Patient Safety – Worker Safety: Building a Culture of Safety to Improve Healthcare Worker and Patient Well-Being

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Abstract

Patient safety within the Canadian healthcare system is currently a high national priority, which merits a comprehensive understanding of the underlying causes of adverse events. Not least among these is worker health and safety, which is linked to patient outcomes. Healthcare workers have a high risk of workplace injuries and more mental health problems than most other occupational groups. Many healthcare professionals feel fatigued, stressed, in pain, or at risk of illness or injury – factors they feel impede their ability to provide consistent quality care.

With this background, the Occupational Health and Safety Agency for Healthcare (OHSAH) in British Columbia, jointly governed by healthcare unions and healthcare employers, launched several major initiatives to improve the healthcare workplace. These included the promotion of safe patient handling, adaptive clothing, scheduled toileting, stroke management training, measures to improve management of aggressive behaviour and, of course, infection control – all intended to improve the safety of workers, but also to improve patient safety and quality of care. Other projects also explicitly promoting physical and mental health at work, as well as patient safety are also underway.

Results of the projects are at various stages of completion, but ample evidence has already been obtained to indicate that looking after the well-being of healthcare workers results in safer and better quality patient care. While more research is needed, our work to date suggests that a comprehensive systems approach to promoting a climate of safety, which includes taking into account workplace organizational factors and physical and psychological hazards for workers, is the best way to improve the healthcare workplace and thereby patient safety.

Patient safety and access to high quality patient care are the top priorities for the healthcare system. However, according to the Canadian Adverse Events Study, approximately 7.5% of Canada's 2.5 million hospital patients experienced at least one adverse event in 2000 and up to 23,750 patients died as a result (Baker et al. 2004). Many of these events were potentially preventable. In addition, access to healthcare is regularly impeded, not only by inadequate availability of qualified staff due to time loss from injuries, illness and long-term

disability, but also ever-increasing infection-control required quarantines.

It is well-documented that the healthcare sector is plagued by high rates of work injuries and illnesses, absences from work and related costs (Koehoorn et al. 2002; Yassi et al. 2002a). Healthcare workers (HCWs) face a wide range of occupational health and safety hazards causing musculoskeletal injuries (MSIs), infectious diseases, chemical-induced disorders and mental stress, among other work-related illnesses and injuries (Yassi et al. In press). They also have more mental health problems than most other occupational groups. Many healthcare professionals feel fatigued, stressed, overburdened, at risk and/or in pain and do not feel able to provide consistent quality care (Nicklin and McVeety 2002). In the United States, more than three quarters of respondents in a 2001 survey conducted by the American Nurses Association indicated that unsafe conditions interfere with their ability to deliver high-quality care (ANA 2001). There is increasing recognition that both patient safety and access to high quality healthcare is linked to healthcare worker well-being.

In British Columbia (BC), the healthcare sector accounted for more injuries and time loss than any other sector until 2003, and remains today as the second biggest source of time loss injury in the province. However, the injury rate in the BC healthcare sector has declined dramatically since 1998 (WCB 2004). This article examines how this was accomplished, linking how the occupational health and safety factors addressed in BC apply to patient safety.

Organizational Culture and Safety Climate

Organizational culture and safety climate are emerging as important determinants of both caregiver well-being and patient safety (Goetzel et. al. 2004; Piirainen et al. 2003; Landsbergis 2003). It is known that common causes of errors leading to adverse events include organization factors such as lack of communication or miscommunication, lack of attention to safety procedures, inadequate supervision, breaks in continuity of care, excessive workload and inadequate numbers of staff for specified tasks (Johnson and Hudson 2004). Furthermore, fatigue of healthcare providers is emerging as an important determinant of patient safety, suggesting that work schedules may affect patient safety. A recent study demonstrated increased error rates in nurses working longer shifts (Rogers et al. 2004), and studies of errors committed by medical residents found strong correlation with sleep deprivation (Lockley et al. 2004). Moreover, a recent randomized controlled trial demonstrated that modification of intern work schedules reduced rates of serious medical errors by 26% (Landrigan et al. 2004). Also, fatigue has been implicated in the occurrence of worker injuries, including needle-stick injuries and nodding off while driving to or from work (Barger et al. 2005; Gold et al. 1992). Feuerberg (2000) found strong associations between low nurse staff levels and workload, poor resident outcomes, low job satisfaction and high turnover of resident-care staff. Hillmer et al. (2005), Harrington et al. (2000) and McGregor et al. (2005) also found associations of staffing levels with quality of care. A systematic review on the effects of nurse staffing on patient, nurse employee and hospital outcomes found evidence suggesting richer nurse staffing is associated with lower failure-to-rescue rates, lower inpatient mortality rates and shorter hospital stays, as well as fewer needle-stick injuries to staff (Lang et al. 2004).

With the recognition that to improve safety in healthcare, system changes are necessary (Baker et al. 2004) "creating a healthy healthcare workplace" has become the target of major Canada-wide efforts; at a workshop hosted by the Canadian Health Services Research Foundation, autonomy, empowerment, leadership, organizational structure, resources, workload, relationships and professional development were highlighted as factors contributing to a healthier healthcare workplace (CHSRF 2005).

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Meanwhile, the 2003 Health Accord (Health Canada 2003) called for strategies to improve recruitment and retention to ensure the supply of HCWs; a part of this strategy highlighted the urgent need to improve working conditions and minimize loss of skilled HCWs due to disability. A large portion of Registered Nurses are retiring early, citing difficult working conditions as a major cause (ANA 2001). Studies have also shown that in hospitals with low turnover, HCWs do indeed report a healthier workplace with less work stress (Gleason et al. 1999; Laschinger et al. 2003; Koehoorn et al. 2002; Upenieks 2002). A healthy workplace is defined as one in which HCWs are able to deliver higher quality care, and worker health and safety and patient health and safety are mutually supportive (Eisenberg et al. 2001; Koehoorn et al. 2004). An important part of promoting patient safety must therefore focus on how to promote a healthy healthcare workplace (El-Jardali and Lagace 2005).

The Occupational Health and Safety Agency for Healthcare (OHSAH) in BC was conceived in 1998 and established in 1999,

with joint governance by healthcare unions and employers with a shared goal of decreasing injuries and time loss, and improving working conditions. The Accord that created OHSAH states as one of its objectives the promotion of a safe and healthy work environment through healthy workforces, safe workloads and promotion of safer work practices. In every project OHSAH undertakes (Yassi et al. 2002), attention is paid to promoting a culture of safety and improving organizational culture in healthcare by considering policies, procedures and communication methods that enhance participation, training, respect and the qualities of healthy organizational climate.

One OHSAH project, for example, was conducted to determine the factors that cause some intermediate care facilities to have higher injury rates than others, using ergonomic, organizational and psychosocial measures (Cohen et al. 2004; Yassi et al. 2004). We found that safer work environments are promoted by favourable staffing levels, convenient access to mechanical lifts, workers' perceptions of employer fairness in care provision and management practices that support caregivers. Most notably, however, was the finding that perceived quality of care was strongly correlated with burnout (correlation coefficient of 87, p<. .01), self-rated health (88, p<. .01) and job satisfaction (87 p<. .01).

Workers in high-injury rate facilities had more negative perceptions of their job demands and workload pressures than workers in low injury facilities.

We also found a major difference between care facilities with low staff injury rates versus facilities with high injury rates regarding front-line staff's beliefs about the facility's quality of care and their own capacity to deliver good care. Workers in high-injury rate facilities had more negative perceptions of their job demands and workload pressures than workers in low injury facilities. They were more likely to report that they did not have enough time to get their work done, to work safely, to find a partner or to use a mechanical lift. Workers in high injury rate facilities also reported more pain, more burnout, poorer personal health and less job satisfaction. Conversely, workers at facilities with low injury rates were more likely to agree that their facility had enough staff to provide good quality care and did indeed provide good to excellent care.

Other projects focusing on improving organizational culture and safety climate, along with results achieved are illustrated in the more targeted examples below.

Reducing Musculoskeletal Injuries

Systematic reviews have consistently found that HCWs are at high risk of musculoskeletal injuries (MSIs), with patient handling posing particularly high risk (Hoogendoorn et al. 1999; Lagerstrom et al. 1998). Lifts and transfers of patients using awkward postures; adverse psychosocial aspects of work such as high job demands with low decision authority and job control, and low social support at work and low job satisfaction are all deemed to contribute. Although less studied, staff injuries and disabilities may also jeopardize patients; and patient falls are determined by the same set of ergonomic concerns and safety climate factors faced by staff.

OHSAH prioritized reducing MSIs in initiatives to improve worker health and safety, taking into account what was known and had been recently learned about the proximate causes. Four OHSAH-partnered initiatives in particular can be highlighted for their link to patient safety and clinical outcomes, each suggesting that reducing the risk of MSIs in HCWs can also result in an associated improvement in patient safety and clinical outcome.

Ceiling Lifts

Over the past five years, we conducted several evaluations of ceiling lift installations to ascertain the effect of ceiling-mounted patient lifting devices on reducing worker injury (Ronald et al. 2002; Engst et al. 2005; Miller et al. 2005; Chhokar et al. 2005). We found that the installation of ceiling lifts indeed had a dramatic impact on MSI rates among BC HCWs. For example, the impact of the "no unsafe lifts" program resulted in an 83% reduction in lost hours resulting from lift and transfer injuries (Ronald et al. 2002). At the same site, while the staff were surveyed to determine history of pain and injury, preferred patient handling techniques and perceived exertion during various patient lifts and transfers, patients – the residents of this extended care facility – were also surveyed pre- and post-intervention. These surveys showed that residents' satisfaction increased from 80% to 95% after ceiling lifts were installed, and 80% of residents stated they felt comfortable while being moved, versus 65% pre-intervention.

In another ceiling lift project (Engst et al. 2005), the use of ceiling lifts to lift and transfer residents was found to significantly reduce the perceived risk of injury and discomfort to the neck, shoulders, upper and lower back, and arms/hands for care staff. In addition, staff were asked to assess resident perceptions of the safety and effectiveness of ceiling lifts during resident handling. Approximately 85% of staff believed the ceiling lifts to be safer for residents.

Scheduled Toileting Program in Long-Term Care

Another project assessed a scheduled toileting program for its impact on clinical outcomes for residents, and reducing the risk of injury to care providers (Engst et al. 2004). A 75-bed unit in a long-term care facility participated in the program, with another unit in the same hospital acting as the control group. Data related to MSIs and to resident aggression were collected eight months prior to the introduction of the toileting schedule, and again eight months after it had been put in place.

Staff used mechanical lifts to toilet residents, which reduced the physical demands associated with handling residents, and also increased the physical distance between the worker and the resident. The post-intervention questionnaire revealed that staff working in the unit with the new toileting schedule showed a significantly lower perception of risk of injury to their head and neck than staff in the control unit, and the toileting program reduced staff injuries related to resident handling. The toileting program increased the percentage of residents toileting regularly, and reduced resident agitation expressed as verbal behaviours and emotional upset, further supported by staff perception that resident agitation had been reduced by the program. This project suggested that a toileting program, which had a positive impact on the well-being of staff by reducing risk of MSI and risk of injury due to aggressive behaviour, also can improve the quality of clinical care.

Adaptive Clothing

Nursing staff at intermediate and long-term care facilities are frequently required to help dress residents. Due to the limited physical capabilities of many of the residents, dressing often entails repositioning and manual handling. Repositioning patients has been found to be the second most stressful task for nursing staff (Owen et al. 1992; Garg and Owen 1992), and studies have shown that up to 24% of all low back injuries to nursing staff are due to repositioning (Vasiliadou et al. 1995). An adaptive clothing program was developed at two facilities in the Interior Health Authority of BC in response to the high number of injuries to nursing staff that perform dressing tasks, and the fact that many residents consider dressing an unpleasant or painful experience. Residents' own clothing was adapted to make the dressing process easier for residents and caregivers. The evaluation of the program indicated that the adaptive clothing program was effective in reducing the risk of injury to workers. Of note, however, was that, when being dressed with adaptive clothing, the residents' shoulder and other joint movements were considerably reduced, helping also to minimize resident pain and discomfort. Residents were noticeably less agitated and appeared more comfortable throughout the dressing process (OHSAH 2003).

Stroke Recovery Project

A project was initiated to improve stroke care on medical wards and to reduce injuries to nursing staff arising from patient handling. This program involved a physiotherapist teaching nurses about care and specific handling skills for stroke patients. These teaching sessions were followed with bedside teaching during actual patient care. Training caregivers in basic skills of moving and handling, facilitation of activities of daily living and simple nursing tasks has been shown to reduce the burden of care and improve quality of life in patients and caregivers; it reduces the cost of stroke care, and a higher proportion of patients achieve independence at an earlier stage (Kalra et al. 2004). Preliminary assessment of this project suggested that it, too, was effective in improving worker and patient safety and quality of care. Further work is planned in this area.

Promoting Mental Health at Work

Mental disorders are the fastest growing cause of long-term disability in HCWs in BC, as elsewhere. Studies on the impact of cost-reduction strategies (Landsbergis et al. 1999; Sochalski et al. 1997; Woodward et al. 1999; Muntaner et al. 2004) report significant increases in staff depression, anxiety and emotional exhaustion among HCWs. Key job stress factors associated with ill health among HCWs were work overload, pressure at work, lack of participation in decision-making, poor social support, unsupportive leadership, lack of communication/feedback, staff shortages or unpredictable staffing, scheduling or long work hours and conflict between work and family demands. Evidence suggests these factors not only directly impact the psychological well-being of the workforce, but also impact patient care (Suzuki et al. 2004; Rogers et al. 2004). Conversely, the compromise in patient safety caused by organizational change could significantly impact the psychological well-being of healthcare providers. Studies have also documented that the perception of having made an error causing an adverse patient outcome creates substantial emotional distress that can cause longstanding feelings of fear, guilt, anger and embarrassment (Blendon et al. 2002; Firth-Cozens and Greenhalgh 1997). Because of organizational culture, adequate coping mechanisms (such as accepting responsibility, discussion with colleagues, disclosure to patients, etc.) are usually not readily available to HCWs. Indeed HCWs are usually hesitant to admit errors because of worry of blame, punishment and humiliation by their colleagues. These organizational shortcomings may result in dysfunctional methods of dealing with errors, such as alcohol and drug use. It has been suggested that promotion of a "climate of safety" in which HCWs are encouraged to discuss their mistakes with colleagues in a non-judgemental format could not only lead to the detection and elimination of root causes of these errors, but could also dramatically improve worker psychological well-being (Firth-Cozens 2001; Sexton et al. 2000).

In BC, there is considerable interest in addressing the

mental health of healthcare workers. For example, almost at its inception, OHSAH was granted funding from the Canadian Institutes for Health Research for a five-year program of nine interconnected projects, several of which explored occupational psychosocial factors. "*Caring for the Caregivers of Alternate Level Care Patients*," for example, examined how the organization of care for Alternate Level Care (ALC) patients impacts several patient care factors, focusing not only on staff injury rates, but also on job satisfaction, emotional exhaustion and nurse recruitment and retention. While patient outcome was not explicitly studied, we examined the perception of healthcare providers as to the quality of care provided under the various models of care provision, as well as their job satisfaction. Perceived management attention to health and safety was found to be associated with improved staff satisfaction with the hospital and decrease in emotional exhaustion (Yassi et al. 2002b).

More recently, OHSAH's mental health and organizational development team embarked on a four-year, five-phase intervention study to conduct a survey to test a comprehensive work stress and service use model and implement a pilot intervention based on the evidence gathered from the survey. This project was designed by OHSAH explicitly at the request of the health authorities, in recognition not only of the cost to healthcare of not addressing this issue, but also the impact of mental disease on the safety and well-being of patients.

Infectious Disease Exposures

Perhaps the link between worker and patient safety is most clear in the area of infectious disease prevention. The emergence of SARS highlighted the unique vulnerability of HCWs. The hospital setting amplifies the spread of respiratory-borne pathogens, and protecting HCWs became the main defence against further spread to vulnerable patients and the community. Prompt action in BC – establishing and promoting guidelines to protect HCWs – was likely a factor in preventing the secondary spread of SARS; while BC had three imported cases of SARS, only one secondary case occurred – a healthcare worker – and appropriate measures were taken to quickly limit its spread (Yassi et al. 2003). We also formed a multi-agency interdisciplinary team to examine what was known, what was learned and what still needs to be studied in this area. Indeed, emphasis on improving organizational culture and safety climate figured prominently in the findings (Gamage et al. 2005; Moore et al. 2005a; Moore et al. 2005b; Yassi et al. 2005).

It is well-known that vaccinating HCWs against influenza not only protects them and reduces absenteeism (NACI 2004), but there is also evidence that vaccinating HCWS protects patient safety by reducing the likelihood of influenza outbreaks (Nicholson 1998; Potter et al. 1997; Carman et al. 2000). Nonetheless, vaccine rates for HCWs have remained low. With the likelihood of a pandemic influenza outbreak, it is essential that we better understand determinants of vaccine uptake, and ensure that systems are in place to track compliance. We therefore have a project underway to address this issue.

Safety climate had also previously been correlated with better compliance with universal precautions against blood-borne pathogens (Gershon et al. 1995), and studies demonstrated that adherence to blood and body fluid exposure control procedures are related to key organizational and job stress variables. In BC, major initiatives are now underway to implement exposure control plans (OHSAH 2005). Preliminary analysis of survey data will be published shortly.

What Next?

While there is anecdotal and qualitative evidence suggesting that attending to the health and safety of healthcare workers has a positive impact on patient health and safety, this is an area that merits further attention. The conceptual link has now been established, but now interventions are needed that can target this link and be evaluated. In BC, the process of developing measures to better understand this link is in place. The Workplace Health Indicator Tracking and Evaluation (WHITE) database, developed by OHSAH, is already tracking health indicators among the BC healthcare workforce. This database is in the process of being designed for linking to an incident management and reporting information system (IRIS), which will track adverse events and other patient incidents in tandem with worker health and safety indicators.

Good science and good will is needed to improve patient safety. The experience in BC suggests that adopting a collaborative evidence-based approach in which taking care of the well-being of the healthcare workforce is paramount is an important component of improving the quality and safety of the patient care provided.

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