

ABSTRACT

Ergonomic Analysis of Patient Lifting Toward Musculoskeletal Disorders Using Digital Human Modeling Method

This research studies ergonomics aspects of patient lifting using digital human modeling method. Digital human models in the context of this section are computer-generated representations of human beings used in computer-aided design (CAD). Evaluation of patient lifting posture using the posture evaluation Index (PEI) which counts using configuration of virtual environment in software Jack 6.1. Patient lifting has been identified as a significant contributor to MSDs among nurses, especially injuries to the back, neck, and shoulders. This study was conducted in RSUDP Sumbawa between July and August 2015 consisted of 65 nurses. The purpose is to assess the real working conditions based on ergonomics study using Posture Evaluation Index (PEI). PEI integrates the scores of low back analysis (LBA), ovako working analysis system (OWAS), and rapid upper limb assessment (RULA) using digital human model in virtual environment that available on Jack 6.1. Questionnaires and Nordic body map were also used to assess the other risk factors and MSDs-related complaints. The results show that the working conditions in patient lifting had enough amount of risk that can injure the musculoskeletal system of the nurses. The highest MSDs was in the low back (72,3%), followed by upper back (56,92%). Statistic calculation showed that frequencies of patient lifting and work posture influenced MSDs around 14,3%. Individual factors and work station have no influenced toward MSDs. This research enriches the body of ergonomics knowledge in Indonesia because it is the first research in Indonesia that applied virtual environment approach to ergonomics analysis in patient lifting process.

Conclusions: The largest influencing variable toward MSDs was frequencies of patient lifting and the work posture of patient lifting. The management controls, engineering controls and training program are recommended to minimize MSDs.

Key words: ergonomic, patient lifting, digital human modeling, MSDs.