A STUDY ON THE EFFECTS OF MENTAL, VISUAL AND MUSCULOSKELETAL FATIGUE ON PRODUCTIVITY AMONG MANUAL VISUAL INSPECTION WORKERS IN AN ELECTRONIC INDUSTRY

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Manual visual inspection is an important process in an electronic industry to ensure zero quality problems. A cross sectional study was undertaken among 58 female visual inspection workers to identify the prevalence and evidence of mental, visual and musculoskeletal fatigue of the upper extremities through objective and subjective measurements. Prevalence of mental fatigue was measured using Piper Fatigue Questionnaire. Visual fatigue questionnaire was administered together with Piper Fatigue Questionnaire at the beginning and end of work shift for 3 days. Prevalence of musculoskeletal fatigue was measured using Nordic Questionnaire distributed at the beginning of the study. Visual acuity for near and far sight, astigmatism and phoria were also measured. Visual muscle fatigue measurement using D'acomo Dioptic Accommodator measured before work, before and after break time and after work for all 3 work days, showed that visual accommodation improved significantly after break time if compared to before break time. Similar pattern of measurements was performed to examine the evidence of muscle fatigue using surface electromyography (EMG) showed an increase ranging from 2% to 39% in the average EMG readings but no significant change in median frequency. This indicates no muscle fatigue occurring during the measurement period. Prevalence of mental fatigue was found to be at 94.6% while visual fatigue was at 76%. Highest prevalence for localized muscle fatigue was at right shoulder muscle at 69.3%, followed by left shoulder and neck muscle at 59.3% and 48.1% respectively. There is no significant difference in all of the work factors measured when compared to the prevalence of mental, visual and musculoskeletal fatigue. Visual and muscle fatigue prevalence could not be proved or link with the EMG and Visual Near-Point Accommodation performed. Results from this study showed that the break time frequency and duration given to the workers are sufficient for muscle and visual recovery but not enough on reducing mental fatigue for better productivity.