ABSTRACT

Ergonomic Risk Assessment and Musculoskeletal Symptoms among Industrial Production Workers

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Background : Industrial production tasks involving prolonged standing, repetitive movements, and non neutral postures may contribute to work-related musculoskeletal symptoms. Integrating observational ergonomic risk assessments with worker-reported symptoms can help identify priorities for workplace interventions.

Objective : This study assessed ergonomic risks and explored associations between occupational exposures and musculoskeletal symptoms among industrial production workers.

Research Methods/ Implementation Methods : An observational quantitative study was conducted among 26 production workers at PT X. Ergonomic risks were assessed through workplace observation using the Rapid Entire Body Assessment (REBA) and Rapid Upper Limb Assessment (RULA). Musculoskeletal symptoms were evaluated using a self-reported questionnaire. Descriptive statistics and Spearman rank correlations were used to examine ergonomic exposures and symptom patterns.

Results : Participants had a mean age of 28.0 ± 4.5 years; 61.5% were male, and 96.2% worked shifts. Prolonged standing and repetitive movements were reported by 96.2% and 84.6%, respectively. REBA scores of 5-7 indicated moderate ergonomic risks across production tasks, while RULA scores of 6-7 indicated the need for prompt or immediate corrective action. Prolonged standing was positively correlated with thigh/hip symptoms ($\rho = 0.476$; $p = 0.014$), repetitive movements with shoulder ($\rho = 0.449$; $p = 0.021$) and wrist symptoms ($\rho = 0.397$; $p = 0.044$), and bending/stooping with lower-back symptoms ($\rho = 0.453$; $p = 0.020$).These findings suggest task specific ergonomic concerns consistent with reported musculoskeletal symptoms. However, the small sample, multiple statistical comparisons, and potential confounding factors limit the robustness and generalizability of the observed associations

Conclusion/Lesson Learned :Ergonomic assessments identified modifiable postural risks among production workers. Workstation evaluation, improved postural variation, and task specific ergonomic modifications should be prioritized for further investigation and preventive action.

Keyword : ergonomics; musculoskeletal symptoms; REBA; RULA; industrial workers