Prevalence of Musculoskeletal Disorders Among Tea Plantation Workers: A Systematic Review and Meta-analysis

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Musculoskeletal disorders (MSDs) represent a considerable health concern for tea plantation workers, and attribute to physically demanding tasks involving bending, lifting, and repetitive motions in work undertaken by women as pluckers. The work conditions adversely affect worker health, resulting in absenteeism and lower productivity. Addressing MSDs is essential for enhancing worker health, wellbeing and ensuring the sustainability of tea industry. This study evaluated the prevalence of MSDs among tea plantation workers, identified the most affected body regions, and assessed the influence of factors such as gender and land type on the prevalence of MSDs. A systematic review and meta-analysis were performed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The methodology comprised of a structured database search, screening, eligibility assessment, and quantitative synthesis of data from 23 observational studies across eight countries. Prevalence rates were pooled through a random effects model, which was chosen over a fixed-effects model, because studies considered varied in geography, population characteristics, and methods, requiring an approach that accounts for between-study heterogeneity. Variability was evaluated using Cochran's Q test and I^2 statistics. Meta-regression found the factors that affect rates of musculoskeletal disorders, and the subgroup analyses detected the affected body regions and worker characteristics. The prevalence of MSDs among tea plantation workers was 76.5% (95% CI: 66.34%–85.36%) exhibiting considerable variability (I^2 = 97.6%, $p < 0.0001$). The lower back was the most 76.02%) affected region followed by the neck (45.04%) and the shoulders (40.60%) regions. The prevalence among female workers was 83.82%, exceeding that of male workers. Geographical differences were apparent, with Bangladesh (84.3%) and Iran (83.5%) exhibiting the high rates. The results highlight the necessity for ergonomic interventions and mechanised harvesting to alleviate physical strain on workers. These findings emphasise the importance of gender-sensitive ergonomic interventions to address the high prevalence of MSDs among tea plantation workers.

Keywords: Musculoskeletal disorders, tea plantation labours, prevalence, ergonomic interventions, gender discrepancies.

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