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ABSTRACT

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Title : Risk Factors Information And Analysis Of Muscle Activity In Prolonged Standing Job Relating To Decision Support System

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In industrial workplaces, many workers perform processes jobs in standing position for a long period of time. This working practice is a potential contributor to discomfort and muscle fatigue to workers. Analysis of discomfort and muscle fatigue associated with prolonged standing using conventional method has limitations such as individual assessment, pen and paper based, and time consuming. The objectives of this study are to establish information on risk factors pertaining to discomfort and muscle fatigue associated with prolonged standing, and analyze muscle activity of workers while performing processes jobs in prolonged standing. The outcome of the two objectives is the development of a decision support system that is specifically utilized to provide semi-qualitative analysis and solutions in minimizing discomfort and muscle fatigue associated with prolonged standing. Prolonged Standing Questionnaire was administered to production workers to

establish information on risk factors relating discomfort and muscle fatigue. A surface Electromyography (sEMG) was used to analyze muscle activity while the workers are performing processes jobs in prolonged standing. Questionnaire surveys and sEMG analysis were conducted in a metal stamping industry. It involved 20 production workers from metal stamping process lines and handwork section. Meanwhile the decision support system was validated through a case study performed separately in two manufacturing companies. The questionnaire surveys reported that all production workers experienced discomfort and muscle fatigue due to performing processes jobs in prolonged standing. The sEMG quantified that the two groups of workers show significant difference in mean power frequency ($P < 0.05$) in the right gastrocnemius muscle. Moreover, the right gastrocnemius muscle experienced fatigue earlier than other muscles throughout the workday. The findings of validation process showed that the developed decision support system has generated accurate results that are comparable to conventional method. In conclusion performing processes jobs in prolonged standing has contributed to discomfort and muscle fatigue. The developed decision support system provided semi-qualitative analysis and solutions in minimizing discomfort and muscle fatigue.