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Efficiency of overhead ceiling lifts in reducing musculoskeletal injury among carers working in long-term care institutions

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Summary A longitudinal study was conducted in three long-term care facilities to evaluate the effectiveness and cost benefit of overhead lifts in reducing the risk of musculoskeletal injury among healthcare workers. Analysis of injury trends spanning 6 years before intervention (1996—2001) and 4 years after intervention (2002—2005) found a significant and sustained decrease in workers' compensation claims per number of beds and in working days lost per bed. The payback period was estimated under various assumptions and varied from 6.3 to 6.2 years if only direct claim-cost savings were included, and from 2.06 to 3.20 years when indirect savings were added. The significant reductions in injury rates and compensation claims support intervention with overhead ceiling lifts. A more comprehensive evaluation of such programmes should incorporate in the analysis important variables such as staffing ratios, job stresses, injury reporting systems and compensation policies during the study period.

Introduction

There is a high prevalence of musculoskeletal injury (MSI) among healthcare workers (HCWs).[9,14,23,24] Those who regularly lift patients are at greater risk of injury than those who do not.[5,6,11] Biomechanical

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analysis of spinal compressive and shearing forces[3,13,25] and HCW perceptions[2,5] suggest that manual lifting tasks are particularly high-risk activities. The combination of elevated incidence and prevalence of MSI associated with patient handling and the corresponding estimates of biomechanical stress have spurred extensive efforts to develop safer methods for moving patients. Among nurses, back, neck and shoulder injuries are most common and debilitating.[5] However, patients can be handled safely with the assistance of equipment which reduces these hazards and improves the quality of care.[5]

Mechanical devices such as floor lifts have frequently been advocated to assist in moving patients. However, these lifts are often not used to their full extent because of poor access, lack of space for use or storage, difficulty of operation, inadequate staffing or time required for use compared with manual methods.[3,10] In recent years, overhead lifting devices have been endorsed as replacements for mechanical floor lifts, to overcome most of the problems.[12,16,19,21] Ceiling lifts involve a ceiling-mounted track, an electric motor and a sling to assist with lifting, transferring and repositioning patients. A single lift may be configured to support handling of patients for one or more beds. Since ceiling lifts are mounted overhead, they are easier to store and require less room to operate than floor lifts, and have been more effective in reducing the risk of injury associated with patient handling.[1,19,25] This style of lift requires minimal physical effort to manoeuvre, and offers the added feature of always being accessible for use in patient care areas. Collins et al.[2] reported significant time savings when ceiling lifts were used for lifting and transferring patients. Additionally, Zhuang et al.[25] found that using ceiling lifts to transfer patients from bed to chair eliminated approximately two thirds of the exposure to low back stress, when compared with manual methods.

A Memorandum of Understanding (MOU) was signed by the Healthcare Employers and Unions in British Columbia (BC) in March 2001, to eliminate unsafe manual handling of patients in BC healthcare facilities.[7] The MOU states that 'the parties agree to establish a goal of eliminating all unsafe manual lifts of patients through the use of mechanical equipment, except where the use of mechanical lifting equipment would be a risk to the well-being of the patients'. To reduce the number of patient-handling MSIs, Providence Health Care (a large healthcare provider in Vancouver), in cooperation with workers compensation board (WorkSafeBC) and the Ministry of Health, has been installing and using overhead ceiling lifts in its facilities since 2001.

The specific objectives of this research are to assess the rates of and days lost for MSI injuries among direct-care staff in long-term healthcare facilities over a 10-year period (before and after ceiling lifts were installed), and to evaluate the costs and benefits of the ceiling lift intervention from facility's perspective.

Methods

Three long-term care facilities in Vancouver were chosen for this analysis. Facility A is a home for 221 long-term care residents. Facility B provides care to 150 extended-care residents, many of whom are armed forces veterans. Facility C is a multi-level care facility for 84 residents. Starting in 2002, ceiling lifts were installed in these facilities. By the end of 2005, a total of Can$1,081,410 had been spent to procure and install a total of 110 lifts in these three facilities. Associated training and maintenance costs were included within this price tag.

Data for the three long-term care facilities were obtained through Parklane, an injury incident tracking system used by Providence Health Care. All direct-care staff claims made over a period of 10 years for MSIs related to patient care, together with costs and working days lost, were obtained from the Parklane system. The study was divided into pre-intervention (1996–2001) and post-intervention (2002–2005) periods. The bulk of the ceiling lifts (54% in facility A, 94% in facility B and 46% in facility C) were in use in 2002, and a few additional lifts were added in subsequent years. For the purposes of this evaluation, it was assumed that the effects of the ceiling lift implementation on injury rates would have been observed from 2002. Thus, for this study we assumed that all lifts at these facilities were installed in 2002.

Claims were defined as injuries accepted for compensation by WorkSafeBC (payroll data were not available to calculate MSU rates per productive hours). We found total numbers of beds in each care institution to be appropriate indicators of numbers of occupied beds, as past observations have shown that these extended-care facilities are regularly tight on occupancy, with beds always full. Numbers of beds at the three facilities were recorded for the entire study period. It was assumed that the workload (e.g. ratios of direct-care staff to beds and direct-care staff to clients handled) remained unchanged over the 10 years. The numbers of MSI claims, the claims costs and the numbers of working days lost per bed were calculated for each year.

Claims costs were adjusted to the 2005 Canadian Dollar by using the provincial consumer price index.[22]