

Development of a Biomechanical Method for Ergonomic Evaluation: Comparison with Observational Methods

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Abstract : A wide variety of observational methods have been developed to evaluate the ergonomic workloads in manufacturing. However, the precision and accuracy of these methods remain a subject of debate. The aims of this study were to develop biomechanical methods to evaluate ergonomic workloads and to compare them with observational methods. Two observational methods, i.e. SCANIA Ergonomic Standard (SES) and Rapid Upper Limb Assessment (RULA), were used to assess ergonomic workloads at two simulated workstations. They included four tasks such as tightening & loosening, attachment of tubes and strapping as well as other actions. Sensors were also used to measure biomechanical data (Inclinometers, Accelerometers, and Goniometers). Our findings showed that in assessment of some risk factors both RULA & SES were in agreement with the results of biomechanical methods. However, there was disagreement on neck and wrist postures. In conclusion, the biomechanical approach was more precise than observational methods, but some risk factors evaluated with observational methods were not measurable with the biomechanical techniques developed.

Keywords : ergonomic, observational method, biomechanical methods, workload

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