

# Lower Back Pain Among Health Care Workers

Susan Hassan

**L**UMBAR DISC HERNIATION IS FREQUENTLY the cause of lower back pain — an extremely common condition across the United States that affects 84% of the population.<sup>16</sup> Furthermore, the costs are immense; direct costs associated with lower back pain in the United States range between \$20 billion and \$98 billion annually.<sup>16</sup> Including indirect costs, in the form of lost wages and productivity, the total cost of lower back pain is estimated to be nearly \$200 billion per year.<sup>10,16</sup> Therefore, it is apparent that lumbar disc herniation and lower back pain are widespread and pose a considerable financial threat to both individuals and society, as about 149 million days of work per year are lost due to lower back pain.<sup>4</sup> Clearly, lower back pain affects quality of life and work performance.<sup>4</sup> It may restrict one's lifestyle, and slight pain may have minimal effects on physical activity, while pain may hinder or prevent any activity altogether.<sup>6</sup> Therefore, lower back pain has the potential to isolate by affecting a person's social and psychological health and impacting individual, community, and health service economics.

## LOWER BACK PAIN AS A PUBLIC HEALTH ISSUE

**T**he spine is made up of 33 vertebrae separated by spongy discs; the five vertebrae located in the lower back are referred to as the lumbar spine, where lumbar disc herniation occurs.<sup>13</sup> Lumbar disc herniation is caused by “a change in the structure of the normal [disc]” due to continued stress over time.<sup>13</sup> Usually, this is a typical break-down process as a result of aging; however, a normal disc can herniate due to injury, or an already herniated disc may worsen as a result of injury.<sup>13</sup> Often, such an injury occurs when an inactive individual takes on strenuous activity, which is a major risk factor.<sup>13</sup> In such an individual, a sedentary, inactive lifestyle may lead to weak back and abdominal muscles that are not able to support the spine properly.<sup>13</sup> Therefore, injury may occur during strenuous activity or during a job that requires heavy lifting, twisting, or forward bending of the unsupported spine.<sup>13</sup> Lumbar disc herniation, which leads to lower back pain, is a well-defined public health issue as it is widespread and has a significant negative social, psychological, and economic impact. Nevertheless, there are several effective methods to address the condition at institutional, interpersonal, and intrapersonal levels.<sup>16,4</sup>

## HEALTH AMONG HEALTH CARE WORKERS

**I**mportant risk factors for lower back pain include obesity, lack of exercise, increasing age, and improper body mechanics or posture when undertaking strenuous activity.<sup>12</sup> Frequently, these characteristics align among individuals with strenuous occupations; in the world, 37% of lower back pain is attributed to occupations in which professionals are subject to vibrations or long periods of standing, such as

miners, health care workers, and occupational drivers, among other fields.<sup>4</sup> Furthermore, a greater magnitude of lower back pain is associated with the repetitive or prolonged bending or incorrect, heavy twisting with one's trunk, which professionals within these occupations often undertake.<sup>4</sup>

Health care workers often experience musculoskeletal disorders at an even higher rate than workers in physically demanding fields like mining, construction, and manufacturing.<sup>1</sup> This is due to heavy, manual lifting associated with transitioning and repositioning patients in incorrect postures.<sup>1</sup> As of 2008, nursing aides and orderlies suffered the highest incidence of lower back pain among all female workers in the United States; in 2008, 18.8% of female workers experienced lower back pain, reaching 269,000 annual cases.<sup>1</sup> “In 2000, 10,983 registered nurses (RNs) suffered lost-time work injuries due to lifting patients,” and 12% of nurses left their profession due to back pain.<sup>1</sup>

Often, professionals in the fields of mining, construction, occupational driving, and nursing — all occupations that are subject to heavy lifting or whole-body vibrations — originate from lower socioeconomic backgrounds.<sup>3</sup> As such, these professionals are often subject to living in disadvantageously built environments; not only is their work environment plagued with risk factors of lower back pain, the environment they live in also leads to lower back pain through indirect and cumulative mechanisms by which social determinants impact the magnitude of lower back pain.<sup>3</sup> These environments may include inaccessible or nonexistent sidewalks and bicycle pathways, as well as little to no access to recreational spaces and supermarkets.<sup>3</sup> This contributes to sedentary habits and inadequate nutrition, as fast food restaurants become a convenient alternative, and, therefore, lead to obesity — another well-defined risk factor of lower back pain.<sup>3</sup>

## INSTITUTIONAL INTERVENTION: PATIENT LIFTS

**P**atient lifts are devices used to aid health care workers in the transfer of patients.<sup>5</sup> The pioneering patient lift in the 18th century was used by an Order of Christian health care workers working for charity.<sup>5</sup> It was constructed of a wooden frame with four slats; a system of pulleys raised the wooden frame, upper mattress, and patient by use of a crank and cogwheels.<sup>5</sup> This early patient lift conducted the job of four people and put an early emphasis on the importance of safety in regards to health care workers.<sup>5</sup> Furthermore, this patient lift proved to be both more comfortable and safe for patients; health care workers were able to change bed sheets and shake out the lower mattress easily, without moving a patient themselves.<sup>5</sup>

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**Author contact:** Susan Hassan is a junior at Tufts University. Address correspondence to Susan.Hassan@Tufts.edu.

Patient lifts aid in patient transfer from bed to wheelchair to restroom, as well as patient repositioning.<sup>1,8</sup> Traditionally, nurses and nursing aides would manually lift and reposition patients, and this physical load, along with repeated bending and twisting of the spine, led to lower back pain.<sup>1</sup> The obesity epidemic in the United States and the aging population served to further compound this issue.<sup>1</sup> Today, lower back pain is a well-characterized public health problem with a higher prevalence found among health care workers, such as nurses and nursing aides, than in the general population.<sup>8</sup>

Currently, patient lifts include mechanical equipment such as battery-operated hoists, among other assistive equipment.<sup>1</sup> A major study, funded by the National Institute for Occupational Safety and Health (NIOSH), implemented a safe lifting policy by replacing manual lifting in eight facilities, seven nursing homes, and one hospital, with the described patient lifts.<sup>1</sup> The objective was to reduce the lower back pain and injury faced by health care personnel during the manual transfer and repositioning of patients.<sup>1</sup> The results were incredibly compelling when post-intervention data was compared to pre-intervention data: 62% of patient transfer injuries were avoided.<sup>1</sup> All together, the eight facilities witnessed a 32% drop in all injuries, 62% fewer lost workdays, and 55% lower worker compensation costs.<sup>1</sup> The program was even accompanied by greater patient safety and comfort during transfers.<sup>1</sup>

Yet, nurses continue to learn manual patient handling techniques in their course of study, which is largely attributed to outdated textbooks and curricula.<sup>1</sup> To address this problem, NIOSH collaborated with the American Nurses Association and the Veterans Health Administration to develop and evaluate an evidence-based training program.<sup>1</sup> When utilized, the program significantly increased educator and student knowledge, as well as intention to use mechanical patient lifts and other patient handling equipment.<sup>1</sup> This curriculum, awarded the 2008 National Occupational Research Agenda (NORA) Partnership Award, is ready to be implemented on the institutional level of the socio-ecological model so that the program can reach nursing schools across the nation.<sup>1</sup> As a continuation, patient lifts should be implemented on the institutional level, so that the intervention is regarded as an official regulation. As a consequence, hospitals and other nursing facilities should take steps to ensure the inclusion of patient lifts to benefit both patient and health care worker safety.



Patient Lift  
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#### INTERPERSONAL INTERVENTION: EDUCATION

Lower back pain among health care workers is often expedited by the uncomfortable postures and the repeated, prolonged forward bending and twisting of the spine that occurs during patient handling, transfer, and care.<sup>4</sup> Improper body mechanics or posture, stemming from a lack of exercise, and possibly a lack of recreational space, is a social determinant of health that impacts the magnitude and severity of lower back pain among nurses and nursing aides, but this has the potential to be corrected through education regarding proper body mechanics.<sup>9,12</sup> An interventional study in Turkey sought to gauge the effectiveness of an education program in preventing lower back pain among nurses.<sup>9</sup> The educational training program implemented was four hours long, consisting of two hours of theoretical education based on a prepared booklet containing information regarding the anatomy of the back, back health, proper body mechanics and posture, ergonomics, and safe patient handling, among other preventative measures.<sup>9</sup> The other two hours consisted of practical applications.<sup>9</sup> The efficacy of the program was evaluated by the nurses, who regarded the study with a positive attitude and deemed the training adequate.<sup>9</sup> Therefore, training nurses in regards to safe patient handling and body mechanics is essential to preventing lower back pain by improving the nurses' level of knowledge and behaviors.<sup>9</sup>

Although training may not be sufficient, it is one of the most cost-effective and efficient ways to prevent lower back pain among health care workers.<sup>9</sup> Occupational health nurses are in a prime position to implement such training programs among nurses and nursing aides, which programs may also contribute to preventing lower back pain by monitoring conditions within the workplace.<sup>9</sup> Such training programs may be implemented on the interpersonal level of the socio-ecological model as a formal support group between nurses engaging in patient care and occupational health nurses.

## INTRAPERSONAL INTERVENTION: LIFESTYLE

Obesity is linked to lower back pain as a social determinant of health that impacts the magnitude of this public health issue.<sup>12</sup> It is not only a risk factor for lower back pain in health care workers, but obese patients further increase the physical load that many nurses and nursing aids must bear while handling patients on the job.<sup>1</sup> Lack of exercise leads to weakened back and abdominal muscles, providing little to no spinal support and leading to improper body mechanics.<sup>13</sup> Therefore, an intervention to reduce obesity, at the very least, among the vulnerable health care worker population, may prove effective in reducing the incidence and prevalence of lower back pain in the field.<sup>1</sup> A pilot cohort study following 46 obese individuals who reported lower back pain, with a mean body mass index (BMI) of 44.7, sought to assess the efficacy of a multidisciplinary, medically-supervised weight loss program at decreasing the severity of lower back pain among obese adults.<sup>14</sup> The 52-week weight loss program included caloric restriction, meal replacement, exercise, education, and group therapy, and it was administered by physicians, dietitians, and exercise specialists.<sup>14</sup> The medically supervised, noninvasive weight loss program proved effective in improving both pain and function among obese individuals with lower back pain.<sup>14</sup>

Indeed, as shown through a 33-study meta-analysis of the association between lower back pain and obesity, overweight and obese individuals have the seem most inclined to pursue care for both lower back pain and chronic back pain.<sup>15</sup> Obese individuals specifically had a 33% higher prevalence of lower back pain compared to non-overweight individuals and were 56% more likely to seek care for lower back pain.<sup>15</sup> Overweight individuals were slightly less affected by lower back pain when compared to obese individuals, but they still had a higher prevalence of lower back pain than non-overweight people.<sup>15</sup> Due to both statistically significant associations between lower back pain and obesity as well as studies portraying the efficacy of weight loss programs on the reduction of BMI and severity of lower back pain, weight loss programs, or similar lifestyle modifications, should be implemented as an intrapersonal intervention among health care workers.<sup>14,15</sup> Elements of the study, such as education, caloric restriction, and daily physical activity, can be portrayed to nurses and nursing aides so that they are able to take their health into their own hands and work toward improving their individual health outcomes.<sup>14</sup>

## RATIONALE FOR THE BEST INTERVENTION

An intervention involving the implementation and regulation of patient lifts on the institutional level of the socio-ecological model would be most feasible and appropriate for health care workers. The incorporation of patient lifts into the health care atmosphere appears to be a more feasible

intervention than education on proper body mechanics and lifestyle modifications among individual workers. Patient lifts, especially when their use and availability is regulated on an institutional level, provide a more long-lasting preventative measure for lower back pain, whereas the efficacy of training on proper body mechanics decreases over time.<sup>9,11</sup> Furthermore, the intrapersonal intervention described requires independent willpower among health care workers. Even if workers are successful in monitoring their weight, exercising often, and implementing healthy lifestyle modifications for some time, results are not always consistent or long lasting. Therefore, the use of patient lifts in the workplace throughout one's career is the most stable, reliable, and appropriate

intervention that is most likely to reduce injuries in the workplace.

The cost of modern, portable hoists and lift devices is often cited as a reason not to use them. However, in a NIOSH study, the initial investment of \$158,556 for lift equipment and training was recovered in less than three years, in turn, because of an

annual savings of \$55,000 in workers' compensation costs.<sup>1</sup> The cost of the patient lifts would be even more quickly recovered if indirect costs, such as lost workdays, lost wages, and the cost of hiring and retaining workers, were also computed.<sup>1</sup> Another positive of lifting equipment is the reduction of assault on caregivers during patient transfers, reduced by 72%, 50%, and 30% based on workers' compensation, Occupational Safety and Health Administration (OSHA) recordable incidents, and the first reports of injury data, respectively.<sup>1</sup>

## CONCLUSION

Lower back pain, with its high and increasing prevalence, is a well-characterized public health issue.<sup>16</sup> Health care workers, such as nurses and nursing aids, face even higher prevalence of lower back pain than does the general population, as well as at a rate even higher than workers in mining and construction.<sup>1</sup> The issue of lower back pain among health care workers is further impacted by a high physical load in the workplace during patient handling, improper body mechanics, obesity, and an aging population, as well as disadvantageously built environments.<sup>3,1</sup> Fortunately, interventions exist on varying levels of the socio-ecological model, including the institutional regulation of patient lifts, interpersonal training regarding proper body mechanics, and individual lifestyle modifications to reduce BMI.<sup>15</sup> Patient lifts are the best intervention due to their feasibility for most health care workers and their unwavering continuity in the workplace, which yields long-lasting improvements in the outcome of lower back pain among health care workers.

**“The incorporation of patient lifts into the health care atmosphere appears to be a more feasible intervention than education...”**

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