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A multi-component patient-handling intervention improves attitudes and behaviors for safe patient handling and reduces aggression experienced by nursing staff: A controlled before-after study

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ABSTRACT

This study evaluated an intervention for patient-handling equipment aimed to improve nursing staffs' use of patient handling equipment and improve their general health, reduce musculoskeletal problems, aggressive episodes, days of absence and work-related accidents. As a controlled before-after study, questionnaire data were collected at baseline and 12-month follow-up among nursing staff at intervention and control wards at two hospitals. At 12-month follow-up, the intervention group had more positive attitudes towards patient-handling equipment and increased use of specific patient-handling equipment. In addition, a lower proportion of nursing staff in the intervention group had experienced physically aggressive episodes. No significant change was observed in general health status, musculoskeletal problems, days of absence or work-related accidents. The intervention resulted in more positive attitudes and behaviours for safe patient-handling and less physically aggressive episodes. However, this did not translate into improved health of the staff during the 12-month study period.

1. Introduction

Nurses have increased risk of sustaining musculoskeletal injuries and experiencing aggressive responses when they handle patients, which potentially leads to long-term health problems and absence from work (Høgh et al., 2007). In particular, manual patient-handling can be physically demanding. A large prospective cohort study revealed that nurses with daily patient-handling tasks had almost twice the risk of sustaining work-related back injuries compared with nurses without daily patient-handling (Andersen et al., 2014). The US National Institute for Occupational Safety and Health (NIOSH) recommends avoiding compression on the lower back that exceeds 3400 N (Waters, 2007). When patient-handling is performed manually the recommended maximum compression can easily be exceeded (Daynard et al., 2001; Essendrop et al., 2002; Schibye et al., 2003; Skotte and Fallentin, 2008b; Skotte et al., 2002a; Zhuang et al., 1999). Although consistent use of patient-handling equipment is associated with reduced risk of back injury (Andersen et al., 2014), about 20% of Danish nurses appear to handle patients without proper use of patient-handling equipment, and around 33% handle patients in unsafe ways (Fallentin et al., 2007b). Thus, the potential to prevent injuries through increased use of patient-handling equipment is enormous.

When appropriate patient-handling equipment is used the physical burden might be reduced to a safe level (Daynard et al., 2001; Essendrop et al., 2002; Schibye et al., 2003; Skotte and Fallentin, 2008b; Skotte et al., 2002a; Zhuang et al., 1999). Floor-based lifts and ceiling lifts have been compared, and ceiling lifts seem to be most advantageous in terms of load reduction (Alamgir et al., 2009; Marras et al., 2009; Occupational, 2006; Rice et al.,

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2009). Also the number of caregivers may be important in the comparison between the two types of lifts. One study concluded that ceiling lifts should be used whenever possible because of significantly lower back loads. The higher back load when using floor lifts was not offset when operated by two caregivers (Dutta et al., 2012). However, complete avoidance of manual lifting was the most important factor (Martin et al., 2009; Schoenfisch et al., 2013), e.g. by implementing no-lifting policies. Even low-tech devices (draw and sliding sheets) may reduce the risk independently of patients' weight and disability (Skotte and Fallentin, 2008a). Several studies have suggested that easy access to a variety of patient-handling equipment, adequate ergonomic training and managerial focus on the physical work environment may reduce the frequency and duration of nurses' physical health problems and absence from work (Essendrop et al., 2002; Holm and Wendelboe Johannsen, 2004; Lyng, 2007; Tullar et al., 2010). Importantly, these goals can be obtained without reducing the quality of patient care (Arnold et al., 2011; Campo et al., 2013; Nelson et al., 2008a, 2008b). Several other studies have addressed methods for preventing musculoskeletal injuries in nursing staff (Nelson et al., 2006; Owen et al., 2002; Rivilis et al., 2008; Tullar et al., 2010; Yassi et al., 2001). Many studies have evaluated multi-component interventions recommending specific policies for patient-handling and providing appropriate patient-handling equipment and ergonomic training programmes aimed at reducing the risk of injuries and biomechanical hazards (Nelson et al., 2006; Owen et al., 2002; Rivilis et al., 2008; Thomas and Thomas, 2014; Tullar et al., 2010; Yassi et al., 2001).

Aggression is another important aspect of patient-handling that not only has physical but also mental consequences. A Danish study found that a third of all hospital nurses have experienced patient-related aggression within the last year (Høgh et al., 2007). Aggressive responses and threats of violence may seriously affect nurses' health, e.g. increased stress, occurrence of chronic mental illness, long-term absence and early retirement. Nurses may ease the patient-handling situation when communicating with patients and actively engaging them in the handling and transfer situations. Better patient-handling techniques – and thus less direct physical contact with the patient – may therefore have potential for reducing nurses' physical burden and reduce the risk of aggression (Essendrop et al., 2002; Holm and Wendelboe Johannsen, 2004; Lyng, 2007; Nelson et al., 2008a; Tullar et al., 2010). Application of technical equipment creates a physical distance between the patient and nurses thereby reducing the risk of intruding on patients' personal boundaries, and may also be more pleasant for patients than being physically pushed or pulled.

To address these work place challenges, the hospital management at the Horsens (~1500 employees) and Aarhus (~6500 employees) hospitals of Denmark initiated the development, implementation and evaluation of a multi-component programme for appropriate use of patient-handling equipment. The programme consisted of formulation of policy recommendations on application of patient-handling equipment, additional funds to purchase new equipment and an extensive training programme. An evaluation of the programme was planned alongside the implementation and included data collection among nurses working at the participating bed wards at baseline and 12-month follow-up.

It was expected that the programme would result in: (1) improved attitude towards using patient-handling equipment, (2) increased use of patient-handling equipment, (3) fewer musculoskeletal problems, (4) better self-reported general health, (5) fewer aggressive episodes, (6) reduced sickness absence, and (7) fewer work-related accidents. The aim of this study was to evaluate to what extent the programme fulfilled these objectives.

2. Material and methods

2.1. Study design

This was a controlled before-after study with comparison of changes over time between the intervention and control group (i.e. difference-in-difference comparison). The intervention was implemented in six bed-wards at two hospitals in the Central Denmark Region. The control group that was not offered the intervention consisted of seven similar bed-wards from the two hospitals.

2.2. Intervention

The multi-component intervention was developed during several workshop sessions with participation of the hospital safety manager, two managers of patient-handling equipment (one from each hospital), two externally recruited ergonomic experts, a scientist from the Danish Center for Assistive Technology (HMI) and a project manager.

The intervention consisted of the following elements:

(1) Development and dissemination of patient-handling guidelines that clearly described the responsibilities of different staff groups in order to prevent misunderstandings among regular staff and leaders. Systematic dissemination intended to ensure that all relevant nursing staff knew the importance of using patient-handling equipment.
(2) Guidelines for purchasing new equipment. The group of experts emphasised that any new equipment should aim to resolve situations involving the highest physical load, such as manually lifting patients during handling.
(3) Purchasing new patient-handling equipment of an allocated amount of €13,300 per bed-ward.
(4) A comprehensive training programme for all nursing staff in the intervention bed-wards. At each ward, the local patient-handling instructors were offered a two-day training programme on how to use the assistive devices during patient-handling. To support their colleagues, one instructor from the ward assisted whenever other staff participated in training, as required. Managerial staff was offered half-day training and all other nursing staff were offered full-day training. All new nursing staff (with less than one year of employment at the ward) were offered two-day training. The training programme included introduction to and practical training in the use of patient-handling equipment. All employees were informed about the safe patient-handling policies, roles, and commitment of the ward.
(5) Once a week each ward was visited by the project manager who provided support and guidance to the local patient-handling instructors, managers and other nursing staff as requested.

The total budget of the intervention was estimated at €297,500 of which €89,500 related to the purchase of new equipment, €58,000 to staff training, and €150,000 to the salaries of staff undertaking the training programme. In addition to these running costs a similar amount was incurred in planning and evaluating the programme. Most of the funding was obtained from a grant provided by a Danish fund: The Prevention Fund.

2.3. Recruitment of bed wards

The intervention group consisted of six bed wards equally distributed between the two participating hospitals. The