Development of an Omaha System-Based Remote Intervention Program for Work-Related Musculoskeletal Disorders (WMSDs) Among Front-Line Nurses

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Abstract : Introduction: Healthcare workers, especially the nurses all over the world, are highly vulnerable to work-related musculoskeletal disorders (WMSDs), experiencing high rates of neck, shoulder, and low back injuries, due to the unfavorable working conditions. To reduce WMSDs among nursing personnel, many workplace interventions have been developed and implemented. Unfortunately, the ongoing Covid-19 (SARS-CoV-2) pandemic has posed great challenges to the ergonomic practices and interventions in healthcare facilities, particularly the hospitals, since current Covid-19 mitigation measures, such as social distancing and working remotely, has substantially minimized in-person gatherings and trainings. On the other hand, hospitals throughout the world have been short-staffed, resulting in disturbance of shift scheduling and more importantly, the increased job demand among the available caregivers, particularly the doctors and nurses. With the latest development in communication technology, remote intervention measures have been developed as an alternative, without the necessity of in-person meetings. The Omaha System (OS) is a standardized classification system for nursing practices, including a problem classification system, an intervention system, and an outcome evaluation system. This paper describes the development of an OS-based ergonomic intervention program. Methods: First, a comprehensive literature search was performed among worldwide electronic databases, including PubMed, Web of Science, Cochrane Library, China National Knowledge Infrastructure (CNKI), between journal inception to May 2020, resulting in a total of 1,418 scientific articles. After two independent screening processes, the final knowledge pool included eleven randomized controlled trial studies to develop the draft of the intervention program with Omaha intervention subsystem as the framework. After the determination of sample size needed for statistical power and the potential loss to follow-up, a total of 94 nurses from eight clinical departments agreed to provide written, informed consent to participate in the study, which were subsequently assigned into two random groups (i.e., intervention vs. control). A subgroup of twelve nurses were randomly selected to participate in a semi-structured interview, during which their general understanding and awareness of musculoskeletal disorders and potential interventions was assessed. Then, the first draft was modified to reflect the findings from these interviews. Meanwhile, the tentative program schedule was also assessed. Next, two rounds of consultation were conducted among experts in nursing management, occupational health, psychology, and rehabilitation, to further adjust and finalize the intervention program. The control group had access to all the information and exercise modules at baseline, while an interdisciplinary research team was formed and supervised the implementation of the on-line intervention program through multiple social media groups. Outcome measures of this comparative study included biomechanical load assessed by the Quick Exposure Check and stresses due to awkward body postures. Results and Discussion: Modification to the draft included (1) supplementing traditional Chinese medicine practices, (2) adding the use of assistive patient handling equipment, and (3) revising the on-line training method. Information module should be once a week, lasting about 20 to 30 minutes, for a total of 6 weeks, while the exercise module should be 5 times a week, each lasting about 15 to 20 minutes, for a total of 6 weeks.

Keywords : ergonomic interventions, musculoskeletal disorders (MSDs), omaha system, nurses, Covid-19