Rapid EVIDENCE Reports

Safe Patient Handling Programs and Injury Prevention

for Eastern Health in Newfoundland and Labrador

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Rapid EVIDENCE Reports

Contents

This Rapid Evidence Report was prepared by the Newfoundland & Labrador Centre for Applied Health Research (NLCAHR), Memorial University. It was developed through the analysis, interpretation and synthesis of scientific research and/or health technology assessments conducted by other parties. It also incorporates selected information provided by expert consultants in the subject area. This document may not fully reflect all the scientific evidence available at the time this report was prepared. Other relevant scientific findings may have been reported since completion of this synthesis report.

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About This Report

About NLCAHR

The Newfoundland and Labrador Centre for Applied Health Research, established in 1999, contributes to the effectiveness of health and community services in Newfoundland and Labrador and to the physical, social, and psychological wellbeing of its population. NLCAHR accomplishes this mandate by building capacity in applied health research, supporting high-quality research, and fostering the effective use of research evidence by decision makers and policy makers in the provincial healthcare system.

Rapid Evidence Reports

NLCAHR designed Rapid Evidence Reports to provide support for evidence-based decision making in the Newfoundland and Labrador healthcare system on an expedited basis as compared to the reports that we provide in our regular Contextualized Health Research Synthesis Program. Through these expedited reports, NLCAHR provides a brief synthesis of the best available research evidence on a high-priority research topic selected by decision makers in the province.

Rapid Evidence Reports include:

- a clear statement of the issue and the background to the issue/problem;
- a description of the scope and nature of the pertinent scientific literature;
- a summary of the principal features of the available evidence - points of consensus, points of disagreement, areas of uncertainty, areas that lack evidence - on some or all of the following: effectiveness of interventions, potential benefits and harms/risks, costs and cost effectiveness;
- a comprehensive reference list of scholarly, peer-reviewed research literature from the past five years, as well as a more selective list of policy reports and other grey literature on the issue; and
- a brief analysis of the types of issues that might influence the applicability of the evidence to the Newfoundland and Labrador context.

Unlike the regular products of NLCAHR's Contextualized Health Research Synthesis Program, a Rapid Evidence Report is **not** a comprehensive and systematic synthesis of the literature on the topic. The report provides neither critical appraisal of included articles nor a full analysis of the contextual issues involved in applying evidence to the Newfoundland and Labrador healthcare setting. Rather, a Rapid Evidence Report provides decision makers with a solid view of the scope and nature of the scientific literature on the topic in question, an initial assessment of the strengths and gaps in this literature, and a review of the key points of agreement and disagreement among researchers.

Background

Patient handling tasks are a leading contributor to injuries among healthcare workers, who are more likely to suffer from workplace-related injuries than individuals who work in other sectors. The Newfoundland and Labrador Department of Health and Community Services has developed an Injury Prevention Program (IPP) for nursing staff employed in Long Term Care (LTC) to promote safe patient handling and to prevent injuries to the staff. The IPP consists of education and training, installation of lifting equipment, and the creation of several new positions for program coordination, policy development, education, and training (NL Department of Health and Community Services, 2011).

The Department of Research, Eastern Health, is evaluating the IPP to determine the impact and effectiveness of this program on nursing staff and residents in LTC (Eastern Health, 2012). Our partners in the Department of Research asked the Newfoundland and Labrador Centre for Applied Health Research to complete a scan of the peer-reviewed literature related to safe patient handling, with particular interest in the types of programs or interventions that may be associated with reduced musculoskeletal injuries among nursing staff.

"Safe patient handling" programs often involve multiple interventions such as worker education programs, physical conditioning or exercise programs, disability management, organizational policies, and/or the use of mechanical lifts or other patient transfer equipment. The published literature in this area includes a number of special topics that are not relevant to the particular needs of our partners for this report, such as lifting bariatric patients or muscular/spinal motion analysis during lifting. Given the project parameters specified by the Department of Research, Eastern Health, we formulated a search strategy that would enable us to focus on outcomes identified in their proposal, namely those related to the intervention process and the intervention outcomes.

Scope and Nature of the Scientific Literature

This review covers all relevant peer-reviewed English language primary studies and systematic reviews published within the last ten years. In total, we identified thirty primary studies and four systematic reviews. The literature has been categorized according to the two types of evaluation in the Eastern Health proposal: outcome evaluation and process evaluation.

The research we reviewed included only two randomized controlled trials (Baptiste, Boda, Nelson, Lloyd, & Lee, 2006 and Yassi, et al., 2001). This is because the question under investigation—the introduction of large and expensive machinery and/or educational programs—does not lend itself to blinded randomized trials. Of the primary studies we found, twenty-eight were non-randomized comparative designs. Many of these comparative studies employed a pre- and post-intervention comparison. These studies often analyzed data from surveys administered before and after the intervention was implemented. In order to complete this rapid review promptly, we did not critically appraise the studies for quality but included the results from all of them.

Outcome Evaluation

The Department of Research, Eastern Health, is interested in evaluating outcomes associated with the implementation of the IPP. To aid in this evaluation, we have examined the relevant literature in light of their three research questions and the indicators associated with each:

Lost-time Incidents

Has the implementation of a comprehensive IPP in LTC impacted the number of lost-time incidents due to musculoskeletal injuries and/or associated costs for nursing staff (RNs, LPNs and PCAs)?

There is a body of safe patient handling research that focuses on the outcome of musculoskeletal injuries. First, a systematic review by Tullar and colleagues (2010) examined whether occupational safety and health interventions in healthcare settings have an effect on musculoskeletal health status. The authors reviewed sixteen studies and found moderate evidence supporting multi-component patient handling interventions, defined as consisting of:

(a) an organizational commitment to reducing patient handling injuries,
(b) the purchase of lift and/or transfer equipment, and
(c) a training program that includes safe patient handling and/or equipment usage.

In addition, the authors found a moderate level of evidence indicating that patient handling training alone had no effect on musculoskeletal health. These authors conclude by urging policy makers to consider implementing multi-component patient handling interventions.

The second systematic review was conducted by Hignett (2003) who examined intervention strategies to reduce MSIs associated with patient handling. There were sixty-three studies included in the review, and the findings were grouped into three categories:

(a) Multifactor interventions,
(b) single factor interventions, and
(c) technique training interventions.

Multifactor interventions, defined as those that include any combination of two or more

intervention strategies (e.g., equipment provision, education and training, work environment redesign) were examined in two groups: those that included a risk assessment program and those that did not. The results of the review indicated that there is a moderate level of evidence supporting the effectiveness of both groups of multifactor interventions. Single factor interventions were also examined in two distinct groups: those that were based on the provision of equipment, and those that were based on a lift team approach. There was moderate evidence to support the effectiveness of both types of approach. Finally, there were mixed findings for technique training: some of the reviewed studies indicated that there was strong evidence suggesting that interventions based on technique training alone had no impact on working practices or injury rates, but other reviewed studies presented moderate evidence finding that technique training had some short-term benefits. In addition to these systematic reviews, the primary research we examined also supports the finding that multi-component interventions are beneficial for reducing MSIs. For example, three studies found that lifting interventions comprised of education, a lift team, and mechanical lifting equipment have been shown to reduce staff injuries (Guthrie et al., 2004; Kutash, Short, Shea, & Martinez, 2009; Wardell, 2007).

There is also a body of primary research examining the effects of installing mechanical lifts and transfer devices without the addition of organizational policies and/or extensive training programs. These studies also demonstrate beneficial effects of using transfer equipment. Yassi and colleagues (2001) conducted an RCT and found that, as compared to a control group and a group instructed in "safe lifting," the staff provided with mechanical lifting equipment showed the greatest improvements in work fatigue, self-reported back and shoulder pain, safety, and the frequency and intensity of physical discomfort associated with patient handling tasks. There were, however, no differences in the number of musculoskeletal injuries, rates, or costs for all musculoskeletal injuries, as reported in workers' compensation claims. Studies using other than RCT designs show similar results.

The introduction of mechanical lifts has been associated with:

- reduced musculoskeletal injuries (Evanoff, Wolf, Aton, Canos, & Collins, 2003; Li, Wolf, & Evanoff, 2004; Lim, Black, Shah, Sarker, & Metcalfe, 2011; Silverwood & Haddock, 2006),
- lower odds of repeated injuries (Lim et al., 2011), and
- a reduction in days lost because of injuries (Chhokar, Engst, Miller, Robinson, Tate, & Yassi, 2005; Evanoff, et al., 2003).

In addition, the implementation of ceiling lifts is also associated with a decrease in the perceived risk of injury (Engst, Chhokar, Miller, Tate, & Yassi, 2005)

Despite the fact that there are many studies in support of reduced injuries following installation of lifting devices, Springer et al. (2009) did not report the same finding. Springer and colleagues examined the effect of implementing a lift team without the introduction of a no-lift[1] policy. A no-lift policy directs staff to transfer using lifting equipment and aids for patients with certain characteristics, for example, those who cannot bear weight, who require more than one person to bear their weight, and/or who cannot assist when

[1] The term "no-lift policy" appears to be the most common in safe patient handling research, but it is also known as "zero-lift", "minimal-lift", or "lift-free".

repositioning in bed (Darragh, Campo, & Olson 2009). They found that the number of employee injuries was not reduced to the same degree as was found by the other studies. The authors suggest that this is the result of the absence of an institutional no-lift policy.

We did not locate any relevant peer-reviewed economic evaluations. However, some of the reviewed studies do include economic data. Several of the papers included compensation claims information and found that the installation of mechanical lifting devices was associated with a reduction in the annual costs of workers' compensation claims (Alamgir, Kidd, & Yassi, 2007; Alamgir, Yu, Fast, Hennessy, Kidd, & Yassi, 2008; Li, et al., 2004; Miller, Engst, Tate, & Yassi, 2006; Park, Bushnell, Bailer, Collins, & Stayner, 2009; Zadvinskis & Salsbury, 2010). It might be possible to extrapolate the economic implications from these findings by using cost information from the WHSCC and Eastern Health's compensation payment rates. As well, no-lift policies have been associated with a decrease in patient handling injury claims and a decrease in lost time (Charney, Simmons, Lary, & Metz, 2006; Martin, Harvey, Culvenor, & Payne, 2009).

Taken together, the studies we reviewed found a great deal of evidence that multifactor lifting interventions, which include the introduction of policies, the installation of equipment, and adequate staff training, have a positive impact on reducing musculoskeletal injuries in staff. Policy makers should be aware that installing equipment without the accompanying policy and educational components may not result in comparable injury reductions and also that adopting educational programs without installing mechanical lifting equipment is similarly unlikely to reduce injury rates among healthcare personnel, as the manual transfer of patients is a leading cause of staff injury. The highest quality evidence in this review, namely the two systematic reviews (Hignett, 2003; Tullar et al., 2010), as well as three of the primary studies (Guthrie, Westphal, Dahlman, Berg, Behnam, & Ferrell, 2004; Kutash et al., 2009; Wardell, 2007) all provide evidence in support of multifactor interventions with regard to reducing injuries. No literature within the current review suggested that the use of ceiling lifts had harmful effects or increased the rates of MSIs in staff.

Workplace Quality

Has the implementation of a comprehensive IPP in LTC improved the quality of the workplace for nursing staff?

Several articles addressed the question of whether safe patient handling had an impact on workplace quality as perceived by staff. Alamgir, Li, Yu, Gorman, Fast and Kidd (2009) conducted a study designed to evaluate ceiling lifts in comparison with floor lifts using several indices of staff and patient satisfaction. The authors found that transfers using ceiling lifts required less time than transfers using floor lifts, and that patients rated the ceiling lifts as being more comfortable than floor lifts. Staff in this study preferred to use the ceiling lifts and reported that, as compared to floor lifts, they were seen as less physically demanding. In a subsequent study, Alamgir, Drebit, Li, Kidd, Tam and Fast (2011) examined the use of peer coaching in conjunction with ceiling lifts and found that following implementation of the peer coaching program, staff reported using the lifts more frequently as well as increased safety awareness and confidence in using the equipment.

Berthelette and colleagues (2012) examined a safe patient handling program designed to

prevent back injuries in healthcare staff, and found that there was weak implementation fidelity, i.e., that there were discrepancies between how the program was implemented and how it was intended to be used by the designers of the program. The authors suggested that the reason for this weak fidelity may have been a shortage of qualified staff, so that having adequate staffing resources is an important point to consider.

Darragh, Campo, and Olson (2009) conducted a qualitative evaluation of a no-lift policy. The findings of this study indicated that occupational and physical therapy staff reported positive perceptions of the equipment. Interestingly, employee age affected the perception of the equipment: the older employees had more difficulty adapting to new equipment. Barriers to the adoption of new equipment included physical variables, such as room layout/size and the proximity of the equipment.

In summary, the literature suggests that safe patient handling programs, including ceiling lifts, had a positive effect on perceived workplace quality. In addition, Alamgir et al. (2011) demonstrate the beneficial effects of a peer coaching program for increasing usage of equipment. Finally, as Berthelette et al. note, there needs to be an appropriate number of trained staff in order to ensure that the lifts are used consistently and appropriately.

Resident Care and Safety

Has the implementation of a comprehensive IPP in LTC improved the quality of resident care and safety?

There is a smaller body of research examining perceived quality of resident care and safety. A Cochrane review by Moore and Cowman (2009) attempted to evaluate repositioning for treating pressure ulcers; however, they did not find sufficient evidence to conduct a systematic review on this topic. Alamgir, Li, Gorman, Fast, Yu, & Kidd (2009 found no significant impacts on patient satisfaction, but found that patients approved of the use of lifts and preferred being transferred using a ceiling lift as compared to floor lifts. The findings of this study should be interpreted with caution, as no other articles pertaining to patients' perceived quality of care were found in this review.

Process Evalution

The Department of Research, Eastern Health also wishes to evaluate processes associated with the implementation of the IPP. Their goal is to determine if the IPP was implemented as intended in the facilities. To aid in this evaluation, we have examined the available literature in light of the four factors they identified:

Nurse-related factors

The Department of Research is interested in whether nurses are satisfied with the training involved in IPPs, whether they feel they have the necessary knowledge to use the equipment, and in utilization patterns. Literature pertaining to these variables is presented below.

Schoenfisch and colleagues conducted three studies examining patient handling and

associated outcomes. Schoenfisch, Lipscomb, Myers, Fricklas, and James (2011) examined the experience of a lift assist team in an acute-care hospital, and found that team members reported increased staff safety and improved patient care; however, the authors also found that the job responsibilities of the members expanded beyond their officially designated roles on the lift assist team. Schoenfisch and colleagues (Schoenfisch, Pompeii, Myers, James, Yeung, Fricklas, Pentico, et al., 2011) also completed a study examining objective measures of adoption of lifts and found that no single variable predicted adoption and use of the equipment. Finally, Schoenfisch and colleagues (Schoenfisch, Myers, Pompeii, & Lipscomb, 2011) conducted a qualitative analysis to examine the factors that influence adoption of mechanical lifts in hospitals and found that the process was complex, as many factors played a role. The variables included time, knowledge and ability, staffing issues, and patient status. The time needed to retrieve the lift, set it up, use it and return it influenced whether the lift was used. Policy and equipment training alone were not sufficient to influence equipment use; staff reported they needed to use the devices regularly and/or have refresher training to feel skilled in the use of the equipment. Nurses felt there were staffing issues, namely that there were not enough staff to complete necessary tasks. Patient condition also influenced whether or not the equipment was used.

While the existing literature does not present strong findings with regard to nurse-related factors, the three studies do highlight some points for consideration when implementing patient handling programs.

Resident-related factors

There are very few studies examining resident/patient perception of the process of safe patient handling interventions. Alamgir and colleagues (Alamgir, Li, Gorman, Fast, Yu, & Kidd, 2009) determined that as compared to floor lifts, patients found ceiling lifts more comfortable. In another study, Alamgir and colleagues (Alamgir, Li, Yu, Gorman, Fast, & Kidd, 2009) found that patients approved of the use of ceiling lifts and also recognized that this equipment is beneficial. Patients in this study also reported that they preferred being transferred using a ceiling lift.

Training-related factors

Only one study examining satisfaction with training was found. Alamgir, Drebit, Li, Kidd, Tam and Fast (2011) evaluated a peer coaching and mentoring program for safe patient handling. They found that staff involved in the peer coaching program reported being satisfied with the program, and that it has increased their awareness of safety and increased their confidence in using the equipment.

Equipment-related factors

Several studies examined equipment-related factors, such as functionality and availability of equipment. Alamgir and colleagues (2009): Patient transfers performed with ceiling lifts took less time than transfers using floor lifts. Spiegel et al. (2002) conducted a cost-benefit analysis of the installation of mechanical lifts and found that that within four years, direct savings had produced a payback.

Baptiste et al. (2006) conducted an experiment in which eight acute care wards in a large

hospital each randomly received one of eight lateral transfer devices, such as draw sheets,

patient rollers, or patient shifters. Caregivers, who were predominantly nurses, reported that air-assisted devices performed better than other types of devices. Additionally, lateral transfer devices were rated higher than traditional draw sheet methods of patient transfer. The authors suggest that policy makers consider these lateral transfer devices, which are relatively cost-effective as compared to mechanical lift equipment when implementing patient handling technologies.

Finally, we found two studies that address barriers and facilitators for implementing patient handling interventions. A systematic review by Koppelaar et al. (2009) was designed to assess barriers and facilitators for implementing patient handling interventions in healthcare. Nineteen studies were included in the analysis, and barriers and facilitators were classified as either individual or environmental factors that influenced the implementation of an intervention. Individual factors were those that are within a person, such as motivation or attitude. Environmental factors were those that are external to a person, such as one's social and physical environment. For the implementation of patient handling programs, findings indicated that the most important environmental factors were "convenience and easy accessibility," "supportive management climate," and "patient related factors." As for individual factors, "motivation" emerged as an important category. The authors found that, overall, environmental factors emerged as more important than individual factors as obstacles to effective program implementation and subsequent program effectiveness. In addition to their systematic review, Koppelaar and colleagues also conducted a cross-sectional study (Koppelaar, Knibbe, Miedema, & Burdorf, 2011) designed to examine determinants of use of ergonomic devices for patient handling. They found that individual variables that influenced the use of these devices included: nurse motivation, the presence of back injury in the past twelve months, and strict protocols for the use of these devices. Organizational variables that influenced use included accessibility, management support, and a supportive management climate. This study suggests that policy makers should take these findings into consideration when implementing patient handling programs, and ensure that these barriers and facilitators are addressed.

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