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An Ergonomic Perspective on the Analysis of Postural Behaviors of Factory Workers: A Human Factors-Based Evaluation

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Abstract **–** In today's industrial production systems, the human factor continues to play a key role. Workers on assembly lines are frequently exposed to ergonomic risks stemming from repetitive movements, static postures, and high-paced tasks. This study aims to analyze the postural behaviors of factory workers from an ergonomic perspective and to identify risk elements associated with human factors. Going beyond conventional quantitative methods, a broader approach is adopted by considering posture duration, organizational dynamics, and environmental conditions. Conducted in a medium-sized manufacturing facility, the study involved observational analyses of employees working at various stations. Data were collected through structured observations, field notes, and semi-structured interviews. The analysis focused on common postures, their duration, and ergonomic risk indicators, while also evaluating the influence of workspace design, equipment placement, and task organization. Results revealed that workers predominantly performed tasks in standing positions, often bending forward or raising their arms above shoulder level. These postures contribute significantly to musculoskeletal stress and increase the risk of work-related injuries. The study also found limited awareness of ergonomic practices among workers and a lack of access to relevant training. Moreover, extended shifts, insufficient rest breaks, and the absence of task rotation were noted as contributing organizational factors. This study highlights the need for a comprehensive ergonomic assessment that incorporates physical, cognitive, and organizational components. A multi-dimensional evaluation model is proposed, offering practical recommendations for workplace improvements. The findings emphasize the necessity of a human-centered approach to workplace design and contribute to both academic literature and practical applications in occupational health and safety.

Keywords – Ergonomics, Posture Analysis, Human Factors, Industrial Work, Musculoskeletal Disorders