



Work-related musculoskeletal risks associated with the care, treatment and transportation of bariatric patients: A review

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Received: December 24, 2014

Accepted: January 01, 2015

Published: January 14, 2015

ABSTRACT

The physical involvement required to care for a bariatric (severely obese) patient is a complex and dangerous order for a health care worker. Obesity rates have significantly increased in the United States, but there has been a lack of bariatric research on the effectiveness of ergonomic intervention for handling a patient of extreme weight and size, as well as on the utilization of equipment. As the number of bariatric healthcare patients rises, so does the risk for those who manually handle these patients - specifically an increased risk in work-related musculoskeletal disorders. A literature review study was conducted to better understand what contributes to effectiveness of ergonomic intervention in the interaction between the bariatric patient and the healthcare worker regarding musculoskeletal risks associated with the care, treatment, and transportation of bariatric patients. Four hazard/risk areas were identified included: Bariatric patient handling equipment, work environment, rules and procedures, and education and training. The literature supports the use of equipment to aid the healthcare worker in lifting and transferring bariatric patients. However, there are significant barriers that need to be addressed in order to reduce musculoskeletal injuries in healthcare workers handling bariatric patients.

KEY WORDS: Bariatric, obesity, ergonomics, musculoskeletal disorders, patient handling

Introduction

Healthcare personnel are consistently identified as one of the occupational groups most at risk for work-related musculoskeletal disorders (WMSDs) [1]. Musculoskeletal disorders are generally caused by overexertion while lifting a load or by the cumulative effects of manual lifting, heavy lifting, twisting, bending, and transferring patients over time [2]. Injuries that are commonly seen are in the lower back, hands, wrist, neck, and shoulders, which are caused by biomechanical stress related to tasks carried out by the healthcare worker [3,4]. The physical demands required to move and handle bariatric patients - because of their weight, body mass, and shape - leave significant risk of injury and possible WMSD development to emergency medical services, nurses, nurses' aides, physical therapists, and doctors [5]. The frequent activities in assisting the patient to move between departments - shifting to and from equipment, changing patient posture for tests or procedures, and handling everyday care and hygiene activities - contribute to the development of WMSDs. It has been noted that 75% of bariatric patients will have co-mobility needs [6]. The admittance of a bariatric patient to the critical care unit has challenges in itself. Up to 7% of all patients admitted to the

critical care unit in the United States are bariatric patients [7]. The exposure to significant risk factors for WMSDs are seen when the workers are lifting and moving heavy patients and equipment, pushing and pulling heavy equipment, working in extreme postures, and standing for long periods of time without adequate rest periods [8,9]. The development of WMSDs occur when the physical demands of the job exceed the capabilities of the worker, causing injuries to the lower back, neck, and shoulders [10]. The injury reports of WMSDs in the health care industry affecting the shoulders, neck, and legs are alarming; however, the most common WMSDs in the health care industry are back disorders.

WHO IS A BARIATRIC PATIENT?

Throughout the years, there has been an increase in obesity. More than one-third of the population of the United States is affected, and this can especially be seen throughout the health care system [11]. With nearly every practice in the health care system seeing an increase in bariatric admissions, the need to protect health care workers and other services has never been greater. There are several criteria that classify a patient as bariatric. The definition of bariatric is the science of

providing health care to a severely obese patient. The origin of the term bariatric comes from the Greek word “baros” (weight). The clarification of what makes a person a bariatric patient could have different criteria; it is not just solely on the basis of a person’s weight or body mass index (BMI: kg/m²). The absence of a definition of what constitutes a ‘bariatric’ patient is a point of debate for a number of services within bariatric patient care. Although a BMI of at least 30 is seen as a useful trigger point to implement bariatric care procedures, its use is limited in informing other procedures such as purchasing [12]. A person with a BMI >40 (severely obese), or a BMI >35 (obese) with co-morbidities, increases challenges for the staffing in providing care [9,13]. A person would be referenced as bariatric who is immobile or has a reduction in mobility; whose weight exceeds or appears to exceed the identified safe working loads of standard hospital equipment such as electric beds, mechanical lifters, operating tables, shower chairs and wheelchairs; or who creates difficulties for healthcare workers to perform their tasks [9].

BARIATRIC PATIENT HANDLING EQUIPMENT

There is a growing body of evidence to suggest that comprehensive programs using mechanical equipment can significantly reduce the risk of musculoskeletal injuries in health care [6,7,12,14-17]. Several studies addressed the selection of the appropriate piece of equipment, and the lack of use of the equipment seems to be a common problem with healthcare workers [6,15]. Knowledge about the equipment’s weight restrictions or weight limit is critical [18]. In the equipment rated to handle increased weight, the design often does not address the size of the patients [7]. The use of friction-reducing devices for the use of lateral transfers showing benefits over manual lifting [14]. Ceiling lift equipment has an advantage over floor lift systems in reducing risk of injuries to the caregiver [7,17]. The width of the bed can cause overextension in performing tasks to care for the patient. In addition, the mattress may not be rated for the weight of the patient, causing difficulties for the healthcare worker performing day-to-day tasks [7].

BARIATRIC PATIENT WORK ENVIRONMENT

Several literatures addressed the healthcare workers’ work environment and focused on limitations the healthcare worker faces on a daily occurrence in working with the bariatric patient. One issue is the limited space that is available to a healthcare worker to perform the necessary tasks in caring for the bariatric patient [12,16,17]. The size and weight of the equipment is a factor in moving the bariatric patient through the building, as well as a limited amount of room to properly use the equipment [12,15,16]. Due to the size of this equipment, lack of storage space for the equipment is a common complaint of healthcare workers [6]. The structural limitation was also a concern because the weight of the equipment and the patient could exceed the load limits of the building structure, ramps, and elevators [12]. The load limits, as well as size limits, create issues with the transportation of the bariatric patient [15].

WORKING WITH BARIATRIC PATIENT RULES AND PROCEDURES

Health care facilities should identify the equipment and procedures for providing care to the bariatric patient [7,16]. Following these rules and procedures is effective in providing guidance to address a bariatric patient [6,7,15,17]. The advance notification of a bariatric patient’s weight and size was rarely considered. Receiving an advance warning would aid in pre-planning the appropriate procedures that are necessary when working with the bariatric patient [7,15,16]. Following set rules and procedures while caring for the bariatric patient is an effective tool in reducing musculoskeletal injuries for a healthcare worker. Communication is also a factor. Strong communication is needed between departments and healthcare workers to address the handling of a bariatric patient so that healthcare workers have information to help reduce musculoskeletal injuries [6]. Using a lift team showed great promise in reducing MSDs within the healthcare industry. The use of lift teams removes the healthcare workers from hazards associated with receiving injuries [19].

EDUCATION AND TRAINING

Research indicates equipment use was viewed as essential when dealing with bariatric health care. However, problems do come up when healthcare workers are not familiar with the equipment and when they have a lack of training and understanding of the risks associated with working with bariatric patients [6,7,12,17]. This lack of training and education becomes a serious concern for the development of musculoskeletal injury by the healthcare workers [6,12]. In the dynamic environments in which healthcare staff operate, bariatric patients’ different needs and circumstances require training that equips staff with knowledge and skills to effectively assess handling risk and to provide appropriate control measures in providing care to a bariatric patient [7,16]. Staffing requirements are also crucial to understand. There are considerations for the manpower needed to provide care to the patients and whether additional staff is needed to provide a safe work environment, especially for facilities with higher proportions of obese residents [20]. The infrequent use of safe handling equipment for bariatric patients by healthcare workers is also a concern. Often healthcare workers’ interaction with the equipment required is limited [12].

Discussion

The studies reviewed highlighted the limitations that healthcare workers face within their work environment. The most cited limitation was the necessary space needed to move and work around a bariatric patient. The standardization of space and design are not specified: “Neither the American Institute of Architects nor the American Disability Act provides specific guidelines of physical design associated with the care of extremely obese patients” [19]. The size and weight of equipment and patient combined are another factor to be considered within the work environment. The equipment used within the work environment needs to withstand increased

loads and the size of the patient. These loads could over-exceed the load limits of the building. An example is that the weight capacity of the elevator should be considered when transferring a bariatric patient. The equipment can also become difficult to move because of the heavy apparatus and the increased size of the patient, causing difficulties when the healthcare worker is performing the task. These loads moving the patient from the room to room would cause increased strain to the healthcare worker. An area of concern to the healthcare worker within their work encirclement is traveling between buildings or other areas. Within buildings, floor coverings can present problems in regard to wheeled equipment, where the wheels that are single casters could become stuck between the grooves.

The use of equipment in lifting and transportation of bariatric patient have been shown to reduce the occurrence of MSDs within the healthcare industry. However, some challenges are addressed within the literature studies, highlighting common issues that can contribute to injuries of the healthcare worker. The lack of use of the equipment, for example, seems to be a common problem within the industry. In addition, knowing the limitations of the equipment, specifically the loads and limitations of the equipment's ability, were found not to be understood, which could lead to injuries to the healthcare worker if the equipment fails to perform. The research papers on the use of equipment supported the use of equipment to reduce the risk of MSDs within the healthcare industry. Friction reducing devices for lateral transfers showed benefits versus overall manual lifting. Though this is a step forward in the understanding of proper tools to help in reducing injuries for healthcare workers, there are still risks involved with transferring a bariatric patient. The healthcare worker is still applying a load to themselves. The friction-reducing devices aid in lateral transfers, but they do not address vertical lifts done by a healthcare worker. The use of vertical lifts necessary to transfer a bariatric patient was also addressed. There are two general lift systems that are available to healthcare workers: Ceiling lifts and floor lifts. Ceiling lifts have shown a better return of reducing injuries in healthcare workers. This could be because floor lifts apply forces and loads on the healthcare worker during the relocation of the patient. When the healthcare worker pushes or pulls the floor lift within a different area - or even maneuvers the floor lift to better accommodate the task of lifting the patient - it causes risk to the healthcare worker [17].

A review of the literature establishes that the use of equipment can reduce MSDs in the healthcare industry. However, following specific rules and processes in the treatment of bariatric patients also has great success in reducing MSD incidents in healthcare workers. Strong communication between healthcare workers is essential to take care of bariatric patients without incurring MSDs at work. Lack of communication between departments causes a barrier for healthcare workers when it comes to proper pre-plan treatment. This could cause healthcare workers to perform lifts or transportation without having the proper equipment. It can also create issues such as the proper equipment not being available or the wrong equipment being used to perform tasks.

Finally, it should be noted that the research that is done on safe patient handling of bariatric patients should focus on individual

factors relating to maximum weight capacity of equipment, review safe-working loads of buildings and vehicles, and identify the need for specialist equipment. There is a need to ensure the implementation of these recommendations relating to moving and handling risks in order to protect employees from work-related musculoskeletal injuries and disorders in the healthcare workplace.

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Source of Support: Nil, Conflict of Interest: None declared.