Introduction

There is particular concern for caregiving performed outside of the institutional setting. In the home environment, caregivers reported considerably higher numbers of lost work days due to injuries compared to nursing home or hospital based caregivers. There is an expected annual growth in home care services of 6.1 percent from 2010 to 2025 due to lower costs of home healthcare settings rather than the higher costs of inpatient facilities. However, there doesn’t appear to be any change in the common practice of home care workers performing patient lifting activities alone, either as a professional or informal family caregiver. This underscores the need to choose the best practices for the individual in addition to the best equipment available. However, little detailed knowledge exists concerning the bed as a risk for increases in low back pain.

Objective

This study reviews and investigates the issues surrounding spinal loading during patient handling, with a specific focus on the bed height and the bedside practices of caregivers.

Methods

Review of scientific papers published until 2014.
- Definition of area of interest, aim of the review, inclusion criteria of papers and search strings following systematic reviews methodology (inclusion criteria: observational, quasi-experimental, or experimental studies, in English, patient handling tasks involving a bed)
- Search through electronic databases (MEDLINE via PubMed, Scopus, Science Direct, and CINAHL) using search strings, and further hand-search through references obtained.

Results

Seventeen articles that carried significant findings and had several characteristics comparable to the proposed study are presented in this review.

Conclusion

There is indication from these studies that several patient handling tasks including repositioning the patient in bed could potentially produce spinal load at hazardous levels. The advantage of a high bed height on the low back may be to the detriment of other upper body joints. Oppositely, at a lower bed height power is generated by movement of the trunk and lower extremities, which could allow a closer handling of the patient horizontal to the caregiver’s shoulder. The span of these studies measured across experience levels, incorporation of mechanical equipment, and patient handling tasks. However, few studies considered variation in bed height and no studies reviewed the back loading imposed in the home care environment.

Next Steps

The second phase of this study will simulate patient handling tasks conducted by experienced nurses in a nursing-home environment. Video recording of these tasks, along with handling force involved will be used to predict the required static strength and spinal load to perform patient handling tasks at varied bed heights using biomechanical modeling on University of Michigan 3D Static Strength Prediction Program (3DSSPP) software.

A simple hand dynamometer system was fabricated to estimate the actual pulling and pushing forces in patient handling.