

CLINICAL PRACTICE

A program to reduce musculoskeletal disorders and promote health in nursing students

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ABSTRACT

Background: Work-related musculoskeletal disorders (MSDs) in health care are estimated to cost between \$24 billion and \$64 billion each year. Nurses and nursing students are prone to occupational injuries because of repetitive movements and poor biomechanics. Recent data from the CDC indicates that such injuries are contributing to the ongoing nursing shortage, as well as, the 260,000 vacancies in the profession projected by 2025.

Objective: This project has the potential to increase knowledge regarding prevention of injuries, decreasing stress on the body, maintaining muscular strength, and avoidance of physical pain related to MSDs. Purpose: To address the informational gap in nursing education concerning musculoskeletal injuries.

Aims: 1) Offer educational modules for implementation into nursing curricula; 2) Provide examples of primary prevention interventions for nursing students to avoid MSDs; 3) Offer "correct vs. incorrect" body mechanics exemplars with a tool to evaluate mastery.

Nursing education implications: This self-learning curriculum has the potential to fill the gap related to prevention of MSDs for students in nursing school and for practitioners in clinical settings.

Key Words: Musculo-skeletal disorders, Occupational injuries, Primary prevention, Ergonomics, Nursing students, Psychosocial risks, Bio-mechanics

1. INTRODUCTION

Registered nurses and nursing aides suffer more injuries than almost any other occupation nationwide and are listed as two of the top six occupations suffering from musculoskeletal disorders (MSDs).^[1] Nursing staff, laborers, freight, stock, and material movers incurred the highest number of injuries related to MSDs and of all causes for workplace absences with 52% of nursing assistants' absences due to musculoskeletal injuries.^[2] Paradoxically, hospitals as health care environments are one of the most hazardous

places at which to work; they are environments that have not kept up with other industries' safety improvements for their employees. As the ages of nurses in the workforce increase, and a shortage of nursing professionals looms, the loss of practicing nurses due to medical leaves associated with MSDs is a critical problem. According to the recent findings of the Occupational Safety and Health Administration (OSHA), in the early 1990's, both construction and manufacturing industries had injury rates similar to hospital injury rates.^[1] During the next two decades, all three

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industries faced monumental financial and human resource challenges for the design and implementation of programs to meet the recommendations from OSHA to decrease these rates. Recent statistics demonstrate that hospital injury rates did not reflect the major improvements that construction and manufacturing made as a result of their worker safety program implementations.^[1] The irony that successful creation of safety programs in the non-health related workplaces outpaced the healthcare industry is striking. There continues to be challenges in healthcare to improve these statistics. It is imperative that the occupational health of nurses, who make up the largest group of healthcare workers, be maintained and that preventive programs are put into place in academic and practice settings to meet these challenges.

Background

A 2013 report from The Society of Human Resources noted that in the fiscal year 2011, work-related MSDs in nursing and residential care facilities cost \$3.9 billion and resulted in 7 to 23 days of lost time in productive employment per injury incident.^[3] According to the US Bureau of Labor Statistics (2013), 11,610 registered nurses (RNs) were away from work in 2012 because of work-related MSDs for a median of 8 days, with an incidence rate of 58.4 per 10,000 full-time equivalents.^[12] The Centers for Disease Control and Prevention cites rising obesity rates, increase in physical demands, the aging of nurses, and work demands increased by a nursing shortage as contributors to the MSDs in the nursing workforce.^[4] The current upward trajectory of many patients' weight and age is an additional variable that undermines the musculoskeletal health of the nurses who choose to practice at the bedside.^[7]

The nursing shortage is a direct result of nurses being forced to leave the profession due to back, neck and hip injuries.^[5] Despite these profoundly negative statistics, there has been no focus in most schools of nursing to teach techniques for safe patient handling^[6] that would prepare the student nurses for their professional roles within healthcare settings. Nursing textbook reviews resulted in findings that nursing students were being taught incorrect body mechanics without the use of evidence-based practices.^[7] This same research hypothesized that this deficit in the students' learning may have been due to the lack of knowledge or teaching materials used by their nursing faculty.

Given the current situation within many nursing programs, student nurses, and newly graduated nurses, may be particularly vulnerable to injuries because they lack experience, technical skills, muscular conditioning, and training in safe patient moving and handling. Improper education or substandard education is often neutralized by nursing school

instructor's belief that most facilities incorporate lift teams, transport teams, or physical therapists as part of the care team for hospitalized patients. In reality, such resources are considered "luxuries" among bedside nurses and not a standard part of the available resources in most acute, tertiary and rehabilitation facilities.

Multiple factors contribute to nursing students' lack of awareness of MSDs potential to undermine having a long and prosperous career. Kneafsey and Smallwood's recent editorial posed the question, "are universities doing enough to protect students?"^[8] The focus of clinical education for students is for the delivery of safe and competent care to patients and may not include a focus on safety of the student. This education often occurs in simulation environments. The separation of actual patients and simulated patients poses challenges to faculty who may not be able to re-create the myriad of circumstances that may present in the clinical setting and lead to musculo-skeletal injuries.^[8] Additionally, students may be exposed in the clinical setting to poor role modeling from assigned staff nurses who do not practice preventive measures against MSDs. Also, researchers have proposed that educational curricula that do not address the psycho-social variables associated with MSD occurrences are not well designed to present preventive interventions to support healthy practices for their nursing school graduates.^[9] Finally, Lee *et al.*, have proposed that the perception of risk is an important determinant, and the discussion of such should be included in the educational offerings to workers (*e.g.* nurses) in addition to the physical elements of body mechanics.^[11]

The lack of attention in nursing education to MSDs is not a recent phenomenon, nor is it limited to programs in the United States. In 2003, Approximately 1,000 nursing students in Sweden participated in a longitudinal study where 40% and 50% of them reported experiencing shoulder and neck pain during and following their enrollment in school, respectively.^[10] Findings supported nurses' prevention strategies for MSDs be implemented during nursing school, and that they continue post-graduation as one of the mechanisms to combat the plethora of problems that nurses encounter with physical health as they age and become unable to practice.

2. METHODS USED IN DESIGNING THE EDUCATIONAL INTERVENTION

The design of the current educational intervention began with a literature search conducted using computerized databases of CINAHL Plus with Full-Text (EBSCO) and ScienceDirect. Reference lists of significant articles were explored. Inclusion criteria for the searches were peer-reviewed jour-

nals, written in English, and published from 2000-2016. The following terms in different combinations were used in the search: (1) occupational injuries; (2) health; (3) injury prevention; (4) ergonomics; (5) nursing students; (6) registered nurses; (7) education; (8) back pain; (9) wellness; (10) lifting techniques; and (11) nursing programs.

Following a search of the literature, the authors designed this educational program as a DVD and workbook to foster self-study for nursing students as well as nurses in clinical settings. The program is not intended to be all-inclusive of exercises that can prevent MSDs, nor does it claim to eliminate pain from past or present injuries. The body postures and exercises included in these educational modules have been reviewed by a panel of experts from the disciplines of nursing, physical therapy, health science and athletic training for appropriateness and minimal risk to the student or practicing nurse.

Based on the limited findings in the literature related to current curricula for prevention of MSDs in nursing students, the authors identified a need to create such a curriculum. The hypothesis that informed this work was formulated after an extensive literature search: Given the current facts and ongoing problems with MSDs within the nursing profession, nursing students would benefit from learning strategies to prevent incapacitating injuries while in nursing school as a means of maintaining an injury free career.

3. DESCRIPTION OF EDUCATIONAL INTERVENTION

The purpose of this project is to create a proposed educational intervention for use in a fundamental of nursing course and for in servicing nursing staff in clinical settings. The focus of the intervention is to increase knowledge of injury prevention, decrease stress on the body, maintain strength, and avoid physical pain while performing nursing activities. Novice nurses may benefit from this awareness as repetitive movements become a regular part of their nursing practice. New behaviors learned through this curriculum can potentially cultivate long-term physical health and wellness and eliminate attrition from the profession due to declining overall health from musculoskeletal injury.

The long-term goal of this intervention is that knowledge provided in these modules will enhance education in nursing programs and clinical settings relative to injury prevention, have a lasting effect on the health of nurses, and lead to prevention of MSDs in the workplace. This curricular enhancement will emphasize injury prevention through a series of photographic images of movements and exercises that include evidence-based explanations for several common

bedside patient encounters and ways to keep the body stable.

3.1 Program components

This program is an educational intervention consisting of a two part self-learning curriculum in PowerPoint format, designed for nurses and nursing students. The course objective is to identify preventive behaviors and appropriate body mechanics that will minimize physical pain or injury related to MSDs. The course objective can be met by reviewing the curriculum, learning how to prevent MSDs by correcting common mistakes in body mechanics by scoring at an acceptable level during the return demonstration evaluation. The evaluation tool used during the return demonstration is seen in Figure 1. The modules are divided into two sections (Part I and Part II) with the information intended to be utilized as a perpetual course (reviewed periodically during school or at clinical sites) for nurses. If consistently practiced, the benefits of this program have the potential to assist nurses in maintaining healthy bodies resulting in longer years to practice.

Posture Evaluated	Description	Pass	Fail		
Bedside Stance	Feet hip width apart	1		Theory described by student	
	Feet together		0		
Assisting to and from chair	Knees flexed	1		Theory described by student	
	Close to patient	1			
	Knees locked		0		
Bed position while repositioning	Distant from patient		0	Theory described by student	
	Mattress at waist	1			
	Shoulders low/relaxed	1			
	Mattress not at waist shoulders raised		0		
Posture during bedside care	Tall in mid-back	1		Theory described by student	
	Shoulders low/down/relaxed	1			
	Hand supported/rail	1			
	Curved back		0		
	Bed lower than waist		0		
	Hand not supported		0		
		Total:	<input type="text"/>	<input type="text"/>	(≥ 8 = Pass, < 8 = Fail)
Evaluator's comments:					
Evaluators' signature:					
Date:					

Figure 1. Evaluation of safe musculoskeletal posture during patient/nurse interactions

3.1.1 Part I

Part I modules include pictures of common movements and postures that nurses use throughout the day. Each movement is shown with a stressed (or fail) body position and a strong (or pass) body position. The fail photo is the movement that can potentially cause MSDs and the pass picture demonstrates the evidenced-based information that will help keep

the body free from injury while working with patients. Part I modular topics include: (1) moving patients in bed; (2) foot position; (3) assisting patients to standing; (4) bed height; and (5) posture (see Figure 2). After completing the modules in Part I, students will have the opportunity to review extra credit modules in Part II.

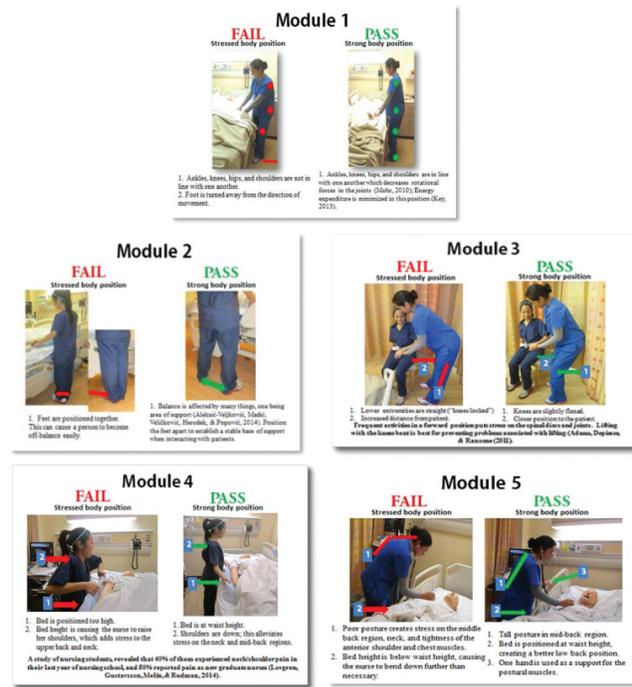


Figure 2. Part I modular topics. Body positions (1) moving patients in bed; (2) foot position; (3) assisting patients to standing; (4) bed height; (5) posture

3.1.2 Part II

Part II is the additional work that is necessary to maintain a stable and optimally conditioned body in order to maintain injury free practice patterns. This includes exercises for strengthening and stretching muscles that are vulnerable to injury, with step-by-step instructions for correct performance. The exercises are intended to increase strength and flexibility to assist the body to remain stable and in optimum condition for the purpose of proper body mechanics for nurses at the bedside. By completing the exercises consistently and correctly, nursing students may potentially avoid MSDs while in school as well as in their future careers. In Part II, topics include: (1) understanding the core; (2) keeping the core strong; (3) lower body strengthening; (4) lower body stretching; (5) upper body strengthening; (6) and upper body stretching (see Figures 3 and 4).

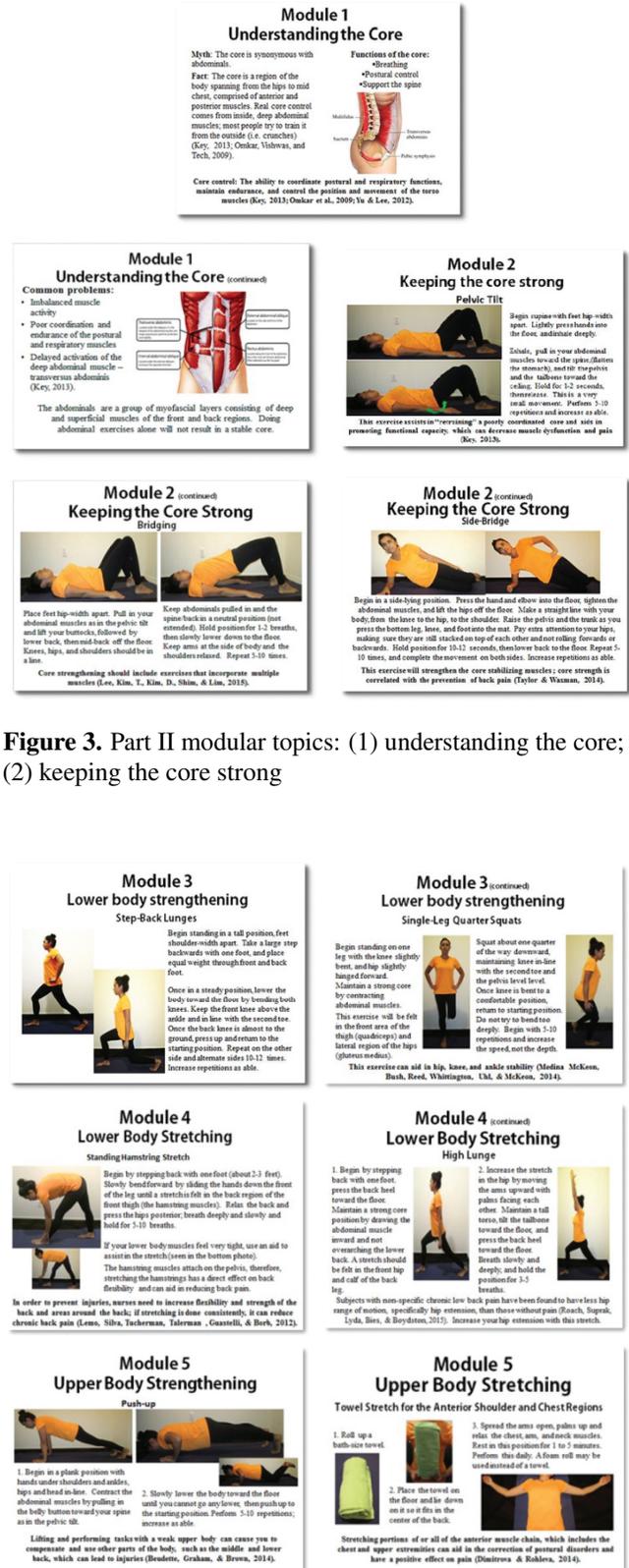


Figure 3. Part II modular topics: (1) understanding the core; (2) keeping the core strong

4. DISCUSSION

This program is not intended to be all inclusive of exercises that can assist in preventing MSDs, nor does it claim to eliminate pain from a past or present injury. The search of the literature presents a non-exhaustive review of this subject.

This self-learning curriculum has the potential to impact educational programs related to prevention of MSDs and the promotion of health. As this is a proposed curriculum, the authors acknowledge that the effectiveness of this intervention must be measured in a scientifically controlled study following integration into a nursing school curriculum. Following implementation into the nursing education cur-

riculum, a longitudinal study will be designed to measure the effectiveness of this intervention, as nursing students transition into their clinical practices. Ultimately, the goal is to have this intervention meet evidence based rigor that supports its implementation into multiple nursing programs and health care agencies thereby contributing to the health, vitality and career longevity of practicing nurses.

CONFLICTS OF INTEREST DISCLOSURE

The authors have no potential conflicts of interest, financial or otherwise, to disclose. No funding has been received to conduct this study.

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