditions, respiratory illnesses, and other occupation-linked morbidities among tea workers in South Asian countries<sup>3-8</sup>. These health risks are further compounded by environmental and lifestyle factors, including poor housing, unsafe water sources, substandard sanitation, and nutritional deficiencies, which increase susceptibility to infectious and communicable diseases<sup>9</sup>.

Research from India, Sri Lanka, and Nepal consistently highlights that tea garden populations experience significantly higher morbidity than the general population due to a combination of occupational stressors and socio-economic deprivation<sup>10</sup>.

In Bangladesh, however, scientific literature on the health status of tea workers remains limited, with most existing studies being small-scale or outdated. This gap is particularly evident in Sylhet, where the country's oldest and largest tea estates are located, yet comprehensive data on workers' health profiles and associated determinants are still scarce.

Given this context, a thorough understanding of the health problems faced by tea workers, along with their socio-demographic and occupational risk factors, is essential for designing effective public health interventions and policy strategies. Therefore, the present study aims to assess the pattern of health problems among tea workers in Malnicherra Tea Estate, Sylhet, and to identify the socio-demographic and occupational factors influencing their health status.

## Methodology

**Study Design and Settings:** This study employed a descriptive cross-sectional design to assess the prevalence and pattern of health problems among tea workers. This design was appropriate for capturing socio-demographic characteristics, occupational exposures, and existing health conditions at a single point in time. The study was conducted at Malnicherra Tea Estate, located in the Sylhet District of Bangladesh. As one of the oldest and largest tea estates in the country, Malnicherra provides a representative tea garden environment where workers engage in labor-intensive activities and experience various occupational hazards. Data collection was carried out over a defined period from March 2025 to April 2025, ensuring consistency in environmental and work-related factors throughout the study duration.

**Study Population:** The target population consisted of adult tea garden workers aged 18 years or older, who were actively employed in Malnicherra Tea Estate during the study period. This group included both male and female workers engaged in plucking, processing, or other routine tasks within the tea garden.

**Sample Size and Sampling Method:** A total of 150 respondents participated in the study. A convenient sampling technique was employed due to practical challenges, including the widespread distribution of workers across different sections of the tea estate and the need for direct access during working hours. This method allowed efficient data collection while maintaining representativeness of the garden workforce.

**Inclusion and Exclusion Criteria:** Participants were eligible for the study if they were aged 18 years or older, currently employed at the Malnicherra Tea Estate, had been working there for at least three months to ensure sufficient occupational exposure, and were able to communicate in the local language used during interviews. Individuals were excluded if

they were below 18 years of age, not employed in the estate (such as visitors or temporary non-workers), had less than three months of work experience, refused to provide informed consent, or were not available on-site despite reasonable attempts to reach them during the data collection period.

**Data Collection Tool:** A semi-structured questionnaire was developed and used to collect data. The tool covered key areas such as socio-demographic information, occupational environment, existing health problems, healthcare-seeking behavior, and preventive health practices. The questionnaire was pre-tested to ensure clarity, relevance, and appropriateness for the study population.

**Data Collection Procedure:** Data were gathered through face-to-face interviews conducted by trained data collectors. Interviews were administered in the local language to facilitate accurate understanding and reduce response errors. Before commencing each interview, the purpose of the study was explained clearly, and informed verbal consent was obtained from all participants. Privacy during interviews was ensured as far as possible to encourage honest responses.

**Statistical Analysis:** After completing the data collection, responses were coded, cleaned, and entered into Microsoft Excel and later analyzed using SPSS. Descriptive statistics such as frequency and percentage distributions were used to summarize the data. Additionally, Chi-square tests were applied to examine relationships between selected socio-demographic variables and reported health problems, with significance assessed at the appropriate confidence level.

**Ethical Considerations:** Ethical principles were strictly followed throughout the study. All participants provided informed verbal consent before taking part. Confidentiality and anonymity were ensured by avoiding the collection of personal identifiers and by securing all study data. Ethical approval for conducting the research was obtained from the respective Institutional Review Board (IRB) prior to initiation of field activities.

**Results**

Table 1 showed the socio-demographic characteristics of the respondents. The majority of the participants were female 102 (68.0%), while males constituted 48 (32.0%) of the respondents. The age distribution showed that 81 (54.0%) of the tea

workers were between 25 to 45 years, followed by 36(24.0%) aged above 45 years and 33 (22.0%) aged below 25 years. Regarding economic status, 105(70.0%) of the respondents reported a monthly family income of ≤15,000 BDT and 45(30.0%) had monthly family income of more than 15,000 BDT. Housing conditions revealed that 96(64.0%) lived in kutcha houses, 36(24.0%) in semi-pucca houses and only 18(12.0%) in pucca houses, suggesting poor living standards within the tea worker community.

**Table 1: Distribution of Respondents by Socio-Demographic Characteristics (n=150)**

Variables	Frequency	Percent
<b>Gender</b>		
Male	48	32.0
Female	102	68.0
<b>Age Group (years)</b>		
Less than 25 Years	33	22.0
25 to 45 Years	81	54.0
More than 45 Years	36	24.0
<b>Monthly Household Income (BDT)</b>		
≤15,000	105	70.0
>15,000	45	30.0
<b>Type of Housing</b>		
Kutcha	96	64.0
Semi-pucca	36	24.0
Pucca	18	12.0

Table 2 showed the distribution of illnesses and healthcare-seeking behavior among tea workers. The most frequently reported health problems in the past six months were joint or muscle pain 87(58.0%), followed by skin diseases 62(41.0%), respiratory problems 51(34.0%), gastrointestinal issues 44(29.0%), and fever/malaria/dengue 36(24.0%). Dental problems were reported by 27(18.0%) of respondents.

About 48(32.0%) of the participants had chronic illnesses, mainly hypertension and asthma. In terms of healthcare utilization, the tea garden clinic was the primary source of care for 80(53.0%) of respondents, while 31(21.0%) sought help from traditional healers. Only 22(15.0%) visited government hospitals and 11(7.0%) used private clinics.

Regarding preventive health practices, 108(72.0%) of respondents reported using safe water sources and 98(65.0%) used sanitary latrines. However, only 57(38.0%) had received health education and 83(55.0%) reported being vaccinated under the EPI program.

A chi-square test was performed to assess the association between gender and the type of common illness. The findings revealed that joint or muscle pain and respiratory problems were significantly associated with gender ( $p < 0.05$ ). Joint or muscle pain was more prevalent among females 67(65.7%), compared to males 20(41.7%) and respiratory problems were also more common among females 41(40.2%) than 10 males (20.8%). However, no significant gender difference was found for skin diseases ( $p = 0.082$ ) or gastrointestinal issues ( $p = 0.27$ ) (Table 3).

**Table 2: Distribution of Respondents by Type of Illness and Health-seeking Behavior (n=150)**

Variables	Frequency	Percent
<b>Common Illnesses (past 6 months)</b>		
Joint or muscle pain	87	58.0
Skin diseases or rashes	62	41.0
Respiratory problems	51	34.0
Gastrointestinal issues	44	29.0
Fever/Malaria/Dengue	36	24.0
Dental problems	27	18.0
<b>Chronic Diseases (self-reported)</b>		
Present	48	32.0
Absent	102	68.0
<b>Healthcare Facility Used</b>		
Tea garden clinic	80	53.0
Traditional healer	31	21.0
Government hospital	22	15.0
Private clinic	11	7.0
Others/None	6	4.0
<b>Safe Water Use</b>		
Yes	108	72.0
No	42	28.0
<b>Sanitary Latrine Use</b>		
Yes	98	65.0
No	52	35.0
<b>Received Health Education</b>		
Yes	57	38.0
No	93	62.0
<b>Vaccinated (EPI coverage)</b>		
Yes	83	55.0
No/Don't know	67	45.0

**Table 3: Association between Gender and Common Illnesses among Tea Workers (n = 150)**

Common Illnesses	Male	Female	Total	P Value
Joint/Muscle Pain	20(41.7%)	67(65.7%)	87(58.0%)	0.009*
Skin Dis.	15(31.3%)	47(46.1%)	62(41.3%)	0.082
Resp. Dis.	10(20.8%)	41(40.2%)	51(34.0%)	0.031*
GI Issues	11(22.9%)	33(32.4%)	44(29.3%)	0.27

Common Illnesses	Male	Female	Total	P Value
Total	48	102	150	

Significant at  $p < 0.05$ ; GI = Gastrointestinal; Dis. = Diseases; Res. = Respiratory

**Discussion**

This study investigated the socio-demographic characteristics, health problems, and healthcare-seeking behaviors of tea workers at Malnicherra Tea Estate in Sylhet, Bangladesh. The findings highlight the persistent socio-economic disadvantages, poor living conditions, and high burden of health issues among this marginalized population, emphasizing the need for comprehensive occupational and public health interventions.

The majority of participants were female (102; 68.0%), reflecting the predominance of women in tea garden labor in Bangladesh, particularly in tasks such as leaf plucking and processing. Similar patterns have been reported in studies conducted in tea estates of Moulvibazar and Sreemangal, where women represented the bulk of the workforce due to their dexterity and affordability as laborers<sup>11,12</sup>. The age distribution showed that 81(54.0%) workers were between 25 to 45 years, representing the core economically productive population, while younger and older workers indicate that entire families often contribute to income due to economic necessity<sup>13</sup>.

A large proportion of respondents (105; 70.0%) reported a monthly household income of  $\leq 15,000$  BDT, consistent with previous studies indicating that tea workers in Bangladesh are among the lowest-paid laborers<sup>14,15</sup>. Low income affects access to adequate nutrition, healthcare, and education, perpetuating cycles of vulnerability. Housing conditions were also poor, with 96 (64.0%) living in kutcha houses, reflecting inadequate housing infrastructure and limited access to essential services. These socio-economic factors are strongly associated with higher susceptibility to occupational and environmental health risks<sup>2,16,17</sup>.

Musculoskeletal complaints were the most prevalent health issue (87; 58.0%), followed by skin diseases (62; 41.0%) and respiratory problems (51; 34.0%). The high prevalence of musculoskeletal pain can be attributed to repetitive manual labor, prolonged standing, and lifting, which are inherent to tea plantation work<sup>3,5,6</sup>. Similar trends have been documented in Indian and Sri Lankan tea estates, where women, in particular, are prone to ergonomic strain due to repetitive movements and inadequate work postures<sup>3-6</sup>. Skin diseases were common and

likely resulted from frequent exposure to sunlight, rain, insect bites, and agrochemicals. Limited access to safe water and poor sanitation exacerbate these conditions<sup>9</sup>. Respiratory symptoms may stem from occupational exposure to dust, pollen, smoke from biomass fuels, and poorly ventilated living environments<sup>8</sup>. Gastrointestinal problems (44; 29.0%) and vector-borne illnesses such as fever, malaria, or dengue (36; 24.0%) further reflect poor sanitation, contaminated water sources, and insufficient vector control measures in the estate<sup>16</sup>. Additionally, chronic diseases were reported by 48(32.0%) workers, mainly hypertension and asthma, indicating that non-communicable diseases are emerging even among low-income, high-risk occupational groups<sup>17</sup>.

Significant gender differences were observed in the prevalence of certain health problems. Females were more likely to experience joint or muscle pain (67; 65.7%) and respiratory problems (41; 40.2%) compared to males. These differences may arise from the dual burden of labor-intensive work and household responsibilities, which increases physical and physiological stress. Similar findings have been reported in Assam and other tea-growing regions in Bangladesh, suggesting that female workers are more vulnerable to occupational and environmental health hazards<sup>6,18</sup>. Nutritional deficiencies, unequal workload distribution, and limited access to healthcare may further exacerbate these disparities.

Healthcare utilization was dominated by tea garden clinics (80; 53.0%), reflecting accessibility and affordability, whereas 31(21.0%) relied on traditional healers. Government and private healthcare facilities were underutilized, likely due to financial constraints, distance, and lack of awareness<sup>19</sup>. This pattern mirrors observations in other South Asian tea estates, where inadequate healthcare infrastructure and delayed treatment-seeking are common challenges. Preventive health practices were suboptimal: only 108 (72.0%) used safe water, 98 (65.0%) used sanitary latrines, 57 (38.0%) received health education, and 83 (55.0%) reported being vaccinated under the EPI program. Limited health literacy and poor sanitation likely contribute to the high prevalence of communicable diseases in this population<sup>20,21</sup>. These findings underscore the urgent need for targeted health promotion programs, including occupational safety training, improved access to clean water and sanitation, vaccination campaigns, and community-based health education to mitigate risks and improve overall well-being.

There are some limitations of this study. The study used a convenience sample, which may not represent all tea workers. Limited sample size restricts inferential analysis. Health problems were not clinically verified, relying on participants' perceptions.

## Conclusion

Tea workers of Malnicherra Tea Estate experience a high burden of occupational and general health problems, especially musculoskeletal, skin and respiratory problems. Socio-economic hardship, poor working conditions and limited access to healthcare contribute to their vulnerability. However, some of them were aware of hygiene and health; there were still gaps in their practice and health service utilization. Improving the health of tea workers requires integrated efforts from estate management, local health authorities and NGOs. It is recommended to provide all tea garden workers with appropriate protective equipment and regular safety training to minimize occupational hazards. Tea garden clinics should be strengthened through the recruitment of qualified healthcare personnel and the supply of essential medicines to ensure adequate medical care. Regular health screening programs and mobile clinic services should be introduced to improve early detection and management of diseases among workers. In addition, monthly awareness sessions on hygiene, nutrition, and disease prevention should be conducted to promote healthy practices. Access to safe drinking water and sanitary latrine facilities must also be ensured to reduce the burden of waterborne and communicable diseases. Furthermore, the health and well-being of tea workers should be integrated into national occupational health policies to support sustainable and equitable healthcare interventions.

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## Conflict of Interest

None

## Financial Disclosure

None

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**Data Availability**

Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

**Ethics Approval and Consent to Participate**

The Institutional Review Board granted the study ethical approval. Since this was a prospective study, every study participant provided formal informed consent. Each method followed the appropriate rules and regulations.

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