Journal

Title

Application and evaluation of a body mechanics learning material by nurses working in medical settings

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Abstract

Background: Occupational lower back pain is a serious problem among nurses, and appropriate application of body mechanics is important for enabling efficient actions with minimal burden on the lower back. However, at present many nurses routinely perform actions that place a burden on the lower back, such as forward leaning, due to lack of body mechanics techniques as well as knowledge and awareness of body mechanics.

Objective: The objective of the present study was to apply and evaluate a body mechanics learning material developed for the purpose of increasing the awareness of body mechanics and improving posture during nursing actions, using nurses working in medical settings as subjects.

Methods: 1. Overview of the present learning material: Dangerous angles of forward leaning at which a burden is placed on the lower back are displayed in real-time or on replay. Dangerous angles of forward leaning were defined as $\geq 40°$ based on calculation of the joint moment on the lower back and other data. 2. Methods: Subjects were a total of 32 nurses who consented to participate in the study in August 2009.

After attaching the posture measurement sensors of the present learning material to subjects, subjects were instructed to perform bedmaking, an action they routinely perform at work, under three settings (1-3) in the following order. Setting 1: Normally performed action, Setting 2: Action performed at a suitable bed height (45% of body height), Setting 3: Action performed after using and objectively evaluating the present learning material.Data on angles of forward leaning were compared among these settings and analyzed by performing the Wilcoxon signed rank test using SPSS version 16.0 for Windows. The effectiveness of the present learning material was verified based on changes in the angle of forward leaning.

In addition, an awareness survey was conducted before and after application of the present learning material. Survey contents were awareness of body mechanics as well as application of the present learning material (five-point scale).

Results: The mean angle of forward leaning was the largest for Setting 1 at $55.6\pm14.7°$, which was at a dangerous level resulting in burden on the lower back. The mean angle for Setting 2 was $43.2\pm11.5°$, which was significantly smaller than for Setting 1 but still at a dangerous level resulting in burden on the lower back. The mean angle of forward leaning for Setting 3 was $28.0\pm11.3°$, indicating a significant improvement.

Furthermore, the mean score for "wish to use body mechanics in the future" increased significantly ($p<0.01$) from 4.5 ± 0.7 to 4.8 ± 0.4 points following application of the present learning material.

Conclusions: Application and evaluation by nurses of a body mechanics learning material showed an increase in the awareness of body mechanics as well as improvement of posture during nursing actions. We will conduct further research in the future in order to verify the effectiveness of the present learning material and its effects on prevention of lower back pain in nurses.