Effects of Job Strain, Hospital Organizational Factors and Individual Characteristics on Work-Related Disability Among Nurses

Final Report

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Abstract

Objective: This study examined the impact of job strain on the health of nurses by describing nurses' health status, examining trends in injury compensation claims, determining factors contributing to claims, asking nurses to rank interventions aimed at improving workplace health and safety and gathering input from nurses and hospital stakeholders on nurse injuries, stress and absenteeism.

Methods: This study included both quantitative and qualitative components. Data from three 1998/9 Ontario data sources were merged: a survey completed by nurses about their work life, the Ministry of Health and Long-Term Care (MoH) hospital submissions and Workplace Safety and Insurance Board (WSIB) lost-time claim rates. Nine-year trends in WSIB claim rates were also examined. Data obtained from nurse focus groups and stakeholder interviews at 10 Ontario hospitals are also presented.

Results: Nearly one-half of nurses reported missing work due to illness at least once in the past three months. High emotional exhaustion was experienced by more than one-third of nurses. Nurses were found to have higher overall and musculoskeletal claim rates compared to non-nurses, and musculoskeletal claims comprised the majority of nursing claims. Overtime, occasions of sick time and nurse relations with physicians significantly predicted hospitals having high nursing claim rates. Nurses believed improvements to staffing levels and workload would improve their health.

Conclusions: Injuries among nurses are costly to hospitals in terms of lost productivity, disruption to work flow and claims paid, as well as to nurses in terms of pain, stress and possible loss of employment. Recommendations are made to reduce injury claims and improve nurses' health.

Executive Summary

This study examined how job strain (including staffing and workload indicators, organizational factors and individual nurse characteristics) affects the health of nurses by describing nurses' health status, examining trends in injury compensation claims and determining factors contributing to claims. We also asked nurses to rank interventions aimed at improving their workplace health and safety and gathered input from nurses and hospital stakeholders on factors related to nurse injuries, stress and absenteeism.

This report has fulfilled the following research objectives:
1) What is the general self-reported health status of nurses in acute care hospitals in Ontario and what is the prevalence of self-reported health-related work absence, burnout, back pain and neck pain?
2) What are the main trends in WSIB claims for nurses in acute care hospitals in Ontario over the past nine years?
3) To what extent can individual and job strain factors explain variation in WSIB claims rates among participating hospitals?
4) What additional factors, from the staff nurses' perspective and from an organizational perspective, should be included to develop effective workplace interventions to improve the health of nurses?

Method

This study included both quantitative and qualitative components. The quantitative aspects involved both cross-sectional and time-series analyses. Data from three 1998/9 Ontario data sources were linked together at the hospital-level into one database: a survey completed by acute-care nurses about their work life, the MoH hospital submissions and WSIB lost-time claim rates. WSIB claim rates were examined for a nine-year period, from 1990/1 to 1998/9. The qualitative component involved analyses of data obtained from focus groups with nurses and interviews with hospital stakeholders at 10 Ontario hospitals. The study focused exclusively on acute care hospitals due to the availability of existing nurse survey and MoH data.

Results

1) Almost half of nurses (44%) reported missing work due to illness at least once in the past three months. High emotional exhaustion was experienced by more than 36% of nurses. A substantial number of nurses reported experiencing musculoskeletal pain most or all of the time during the past week (16% for back pain and 17% for neck pain).
2) Over the nine years examined, nurses had consistently higher injury claim rates compared to non-nurses. Musculoskeletal claims comprised the majority of hospital claims. While there was a 61% decrease in the musculoskeletal claim rate for non-nurses between 1990 and 1998, musculoskeletal injury rates dropped by only 39% for nurses.
3) Hospital-level regression analyses revealed that the probability of a hospital having a high RN

lost-time claim rate increased with RNs working more than one hour of overtime per week and RNs reporting more occasions of sick time than average. The probability of a hospital having a high RN musculoskeletal lost-time claim rate decreased with improvements in nurses' relations with physicians, while the probability of a hospital having a high RN musculoskeletal lost-time claim rate increased with RNs reporting more occasions of sick time than average.
4) While the majority of nurses ranked adequate staffing levels and reasonable workload as interventions that would improve their workplace health and safety, most did not believe that these variables were currently present or likely to happen in their hospital. To reduce injuries, nurses suggested improving the physical environment, while stakeholders also suggested improving the physical work environment as well as offering education to nurses. To decrease stress levels, nurse most frequently suggested improving benefits, staffing levels and respect for nurses, while stakeholders also suggested increasing respect and improving benefits. Finally, to reduce absenteeism, nurses most often suggested improving benefits, while stakeholders offered improved benefits, changes in policy and reduced workload as potential solutions.

Recommendations

Since nurse injury rates are high, they need to be reduced through workplace improvements. Recommendations are made for hospitals, WSIB, government and future research.

Conclusions

Injuries among nurses are costly to hospitals in terms of lost productivity, disruption to work flow and claims paid, as well as to nurses in terms of pain, stress and possible loss of employment. There are further implications for the retention of qualified nursing personnel in the workforce and the delivery of quality patient care. One of the key elements of the future recruitment and retention of the nursing workforce will be protection of the health of employees from disabling injuries.

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Introduction

For nursing personnel there will always be health concerns due to exposure to hazards such as infectious agents or allergenic chemicals and violence from patients with dementia. As well, there remains a striking physical workload in nursing associated with patient lifting and related patient care activities. At the same time, several important organizational developments are changing the working environment for health care workers in general and nursing personnel in particular, including more integration and coordination of care, increasing job complexity associated with advances in medical technology and new care delivery systems focusing on ambulatory care (Dussault, Fournier, & Zanchetta, 2001). These changes have been coupled with cost containment strategies such as the restructuring and downsizing experienced during the 1990s that altered the nature of work and the resources that workers had available to do their work. Restructuring strategies have led to fewer jobs, job insecurity, shorter hospital stays, longer working hours, higher patient-staffing ratios and changes in workplace structures (i.e., loss of head nurses and chief nursing offices). The recent widespread experience with the reorganization of work in acute-care hospitals has raised questions about its subsequent impact on the health of the workforce over the past few years.

The current study focused on how job strain (including staffing and workload, organizational factors and individual nurse characteristics) affects the health of nurses as measured by lost-time compensation claim rates. We have also identified with practicing nurses, the intervention strategies that they believe are important for improving nurses' health. This study also explored the trends in nursing compensation claims throughout the 1990s. An important component of this study is to share our findings with stakeholders in order to improve the work life and health of Ontario's registered nurses (RNs).

Research Objectives

1) What is the general self-reported health status of nurses in acute care hospitals in Ontario and what is the prevalence of self-reported health-related work absence, burnout, back pain and neck pain?

2) What are the main trends in WSIB claims for nurses in acute care hospitals in Ontario over the past nine years?

3) To what extent can individual and job strain factors explain variation in WSIB claim rates among participating hospitals?

4) What additional factors, from the staff nurses' perspective and from an organizational perspective, should be included to develop effective workplace interventions to improve the health of nurses?

Background Literature

Importance of Work-Related Musculoskeletal Disorders

It has already been established that health service workers tend to have higher rates of injury relative to other types of workers. Data from the Association of Workers' Compensation Boards of Canada indicate that the health and social services sector had 26 lost-time claims per 1000 workers in 1996, surpassed by logging/forestry (82 claims/1000 workers), transportation (54 claims), manufacturing (52 claims), construction (41 claims), wholesale trades (35 claims) and mining sectors (28 claims) (Statistics Canada, 1999). According to a focus report in British Columbia (Workers' Compensation Board of BC, 2000), the rate of lost-time claims among health care workers was 7.4 claims per 100 person years of employment in 1998. This is 54% higher than the overall rate of 4.8 claims per 100 person years of employment for the province. Furthermore, between 1994 and 1998, days lost per claim among health care workers have risen from a low of 37 days per claim in 1996 to a high of 49 days per claim in 1998. During the same period, costs per claim have increased steadily from an average of $3959 in 1994 to $5154 in 1998.

Workers' compensation and other insurance data indicate that musculoskeletal injuries are the major source of work-related disability among health care workers (Association of Workers' Compensation Boards of Canada, 1998) and that nursing aides and orderlies, followed by nursing assistants and then registered nurses have the highest risk of a claim for a musculoskeletal sprain or strain compared to all other occupational groups (Choi, Levitsky, Lloyd, & Stones, 1996; Workers' Compensation Board of BC, 2000).

Risk Factors Associated with Musculoskeletal Strain

One of the potential effects of downsizing and restructuring in the health care industry is that the opportunity for employees to recuperate following stressful periods (i.e., a buffer) has been decreased. A reduction in the time allowed to recuperate may represent a key dividing line as to whether or not stressful work conditions will have harmful consequences (Aronsson, 1999). This is particularly relevant for musculoskeletal strains and sprains, as these types of injuries are more typically associated with the cumulative effects of physically and mentally demanding work.

Evidence for job strain. In the past, musculoskeletal injury has primarily been associated with work- related physical factors. However, throughout the 1990s, studies have emerged implicating the role of job strain factors as predictors of musculoskeletal injury. Job strain has also been shown to be predictive of psychological disorders, absenteeism, medication use and other health behaviors (Karasek & Theorell, 1990) as well as cardiovascular disease (Schnall, Landsbergis, & Baker, 1994; Siegrist, Peter, Junge, Cremer, & Seidel, 1990).

Amick et al. (1998) found work high in psychological demand and low in level of control (i.e., job strain) to be associated with a variety of deleterious health consequences. The job strain

model posits that the most hazardous work occurs when jobs that are high in demand and low in control are combined with low levels of co-worker or supervisor support at work. The few studies that have been conducted with women have found that job strain increased the risk of cardiovascular disease, stroke, problem drinking and elevated blood pressure.

The demand/control concepts used in Karasek's model of job strain (Karasek & Theorell, 1990) that initially focused on cardiovascular disease, has been expanded to musculoskeletal injuries (Theorell, Harms-Ringdahl, Ahlberg-Hulten, & Westin, 1991).There is growing evidence to suggest that demand and control levels among workers are associated with the prevalence of musculoskeletal injury. Research now indicates that the direct biological effects of stress on the musculoskeletal system are possible (Lundberg, Granqvist, Hansson, Magnusson, & Wallin, 1989; Marras, Davis, Heaney, Maronitis, & Allread, 2000; Theorell, 1996). Some researchers have provided increasing evidence that job strain factors have an independent contribution to the onset of work-related musculoskeletal injuries (Bongers, de Winter, Kompier, & Hildebrandt, 1993; Kerr et al, 2001) .

Toomingas et al. (1997) observed that the most consistent and pronounced associations were found between poor psychological work conditions and coexisting symptoms and signs in the neck and back regions. High psychological demand and high job strain were associated with these symptoms but decision latitude was not. In another study, those with low control over their work have been shown to be prone to short-term sick leaves, attributed to back pain, more commonly than those with high control (Hemingway, Shipley, Standfield, & Marmot, 1997). Wickstrom and Pentti (1998) reported that sick leave due to low back pain was predicted by a number of physical factors; furthermore, lack of recognition and respect at work predicted sick leave attributed to low back pain.

An analysis of routinely collected survey data in the Netherlands found a significant association between psychological stressors and musculoskeletal complaints after taking self-reported physical work stressors and worker characteristics into account (Houtman, Bongers, Smulders, & Kompire, 1994). Similar results were obtained in a study conducted in the auto industry where negative perceptions of the work environment, low job control and perceived mismatch between one's education and their job were related to reported back pain, even after controlling for the directly measured physical demands of work (Kerr et al., 2001).

One cross-sectional study of nurses in Sweden found job strain associated with a two-fold increased risk of low back pain (Ahlberg-Hulten, Theorell, & Sigala, 1995). In a longitudinal study of health care workers in Sweden, job strain defined by high job demands and low job control was associated with an increased risk of upper and low-back problems (Josephson, Lagerstrom, Hagberg, & Hjelm, 1997). A later study by Josephson et al. (1998) found no increased risk of low-back pain consultation among female nurses compared to other women. They concluded that physical work was more significant than psychosocial factors but that psychosocial factors were associated with the intensity of low back pain for full-time workers but not for part-time workers. However, they did identify an increased risk of low back pain for part-

time workers and an independent positive relationship between low back pain and workers on the night shift. Canadian researchers have reported the risk of an upper or lower-body musculoskeletal claim to be significantly elevated for those health care workers with job strain defined by measures of low control and high workload levels (Koehoorn, Kennedy, Demers, Hertzman, & Village, 1998). Finally, a large prospective study of nurses in the United States has shown job strain to be the most important predictor of functional health status examined (Cheng, Kawachi, Coakley, Schwartz, & Colditz, 2000).

Workload and Injuries

In 1996, the Institute of Medicine (IOM) in the United States concluded that there was a strong relationship between back injuries and staffing levels. The injuries incurred by nurses are often related to the nature of their work and the resources available to perform the tasks. This report also noted that despite stable or declining illness and injury rates in private industry in the United States since 1980, the illness and injury rates for nurses working in hospitals and nursing homes have increased by 52% and 62%, respectively. The IOM report referred to the survey conducted by the American Association of Nurses which reported increased headaches, gastrointestinal complaints and hypertension, as well as to one conducted by the Bureau of Labor Statistics which documented that the rate of illness and injury for hospital workers surpassed the national average, particularly for musculoskeletal injuries.

Shindul-Rothschild, Berry, and Long-Middleton (1996) stated that many nurses injure their backs when units are short-staffed and they are required to lift patients by themselves. The etiology of back injury includes both individual factors, such as age and previous back problems as well as situational factors, such as staffing levels and the availability of lifting devices. A case-referent study of United States nurses identified work overload as a significant risk factors for back injuries (Owen, 1986).

A prospective study of all overexertion back injuries reported by Swedish nurses found that most incidents occurred during patient transfer and often when the nurse was working alone (Engkvist et al., 1998). In the United Kingdom, one in three nurses reported the equivalent of one shift a month of unpaid overtime and one in six reported more than two shifts per month (Wing, 1999). Furthermore, poor staffing levels motivated nurses to come to work when feeling ill, underestimating the level of absenteeism. There is also evidence to link low pay and poor working conditions with ill health but the impact of staff shortages, increased workload and the required nurse to patient ratio with increasing dependencies is not clear.

Following an extensive literature review of back pain among nurses from 1988 to 1998, Lagerstrom, Hansson, and Hagberg (1998) found that several studies demonstrated a relationship between staff density, work overload, stress and musculoskeletal injuries. During downsizing in Sweden in early 1990, there was an increase of low back pain from 11% to 16% for nurses who transferred patients alone. Another consequence of overwork is negative stress which can influence the mechanical load through changing posture. There are also several studies that have

shown a relationship between psychological demands, authority over decisions, skill utilization, social support and incidence of low back pain. There was no conclusive relationship found between individual factors (i.e., age, gender) and low back pain of nurses. Interestingly, one study of emotional burnout in nurses has shown that not only can it be linked to the health of nurses themselves, but also to patient satisfaction with their nursing care (Leiter, Harvie, & Frizzell, 1998).

Workplace Interventions

It is possible to take steps to decrease the risk of a workplace injury. Specific interventions to prevent or reduce nursing injuries described in the healthy workplace literature include: implementing safe lifting practices such as lifting with a partner or having lifting teams (Charney, Zimmerman, & Walara, 1991), teaching nurses to assess patients' weight and to identify and use appropriate equipment for lifting (Goodridge & Laurila, 1997; Owen & Garg, 1994) and educating nurses about safe lifting practices (Owen, Welden, & Kane, 1999; Videman et al., 1989).

In order to address the workplace risk factors for musculoskeletal injuries that researchers have found to be important in preventing injuries (Coleman & Hansen, 1994; Dixon, Lloyd, & Coleman, 1996), ergonomic evaluations are needed since they provide information about potential risk factors for injuries. Ergonomic assessments have helped to identify such problems as environmental barriers in the physical layout of workspace (Garg, Owen, & Carlson, 1992). Employee input and involvement in designing an effective ergonomic program has also been suggested (Orr, 1997). Ergonomically assessing equipment (Bell, 1987) and using equipment such as walking belts, mechanical hoists and lifts have been found to be effective in preventing back injuries (Collins & Owen, 1996; Garg & Owen, 1992; Owen & Garg, 1993). Proper training for nurses using the new equipment (Dixon et al., 1996) is also important, as is educating nurses about proper body mechanics (Cooper, Tate, Yassi, & Khokhar, 1996; Cooper, Tate, & Yassi, 1998) and re-injury prevention (Sinclair, Hogg-Johnson, Mondloch, & Shields, 1997).

Finally, interventions specific to work organizational factors including implementing modified return-to-work programs (Ryden, Molgaard, & Bobbitt, 1988) and re-training management to accept and accommodate workers with low back pain (Frank et al., 1996; Kaplansky, Wei, & Reecer, 1998) have also been suggested. In their literature review, Shannon, Mayr, and Haines (1997) identified empowerment of the work force, long-term commitment of the work force and good relations between management and workers to be important characteristics for reducing injury rates.

Nurses' Work Environment

Drastic changes have been made in the immediate work environment of hospital nurses as a consequence of the major restructuring activities in this province. Patient days have declined by 19%, and 29% of the hospital beds have been eliminated in the province (O'Brien-Pallas,

Baumann, & Lochhaas-Gerlach, 1998). Only the most acute patients are now admitted to Ontario hospitals, and with this reduced length of stay, nurses' work has been compressed into a shorter and more intense time frame (O'Brien-Pallas, Irvine, Peereboom, & Murray, 1997). The immediate work environment has become more complex with fewer support and management personnel in place to assist with patient care (Baumgart, 1997; O'Brien-Pallas, Baumann, et al., 1998). A reality of restructuring is that nurses with less seniority have been moved from units where they used their education and experience to care for patients to units where they may not feel immediately competent (Baumann et al, 1998). Recent research in this province suggests that the uncertainty and unpredictability of current working environments creates significant stress, frustration and anxiety for these nurses (Baumann et al, 1998). While the average age of nurses is 44 years, approximately 25% are over the age of 50 (O'Brien-Pallas, Baumann, et al., 1998). This may be problematic since nurses often express concerns about their capacity to take on additional workload in the complex environments in which care is given (Baumann, et al., 1998; Baumgart, 1997; O'Brien-Pallas, Baumann, et al., 1998, O'Brien-Pallas, Murray, et al., 1998). A recent policy synthesis on nurses' health revealed that while increased workloads may improve short-term productivity, the long-term costs actually increase since stress and illness among nurses may lead to poor judgement and low productivity that can hurt patients (Baumann et al., 2001). Furthermore Baumann et al. (2001) reported that one of the implications of nurses' high absenteeism and injury rates is the disruption of care which, in turn, makes planning difficult and has financial costs to the healthcare system. Thus, the combination of work place reorganization, coupled with unrelenting workload demands in uncertain work environments and the aging nursing workforce could potentially have a major impact on nursing health and compensations claims (Baumann et al., 2001).

Summary

In summary, there is strong evidence to suggest that nurses' injuries contribute significantly to workplace absenteeism and compensation costs. Nurses are at risk of injury and illness due to a number of factors, some of which are unique to the current time period. Massive restructuring and downsizing has changed both the nature of work and the characteristics of the workforce. Due to reduced staffing levels, nurses are expected to perform more physical activities within a given shift. As well, the intensity of work has increased and there are fewer personnel to support the activities of nurses. Furthermore, the work environment is in a state of constant change. All of these circumstances may increase musculoskeletal injury rates either directly through overexertion or indirectly through job strain. In addition, the workforce itself is experiencing a major shift. The average age of the workforce is increasing, the skill level is being polarized and the percentage of full-time workers has decreased. These factors can also lead to musculoskeletal injuries due to reduced physical capacity, lack of familiarity with workplace safety policies and constantly changing work environments.

There is a significant body of nursing research on the effect of organizational factors such as workload (Robertson, Dowd, & Hassan, 1997), skill mix (Aiken, Smith, & Lake, 1994; Hartz et al., 1989; Krakauer et al., 1992; O'Brien-Pallas, Murray, et al., 1998; Prescott, 1993), autonomy,

control, nurse-physician communication (Mc Closkey, 1990) and the professional practice environment. These factors have been examined in relation to nurse satisfaction (Roedel & Nystrom, 1988), productivity (Helt & Jelinek, 1988; Minyard, Wall, & Turner, 1986), cost effectiveness (Shamian & Chalmers, 1996), organizational commitment (Laschinger & Shamian, 1994; Laschinger, 1996) and patient outcomes (Aiken et al., 1994; Aiken, Sochalski, & Lake, 1997; O'Brien-Pallas, Murray, et al., 1998). Until recently there has been little investigation regarding the impact of these factors on the health and well-being of nurses. Past research suggests that in order to prevent or reduce musculoskeletal injuries among hospital nurses, the role of organizational factors on nurses' musculoskeletal injury rates needs to be better understood.

Although there is evidence that job strain in the form of under-staffing, increased workload and constant change may increase the incidence of workplace injuries there is a need to more fully understand how and why these factors affect injury rates and what can be done to mitigate their occurrence. There has been little understanding of the impact of individual nurse characteristics on injury rates and only minimal investigation into the risks inherent in a casual workforce. The workforce is aging and organizations may need to make modifications to the work environment or the process of work to ensure that the health and productivity of the nurses they employ and insure is maintained. Since there have been few studies that have attempted to discover the relationship between these variables and the health of nurses, this study builds upon the existing foundation and advances our understanding of how key organizational and environmental factors might affect these outcomes.

Data Sources

This study included both quantitative and qualitative components. The quantitative aspects involved both cross-sectional and time-series analyses. Cross-sectionally, data were collected for the fiscal year of April 1, 1998 to March 31, 1999 from the Ontario Ministry of Health and Long-Term Care (MoH) hospital submissions and the Workplace Safety and Insurance Board (WSIB) lost-time claims for hospital workers in Ontario. Nurse survey data were also collected in 1998/9 by Shamian, Anderson, and Tu in the 'Outcomes of Hospital Staffing' project. The three 1998/9 data sources were linked together at the hospital-level into one database. For the time-series analysis, WSIB claim rates, calculated by combining the WSIB and MoH data, were examined for a nine-year period of 1990/1 to 1998/9. The qualitative component involved analysis of data obtained from focus groups with nurses and interviews with hospital stakeholders at 10 Ontario hospitals. All analyses focused exclusively on acute care hospitals.

To fulfill research objective #1, the prevalence of self-reported health status, absenteeism, burnout, back and/or buttock pain as well as neck and/or shoulder pain were obtained by calculating frequencies at the individual nurse-level from the nurse survey responses. To fulfill research objective #2, claims data were extracted for the years 1990/1 to 1998/9 inclusive and analyzed by nursing and non-nursing populations across 134 hospitals. Research objective #3

involved multivariate regression analyses to identify individual and organizational variables associated with high hospital-level WSIB claim rates. Research objective #4 involved analyses of data collected from hospital visits which included both a quantitative analysis of workplace health and safety interventions ranked by nurses, as well as qualitative analyses of nurse focus groups and stakeholder interviews. Measures and data sources used to fulfill each of the four research objectives are presented in Table 1. Following this, the methods and results for each research objective are sequentially discussed.

Table 1
Measures and Data Sources Used to Fulfill Research Objectives

Research Objectives and Measures	Data Source
#1 What is the general self-reported health status of nurses in acute care hospitals in Ontario and what is the prevalence of self-reported health-related work absence, burnout, back pain and neck pain?	
General health status	Survey
Absenteeism: occasions sick in the past 3 months	Survey
Absenteeism: shifts missed in the past 3 months	Survey
Burnout: emotional exhaustion	Survey
Back/buttock pain in the past week	Survey
Neck/shoulder pain in the past week	Survey
#2 What are the main trends in WSIB claims for nurses in acute care hospitals in Ontario over the past nine years?	
Total claims per 100 FTEs per year	WSIB/MoH
Nursing claims per 100 FTEs per year	WSIB/MoH
Non-nursing claims per 100 FTEs per year	WSIB/MoH
#3 To what extent can individual and job strain factors explain variation in WSIB claim rates among participating hospitals?	
Hospital RN claims per 100 FTEs in 1998/9	WSIB/MoH
Percentage of RNs reporting more occasions sick than the national average	Survey
Percentage of RNs reporting more shifts missed than the national average	Survey
Percentage of RNs reporting job dissatisfaction	Survey
Percentage of RNs working more than one hour of overtime a week	Survey
Percentage of RNs reporting high emotional exhaustion	Survey
Hospital means for RNs' scores on control over practice setting subscale	Survey
Hospital means for RNs' scores on nurses relations with physicians subscale	Survey
Nursing workload hours per patient day	MoH
Nursing worked hours per patient day	MoH
RN earned hours as percentage of nurse earned hours	MoH
RN casual earned hours as percentage of total earned hours	MoH
Average age of RNs working at each hospital	CNO*

Research Objectives and Measures	Data Source
#4 What additional factors, from the staff nurses' perspective and from an organizational perspective, should be included to develop effective workplace interventions to improve the health of nurses?	
Ranking of workplace health and safety interventions	Nurses
Nurse focus group transcripts	Nurses
Stakeholder interview transcripts	Stakeholders

Note. RN measures contain data for RNs only. Nurse measures include data for RNs, registered practical nurses (RPNs) and unregulated care providers (UCPs).
* College of Nurses of Ontario

Research Objective #1

What is the general self-reported health status of nurses in acute care hospitals in Ontario and what is the prevalence of self-reported health-related work absence, burnout, back pain and neck pain?

Method

In order to describe the health status of nurses, data from the "Outcomes of Hospital Staffing" project (Shamian et al., 1998) were examined. Shamian et al. collected data regarding nursing work life and hospital characteristics from 8229 RNs in 139 Ontario acute care hospitals. Since WSIB claims data were available for only 134 hospitals and these databases needed to be linked at the hospital-level, only survey responses from those nurses identifying themselves as working at one of the 134 hospitals ($\underline{n}$ = 8044) were included in the current study. Separate sampling criteria were used depending on whether hospitals were small (less than 100 nurses) or large (100 or more nurses). For small hospitals, all nurses were sampled and for large hospitals, only 100 nurses were sampled.

Nurses in the current study were primarily female (98%) and their ages ranged from 22 to 70 years ($\underline{M}$ = 43, $\underline{SD}$ = 8.5). Furthermore, 99% identified their job title as a 'staff nurse' and almost half of respondents were working primarily on medical and/or surgical units. Finally, less than one-half were working part-time (46%) while a little more than one-half were working full-time (54%), and the majority of nurses (92%) identified their employment as permanent rather than temporary or casual.

Five single item measures were examined from this survey to fulfill research objective #1: general health status (adapted from the SF-36 scale, see Ware, Snow, Kosinski, & Gandek, 1993); absenteeism measured by number of occasions sick in the past three months and number of shifts missed due to illness in the past three months; and frequency of back and/or buttock pain in the past week and frequency of neck and/or shoulder pain in the past week (as used by Shannon et al., 2001). An emotional exhaustion subscale (see Appendix A) was also calculated from survey items from Maslach's Burnout Inventory (Maslach & Jackson, 1986). Single item measures taken from the survey are presented in Table 2.

Table 2
Single Item Measures from Survey used for Research Objective #1

Survey Items	**Response Options**
In general, would you say your health is:	1=excellent, 2=very good, 3=good, 4=fair, 5=poor
In the past 3 months: a) on how many occasions have you missed work due to illness? b) How many shifts have been missed?	_____ # occasions _____ # shifts
In the past week, how often have you suffered from back pain and/or buttock pain?	1=none of the time, 2=a little of the time, 3=some of the time, 4=most of the time, 5=all of the time
In the past week, how often have you suffered from neck pain and/or shoulder pain?	1=none of the time, 2=a little of the time, 3=some of the time, 4=most of the time, 5=all of the time

Calculating Emotional Exhaustion: Emotional Exhaustion is one of three subscales from Maslach's Burnout Inventory. This scale asked nurses to indicate how often they experienced nine job-related feelings (see Appendix A). The nine-item scale was calculated by examining each item and imputing hospital means for the missing item when an individual had only one or two of the nine items missing. Items were summed to obtain an emotional exhaustion score for each individual nurse. This subscale contains nine items on a six-point scale and thus has a potential range of 0 to 54. Maslach has classified the subscale scores as follows: 0-16 as low, 17-26 as moderate and 27-54 as high emotional exhaustion. It should be noted that in calculating this subscale, data from individuals with more than two missing values were not used in creating the subscale scores.

Results

General health status. Prevalence numbers for health status, absenteeism, burnout, back and/or buttock pain and neck and/or shoulder pain were obtained by calculating frequencies at the individual nurse-level from the nurse survey responses. Frequencies are reported as valid percent which refers to calculation of percentages adjusting for missing responses.

When asked to report their health status, 7921 of 8044 (98.5%) of nurses responded. Of those who responded, almost all nurses (96.5%) reported their health as being either excellent, very good or good. Since this measure was used in the 1996/7 National Population Health Survey (Statistics Canada, 1999), the responses in the current study were compared to the national average for all females ages 12 and up, including both workers and non-workers (see Table 3).

Table 3
Comparing Responses from the Nurse Survey to Female Responses from the 1996/7 National Population Health Survey (NPHS) for the General Health Status Item

Health Status Response Options	**Nurses' Responses (n = 7921)**	**NPHS 1996/7 Responses by Females**
Excellent	38.0%	24.0%
Very good	41.0%	38.0%
Good	17.5%	27.0%
Fair	3.2%	8.0%
Poor	0.3%	2.0%

Absenteeism. When asked to report the number of occasions as well as shifts missed due to illness in the past three months, 7686 of the 8044 (95.5%) respondents reported the number of occasions while 7420 of the 8044 (92.2%) nurses reported the number of shifts missed. Of those who responded to each question, nearly 44% reported having one or more occasions of sickness and 44% reported missing one or more shift due to illness in the past three months (see Table 4).

Table 4
Number of Occasions Sick and Shifts Missed Reported from the Nurse Survey

Number of Occasions/Shifts	**Occasions Sick in Past 3 Months (n = 7686)**	**Shifts Missed in Past 3 Months (n = 7420)**
0	56.2%	56.0%
1	26.8%	16.3%
2	10.6%	12.5%
3 or more	6.4%	15.2%

Burnout. Burnout, measured by the emotional exhaustion subscale score for Maslach's Burnout Inventory, was calculated for the 7562 of the 8044 nurses who responded (94.0%). Of those who responded, the mean emotional score was in the moderate range (M=22.87, SD=11.48), but

scores for more than one-third of nurses were in the high emotional exhaustion category. See Table 5 for classification of scores.

Table 5
Classification of Nurses' Emotional Exhaustion Subscale Scores

Classification Categories	**% of Subscale Responses (n = 7562)**
Low emotional exhaustion	32.5%
Moderate emotional exhaustion	31.2%
High emotional exhaustion	36.3%

Back pain and neck pain. When asked to report the frequency of back and/or buttock pain that they experienced in the past week, 7724 of 8044 (96.0%) of nurses responded. Of those who responded, 16% of nurses reported experiencing back and/or buttock pain most or all of the time (see Table 6). When asked to report the frequency of neck and/or shoulder pain that they experienced in the past week, again 7724 of 8044 (96.0%) of nurses responded. Of those who responded, nearly 17% reported experiencing neck and/or shoulder pain most or all of the time (see Table 6). When the number reporting either one or the other type of pain was determined, more than 25% of nurses reported either type of musculoskeletal pain most or all of the time.

Table 6
Frequencies of Self-Reported Back and/or Buttock Pain and Neck and/or Shoulder Pain

Response options	**Back/buttock pain (n = 7724)**	**Neck/shoulder pain (n = 7724)**
None of the time	33.5%	36.8%
A little of the time	23.1%	22.1%
Some of the time	27.4%	24.5%
Most of the time	11.6%	12.1%
All of the time	4.4%	4.6%

Research Objective #2

What are the main trends in WSIB claims for nurses in acute care hospitals in Ontario over the past nine years?

Method

The WSIB database provided information about all lost-time claims filed in the 134 acute care hospitals for each year from 1990/1 (hereafter referred to as 1990) to 1998/9 (hereafter referred to as 1998). Claims were restricted to lost-time, short-term disability claims with an injury date between 1990 and 1998. Short-term disability claims are those where a payment is made for lost income and the worker is expected to return to work. Claims were further subdivided into musculoskeletal injuries and non-musculoskeletal injuries (fractures, burns, cuts, infections and chemical exposures). Using classification lists developed by others (Beaton, Cole, & Manno, 2000; Wang, 2000), musculoskeletal injuries from the International Classification of Diseases (ICD-9) diagnoses codes included in workers' compensation records were identified. Acute or traumatic injuries such as fractures, dislocations, open wounds and amputations were included in the 'other' category.

Data were separated for nursing and non-nursing hospital staff. Nursing staff included nurse managers, RNs, registered practical nurses (RPNs) and unregulated care providers (UCPs). Non-nursing staff included support personnel (e.g., housekeeping and dietary), allied health professionals (e.g., therapists, pharmacists), technicians, technologists and administration. Both lost-time claims and lost-time claims that were specific to musculoskeletal injuries were isolated from the WSIB database. We were interested in lost-time claims generally, although we wanted to pay special attention to musculoskeletal claims since these claim rates are known to be high among health care workers. The focus of this analysis was on capturing musculoskeletal sprains and strains more typically associated with non-traumatic cumulative effects of work.

To calculate the annual claim rates for each hospital, the raw number of total hospital claims were divided by the total hospital earned hours from the MoH data. Assuming that a full-time employee works 2,000 hours annually (as this is the standard number used in WSIB claims research), the resulting proportion was then multiplied by 200,000 to determine claim rates for 100 full-time equivalent workers (FTEs) as follows:

$$\frac{\#\ \text{Claims}}{\text{Earned hours}} \times 200{,}000 = \text{claim rate per 100 FTEs}$$

One must be cautioned that it is difficult to compare claim rates between this report and that of other reports due to the different method of calculating denominators. Many reports on compensation claims rely on total payroll divided by an average salary for a health care worker to

construct denominators. We believe that using actual earned hours is a better estimate of FTEs within acute care hospitals, due to the variation in hourly wage rates.

Claim rates were also calculated separately for nursing and non-nursing staff and for musculoskeletal and non-musculoskeletal injuries, and compared over time from 1990 to 1998. Using fields in the WSIB database, additional descriptive analyses were completed on the type, source and duration of claims among the study hospitals.

In order to fulfill research objective # 2, the analyses involved computing claim rates using the number of claims from 1990 to 1998, and earned hours for both nurses and all hospital staff for each hospital. Initially, we hoped to restrict our analysis of nursing personnel to those who provided direct patient care. However, further examination of the MoH databases revealed that nursing hours data were not separated by direct care and non-direct care personnel, but rather included those providing management and support staff until 1994. Therefore, in order to capture the trends for a nine year period and to keep the denominator consistent for all years, it was necessary to include both direct care and non-direct care personnel working in nursing units in the calculation of the nursing personnel claim rates. Non-nursing earned hours were determined by subtracting nursing earned hours from the earned hours logged by all hospital employees. Since numerous hospitals merged over the nine year period of study, careful assessment was conducted to ensure the comparability of data for the claims numerator and the earned hours denominator.

Results

In 1990, there was just under 100,000 FTEs working in the 134 Ontario acute care hospitals examined (n = 99,100). Of these FTEs, approximately half were nurses (50,939 or 51%). By 1998, the total number of FTEs had dropped to 91,357 and the percentage of nurses had fallen to 49% of the total (n = 44,747).

Description of Compensation Claims

Overall, 28,521 lost-time workers' compensation claims were filed by employees working at the 134 Ontario acute care hospitals between 1990 and 1998 inclusive, of which 18,077 (63%) were musculoskeletal claims. Table 7 places the total number of claims in our study population in context of the claims experience of the province and the health care sector as a whole. As noted in Table 7, the percentage of claims filed by nurses in the 134 hospitals increased over the study period from 59% of lost time claims in 1990 to 69% of claims in 1998.

Table 7

Lost-time Claims for Ontario, the Ontario Health Care Sector and 134 Ontario Acute Care Hospitals, 1990-1998

	1990		1991		1992		1993		1994		1995		1996		1997		1998	
Lost-time claims	184444		155475		136940		125122		125644		118814		103080		101806		97190	
Healthcare Sector (% of total)	11309 (6.1%)		11215 (7.2%)		10632 (7.8%)		9883 (7.9%)		9549 (7.6%)		9026 (7.6%)		7763 (7.5%)		7402 (7.3%)		7066 (7.3%)	
Study:134 hospitals-ON (% of sector)	4430 (39.2%)		4093 (36.5%)		3766 (35.4%)		3263 (33.0%)		3212 (33.6%)		2724 (30.2%)		2329 (30.0%)		2411 (32.6%)		2293 (32.5%)	
Nursing versus Other	Nur	Oth	Nur	Oth	Nur	Oth	Nur	Oth	Nur	Oth	Nur	Oth	Nur	Oth	Nur	Oth	Nur	Oth
# Claims	2612	1818	2510	1583	2390	1376	2131	1132	2029	1183	1805	919	1579	750	1684	727	1586	707
% in 134 hosp.	59.0%	41.0%	61.3%	38.7%	63.5%	36.5%	65.3%	34.7%	63.2%	36.8%	66.3%	33.7%	67.8%	32.2%	69.8%	30.2%	69.2%	30.8%

Note. 'Other' refers to non-nursing personnel.

Nature of Claims

The percentage of claims attributable to musculoskeletal injuries among nurses declined from approximately 70% of claims in the early 1990s to a low of 62% of claims in 1998. During the same period, the percentage of lost-time claims for musculoskeletal sprains and strains among non-nurses increased from 54% of claims in 1990 to a high of 60% of claims in 1994 (Appendix B), returning to 53% of claims by 1998. The tables in Appendices B and C provide a breakdown of the nature of lost-time claims for nurses and non-nurses by year, from 1990 to 1998 inclusive.

The largest increase in the nature of claims among nurses was for injuries not otherwise classified increasing steadily from 10% of lost-time claims in 1990 to 18% of claims in 1998. Although the numbers are small, the percentage of claims for exposure to infectious agents increased from 1990 to 1998 (1.5% to 2.7%, respectively) with the most notable increase in the last two years of the study's data (see Appendix B).

The largest increase in the nature of claims among non-nurses was also for injuries not otherwise classified rising from 14% of claims in 1990 to 19% of claims in 1998. The percentage of claims attributable to exposure to chemicals increased from 0.9% in 1990 to 2.1% in 1998. Injuries resulting in burns have dropped steadily from 5% of claims in 1990 to 3% of claims in 1998.

Source of Injury

Over the nine years and for all hospital personnel, the majority of lost-time claims were attributable to overexertion type activities at work (n = 14,048, or 49%). The percentage of claims attributable to overexertion activities among nurses gradually declined during the study period from 61% of lost-time claims in 1990 to 48% of lost-time claims in 1998. The largest increase in the source of injury among this group was for bodily reactions as a result of voluntary or involuntary motions increasing from 13% of claims in 1990 to 18% of claims in 1998, as well as for falls, increasing from 8% in 1990 to 12% in 1998.

During the same period, the source of injury among non-nurses was more evenly distributed between the different categories. The percentage of lost-time claims attributable to overexertion activities was 35% in 1990 compared to 30% in 1998. The largest change in the source of injuries among this group was for bodily reactions due to voluntary and involuntary motions increasing from 16% of claims in 1990 to 27% of claims in 1998.

Days Lost

To investigate trends in duration of claims from 1990 to 1998 and between nurses and non-nurses, we looked at days lost within the year from the start of the claim (i.e., first 365 days). Nurses continue to experience a higher number of days lost per claim compared to non-nurses regardless of the type of claim or the year of the study. Across all nine years, the average days lost per claim for nurses was 37 days compared to 32 days for non-nurses. While both groups

experienced a decrease in the average days lost per claims from 1990 to 1998, the rate of decline was slower for nurses compared to non-nurses. Nurses experienced a 43% drop in days per claim between 1990 (47 days per claim) and 1998 (27 days per claim), whereas non-nurses experienced a 52% drop in days per claim during the same time period (from 42 days per claim in 1990 to 20 days in 1998).

Across both nurses and non-nurses, the rate of decline in duration has been greater for musculoskeletal injuries compared to non-musculoskeletal injuries. While the average days per claim for musculoskeletal injuries declined from 53 days in 1990 to 27 days in 1998 (a drop of 50%), the average days per claim for non-musculoskeletal injuries only declined from 27 days in 1990 to 22 days in 1998 (a drop of 27%).

Lost-Time Claim Rates and Trends Over Time

By occupational group and across all years, nurses had almost double the claim rate (4.33 per 100 FTEs, 95% CI = 4.27, 4.39) of non-nurses (2.34 per 100 FTEs, 95% CI = 2.29, 2.39). This difference in claim rates between nurses and non-nurses remained statistically significant in 1990 ($z = 10.36$, $p < .001$) and in 1998 ($z = 19.52$, $p < .001$).

Regardless of occupational group or type of claim, the decline in claim rates tended to occur between 1990 and 1995 with a leveling off of the claim rates in subsequent years. While this decline was observed among both nurses and non-nurses, the rate of decline was slower among nurses (Figure 1). The claim rate among non-nurses dropped by more than 2 claims per 100 FTEs over the nine year period (from 3.77 claims to 1.52 claims, or a 60% decrease; $z = 21.51$, $p < .001$)) while the rate among nurses dropped by 1.6 claims per 100 FTEs over the same period (from 5.13 claims to 3.54 claims, or a 31% decrease; $z = 11.99$, $p < .001$). Expressed slightly differently, the ratio of claim rates among nurses to non-nurses almost doubled, increasing from 1.4 claims among nurses for every 1 claim among non-nurses in 1990 to 2.3 claims among nurses for every 1 claim among non-nurses in 1998.

Musculoskeletal and Non-musculoskeletal Lost-Time Claim Rates and Trends Over Time

Overall, there was a 61% decrease in the claim rate for musculoskeletal injuries among non-nurses between 1990 and 1998 (dropping from 1.98 claims per 100 FTEs to 0.78 claims, $z = 15.59$, $p < .001$), see Figure 2. This is in contrast to only a 39% decrease in the claim rate for musculoskeletal injuries among nurses during the same time period (dropping from 3.56 claims per 100 FTEs to 2.19 claims, $z = 12.34$, $p < .001$). Expressed as a ratio, the musculoskeletal claim rates among nurses compared to non-nurses increased from 1.8 (almost 2 claims among nurses for every 1 claim among non-nurses) to 2.8 (almost 3 claims among nurses for every 1 claim among non-nurses) between 1990 and 1998.

The slower rate of decline in claim rates among nurses was most pronounced for non-musculoskeletal injuries (Figure 3). The rate of non-musculoskeletal injuries fell only 15%

among nurses over the study period (from 1.56 claims per 100 FTEs in 1990 to 1.33 claims in 1998, $z = 2.97$, $p > .05$), compared to a drop of 58% among non-nurses during the same time period (from 1.68 claims per 100 FTEs in 1990 to 0.7 claims in 1998, $z = 13.89$, $p < .001$). Expressed slightly differently, the ratio of non-musculoskeletal claim rates among nurses compared to non-nurses doubled from a ratio of 0.93 (approximately 1 claim among nurses for every 1 claim among non-nurses) in 1990 to a ratio of 1.9 in 1998 (approximately 2 claims among nurses for every 1 claim among non-nurses).

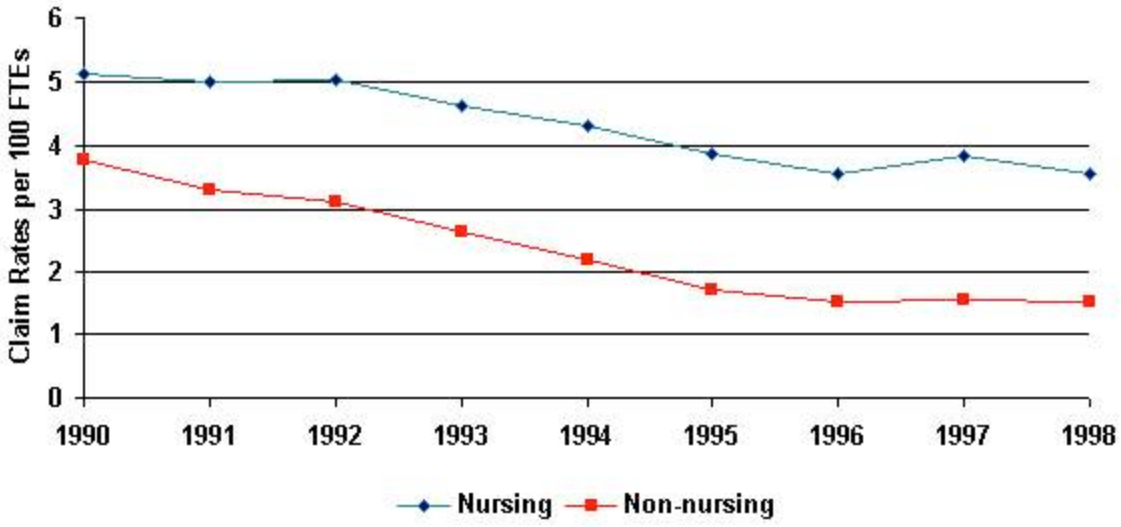

Figure 1. Claim rates (all lost-time claims) for nursing and non-nursing personnel across 134 acute care hospitals in Ontario from 1990 to 1998.

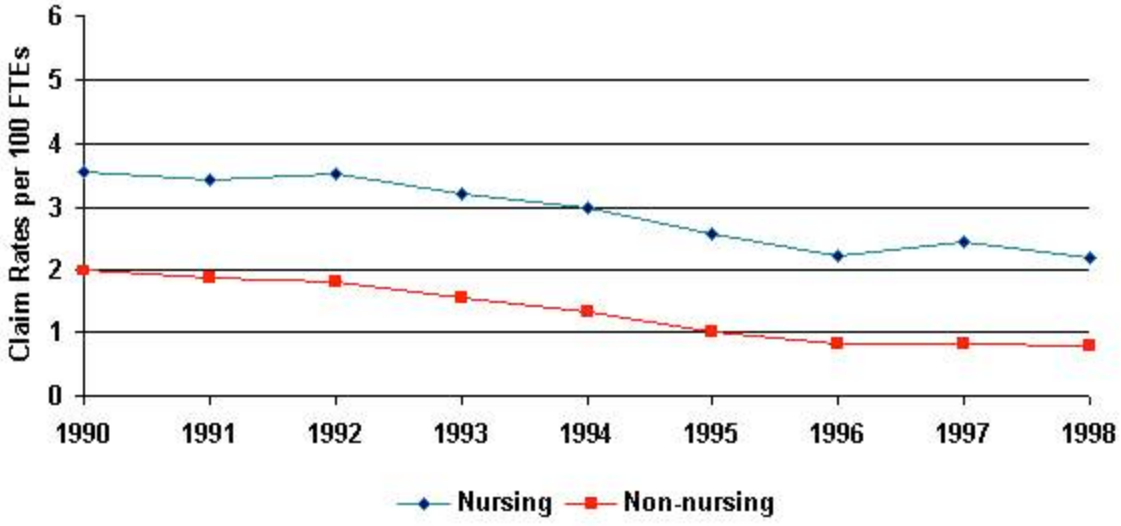

Figure 2. Claim rates (musculoskeletal injuries) for nursing and non-nursing personnel across 134 acute care hospitals in Ontario from 1990 to 1998.

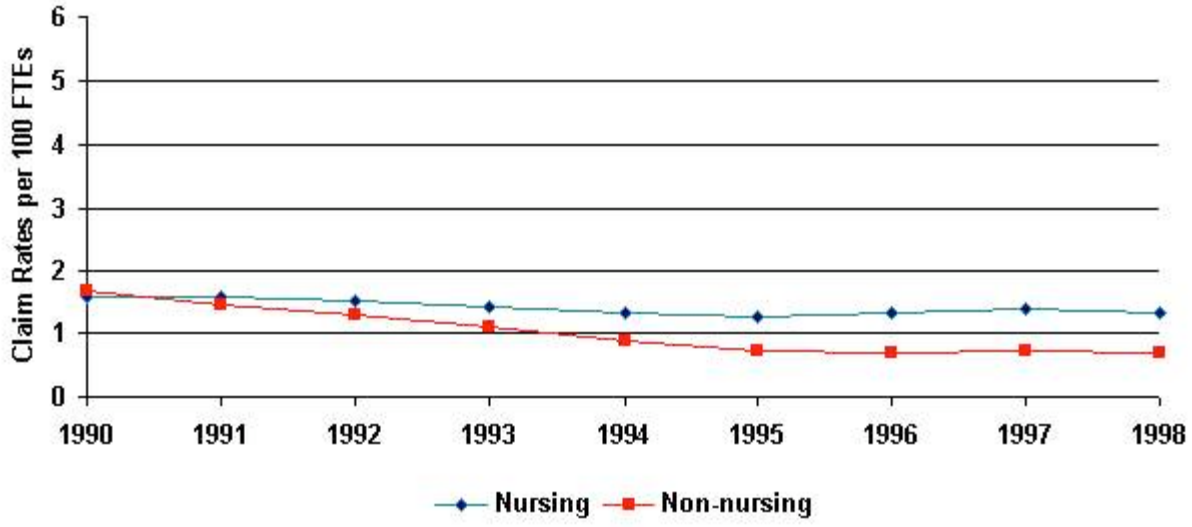

Figure 3. Claim rates (non-musculoskeletal injuries) for nursing and non-nursing personnel across 134 acute care hospitals in Ontario from 1990 to 1998.

Research Objective #3

To what extent can individual and job strain factors explain variation in WSIB claim rates among participating hospitals?

Method

In order to fulfill research objective 3, two logistic regression analyses were conducted with the cross-sectional data.

Dependent Variables for Regression

The dependent variables was the hospital-level claim rates for all RN lost-time claims and for RN musculoskeletal lost-time claims. Both lost-time claims and musculoskeletal lost-time claims were isolated strictly for RNs since RN earned hours were available from the MoH data for 1998. Earned hours consist of both worked and benefit hours. To calculate the RN claim rates for each hospital, the raw number of RN claims was divided by RN earned hours. The resulting proportion was then multiplied by 200,000 to express claim rates for 100 FTEs.

In one analysis, the dependent variable was the hospital-level RN lost-time claim rate for 1998 while in the other analysis, the dependent variable was the RN musculoskeletal lost-time claim rate, also for 1998. The RN lost-time claim rates ranged from 0 to 53.98 per 100 FTEs ($\underline{M}$= 4.55, $\underline{SD}$=6.33), while the RN musculoskeletal lost-time claim rates also ranged from 0 to 53.98 per 100 FTEs ($\underline{M}$= 2.94, $\underline{SD}$=5.35). Because claim rates were distributed in a non-normal fashion, it was decided it would be best to dichotomize the dependent variables and conduct logistic regression rather than linear regression.

To dichotomize the dependent variables, the RN claim rates were split into high versus low using information provided in a 1997 report from the Association of Workers' Compensation Boards of Canada (AWCBC, 1997); the AWCBC provides the most recent estimates of national average claim rates for different sectors. According to this report, the 1996 national average claim rate for the health care industry was 2.59 lost-time claims per 100 workers, so the RN lost-time claim rate was dichotomized as being at or below 2.59 per 100 FTEs (labeled as low) or above 2.59 per 100 FTEs (labeled as high).

The AWCBC (1997) also provided the raw number of musculoskeletal lost-time claims among healthcare workers in 1996, but had not calculated a musculoskeletal claim rate. In order to calculate a national musculoskeletal rate against which the current study's musculoskeletal claim rates could be compared, the denominator of 'number of workers' was derived using the AWCBC overall lost-time claim rate and number of claims and then solving for 'number of workers'. Once this number was determined, it was used as the denominator to calculate the

national average musculoskeletal lost-time claim rate, which was 1.49 per 100 workers. The Ontario acute care hospital musculoskeletal lost-time claim rate for 1998 which was then dichotomized as being at or below 1.49 per 100 FTEs (labeled as low) or above 1.49 per 100 FTEs (labeled as high).

Since it was necessary to dichotomize claim rates in order to conduct logistic regression, claim rates were dichotomized based on the method previously discussed. RN lost-time claim rates were dichotomized as being either at or below 2.59 (low) or above 2.59 claims (high) per 100 FTEs. Fifty-six of the 127 hospitals (44%) were classified as low and 71 (56%) were classified as being hospitals with high claim rates. RN musculoskeletal lost-time claim rates were dichotomized as being either at or below 1.49 (low) or above 1.49 claims (high) per 100 FTEs. Fifty-one of the 127 hospitals (40%) were classified as low and 76 (60%) were classified as being hospitals with high musculoskeletal claim rates.

Predictor Variables for Regression

Twelve predictor variables were included in each of the regressions conducted: seven from the nurse survey, four from the MoH data and one from the College of Nurses of Ontario data. A description of each of these measures follows. Since the analyses were exploratory, all 12 variables were entered into a forward regression in one single step (i.e., as a single block).

Variables from the survey. Seven RN survey variables calculated at the hospital-level were entered as predictor variables, of which four were single item measures: percentage of RNs reporting more occasions sick than the national average, percentage of RNs reporting more shifts missed than the national average, percentage of RNs reporting job dissatisfaction and percentage of RNs working more than one hour of overtime a week. Three subscales were also calculated from survey items: one subscale from Maslach's Burnout Inventory (emotional exhaustion, see Appendix A) and two subscales from the Nursing Work Index (control over practice setting and nurse relations with physicians, see Appendices D and E).

Absenteeism: For the absenteeism items, as described in research objective #1, RNs were asked to indicate for the past three months: (1) the number of occasions that they missed work due to illness as well as (2) the number of missed shifts (see Table 2). Both the number of occasions and number of shifts were multiplied by four to obtain an annualized value. Annualized values for number of occasions sick and shifts missed were compared to the 1998 Labour Force Survey averages for days lost due to illness/disability and overall days lost per year for female workers (Akyeampong, 1999). Female statistics were used for comparison since 98% of the nurse survey respondents were female. According to the 1998 Labour Force Survey, for women, the average days lost per year specifically due to illness/disability was 7.7, whereas the average days lost per

year for any reason was 9.2. Hospital-level variables indicating percentages of RNs reporting more occasions sick and more shifts missed than the national female average were created as predictor variables.

Job dissatisfaction: For the job dissatisfaction item, nurses were asked "On the whole, how satisfied are you with your present job?" On a four-point scale, response options ranged from 1=very dissatisfied to 4=very satisfied. This variable was expressed as the percentage of RNs at each hospital indicating that they were very dissatisfied with their job.

Overtime: Nurses were asked to report separately how many hours per week, on average, they worked paid and unpaid overtime. These two values were added together to create a 'total overtime' variable. For those who reported no value for paid or unpaid overtime, zero hours were assumed. This item was converted to a hospital-level variable by calculating the percentage of RNs reporting more than one hour of total overtime per week at each hospital.

Emotional Exhaustion: Calculation of the emotional exhaustion subscale was described in the research objective #1 section. Scores were dichotomized as 27 or less (low or moderate emotional exhaustion) or greater than 27 (high emotional exhaustion). A hospital-level variable with percentage of RNs indicating high emotional exhaustion was entered as a predictor variable.

Nursing Work Index: The Nursing Work Index consists of three subscales that measure a) nurse autonomy (six items), b) control over practice setting (seven items) and c) nurse relations with physicians (three items). Each statement asked RNs to indicate the extent to which they agreed that each item was present in their current job. Each individual item was reverse coded so that higher values indicated better working conditions. Item means were calculated so that each hospital had a mean score for each item. For each subscale, the means for the appropriate items were summed to give an aggregated hospital-level subscale score. Since nurse autonomy and control over practice setting were highly correlated, $r(125) = .77$, $p < .0001$, only one of these subscales could be entered into the regression. Therefore, the control over practice setting subscale scores (Appendix D) and nurse relations with physicians subscale scores (see Appendix E) were entered as predictor variables into the regression analyses. Given that job strain is a combination of high demands and low control, we chose the control over practice setting subscale because job strain has been associated with injury rates in all sectors (Baumann et al., 2001; Karasek & Theorell, 1990). Additionally, control over practice was identified as the most important hospital characteristic predictive of nurses' emotional exhaustion and job satisfaction (Clarke et al., 2001).

Variables from the MoH data. Four of the twelve predictor variables (nursing workload hours per patient day, nursing worked hours per patient day, RN earned hours as percentage of nurse

earned hours and RN casual earned hours as percentage of total earned hours) were created from the MoH database. These variables included both inpatient and outpatient functional centers since the WSIB database did not differentiate between claims for staff in inpatient and outpatient units. Inpatient units included: medical, surgical, combined medical/surgical, intensive care, obstetrics, operating rooms, post anesthetic recovery rooms, combined operating rooms/post anesthetic recovery rooms, pediatrics, psychiatry, rehabilitation, palliative and long term care. Outpatient units included: emergency, day/night care and outpatient clinics.

Workload: Workload, as defined by the MoH, is the measure of resources requirements for a specific service in terms of a unit of productive personnel time and is collected separately for patient care and non-patient care activities. Patient care workload activities are specific to individual patients and include assessment, therapeutic intervention and consultation. Non-patient care workload consists of activities on behalf of the unit as a whole and includes unit/facility/community/professional activities as well as teaching/inservice and research (Ministry of Health and Long-Term Care, 1997). Although the 1998/9 fiscal year was the second year in which workload data were collected by the MoH, there were issues with non-reporting of this data by hospitals. The original plan for analyzing workload was to consider total workload (i.e., both patient-care and non-patient-care workload). However, only 87 of the 134 (65%) hospitals reported non-patient care workload data. Therefore, only patient-care workload data were used. From here on, the term "workload" is used to refer to patient-care workload only. The process for imputing missing workload values is discussed in Appendix F. Inpatient and outpatient workload hours were summed to get total workload hours.

Hours: Although worked hours may be a more appropriate measure to include in our model since claims are only filed for injuries incurred while at work, earned hours were used to construct the RN skill-mix variables that were used as predictors. This was because RN earned hours were not separated into worked and benefit hours for 1998. Nursing hours, which includes RNs, RPNs and UCPs combined, were available for worked and benefit hours separately, however. Therefore worked hours were used to construct the nursing worked hours per patient day variable.

Patient days: Patient days are the number of days of service provided to an inpatient from the day of admission to the day of discharge where the day of admission is counted but the day of discharge is not counted (Ministry of Health and Long Term Care, 1997). Patient days are commonly used as the denominator for calculating nurse service provision measures involving worked hours and workload. A formula to convert outpatient visits to inpatient patient days was applied so that all service provision variables were expressed in the same unit. The formula involved calculating inpatient worked hours per patient day and outpatient worked hours per visit and then obtaining a ratio of the two values for each hospital. Outpatient visits were then divided by this ratio for each hospital, resulting in a quantity for 'outpatient-equivalent patient days'. Inpatient and outpatient patient days were then summed together to obtain a total patient day

value for each hospital. The total patient days variable was then used to calculate both nursing workload hours per patient day and nursing worked hours per patient day.

Indicators calculate using MoH variables: Nursing workload hours per patient day were calculated by dividing workload hours by patient days. Similarly, nursing worked hours per patient day were calculated by dividing worked hours by patient days. Percentage of RN earned hours of total nurse earned hours was calculated by dividing RN earned hours into nurse earned hours and multiplying by 100. These calculations included full-time, part-time and casual/relief/agency hours. RN casual hours as percentage of RN total hours was created by dividing RN casual earned hours by RN total earned hours and multiplying by 100.

Variable from the College of Nurses data. Average age of RNs working at each hospital was obtained by the College of Nurses of Ontario registration form that nurses complete annually.

The 12 predictor variables entered into the regression model are listed in Table 9. Five of the variables were left as continuous variables. However, the seven variables expressed as percentages were transformed into quartiles. This strategy was adopted since, as shown in Table 10, while these variables had potential ranges from 0 to 100%, among Ontario hospitals the actual values of these variables did not approach the full range of potential values. Our strategy more accurately reflects the actual range of values that these percentages can take.

Table 8

Predictor Variables Entered into Two Logistic Regressions

Predictor Variables	**Variables Expressed**
Staffing	
Nursing worked hours per patient day	Continuous
RN earned hours as percentage of nurse earned hours	Quartiles
RN casual earned hours as percentage of RN total earned hours	Quartiles
Workload	
Nursing patient care workload hours per patient day	Continuous
Organizational Factors	
Hospital means for RNs' scores on control over practice setting subscale	Continuous
Hospital means for RNs' scores on nurses relations with physicians subscale	Continuous
Percentage of RNs working more than one hour of overtime a week	Quartiles
Individual Nurse Characteristics	
Percentage of RNs reporting more occasions sick than the national average	Quartiles
Percentage of RNs reporting more shifts missed than the national average	Quartiles
Percentage of RNs reporting high emotional exhaustion	Quartiles
Percentage of RNs reporting job dissatisfaction	Quartiles
Average age of RNs working at each hospital	Continuous

Eliminating Hospitals from Regression Analyses

For the regression analysis, from the initial 134 hospitals for which we had at least some MoH, nurse survey and WSIB claims data for 1998, seven hospitals were eliminated by using the following criteria. Two hospitals did not report their RN earned hours which was necessary to calculate the RN claim rates. One hospital was eliminated because the age data were missing. One hospital was removed because it had recently merged with two other hospitals and although we knew that the claims for only one of the three hospitals were included in the numerator, we were unable to ascertain which of the three hospital sites were included in the denominator of RN earned hours. Three more hospitals were eliminated based on low response rates to the survey. Separate criteria for including hospitals based on number of RN responses and response rates were established depending on whether a hospital was small (less than 100 nurses) or large (100

or more nurses). Small hospitals with response rates of less than 40% were eliminated (n = 3), and large hospitals which had less than 40 responses were excluded (no large hospitals needed to be excluded). The removal of these seven hospitals from the initial 134 hospitals brought the sample to 127.

Results

Sub-analysis of Hospital Claim Rates by Hospital Characteristics

As a preliminary analysis, data for the sub-analysis of hospital claim rates by hospital characteristics were obtained by combining two sets of information, claim rates data restricted to RN lost-time claims in 1998 and survey data. Since the denominator to calculate RN claim rates was missing for two hospitals, this sub-analysis was limited to 132 hospitals. Hospitals were categorized into quartiles based on the distribution of RN claim rates per 100 FTEs across all hospitals. The lower quartile (n = 33) represented hospitals with the lowest RN claim rates while the upper quartile (n = 33) represented hospitals with the highest RN claim rates. Measures of hospital characteristics were constructed for the acute care hospitals by taking the mean score or percentage of RNs' responses to survey items within each hospital (see Table 8).

RNs at high claim rate hospitals reported having significantly less autonomy than those RNs at low claim rate hospitals. Although not statistically significant, patterns for the other variables are interesting to note, since overall, more RNs working in hospitals with the highest claim rates reported adverse health outcomes and adverse working conditions compared to those working in hospitals with the lowest claims rates. Specifically, a higher percentage of RNs in hospitals with high claim rates reported poor health, frequent back and/or buttock pain, frequent neck and/or shoulder pain and high emotional exhaustion compared to RNs working in hospitals with low claim rates. RNs at high claim rate hospitals also reported having less control over the practice setting. The percentage of RNs reporting more than one hour of overtime per week was also higher among hospitals with high claim rates. A higher percentage of RNs reported occasions sick as well as missed shifts due to illness than the national average in hospitals with high claim rates. Finally, the percentage of RNs who reported being dissatisfied with their job was higher among those working in hospitals with high claim rates.

Table 9

Characteristics of RNs Working in High and Low Claim Rate Hospitals Based on Means (M) and Percentages (%) from Survey Responses

Hosp. Claim Group	Poor hlth. status(%)	Freq. back pain (%)	Freq. neck pain (%)	NWI - Ctrl. † (M)	NWI - Nrs-dr rel. † (M)	NWI-Aut. † (M)	> 1 hr over-time wk (%)	Occ. sick > avg. (%)	Missed shifts > avg. (%)	High emot exh. (%)	Job dis-satisf. (%)
High	4.3	16.7	20.9	16.0	8.6	14.3	48.6	17.0	12.5	32.1	11.2
Low	4.1	15.6	16.5	17.0	8.6	15.3	43.1	13.4	11.0	29.0	8.1
p-value	.89	.56	.07	.07	.84	.01*	.31	.13	.42	.41	.07

† higher score indicates more control over practice, better nurse-physician relations and more autonomy

* indicates statistical significance at $p < .05$

Logistic Regression

Prior to conducting logistic regression, frequencies were determined for all independent variables and numerous outliers were identified. Outliers greater than three standard deviations were replaced with a value that was one whole number less extreme than the largest non-outlier, as recommended by Tabachnick and Fidell (1989). Frequencies were re-calculated for each variable until all outliers were removed. Descriptive statistics for the 12 predictor variables are presented in Tables 10 (continuous variables) and 11 (variables expressed as quartiles). Bivariate correlations were calculated among all independent variables to ensure variables were not correlated greater than .70. No multicollinearity problems were identified.

Table 10

Descriptive Statistics for Predictor Variables Expressed as Continuous

Predictor Variables Expressed as Continuous	**M**	**SD**
Hospital means for RNs' scores on control over practice setting subscale	16.39	1.46
Hospital means for RNs' scores on nurses relations with physicians subscale	8.50	0.65
Nursing patient care workload hours per patient day	4.04	1.20
Nursing worked hours per patient day	5.83	1.04
Average age of RNs working at each hospital	43.38	2.38

Table 11

Descriptive Statistics for Predictor Variables Expressed as Quartiles

Predictor Variables Expressed as Quartiles	**M**	**SD**	**Quartiles**
Percentage of RNs reporting more occasions sick than the national average	15.30	8.33	Q1=0 to 9% Q2=9.0 to 15.7% Q3=15.7 to 20.3% Q4=20.3 to 37.5%
Percentage of RNs reporting more shifts missed than the national average	33.30	12.73	Q1=0 to 7.7% Q2=7.7001 to 13% Q3=13.001 to 17.4% Q4=17.4001 to 33.3%
Percentage of RNs reporting job dissatisfaction	10.11	5.80	Q1=0 to 6.9% Q2=6.9001 to 10% Q3=10.001 to 14.3% Q4=14.3001 to 25%
Percentage of RNs working more than one hour of overtime a week	43.72	15.94	Q1=0 to 34.1% Q2=34.1001 to 43.8% Q3=43.8001 to 50.7% Q4=50.7001 to 83.3%
Percentage of RNs reporting high emotional exhaustion	33.40	12.85	Q1=0 to 25.5% Q2=25.5001 to 34.6% Q3=34.6001 to 42.9% Q4=42.9001 to 64.7%
RN earned hours as percentage of nurse earned hours	69.19	13.56	Q1=41.03 to 60.618% Q2=60.6181 to 68.7034% Q3=68.7035 to 79.3068% Q4=79.3069 to 100%
RN casual earned hours as percentage of RN total earned hours	5.08	6.44	Q1=0 Q2=0.01 to 2.417% Q3=2.418 to 8.641% Q4=8.642 to 24%

Two separate logistic regression analyses were conducted since there were two dependent variables of interest, hospital-level RN lost-time claim rates and RN musculoskeletal lost-time claim rates. Two of the 12 variables significantly predicted high hospital RN lost-time claims rates (see Table 12). The regression showed that the probability of having a high RN lost-time claim rate increased by 70% for each quartile increase in the percentage of RNs reporting more than one hour of overtime per week (OR = 1.70, p < .01). Similarly, the probability of having a high RN lost-time claim rate increased by 61% for each quartile increase in the percentage of RNs reporting more occasions sick than the national average (OR = 1.61, p < .01).

Two of the 12 variables also significantly predicted RN musculoskeletal lost-time claim rates. The probability of having a high RN musculoskeletal lost-time claim rate decreased by 64% with every one unit increase in the hospital-level score on the nurse relations with physicians subscale (OR = 0.36, p < .01). The probability of having a high RN musculoskeletal lost-time claim rate increased by 51% for each quartile increase in the percentage of RNs reporting more occasions sick than the national average (OR = 1.51, p < .05), see Table 12.

Table 12

Significant Variables Predicting High RN Lost-time Claim Rates and High RN Musculoskeletal Lost-time Claim Rates

Variables	**B**	**SE**	**Odds Ratio**	**p**
Variables significantly predicting high RN lost-time claim rates				
Percentage of RNs working more than one hour of overtime a week	0.53	0.18	1.70	0.003
Percentage of RNs reporting more occasions sick than the national average	0.48	0.18	1.61	0.007
Variables significantly predicting high RN musculoskeletal lost-time claim rates				
Hospital means for RNs' scores on nurses relations with physicians subscale	-1.02	0.33	0.36	0.002
Percentage of RNs reporting more occasions sick than the national average	0.41	0.17	1.51	0.02

Research Objective #4

What additional factors, from the staff nurses' perspective and from an organizational perspective, should be included to develop effective workplace interventions to improve the health of nurses?

Method

In order to fulfill research objective # 4, we visited 10 Ontario hospitals, five with high RN claim rates and five with low RN claim rates, and obtained nurses' written and verbal input on improving their work environment. We conducted focus groups with nurses as well as interviews with various hospital stakeholders.

Selecting Hospitals to Visit

The strategy adopted to identify the 10 hospitals to visit involved looking for stable patterns of high and low claim rates over a few years, rather than using a single year's claim rate that may not necessarily be consistent with prior years' claims. To obtain the numerator for calculating claim rates, the raw number of claims for three years (i.e., 1996/7, 1997/8 and 1998/9) were summed separately for lost-time claims and musculoskeletal lost-time claims for RNs. The denominator was different from the one used to construct the dependent variable for the regression analyses. For the years prior to 1998/9, earned hours data specific to RNs were not available. Rather, overall nursing earned hours were available. Thus, for each of the three years of interest, the percentage RN earned hours of nursing earned hours observed in 1998 were applied to overall nursing hours for 1996/7 and 1997/8, resulting in an estimate for RN earned hours for 1996 and 1997. Once the RN earned hours were summed together for the three years, the lost-time claims and musculoskeletal lost-time claims were summed for the corresponding years. For each hospital, overall 3-year lost-time claim rates and overall 3-year musculoskeletal lost-time claim rates for RNs were calculated by dividing the raw number of claims into RN earned hours and multiplying by 200,000 to obtain the claim rates per 100 FTEs. Since two hospitals did not report RN hours in 1998 (and thus, we were unable to ascertain their RN claim rate), they were excluded from being selected for participation in the focus groups.

When selecting which 10 of the 132 hospitals to visit, RN lost-time claim rates and RN musculoskeletal lost-time claim rates for the combined three years were divided into quartiles. Each quartile consisted of 33 hospitals. We were interested in the hospitals that were in the top and bottom quartiles, which represented hospitals with high and low claim rates. The claim rate quartiles for all lost-time claims and lost-time musculoskeletal claims were examined separately and hospitals that were ranked in the top or bottom quartiles for both types of claim rates were considered for selection. Of the 33 potential hospitals in the top quartile (high claim rates), 27

hospitals fell into both the top quartile for all lost-time and musculoskeletal lost-time claim rates. Similarly, of the 33 potential hospitals in the bottom quartile (low claim rates), 26 hospitals fell into both the bottom quartile for all lost-time and musculoskeletal lost-time claim rates.

Since only five hospitals from both the top and bottom quartiles could be selected due to resource limitations, it was decided to choose three community, one teaching and one small hospital from each quartile in order to capture the input from nurses and stakeholders at all types of hospitals. The number for each hospital type was chosen since the majority of Ontario hospitals are community, followed by small and then by teaching hospitals. Using this criteria with the random selection function in SPSS, the 10 hospitals were chosen.

Approaching Hospitals

Once the ten hospitals were selected, a letter introducing the study (see Appendix G) was mailed to each Chief Executive Officer (CEO) and a carbon copy was sent to each Chief Nursing Officer (CNO). The letter described the study and invited each CEO to grant permission for two members of the research team to conduct focus groups with nurses and interviews with stakeholders such as the CEO, CNO, Occupational Health and Safety (OH&S) personnel and other stakeholders such as Human Resources (HR) personnel. The letter also offered hospitals an honorarium in return for their participation. CEOs were asked to appoint a staff member as a site liaison who would work with the study coordinator to organize the meetings and recruit staff nurses. Eight of the ten hospitals had agreed to participate by returning their consent form by the appointed date. One hospital required a meeting with their research committee prior to granting approval that could not be completed in time to meet study timelines. Therefore this hospital was replaced with another hospital of the same type and in the same quartile of claim rates.

Organizing Hospital Visits

The study coordinator sent the site liaison an advertisement to post for recruitment of the nursing staff (see Appendix H). Each hospital used their own approach to recruiting 10-20 nurses to come to the focus group. The advertisement invited all staff nurses, both RNs and RPNs but excluding members of nursing administration (to ensure staff nurses would feel comfortable sharing their experiences), to join the focus group.

At each hospital, one or two nurse focus groups and two to five stakeholder interviews were held. In total, 12 focus groups (six at high and six at low claim rate hospitals) were conducted which included 121 nurses. Also, 31 interview sessions were held which included: 10 Chief Nursing Officers, nine Occupational Health and Safety personnel, five Chief Executive Officers, three

Human Resources personnel, two Nurse Managers, one Nursing Union President and one Nurse Researcher.

Nurse Focus Group Sessions

Two researchers facilitated the focus group sessions. The sessions began with introductions and an explanation of the study (see Appendix I) and after hearing the explanation, each nurse was asked to read and sign the consent form if they would like to participate (see Appendix J). It was explained that prior to participating in the focus group, nurses would be asked to complete an intervention rating form that would help in analyzing the data. This form listed the top 19 interventions aimed at preventing injuries and improving the health of nurses that had evolved from a review of the pertinent literature as well as significant factors from the study regression analyses (see Appendix K). Nurses were informed that they would be asked to choose the five most important interventions and indicate how likely each was to be implemented in their hospital and how successful they would be if implemented in their hospital. Nurses were informed that in the focus group they would be asked to share their ideas about reasons for, and solutions to, high injury rates, high stress levels and high absenteeism rates among nurses (see Table 13). Prior to signing the consent form, nurses were informed of the study risks and benefits and about the fact that session would be audiotaped

Stakeholder Interviews

Two researchers conducted each stakeholder interview; one researcher facilitated the interview and the other researcher recorded responses and operated the audio equipment. The study was explained to each stakeholder (see Appendix L) and stakeholders were asked the same list of questions as nurse focus group participants (see Table 13).

Pilot Sessions

Prior to visiting the 10 hospitals, one pilot interview with two nurse managers and two focus group sessions, each with two nurses, were conducted at a local hospital. Following the pilot sessions, minor wording changes were made to the focus group/interview questions. For the intervention ranking exercise, two additional interventions were added based on nurses' suggestions.

Analyses of Focus Group and Interview Transcripts

All focus groups and interviews were transcribed verbatim into a word processing program and then transferred to QSR Nudist Vivo 1.2 (NVivo). After reviewing the transcripts, the two coders developed a preliminary list of categories and then each coded five transcripts on their own. All data were assigned to one category for each idea or response expressed by a nurse or stakeholder during the sessions. Depending on the content of some responses, more than one category was assigned. After coding the five initial transcripts, the coders reviewed their coding scheme and discussed any discrepancies. Once the coders were satisfied with their agreement, the transcripts were divided between the two coders and each transcript was then coded by only one coder. Individual categories were grouped into themes based on similarity of content and the list of themes and categories was modified several times throughout the process. The final list contained 107 categories grouped into 17 themes plus an 'other' theme as well as 'yes' and 'no' (see Appendix M).

Frequencies of themes were calculated separately for each question and for each of the six groups (focus groups in high claim rate hospitals, focus groups in low claim rate hospitals, CEOs, CNOs, OH&S and Others). The stakeholder interviews were grouped together for the qualitative analysis as follows: CEOs (n = 5); CNOs consisted of 10 CNOs and two Nurse Managers (n = 12); OH&S personnel (n = 9); and Others consisted of three HR personnel, one union president and one nurse researcher (n = 5).

The two coders independently calculated frequencies on the data and then chose two of the six groups to assess for consistency of results. Various themes were randomly chosen for different questions. Comparisons between coders revealed consistent frequency values for all themes examined.

Table 13

Questions Used for Nurse Focus Groups and Stakeholder Interviews

Questions
Musculoskeletal Injuries
1a) Why do you think musculoskeletal injury rates are high among nurses? What are some factors that might be causing injuries? (Use as probe if necessary)
1b) What should hospitals do to reduce injuries among nurses?
Stress Levels
2a) Why do you think stress levels are high among nurses? What are some factors that might be causing stress among nurses? (Use as probe if necessary)
2b) What should hospitals do to reduce stress among nurses?
Absenteeism
3a) Why do you think absenteeism rates are high among nurses?
3b) Do you think all absenteeism is due to illness? What are some other factors that might be causing absenteeism?
3c) What should hospitals do to reduce absenteeism among nurses?
3d) Are there any absenteeism policies in this hospital?
Claim Rates Scenario
4) Now we are going to give you a scenario and see what you think. Two hospitals that are otherwise very similar have different injury claim rates. One has a high claim rate while the other has a low claim rate. Can you think of some reasons why this might be?

Results

In order to fulfill research objective #4, analyses were conducted on both the intervention ranking form and the focus groups/stakeholder interviews.

Intervention Form Analysis

Frequencies were calculated for nurses' choices of the top five interventions aimed at preventing musculoskeletal injuries and improving the health and safety of nurses in their workplace. Forms were completed by 121 nurses ($n = 60$ from high claim hospitals and $n = 61$ from low claim hospitals). Table 14 shows the eight interventions that 25 or more nurses selected in their top five, in descending order.

Adequate nurse staffing levels followed by reasonable job demands and workload were chosen by the majority of nurses as being in their top five. Very few nurses said these two interventions were already present in their hospital (2% for staffing levels and 1% for workload). Most nurses were not optimistic that these two interventions were likely to be implemented; only 31% believed improved staffing levels and 25% believed reasonable workload would be implemented. However, most nurses believed they would be somewhat or very successful if they were implemented in their hospital (84% for staffing levels and 80% for workload). Items that were not chosen in the top five by the majority of nurses (less than 25 nurses) can be found on the intervention ranking sheet in Appendix K.

Table 14

Frequencies of Interventions that Nurses Rated as the Five Most Important and the Likelihood and Successfulness of their Implementation

Interventions	**% Ranked in Top 5 (n=121)**	**% Already Present**	**% Somewhat or Very Likely to be Implemented**	**% Somewhat or Very Successful if Implemented**
Adequate nurse staffing levels	72.7% (n=88)	2.3% (2/88)	30.7% (27/88)	83.7% (72/86)
Reasonable job demands and workload (e.g., physical job demands, number of patients, complexity of patients)	70.2% (n=85)	1.2% (1/85)	24.7% (21/85)	79.8% (67/84)
Safe lifting practices (lifting teams, assessing patient and determining necessary equipment prior to lifting, exercising prior to lifting)	38.8 % (n=47)	12.8% (6/47)	44.7% (21/47)	70.7% (29/41)
Adequate layout of workspace to better accommodate safe lifting and equipment	34.7% (n=42)	0% (0/42)	21.4% (9/42)	66.7% (28/42)
Educational programs or sessions (e.g., back care, exercise, safe lifting)	27.3% (n=33)	15.2% (5/33)	48.5% (16/33)	64.3% (18/28)
Quiet room or space available for nurses to relax	25.6% (n=31)	3.2% (1/31)	12.9% (4/31)	93.3% (28/30)
Availability of adequate patient equipment (e.g., wheelchairs, stretchers)	24.8% (n=30)	6.7% (2/30)	40% (12/30)	75.0% (21/28)
On-site workplace wellness sessions (e.g., stress management, fitness classes)	24.0% (n=29)	6.9% (2/29)	24.1% (7/29)	81.5% (22/27)

Focus Group and Stakeholder Interview Analyses

Focus group transcripts were analyzed separately for nurses in high versus low claim rate hospitals and frequencies of themes were separated by question. Similarly, interview transcripts were analyzed separately for each group of stakeholders and frequencies of themes were also separated by question. As mentioned earlier, stakeholders were categorized into CEOs, CNOs, OH&S personnel and Others (HR, union representative, nurse researcher). Analyses of participants' responses are presented first for injuries, then stress, then absenteeism and finally, discrepancies in claim rates.

Injuries

Why do you think musculoskeletal injury rates are high among nurses?

Nurses' reasons for injuries. The top three factors suggested by nurses are presented in Table 15. See Appendix N for frequencies of all themes. Nurses in both high and low claim rate hospitals discussed workload most often as being a contributing factor. One nurse said:

> I call it trying to beat the clock, so you are looking for short-cuts and a short-cut often hurts you. Instead of thinking it through – I will get help – no, you do it yourself, trying to save time because you have this thing in the back of your head about all these things I have to do and if I get somebody I will have to wait for her and she might not be there, she is too busy, so you do it yourself. That is my day. Beat the clock. I have eight hours to do a nine hour job, that is it. Because if you do it in the pace it should be done, it is not eight hours.

One nurse spoke about the amount of paperwork, "There is so much paperwork, plus not only do you do your paperwork then you turn around and put it on the computer." Another nurse said:

> You hear different departments always saying to the nurses 'that is not my job, I am not going to do it'. But it always seems if it is not someone else's department's job it is always the nurses' job. And you can't let it go not being done.

Finally, one nurse spoke about the physical demands associated with nursing, "It is not uncommon to move six beds in an hour and some of them have patients in them because you can't just dump them in a chair."

Physical work environment and staffing were also perceived as important factors to both high and low claim rate focus groups. Nurses talked about the lack of equipment, crowded space and lack of ergonomics in their work setting. One nurse said, "I think there are a lot of lift devices out

there to help us do this work but we don't have access to them." Another nurse expressed her frustration:

> Then you have got to wait for the equipment to come because it could be at another site. We had no walker to get this 400lb person because it was at the other site. So the unavailability of equipment is really a problem.

Space issues were frequently mentioned:

> We don't even have a space to eat our lunch. We were one hospital, had a huge cafeteria and become two hospitals and the cafeteria shrunk. We have no staff room, no lounges, nothing. As we got amalgamated we went smaller.

Another nurse said:

> There is no quiet place to sit. On the floor I work, there is no place to sit and change my shoes when I come to work. I stand in a closet I can hardly turn around in to put on my shoes.

Lack of ergonomics was also an issue frequently cited:

> I think also the way the nursing stations are set up – they are not user friendly. We are getting computers, etc. but they are not set up properly and you are getting sore shoulders. Even the chairs we sit in, they don't look at the better quality chairs to support our backs.

Another nurse said:

> Units are not ergonomically safe. We have no suction on the walls. We have no plugs. We have some of those powerbars and we are leaning over tables to plug and unplug and you have to crawl under furniture to plug in a control line.

In terms of staffing, nurses talked about shortages of all health care personnel as well as competency and teamwork among nurses, doctors and support staff. One nurse said:

> In this hospital, we work with attendants who do not have all that much training and no insight into the condition of the patients and it is very difficult. I find transferring patients with a lot of them is not very safe. It is very dangerous lifting. They do get education but it hasn't sunk in.

Another said:

> If you are working with the staff member, you know how to lift but that other one doesn't know how to lift and you are working as two together and that just about breaks your back. You are doing your bit on your side but you are not getting matched on the other. So the timing is off.

Nurse staffing shortages were commonly mentioned, "There are no part-time staff to work especially in Emerg and ICU. We are short staffed. No reserve pool of nurses to do part-time work or relief work." Lack of support staff on weekends was also viewed as contributing to increased workload for nurses:

> Another problem we have at this hospital after 3pm on the weekends, even during the week, we have no respiratory, no EKG department here, no support staff, so nurses have to do all that. We don't have physiotherapy on the weekend. If they call a code here, you are on your own.

Table 15

Top Three Factors Identified by Nurses in High versus Low Claim Rate Hospitals as Contributing to Nurses' Musculoskeletal Injuries

Top Three Factors Identified by Nurses in High Claim Rate Hospitals	**Top Three Factors Identified by Nurses in Low Claim Rate Hospitals**
Workload (25%)	Workload (26%)
Physical work environment (16%)	Physical work environment (17%)
Staffing (15%)	Staffing (14%)

Stakeholders' reasons for injuries. The top three factors suggested by stakeholders are presented in Table 16. See Appendix O for frequencies of all themes. All stakeholder groups discussed workload most often when listing factors contributing to high injury rates. One CEO said, "There is no question that the staff are busy, very busy. I think we have thinned out the place to a point where there isn't any reserve left." A CNO talked about the work expectations of nurses:

> I don't know if it is a public perception but nurses are not allowed to just sit down. Nurses are always supposed to be busy. Ambulance attendants can sit in their truck for hours and nobody cares and the firemen can go to work, make lunch, work out and go to sleep at night and nobody cares. Nursing is not treated that way.

One OH&S personnel discussed the physical demands:

> There are not many areas in nursing where you can get away from any kind of heavy lifting. There are a lot of things we can do to help but there are always instances that there is no mechanical apparatus that you can use to totally get the patient where you want them to be.

A stakeholder from the Other category said, "The physical nature of their job obviously, any time they are moving, turning, lifting, walking or running."

CEOs frequently cited staffing as contributing factors to injuries. One CEO pondered whether the staffing shortage and thus, the need for nurses to float from unit to unit could be a factor:

> I wonder again, just emphasizing the movement of nursing staff to various areas, because of the part-time and the false efficiency concept, would result in them not being as necessarily prepared in a particular area as maybe they would have been had they been more consistently assigned to that area.

Patient issues were also frequently cited by all groups. One CNO discussed issues with patients and their families:

> They won't challenge a [patient's] family's perception, or a family's direction to not use lifts. That is another variation, a person is very unstable, unpredictable moods, and the family doesn't want this individual in the lift. They think it is dehumanizing and yet, the staff is a great risk. This particular individual is very tall and there isn't the nurse, very few nurses on this unit, who can actually balance themselves when transporting a patient.

Table 16

Top Three Factors Identified by Stakeholders as Contributing to Nurses' Musculoskeletal Injuries

Top Three Factors Identified by CEOs	**Top Three Factors Identified by CNOs**	**Top Three Factors Identified by OH&S**	**Top Three Factors Identified by Others**
Workload* (14%)	Workload (17%)	Workload (27%)	Workload (28%)
Staffing* (14%)	Patient issues (16%)	Demographics* (13%)	Physical work env. (16%)
Patient issues* (14%)	Physical health (15%)	Patient issues* (13%)	Patient issues (13%)

* Frequency scores within a particular stakeholder group were tied.

What should hospitals do to reduce injuries among nurses?

Nurses' suggestions to reduce injuries. The top three solutions suggested by nurses are presented in Table 17. See Appendix N for frequencies of all themes. Nurses in both groups most frequently suggested improving the physical work environment to reduce injuries, "We need more space too. The rooms are too crowded, really small bathrooms. There is more equipment nowadays in the hospitals and the rooms just do not accommodate it." Having and maintaining equipment to lift patients was also discussed:

> Have equipment that will help you lift. Not only just for chairs, make sure the locks on the wheels and on the beds work because there are too many beds that they may be in a locked position, but they are not working.

As well, a suggestion was made to:

> Deal with a company who will take proper care of the equipment and not make you wait three, four or six weeks for a replacement part or a repair. When you call down to get equipment fixed through the different departments, don't get a reply back that so and so is on vacation for three weeks and you will just have to wait. It is absolutely ridiculous.

Improving staffing levels was also mentioned often by nurses in both types of hospital claim rate groups. Many responses included the hiring of more nurses, "Sufficient staff to do the job the way it should be done" and providing lifting teams, "Hire a lift team." Other suggestions to reduce the amount of lifting and transferring of patients included, "Have the physiotherapists visit the floors."

Access to education, particularly ongoing education, as a potential solution for hospitals was also suggested, "They have to have more programs to teach the proper way of lifting"and "Teach proper body mechanics on an ongoing basis." One nurse said, "We need more constant inservices on back care, not just once when you get hired. Even more when you have a whole session on how to handle a heavy patient." Another nurse said:

> Years ago you used to have to do an annual review for lifts and carries. What happened to that? I think once a year they should take each staff member and have all of those plus back care and CPR. We have to pay for our own CPR. The hospital wants you to do it so they should pay for it. If they had one day for an annual review which every staff member went to for WHMIS, back care, lifts and carries, CPR, fire care, all done at one shot. Not on your days off.

Finally, workload and respect were also discussed as solutions to reduce injury rates by nurses in high claim rate hospitals.

Table 17

Top Three Solutions Identified by Nurses in High versus Low Claim Rate Hospitals to Reduce Nurses' Musculoskeletal Injuries

Top Three Solutions Identified by Nurses in High Claim Rate Hospitals	**Top Three Solutions Identified by Nurses in Low Claim Rate Hospitals**
Physical work environment (28%)	Physical work environment (40%)
Staffing (19%)	Staffing (16%)
Workload* (10%) & Education* (10%) & Respect* (10%)	Education (12%)

* Frequency scores within a particular claim rate group were tied.

Stakeholders' suggestions to reduce injuries. The top three solutions suggested by stakeholders are presented in Table 18. See Appendix O for frequencies of all themes. Both CEOs and CNOs discussed improving the physical work environment most frequently as a solution to the high injury rates. One CEO said:

> Look at the market place in terms of what has been done from a research point of view with equipment and supplies that will help minimize the occurrences and take advantage in whatever way of funding and updating the equipment on site.

One CNO said:

> Sometimes I wonder how much is the geographic environment too. I think we have got a lot of the facilities that are perhaps older. There is less room in rooms and as a result you try to adapt and make it as safe as possible but I think [it is] the space, the geography.

Another CNO recognized the importance of ergonomics:

> Practice patterns have changed and we have more need now for nurses to sit in front of computers to do their workload measurement, or their charting or whatever it might be. So to make sure their environments are ergonomically addressed. Right from visual fatigue but more for musculoskeletal focus as to their posture. To make sure things are there. If they have footstools under the conference table so they can lift their legs. Make it as user-friendly as we can to be good to our bodies.

Education of nurses was listed most often by OH&S and Others. One OH&S stakeholder discussed the issues with offering wellness sessions:

> We have always said as many things as you can do on wellness is really important but we are finding that the people who attend the wellness programs are not the people who need it. Getting the people away from their work site to go to wellness education programs is problematic.

Another OH&S personnel said, "It is not good enough to provide the equipment. You have to teach them how to use it." One stakeholder in the Other category talked about the need for, "refresher courses for nurses who have not basically had the upgrades and I think that is our responsibility corporately to do it in-house."

Policies/social factors were also discussed frequently by those in the Other category. One stakeholder said:

> We have had a problem here with quite a few injuries related to the psychiatric unit. Some of them are lost-time injuries and some of them are not, but they are still incidents though. So I mean we really have to look at the processes and policies in place to deal with these things to try and prevent them.

Modified work was a common category mentioned from the policies/social factors theme. One stakeholder from the Other category said, "I don't think we are doing a good job in managing the returns to work." Finally, increasing staffing and decreasing workload were also key solutions identified by most groups.

Table 18

Top Three Solutions Identified by Stakeholders to Reduce Nurses' Musculoskeletal Injuries

Top Three Solutions Identified by CEOs	**Top Three Solutions Identified by CNOs**	**Top Three Solutions Identified by OH&S**	**Top Three Solutions Identified by Others**
Physical work env. (29%)	Physical work env. (21%)	Education (21%)	Education* (20%)
Staffing (17%)	Staffing (18%)	Staffing* (15%)	Policies/social* (20%)
Education* & Benefits* (12%)	Workload (14%)	Physical work env.* (15%)	Workload (16%)

* Frequency scores within a particular stakeholder group were tied.

Stress

Why do you think stress levels are high among nurses?

Nurses' reasons for stress. The top three factors suggested by nurses are presented in Table 19. See Appendix P for frequencies of all themes. Nurses in both high and low claim rate hospitals again discussed workload most often as being a contributing factor. One nurse discussed the stress associated with the increase in responsibility:

> We have a lot more responsibility to do things that physicians used to do as far as taking care of babies as well as mothers. So it is constantly dumping more work for the same amount of money and expecting far more from us. No providing breaks. It has just gone out of control.

Another nurse talked about the stress of not being able to spend time with patients, "The workload is unreal. Sometimes the patient wants a glass of water and sometimes you don't have time to get one and that is just a simple thing. You just don't have that extra time to spend with them anymore."

After workload, nurses in high claim rate hospitals mentioned psychosocial factors and lack of social support most frequently as stress contributing factors, whereas for nurses in low claim rate hospitals, patient issues and lack of respect were the second and third most frequently discussed, respectively, as stressful factors. Psychosocial factors frequently cited included feelings of exhaustion, burnout and frustration. One nurse said "We are tired even to start with." Another discussed the stress associated with:

> ...your accountability because you are always trying to do your very best under very stressful times. Even a pleasant experience such as a delivery is a stressful time. The natural process in life of dying is a very stressful time. There is so much stress that you can turn it into a good stress but quite often, I think we have so many other stressors that it just naturally gets molded into not such a good stress.

Nurses in high claim rate hospitals discussed stress from lack of social support from management:

> When I first started nursing, my head nurse would go to the ends of the earth to protect her nurses. You might get 's' in her office afterwards but she stood up for you. She protected you. We do not have that any more. We are out there on our own. There is nobody backing you.

Support from each other was also discussed, "There is more part-time and casual staff than full-time so there is less connection, trust or cohesiveness among nurses."

Patient issues and lack of respect were cited as stressful factors for nurses in low claim rate hospitals. Families of patients were frequently mentioned as a stressor, "Families are a big stress too because they expect so much more from you as a nurse. They look at all the things you are not doing but they don't see all the things you are doing." One nurse said:

> We don't just have patients, we have families too and we have a lot of criticism because they are really at us in a critical way. We represent the medical team so they question us. We are the first ones they see and we take a lot of abuse from the families too, so that is very stressful situation.

Stress associated with respect for nurses frequently included lack of appreciating and listening to nurses:

> We come into work and work hard and it would be nice to have them say 'you are really doing a good job' rather than have them say 'this, this and this is wrong'. It doesn't make you want to come in the next day.

One nurse said, "We just don't have the respect and, you know, we used to have respect and I don't know what happened but we don't seem to have it anymore and that is hard to work with." Another nurse said, "In some cases, family is listened to over staff and staff is not listened to." Respect from physicians was also discussed:

> I don't think doctors respect us. When they walk on the floor, right away your stress level goes up. I think there is a little bit of verbal abuse too from physicians. They can say some pretty nasty things that are not deserved. I don't think they are reported enough or at all.

Table 19

Top Three Factors Identified by Nurses in High versus Low Claim Rate Hospitals as Contributing to Nurses' Stress

Top Three Factors Identified by Nurses in High Claim Rate Hospitals	**Top Three Factors Identified by Nurses in Low Claim Rate Hospitals**
Workload (19%)	Workload (14%)
Psychosocial/mental health (13%)	Patient issues (13%)
Social support (12%)	Respect (12%)

Stakeholders' reasons for stress. The top three factors suggested by stakeholders are presented in Table 20. See Appendix Q for frequencies of all themes. CEOs discussed respect and policies/social factors most often. One CEO talked about the "lack of appreciation by the rest of

the healthcare providers of the unique role nurses have". Another CEO said, "Nurses frankly are almost powerless in this struggle [restructuring], they are just wondering what is going to happen. They are not even at the table when this stuff is being discussed."

CNOs discussed psychosocial factors most frequently including fear and coping skills:

> I think there is a lot fear around. Are we losing ground? Are we talking about a massive nursing shortage? The media has played a phenomenal amount of attention to it and there is a fear among the older nurses as to where this profession will go or are we facing our demise?

Another CNO said:

> Stress levels are very high. I think there is a socialization in nursing and we are going through a transitional shift. We are heading towards a very large retirement group and those nurses in that age group of 45-55, they were all socialized very differently and in the way we educated nurses. So we have sub-groups within nurses which are varying in different needs. The way the older experienced nurse worked for many years, she sees change differently, she copes differently. Maybe she doesn't cope as well, maybe she copes better but I think the evolution of nursing has changed.

Another CNO cited factors contributing to stress as:

> Fatigue. Working too many shifts, too much overtime, not enough time off and I think, probably now for a smaller group of people burning the candle at both ends. Not necessarily at work, but I think some younger folks tend to work hard and play hard.

Workload was mentioned most frequently by OH&S and Others as a contributing factor in high nurse stress levels. One OH&S personnel said, "It is because of the cut-backs I think. Because they are required to do more now than they ever had to do." Another OH&S stakeholder said, "Because on the job it is go, go, go, and if you don't go, go, go, somebody is going to die and if somebody dies you end up with an inquest."

Table 20

Top Three Factors Identified by Stakeholders as Contributing to Nurses' Stress

Top Three Factors Identified by CEOs	Top Three Factors Identified by CNOs	Top Three Factors Identified by OH&S	Top Three Factors Identified by Others
Respect* (19%)	Psychosocial/mental health (16%)	Workload (18%)	Workload (17%)
Policies/social* (19%)	Policies/social (15%)	Workplace env. (12%)	Staffing* (13%)
Patient issues* & Workplace env.* (13%)	Workplace env. (13%)	Psychosocial/mental health (11%)	Patient issues* (13%)

* Frequency scores within a particular stakeholder group were tied.

What should hospitals do to reduce stress among nurses?

Nurses' suggestions to reduce stress. The top three solutions suggested by nurses are presented in Table 21. See Appendix P for frequencies of all themes. As for potential solutions from hospitals, nurses in both groups discussed improving benefits, increasing respect for nurses as well as increasing staffing levels. Improving benefits included offering incentives and rewards, staff programs and mental health or personal days, "A lot of places have memberships at health clubs for people and we have nothing like that. Employee Health never has any programs. No incentives." One suggestion that was often made is summed up by one nurse:

> I think we should be allowed so many personal days, discretionary days, whatever you want to call them, a year so that you can call in if your kids are sick or if something else is going on and still get paid, but are flexible.

Again, improving staffing levels was suggested as a potential solution to decrease nurses' stress since one nurse said, "I have come in to work before when I am sick and I should be at home and I got told last time 'well there is no staff so you are not allowed to be off sick'." Suggestions to increase respect included, "Listen to us. Every other department is more important than nursing. This building is here because people receive nursing care." Another nurse said:

> They need to do more than listen, they actually need to support us in front of the doctors and families. That we do not get We are always in the wrong no matter what. They just come and tell you that you have done wrong without even asking you. Administration comes to you and says 'do it'. They don't ask what the situation is.

Table 21

Top Three Solutions Identified by Nurses in High versus Low Claim Rate Hospitals to Reduce Nurses' Stress

Top Three Solutions Identified by Nurses in High Claim Rate Hospitals	**Top Three Solutions Identified by Nurses in Low Claim Rate Hospitals**
Benefits (28%)	Respect (23%)
Staffing (16%)	Benefits (18%)
Respect (14%)	Staffing (16%)

Stakeholders' suggestions to reduce stress. The top three solutions suggested by stakeholders are presented in Table 22. See Appendix Q for frequencies of all themes. Respecting nurses was a solution to reduce stress that was frequently suggested by all groups. One CEO said:

> One main issue is the fact that the nurses have to feel respected and that they are needed and they need to receive positive feedback on the job they are doing. I think we are all guilty of not doing that frequently enough, so that they have to feel like they are valued.

One CNO discussed the importance of giving nurses autonomy:

> The most important thing is to be able to help them find some ways of giving input into how things are done and to make that a meaningful process because they are the ones who are there. If they have input into solving some of these issues and making them work and so to give them that autonomy and make a way that that can happen.

One Other stakeholder said:

> We have to be concerned for one another genuinely and not just say it. So somebody calls in with a sick child, we have to do whatever we can to make sure they don't have to come to work and have the pressure of work on top of them. I think we need to be sensitive to that.

Changing the benefits offered to nurses was also suggested by all groups as a potential solution to reducing stress. OH&S personnel most frequently discussed this as a solution citing such examples as paid education:

> I like the idea of appreciation and incentive programs too. Education as well. Some nurses think 'this is my job and I am not going to go any further'. I think if more money were put forth for nurses to educate themselves, we know from experience with myself and colleagues, from the time you graduate from nursing you have to pay all along the

> way for anything you want to better yourself for. You don't find that at a lot of other businesses. They will pay for you to better yourself.

Table 22

Top Three Solutions Identified by Stakeholders to Reduce Nurses' Stress

Top Three Solutions Identified by CEOs	**Top Three Solutions Identified by CNOs**	**Top Three Solutions Identified by OH&S**	**Top Three Solutions Identified by Others**
Respect (38%)	Respect (24%)	Benefits (27%)	Respect (23%)
Benefits* (13%)	Benefits (18%)	Respect * (13%)	Benefits* (17%)
Scheduling* & Staffing* & Workplace env.* (13%)	Policies/social (11%)	Physical health* & Psychosocial/mental health* (13%)	Scheduling* (17%)

* Frequency scores within a particular stakeholder group were tied.

Absenteeism

Why do you think absenteeism rates are high among nurses?

Nurses' reasons for absenteeism. The top three factors suggested by nurses are presented in Table 23. See Appendix R for frequencies of all themes. Nurses in both high and low claim rate hospitals discussed psychosocial factors most often as contributing to high absenteeism:

> I think anxiety and depression and I think a lot of that is because if we don't pat ourselves and each other on the back, nobody will and we have to be Miss Wonderful to every group out there and if not, we are going to hear about it.

One nurse said absenteeism is high "because you need to recoup and just can't face it again tomorrow."

Scheduling, including shift issues, was cited as a reason for high absenteeism by nurses in both high and low claim rate hospitals. One nurse said, "I think the shift work and not being able to sleep. For people that have a lot of difficulties sleeping, [they have] physical and mental exhaustion." Another said, "It makes me physically ill to keep changing shifts." Nurses also spoke about the lack of control in scheduling, "Scheduling is not under the nurse's control so if

some nurse needs a day off they say 'sorry we can't find anyone to work that day'." One nurse expressed her disdain for eight hour shifts, "I can't think I have to come here six days in a row. I would have a mental break down if I was to have to work an 8 hour shift instead of 12."

Physical health of nurses was also discussed as a reason for absenteeism among nurses in high claim hospitals, "We are getting older and getting hurt and getting gall bladder tests or whatever." One nurse said, "People are working full-time and doing overtime and coming in on their days off and getting really sick too." Another said, "You get a headache. What the heck am I am staying on for? Or your back is aching."

Benefits were discussed by low claim rate nurse groups as contributing to high absenteeism. Nurses spoke frequently about abuse of sick time, "I think sometimes, unfortunately, being in a unionized environment, we have the idea it is our right to have the occasional mental health day." Others talked about taking sick time as a result of the inflexibility of scheduling vacation time or personal days:

> You don't have your holidays and you don't have any choice but to call in sick. People need their pay cheque. You can't continue to take days without pay all the time. There is no allowances for people who are raising young families. There is no allowances for people that are working shift work and can't find babysitters.

For the question "Do you think all absenteeism is due to illness?", a full 100% of nurses in both high and low claim rate hospitals responded 'no'. As a second part to that question, nurses were asked, "What are some other factors that might be causing absenteeism?" We decided not to report these responses as many of the same factors emerged as in the previous question, "Why do you think absenteeism rates are high among nurses?" By analyzing the suggestions, we would have been double counting many of the factors. For the question, "Are there any absenteeism policies in this hospital?", again 100% of nurse focus groups reported that their hospital did indeed have an absenteeism policy. One nurse described their policy as:

> There is a protocol after so many times you call in sick you are called in for an interview and your sick patterns are discussed, then you are given a verbal warning. Then you are given three months and then it is reviewed again, but it never gets past that.

Another nurse at a different hospital said:

> They are just starting a new one, but it sounds like the same as the old one. It is a non-disciplinary process whereby they will counsel you on your absenteeism and they are not allowed to call it 'sick time'. The ultimate goal is to improve your sick time or fire you, but it is 'non-disciplinary'. After your third letter, they can terminate you.

Table 23

Top Three Factors Identified by Nurses in High versus Low Claim Rate Hospitals as Contributing to Nurses' Absenteeism

Top Three Factors Identified by Nurses in High Claim Rate Hospitals	**Top Three Factors Identified by Nurses in Low Claim Rate Hospitals**
Psychosocial/mental health (25%)	Psychosocial/mental health (25%)
Physical health* (14%)	Scheduling (15%)
Scheduling* (14%)	Benefits (12%)

* Frequency scores within a particular claim rate group were tied.

Stakeholders' reasons for absenteeism. The top three factors suggested by stakeholders are presented in Table 24. See Appendix S for frequencies of all themes. Psychosocial factors were identified frequently by all groups. One CNO explained why she believed absenteeism is high among nurses, "I think a lot of it is being tired out and burned out and not necessarily sick, or they have got so many other obligations that sometimes you just want the day to catch up at home." Another CNO spoke about using absenteeism as a coping mechanism:

> I think it is the perception of what absenteeism is for a particular nurse and I think the percentage is small. Well, I don't know if it is small, there are some nurses who feel absenteeism is their only strategy for down-time, which is not great.

An OH&S stakeholder discussed psychosocial reasons for absenteeism, "I do think some people become more mentally and physically exhausted and just can't get out of bed in the morning because of the environment. Now if you were in another type of job maybe it would better." Another OH&S personnel also discussed using absenteeism as a coping mechanism, "Burnout, high stress levels. A way to pay back. [Nurses think] 'I have had all I can handle this week and it doesn't matter. I am just going to take the day off. They owe it to me'." One Other stakeholder listed, "exhaustion, powerlessness, helplessness, hopelessness," as reasons for high absenteeism.

Benefits, especially easy access to paid sick days, was also a theme frequently mentioned by most stakeholder groups. One CEO said:

> I think frankly [there is] some abuse of sick time, given all the other factors we were talking about. If you don't feel the organization is committed to you, then are you going to commit to the organization? So, if there is an opportunity I might take it. There is a certain element in there of being 'owed'. That is another issue too, say sick time. If you put me in a situation as a staff, that stresses me to my maximum, it doesn't give me identification or any sense that I am an important person in this but rather just a body, and I have a certain number of sick days then my view of these sick days is 'Hey, I am owed these. In fact, I have already paid my dues for these sick days, so why not take them?'.

Lack of respect was also cited often by CEOs. One CEO said, “They feel less respected, they feel less loyalty and it is easier to make a decision not to work.” Another CEO said, “I think we have devalued or marginalized our nursing profession.”

For the question “Do you think all absenteeism is due to illness?”, most stakeholders reported ‘no’. When a stakeholder did not say ‘no’, s/he made a comment such as:

> I think it is due to somebody’s illness, not sure whether it is always due to the individual nurses’. When I say that, I know for sure that with the full-time staff they will take somebody to a doctor’s appointment or will stay at home with sick children. They have told me that.

For the question, “Are there any absenteeism policies in this hospital?”, stakeholders in all but one hospital reported having an absenteeism policy. In contrast, focus group nurses at that same hospital reported having a policy in place, claiming that some nurse managers require them to produce a doctor’s note after being absent for a set amount of days. One stakeholder at that particular hospital reported:

> We tried to take a policy from a couple of hospitals in the past and brought it in. It tended to be about 10lb in weight so by the time you get through it and look at all the cumulative nature to it, you end up just getting into conflict with the various units. And in all probability you won’t get anywhere with it anyway because of this confrontation. We haven’t really seen a policy that deals in a collective way with making the employees feel good about it. So the mere fact of having a policy does not sell itself. It just has no market value.

Another stakeholder at that same hospital reported that:

> Aside from if you are ill for more than two days you need a medical slip to cover you. The department has a very tenuous management who would identify a pattern of absenteeism if it was showing up more and more frequently and the Clinical Services Manager would follow up and interview some of these people. Some of the other departments don’t follow it up as closely. A number of years ago, we had a HR Director who put an attendance management program into place and heads of departments had to follow it up, but it seemed to take a lot of time and energy and it went by the wayside. Few managers follow it up and track it.

Table 24

Top Three Factors Identified by Stakeholders as Contributing to Nurses' Absenteeism

Top Three Factors Identified by CEOs	**Top Three Factors Identified by CNOs**	**Top Three Factors Identified by OH&S**	**Top Three Factors Identified by Others**
Benefits* (14%)	Psychosocial/mental health (19%)	Psychosocial/mental health (29%)	Psychosocial/mental health* (18%)
Respect* (14%)	Physical health (16%)	Workload (16%)	Benefits* (18%)
Psychosocial/mental health* & Staffing* & Policies/social* (11%)	Benefits (13%)	Physical health (13%)	Workplace env. (14%)

* Frequency scores within a particular stakeholder group were tied.

What should hospitals do to reduce absenteeism among nurses?

Nurses' suggestions to reduce absenteeism. The top three solutions suggested by nurses are presented in Table 25. See Appendix R for frequencies of all themes In an effort to reduce absenteeism, improving benefits was suggested by nurses in both types of claim rate hospitals. One nurse said, "Years ago when I had kids, an on-site day care would have helped me a lot because that seems to be a big problem with people getting to work in March break." Another nurse said, "You can't take your kid to a babysitter when they are sick. I think really there should be, I don't mean weeks on ends, but a couple of days in a year to compensate for that." Once again, improving staffing levels were cited as potential solutions to decrease absenteeism by nurses in high claim hospitals. Increasing flexibility in scheduling was discussed frequently by both groups while increasing social support was suggested by low claim rate nurses.

Table 25

Top Three Solutions Identified by Nurses in High versus Low Claim Rate Hospitals to Reduce Nurses' Absenteeism

Top Three Solutions Identified by Nurses in High Claim Rate Hospitals	**Top Three Solutions by Nurses in Low Claim Rate Hospitals**
Benefits (28%)	Benefits (30%)
Staffing (23%)	Scheduling (15%)
Scheduling (21%)	Social support (10%)

Stakeholders' suggestions to reduce absenteeism. The top three solutions suggested by stakeholders are presented in Table 26. See Appendix S for frequencies of all themes As for solutions that hospitals could implement to reduce absenteeism, most groups agreed that changes to benefits, in particular allowing nurses to take personal leave days, either paid or unpaid, was viewed as a useful possibility. One CEO suggested:

> If they know they have, let's say 5-10 days available to them throughout the year whether as mental health days, or not going to be used unless it is somehow going to be related to their own illness, or a child's illness, or a husband's illness. Or even if it is going to be their own personal inventiveness, but the flexibility of 5-10 days for all front line nurses is probably what needs to be set in place as mandatory. Whether you use them or don't use them is irrelevant, but making it available will make them feel a whole lot better about themselves. They know they are not going to be beaten up because they took a day.

Policies/social factors were most frequently discussed by CNOs and OH&S. One CNO spoke about internal policies:

> Also a lot of sick time, absenteeism strategies coming out of our HR department are very well laid out strategies that are being unfolded now as we speak. It is corporate wide so it is not specific to nursing. However, I think it certainly has clear benefits to nursing. Part of that is building in supports for the nurses experiencing episodic but very clear patterns of illness and absenteeism rates. How do we support them? How do we get a handle on what is underneath that? Is it that stress is very high in that particular unit? If that is the case, then we need to address the stress in the unit that is causing the repeated pattern of sick and absent time. Again, we have to do two things. We have to look at supportive initiatives to dealing with it but also support those patterns and look at what is underneath those like a busy unit or a stressful unit. We had a very high turnover in Emergency nurses in the past but it is getting better. High sick time rates and therefore, high overtime. One of the problems of sick time is the overtime that gets folded in because if you do not have a high number of nurses on a unit you have to get overtime in place. So

> we have to look at those again. Are there specific units where this is an issue? Is it corporate wide? So far the corporate wide initiative is where we are going.

Another CNO discussed one of the hospital strategies to reduce absenteeism:

> One of things I will be doing with the Emerg. is have some focus groups again and I am going to ask people who I know have a history of numerous sick days and I am also going to ask others who do not, what makes the difference. That might only address the Emerg. but maybe that is what you need to do, rather than having an organizational approach, you have a very unit-specific approach as well because these are little sub-cultures unto themselves. Whatever we do, we need to be very consistent, we need to be very open about this and we need to be very transparent in how we handle these types of situation. We also need to communicate with the staff in terms of what is the sick time on this unit, give it in global data. I am not about to point fingers or look for bad apples but maybe those Emerg. staff, for example, need to know they are averaging 2.5 sick shifts per day, which they are. It is a lot. They need to know this and the consequences in terms of retention issues. They are crying for more staff, but when those new staff come in and 50% of the staff are off ill, they are not going to come. They will say 'why would I do this?'.

One OH&S stakeholder suggested:

> I think what we need to do is identify where the issues are and that is something we are doing here internally, is a survey of all the staff to see how they are feeling about their workplace. That happened just recently. That will help us identify if we have certain areas where we might be able to focus a little more energy.

Workload was the key theme articulated by the Others group. One stakeholder suggested that nurses "need to have some choices. They need realistic expectations of a reasonable workload." Another suggested to, "Reinvest money spent on absenteeism to lighten workloads."

Table 26

Top Three Solutions Identified by Stakeholders to Reduce Nurses' Absenteeism

Top Three Solutions Identified by CEOs	Top Three Solutions Identified by CNOs	Top Three Solutions Identified by OH&S	Top Three Solutions Identified by Others
Benefits (27%)	Policies/social (22%)	Policies/social (19%)	Workload (24%)
Respect* (18%)	Scheduling (16%)	Benefits (16%)	Staffing* (18%)
Policies/social* (18%)	Benefits (13%)	Workplace env. (13%)	Policies/social* (18%)

* Frequency scores within a particular stakeholder group were tied.

Discrepancies in Claim Rates

Now we are going to give you a scenario and see what you think. Two hospitals that are otherwise very similar have different injury claim rates. One has a high claim rate while the other has a low claim rate. Can you think of some reasons why this might be?

Nurses' views on discrepancies in hospital claim rates. Responses to the scenario question elicited factors related most often to the physical work environment by both groups of nurses (see Table 27). See Appendix T for frequencies of all themes. Nurses frequently cited differences in equipment and physical space as contributing to different claim rates.

Differences in staffing levels and how the claims process was handled at each type of hospital were suggested by both groups. The claims process theme included such categories as hospitals concealing claims by paying nurses sick time instead:

> They are not reporting them at one hospital. They are hiding their reports. Some places would rather pay the staff than file a compensation because it is cheaper. I see companies do that because they get a big fine and their rates go up.

Another nurse said:

> I know I had a shoulder injury last year and then when I came back to work they paid for me to come back rather than have Workman's Comp. pay for me. I forget what they called it but basically it saved the hospital money rather than have to keep going through Workman's Comp.

Individual reasons for not filing a claim were also cited, "...fear of filling out the forms or a gap in not filling them out promptly and efficiently". Finally, differences in workplace environment

were discussed by nurses in low claim rate hospitals as one nurse said, "I think it has a lot to do with the spirit of the hospital."

Table 27

Top Three Factors Identified by Nurses in High versus Low Claim Rate Hospitals as Differentiating Between High and Low Claim Rate Hospitals

Top Three Factors Identified by Nurses in High Claim Rate Hospitals	**Top Three Factors Identified by Nurses in Low Claim Rate Hospitals**
Physical work environment (16%)	Physical work environment (21%)
Staffing* (15%)	Staffing (19%)
Claims process* (15%)	Claims process* (10%) & Workplace env.* (10%)

* Frequency scores within a particular claim rate group were tied.

Stakeholders' views on discrepancies in hospital claim rates. Responses to the scenario question (see Table 28) elicited policies/social factors most frequently by CEOs and Others (see Appendix U for frequencies of all themes). One CEO questioned the difference in some internal hospital policies:

> If you look at the processes of what is going on, are the staff involved? Are you doing regular inspections? Are you doing anything with what you find? Are you being proactive in introducing new technology? Do you have an education program to teach people at orientation? Do you have a follow-up education program to make sure that they maintain good skills? Are you looking at ergonomics as an issue, not only at the bedside but also for secretaries and other staff? Is this a priority in your system at all?

One Other stakeholder cited potential differences among units in policies and procedures relating to internal meetings:

> How are their meetings going? See if they are having meetings. See what the roadblocks are. Because if they are having meetings then they should be looking at the forms and seeing if they can improve. The whole thing is not to let the workers get injured so what is in their meetings, how have they improved situations in the O.R. etc. It was actually the health nurses up here that discouraged nurses from walking on wet floors. They were actually going to close the O.R. because it was unsafe. They have that right. It used to drive the doctors nuts and it slowed thing down but it worked.

Differences in staffing levels were listed often by both CNOs and OH&S. Physical work environment differences were commonly mentioned by CNOs and Others. One CNO said, "If it

is encouraged to use things like lifts and that to get in and out of beds and chairs, that makes a lot of difference." One OH&S personnel discussed differences in workplace culture:

> The very first one is the organization's culture. Culture is a very important part of any feeling of family, community, how the organization deals with their issues, the support they give the staff. If you have an organization that is very supportive of their people and they recognize the individuals and their individuality and respect the individuals, then the staff know that. They learn that and know if something happens to me, my organization's behind me.

Table 28

Top Three Factors Identified by Stakeholders as Differentiating Between High and Low Claim Rate Hospitals

Top Three Factors Identified by CEOs	**Top Three Factors Identified by CNOs**	**Top Three Factors Identified by OH&S**	**Top Three Factors Identified by Others**
Policies/social (24%)	Staffing* (21%)	Staffing* (13%)	Policies/social (28%)
Respect* (14%)	Physical work env.* (21%)	Workplace env.* (13%)	Physical work env. (20%)
Workplace env.* (14%)	Patient issues* & Policies/social* & Workplace env.* (9%)	Education* & Respect* (12%)	Staffing (16%)

* Frequency scores within a particular claim rate group were tied.

Discussion

What is the general self-reported health status of nurses in acute care hospitals in Ontario and what is the prevalence of self-reported health-related work absence, burnout, back pain and neck pain?

The majority of nurses in this study rated their overall health status as very good to excellent. While the ratings appear to be slightly higher than the general population surveyed in the 1996 National Population Health Survey (NPHS), caution needs to be exercised in making these types of comparisons. The nursing sample in the current study respondents were aged 22 to 70 (M = 43, SD = 8.5), while the NPHS surveys Canadians from over 12 years of age to very old. There were not enough nurses surveyed in the NPHS to be able to draw direct comparisons between our sample and the nurse subset of the NPHS. The distribution of rating frequencies in each health status response category for nurses appear to be similar to the population at large, with the possible exception of 'excellent' responses. Issues around measurement and framing of responses may also influence these scores. What is not clear from this study is the referent point that nurses used to rate their overall health. If nurses use the patients they care for as a referent point, by comparison they might perceive their health as predominately very good to excellent. It is also worth pointing out that the comparison group in the NPHS included both working and non-working people, thus one would expect the nurse health ratings in our study to be somewhat higher that the NPHS scores due to the "healthy worker" effect (i.e., in general, working people are typically fitter than those not working, since some of the latter group are not working due to disability).

While nurses may have positive views of their overall health status, this study's finding suggest that the daily reality for nurses in the workforce is not consistent with this overall health status rating. Nearly 44% of the nurses reported at least one occasion of sick time and one shift missed over the last three months. Furthermore, about one-third of the nursing sample experienced high levels of emotional exhaustion with the majority of the respondents indicating moderate to high levels of emotional exhaustion. When we couple this with the finding that more than 40% of nurses report back/buttock and/or neck/shoulder pain at least some of the time, while about one-quarter are working with either type of musculoskeletal pain most or all of the time, it would appear that nurses' overall ratings of health are incongruent with their daily experiences. The picture presented reflects a workforce facing ongoing threats to their overall well-being which, if left unchecked, could result in more illness among nurses and increased cost to the system. More importantly, these conditions may reduce the chances of retention of nurses in the workforce. Each point will be discussed briefly below.

To begin with, self-reported absenteeism may be an underestimate of the true incidence of sick time since nurses were asked about absenteeism over a relatively short time frame. Many nurses may not report illness in one-quarter of a year, but may easily have had illness experiences to report if they had been asked about the other three-quarters of the year. One study has suggested

that absenteeism among nurses rose steadily from 6.8% in 1986 to 8.5% of the nursing workforce in 1999, and has become a major expense for individual institutions and the healthcare system (Akyeampong, 1999). Also, anecdotal evidence from the current study and others (e.g., Wing, 1999) suggests that nurses will come to work even when they feel unwell in order to prevent their colleagues from having to work short-staffed. If we were to estimate the hours of sick time per quarter of a year from our survey sample alone, approximately 3265 of the 7420 nurses who completed the survey reported missing one or more shifts in a three month period. With an eight hour standard shift equivalent, this represents 26,120 hours to be paid out in sick time and potentially another 26,120 hours for replacement costs if nurses are replaced by staff on the unit, for the nurses in our survey alone. In order to be conservative we have illustrated the impact of missing only one shift; needless to say, the values would increase if we calculated sick time and replacement hours for more than one shift. Furthermore, this example is only for the nurses surveyed and would be substantially larger if it considered all nurses in Ontario who missed shifts.

The high level of emotional exhaustion reported by nurses in Ontario is not dissimilar to findings from an international nursing study (Aiken et al., 2001). Aiken's study found that approximately one-third of nurses in Canada, United States, England and Scotland reported high levels of emotional exhaustion. Furthermore, Wickstrom & Pentti (1998) have found that recognition and respect were important predictors for sick leave associated with back pain. If we consider that in addition to emotional exhaustion, almost one-sixth of the nurses in this study come to work each day with back and/or neck pain, we have a critical human resource issue. There is a preponderance of evidence suggesting that both the psychosocial and physical demands of the job have significant direct and indirect relationships upon both nurses' health and the quality of care provided to hospitalized patients (Baumann et al., 2001). The evidence suggests the need for improved working conditions that will reduce the emotional exhaustion that nurses experience on a daily basis. Addressing this problem is of particular importance now, when we need those nurses in the workforce to reduce the impact of the emerging nursing shortages.

What are the main trends in WSIB claims for nurses in acute care hospitals in Ontario over the past nine years?

In the current study, we found that nurses' claim rates almost doubled those of non-nurses between 1990 and 1998. This is consistent with other studies that have found a higher rate of injury among nursing occupations (Choi et al., 1996). For nurses, musculoskeletal injuries related to overexertion activities at work remained the dominant type and source of injury (62% and 48%, respectively, of all lost-time claims in 1998). These results are consistent with other reports documenting injury prevalence among health care workers (Worker's Compensation Board of BC, 2000). While the same trends in type and source of injury are evident among non-nurses in the current study, the percentage of claims attributable to musculoskeletal injuries and overexertion activities was lower for non-nursing personnel (53% and 30%, respectively, of all lost-time claims in 1998). Researchers have established that physical demands exist due to the nature of nursing as a key contributor to musculoskeletal injuries (e.g., Josephson et al., 1998).

The rate of compensation claims per 100 FTEs in our study population declined from 1990 to 1998. Additionally, the number of days lost per claim also declined during the same time frame. This finding is consistent with other reports that compensation claims rates are generally on the decline in developed economies (Adams, 2001). The cause of these declining rates is uncertain. There has been speculation that the trend may be real, in that it may be due to improved effectiveness of workplace prevention efforts. It is also possible that the drop is a statistical artifact, resulting from compensation policy changes that have made it either harder for workers to file compensation claims or easier for companies to manage claims before they are formally reported (Kerr, 2000). However, it is important to note that we found that the rate of decline in both claims and days lost per claim since 1990 has been slower for nurses compared to non-nurses. This was true regardless of the type of claim. Other investigators have reported a slower rate of decline in claim rates for the health care sector when compared to other sectors (Adams, 2001). As mentioned previously, this slower decline may indicate that prevention of injury efforts have been implemented during this time frame which has been overshadowed by the stressful environments in which nurses work. It could also be a reflection of the quantity and effectiveness of interventions that have not been sufficient to influence claims in this occupational group.

Ontario hospitals have undergone downsizing during the 1990s. If we compare nursing hours in 1990 and 1998, as presented in research objective #2, it would appear that 6000 nursing FTEs have been lost from the hospital system between 1990 and 1998. During the same time, the nursing hours per patient day remained relatively stable while management and support hours declined; this staffing picture persisted despite continued increases in the complexity of cases admitted to hospitals between 1994 and 1998 (O'Brien-Pallas, Thomson, Alksnis, & Bruce, 2001). Changes in the work environment that are associated with restructuring of the health care sector in the 1990s have been linked to nurses' health and psychosocial outcomes by other researchers. For example, Vahtera, Kivimaki, and Pentti (1997) reported a significant association between downsizing and medically certified sick leave among employees, with absenteeism rates two to three times greater after a major downsizing than after a minor downsizing. Research has revealed that nursing personnel reported a decline in the quality of their worklife as a result of downsizing and the hiring of unlicenced personnel (Shindul-Rothschild, Berry, & Long-Middleton, 1996; Shindul-Rothschild & Duffy, 1996). Major concerns included: reduced job security and job satisfaction, increased workloads and stress, reduced organizational morale and lower professional and organizational commitment.

A survey of Ontario nurses (Burke & Greenglass, 2000) and nursing supervisors (Burke, 2000) demonstrated that increased workload due to restructuring contributed to emotional exhaustion and poor psychological health. A longitudinal study on the impact of re-engineering and other cost reduction strategies on the staff of a large Canadian teaching hospital revealed significant increases in depression, anxiety, emotional exhaustion and job insecurity among employees (Woodward et al., 1999). Shannon et al. (2001) examined back and neck pain outcomes and identified that predictors of these outcomes were mainly work-related variables such as job influence, work psychological demands and hours worked. Variables related to staff density have also been identified as a contributing factor to health among nurses (Koehoorn, Kennedy, & Demers,1999; Larese & Fiorito, 1994). When the staff density is lower, the risk of back injury is

higher suggesting that health is affected when nurses have to work alone for longer periods of time or when the number of tasks to be completed within a given time period is increased due to fewer employees. The current study's findings appear to support the notion that job demands that outstrip the available resources of nurses affect their health (Amick et al., 1998; Baumann et al., 2001; Karasek & Theorell, 1990). Finally, Leiter, Harvie, and Frizzell (1998) linked burnout not only to the health of nurses but also to patient satisfaction with the nursing care they received. Similarly, Mc Gillis Hall et al., (2001) found a positive relationship between nurses' job satisfaction and medical surgical patients' satisfaction with the care they receive. Thus, nurses' health has an impact on many facets of the health care system.

To what extent can individual and job strain factors explain variation in WSIB claim rates among participating hospitals?

As a sub-analysis of this research objective, we examined differences in survey responses for RNs working in high and low claim hospitals. Nurses's perception of autonomy in the work environment was the only hospital characteristic that was significantly different between high and low claim hospitals. Nurses in low claims hospitals expressed more autonomy relative to their colleagues in high claim hospitals. Differences in hospital characteristics associated with high versus low claim hospitals, while not significant from a statistical perspective, demonstrated a trend that is clinically interesting. Nurses in hospitals with higher claim rates tended to report marginally more back and neck pain and slightly less control over their practice environment, worked more overtime hours, experienced higher emotional exhaustion and job dissatisfaction and tended to have more occasions sick and shifts missed. While these trends have to be viewed with caution because they are not statistically significant, the situation in high claim hospitals are consistent with characteristics of poor work environments which are amenable to management interventions. The 'magnet' hospital studies indicate that organizational characteristics can influence the ability of hospitals to recruit and retain nurses (Kramer & Schmalenberg, 1988). Magnet hospitals have been defined as having a decentralized organizational structure, flexible scheduling, promoting autonomy over practice and open communication between management and staff (Buchan, 1990).

While interesting, these particular findings do not lend support to our central hypothesis, namely, that work environments influence injury claim rates for nurses. The finding observed in other health and industry studies (e.g., Josephson et al., 1997), that job strain coupled with low employee control over the work is associated with illness and injury was not observed in our comparison of highest and lowest claim rate hospitals. In order to support our contention, we would have expected to see differences in the control over practice setting variable. Since RNs reported more autonomy in low rather than high claim rate hospital, and there was a very high correlation between the autonomy and control subscales, we suspect that autonomy and control measures were tapping into similar domains. In other words, autonomy may have served as a surrogate measure for control, and therefore this study would support the existing literature on job strain. Moreover, since many authors have hypothesized that work environment factors are multifactorial, we did not capture the complexity of the inter-relationships among individual and

organization characteristics in the work environment variables and hospital claims. Finally, there may be measurement issues with the claims data itself as we found that some nurses held the perception that under-reporting of claims by hospitals might influence discrepancies between hospitals when commenting on possible reasons for why different claim rates exist between hospitals.

To fulfill research objective #3, we examined the influence of 12 predictor variables on RN lost-time claim rates, in general and for musculoskeletal claims. Both dependent variables were examined in this analysis since we were interested in lost-time claims generally but, we also wanted to pay special attention to musculoskeletal claims since these claim rates are high among health care workers. Furthermore, because we had very large ranges of values in both dependent variables, we chose to conduct logistic regression and dichotomized the dependent variables using a reference point obtained from prior research on what constituted average claim rates for health care workers.

Across Canada, nurses have reported that overtime expectations, whether mandatory or voluntary, are key worklife issue they face daily (Baumann et al., 2001). In Ontario hospitals, an almost perfect correlation, $\underline{r}(130) = .93$, $\underline{p} < .01$, has been reported between sick time and overtime (O'Brien-Pallas et al., 2001). Resource adequacy was the most significant variable in explaining emotional exhaustion scores in the Canadian portion of an international nursing study (Clarke et al., 2001). Therefore, it was not surprising to find that the probability of having a high RN lost-time claim rate increased by 70% for when the percentage of RNs reporting more than one hour of overtime per week increased, or that the probability increased by 61% for each quartile increase in the percentage of RNs reporting more occasions sick than the national average. Clearly, when overtime hours are used as a regular staffing strategy, particularly if the overtime is mandatory, nurses experience more job strain. As Baumann et al. (2001) summarized, research across occupations suggests that long periods of job strain affect personal relationships and increase sick time, conflict, job dissatisfaction, turnover and inefficiency. The magnitude of the influence of overtime on high RN claim rates is important. Requesting staff to work overtime is a management decision but the findings of this and other studies (e.g., O'Brien-Pallas et al., 2001) suggests that the financial implications of these choices may be greater than previously identified. Not only are employers facing the prospect of higher payrolls due to overtime premiums as well as pay for sick time and replacement staff, but as this study suggests, they may also be paying higher insurance premiums. Other negative consequences associated with high injury claim rates are the loss of productive hours of nursing care as well as the pain and suffering that nurses may experience.

For the musculoskeletal analysis, a slightly different pattern of results was obtained. Hospitals with more occasions sick than the national average were again at significantly higher risk of having claims, as the probability of having a high RN musculoskeletal claim rate increased by 61% for each quartile increase in the percentage of RNs reporting more occasions sick than the national average. However, this time, nurse-physician relations comprised the second (and final) statistically significant predictor. The probability of having a high RN musculoskeletal lost-time

claim rate decreased by 64% with every one unit increase in the nurse relations with physicians subscale. Good physician relations have been associated with better patient outcomes (Knaus, Draper, Wagner, & Zimmerman, 1986; Mitchell & Shortell, 1997), nurse satisfaction and intent to leave (Aiken et al., 2001). The current study is the first to demonstrate a relationship among nurse physician relations and high RN musculoskeletal claim rates. One possible explanation for this finding is that when nurse physician relationships are good, the work environment is characterized by less strain and stress. Alternatively, nurses in this study and others (Baumann et al., 2001; Nicklin, 2001) reported that there is limited recognition for the work that they complete on behalf of patients and the organization. In the absence of other psychological feedback and support for a job well done from their superiors, the approval of physicians takes on special meaning and may mediate the negative effects of the immediate work environment.

The relationship among occasions of sick time and both high lost-time claim rates and musculoskeletal claim rates was not unanticipated. However the magnitude of the odds ratios associated with this predictor variable in explaining both types of claim rates highlights the importance of this variable considering, the impact of overtime on a healthy work environment. Anecdotal evidence suggests that absenteeism programs are generally seen as punitive by nurses, even if developed as a non-disciplinary process. However, as reflected in the comments obtained from hospital management, occupational health and safety personnel and nurses in the focus groups, a punitive approach to absenteeism is likely to cause further deterioration in nurses' work environments.

While the results of this analysis were somewhat disappointing, it should be noted that the dependent variable available to us (i.e., claims data) is an underestimate of the number of injuries that are actually incurred in the hospital setting. Nurses in this study discussed under-reporting of legitimate claims by hospitals in order to reduce hospitals' overall insurance premiums. This strategy of under-reporting has been observed by researchers in other industries. In fact, in one study, clothing plants that had the best ratings of ergonomic conditions had the worst five-year lost-time injury rate (Gunning et al., 2001). It was suggested that the current experience rating system utilized by the WSIB may encourage under-reporting of injuries due to the monetary incentives associated with low lost-time claim rates (Ontario Federation of Labour, 2000). Furthermore, Gunning et al. suggested that management may feel more inclined to use informal modified work to handle work-related injuries out of fear of financial penalties. Finally, lost-time injury statistics, although readily available, represent only the 'tip of the iceberg' of all people experiencing pain or discomfort in the workplace and thus, underestimate the real magnitude of the problem (Beaton et al, 2000).

What additional factors, from the staff nurses' perspective and from an organizational perspective, should be included to develop effective workplace interventions to improve the health of nurses?

The finding that nurses in this study rated adequate staffing as well as reasonable workload and job demands as the most important interventions to improve their health is consistent with findings from the recently completed policy synthesis examining nurses' health (Baumann et al., 2001), as well as other recent publications (Aiken et al., 2001; Clarke et al., 2001). We found that few nurses in the current study identified that adequate staffing and reasonable job demands existed in their current work environments. Response patterns suggested that there is cognitive dissonance related to these issues since the majority of nurses believed that these interventions would have a favorable influence in reducing injuries and improving heath; however, they were not optimistic regarding their implementation. Given the high levels of emotional exhaustion observed in the nurse survey sample, and the increase in having high lost-time claim rates with each quartile increase in overtime, it is clear that this issue must be addressed in order to reduce job strain among nurses. Interestingly, nurses in both high and low claim rate hospitals as well as all stakeholder groups identified workload as being a major source of injury for nurses.

Improving staffing and reducing workload and job demands appears to be an expensive proposition. However, a recent examination of Ontario hospital data for 1998/9 suggested that an estimated $171 million was spent on overtime hours for inpatient nurses, while close to $39 million was spent on impatient nurses' sick time. Therefore, these dollars are available for re-allocation to improve regular staffing and reduce the ratio of patients assigned to each nurse, if different decisions were made about how the nursing budget is allocated in Ontario hospitals (O'Brien-Pallas et al., 2001). The opportunity costs of not increasing nurse staffing to reduce workload and the related job strain may have serious implications for both the health and retention of nurses in the workforce. Recent Ontario studies examining the potential impact of losses from the over 50 age group suggested that 4098 RNs could potentially be lost from the hospital workforce alone by 2004 (this includes losses due to retirement and to death and assumes that loss rates observed between 1999 and 2000 will remain constant, O'Brien-Pallas, Darlington, & Alksnis, 2001). However, estimates of retention scenarios given the changes in the work environment suggest that number could be reduced significantly. If we are to recruit new nurses into the workforce we must create healthy work environments so that potential nursing candidates will view nursing as a viable career option. It may be that workload and staffing issues need to be addressed before less expensive interventions will be effective in improving nurses' work environment and reducing job strain.

While nurses rated having an adequate layout of their workspace as an effective intervention if implemented, and nurses, CEOs and CNOs all agreed that changing the physical work environment for nurses would contribute to a reduction in musculoskeletal injuries, we realize this is a costly intervention. However, other strategies that were ranked highly by nurses are relatively inexpensive such as: implementing safe lifting practices, offering educational

programs, providing quiet rooms on the unit where nurses can relax, having adequate and functioning equipment available for patient care and offering wellness programs at the work site.

While the congruence between discussion of contributing factors and solutions related to injury, stress and absenteeism were not always perfectly aligned the variables identified were consistent with the six principles of Kristensen's (1999) framework adapted by Baumann et al. (2000). Kristensen=s model for society, stress and health is built on the demand/control or job strain model developed by Karasek and Theorell (1990), and the effort-reward model developed by Siegrist (1996). Kristensen=s model combines six dimensions of stressors that have been identified through research and relates them to both the individual and the social dimension. According to this model, the optimal work environment for social and psychological well-being includes: 1) demands that fit the resources of the person, 2) a high level of basic predictability, 3) good social support, 4) meaningful work, 5) a high level of influence at work and 6) a balance between effort and rewards.

In the current study, it is interesting to note that nurses' responses from high and low claim rate hospitals were more similar than different in their discussions about injuries, stress and absenteeism. As mentioned, nurses in both hospital claim rate groups, as well as all stakeholder groups, discussed workload levels most often as being a contributing factor to injuries Consistent with Kristensen's (1999) framework, the demands that exceed the resources of the person are characterized by job overload. Workload was also mentioned most often as contributing to stress by nurses and by OH&S and 'other' stakeholders. Staffing was frequently discussed as playing a major role in injuries by nurses and CEOs. Improving staffing levels was offered as a solution to decrease injuries by nurses in both groups and to reduce absenteeism by nurses in high claim rate hospitals. Improving benefits and increasing respect for nurses were most frequently suggested to reduce stress by nurses and all stakeholder groups. This finding is consistent with others (e.g., Baumann et al., 2001) who have suggested that policy changes need to be made at all levels of the health system with respect to these issues.

Reasons for absenteeism included psychosocial/mental health factors, such as burnout and mental exhaustion, by nurses most frequently and by all stakeholder groups, except for CEOs. While CEOs suggested psychosocial/mental health factors third most often, benefits and lack of respect were the key factors. Nurses' reasons for absenteeism also included inflexible scheduling. Solutions offered by nurses to decrease absenteeism most frequently included improving benefits and scheduling. All stakeholder groups frequently suggested changing policies/social factors such as improving internal absenteeism policies and modified work programs as potential solutions to decrease absenteeism. Yet, CEOs recognized the need for more flexibility in benefits for nurses who they realized are often pushed beyond their capacity.

Our findings suggest that the quantitative analyses is supported by the words of the nurses in both types of claim rate hospitals and by the stakeholders. If these issues are to be resolved, our qualitative findings suggest that there is some room to seek consensus between all roles in the hospital in order to define the specific problem and set priorities for action. However, consistent with Kristensen's (1999) model, the need to reduce the demands that exceed the resources of the individual (workload, staffing, overtime) and the need for a return to a basic degree of predictability (job security, freedom from injury and abuse in the workplace) take a high priority if lost-time claims of any type are to be reduced. The compelling consistency with which finding emerge from a number of other sources (e.g., Aiken et al., 2001) lend support to our hypothesis that these issues must be addressed first if other interventions are to improve the current situation. The significant role of support by administrators and colleagues for nurses has been highlighted by the finding that increases in good nurse/physician relations predicted a 64% reduction in the probability of a hospital having high musculoskeletal injury rates.

Recommendations

Hospitals:

Nurse burden of illness is too high and it needs to be reduced through workplace improvements that focus on creating more manageable and sustainable workloads as well as improving the workplace environment.

Promote team building among nurses and other groups to create supportive environments. Stress reduction programs and conflict management strategies should be offered to support nurses in these work environments.

Staff should receive education and be certified annually in injury prevention programs that are tailored to their nature of work. For example, nurses and others involved in direct patient care would require different educational foci (e.g., body mechanics, safe lifting practices) than those who are primarily involved in desk work.

Implement constructive programs of absenteeism management that will utilize positive strategies such as special incentives to reward desired outcomes rather that punitive approaches.

Implement several of the low cost interventions suggested by nurses in this study. These include: quiet spaces for nurses to relax, functioning patient equipment, fitness opportunities and wellness programs.

Consider mechanisms to limit use of overtime.

Engage in a dialogue with unions related to desired approaches to reduce and manage overtime.

WSIB:

Develop and implement monitoring mechanisms to ensure that organizations have both the proper equipment for nurses to use with patients and, more generally, healthy workplace environments.

WSIB and/or the Institute for Work & Health to develop workplace health programs on such topics as stress management for hospitals' use. Hospitals should either tailor these programs for their specific needs, or submit detailed plans for their own stress reduction programs and conduct evaluations of stress management programs.

Host regular conferences for executives and managers on employee health topics such as safe equipment, absenteeism management and stress management programs.

Organize a committee that rates hospital equipment and sets standards for equipment.

Request annual absenteeism, overtime and turnover data from hospitals. Monitor overtime and absenteeism as employees may use these strategies rather than filing formal injury claims with WSIB. In this way, a more complete picture of nurses' health may be obtained.

Develop an award program encouraging the implementation of effective workplace health programs at hospitals.

Government:

Have hospitals report to the Ontario Ministry of Health and Long-Term Care regarding their presence/absence of equipment designed to reduce injuries as well as hospital staff injury rates.

WSIB and the Ontario Ministry of Health and Long-Term Care should work together to create a commonly understood workforce denominator so that accurate injury rates can be determined.

Research:

Conduct more studies to understand how to reduce the emotional exhaustion among nurses.

Develop intervention studies to evaluate stress reduction programs, injury reduction and other approaches to manage high absenteeism and claim rates.

Further explore the relationship among organizational/management behaviors and job strain in nursing and other allied health professions.

Conclusions

Injuries among nursing personnel are costly to employers in terms of lost productivity, disruption to work flow and claims paid to injured workers. They are also costly to workers in terms of pain and suffering, disability, stress and possible loss of employment. There are further implications for the retention of qualified nursing personnel in the workforce and the delivery of quality patient care. One of the current challenges for the health care system in many countries, including Canada is the aging of the nursing workforce. The number of RNs under the age of 29 made up only 10% of Canadian RNs in 1998, and the youngest age group has decreased by 30% since 1993; on the other hand, the number of RNs over 50 rose by 20% during the same five year period (CIHI, 2000). Similar trends are also observed in the RPN population. In 2000, the average age of a Canadian RN was 43.3 years while the average age for Ontario RNs was 44.2 (CIHI, 2001). One of the growing challenges for the health care system will be to ensure that there are sufficient numbers of trained nurses to replace workers who retire. It is equally important to make sure that nursing personnel can continue to work until the time of retirement (O'Brien-Pallas & Baumann, 1999)

One of the key elements of the future recruitment and retention of the nursing workforce will be protection of the health of employees from disabling injuries. This will be particularly important with the aging of the health care workforce. Older workers are disadvantaged in terms of their rehabilitation following injury since they sustain more serious injuries, take longer to recover and are less likely to return to work than younger workers. This results in substantial economic costs to the community as well as a reduction in financial security and quality of life for the older person. There is an increased recognition in developed economies of the importance of guidelines, regulations and interventions for workplace practices both at the industry and workplace level to protect the health of workers.

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Appendix A

Maslach's Burnout Inventory: Emotional Exhaustion Subscale

This section contains statements of JOB-RELATED *FEELINGS*. If you have *never* had this feeling, circle the "0" (zero) after the statement. Otherwise, indicate *how often* you feel like this by circling the number (from 1 to 6) that best describes how frequently you feel that way.

		How Often?						
		Never	**A few times a year or less**	**Once a month or less**	**A few times a month**	**Once a week**	**A few times a week**	**Every day**
1.	I feel emotionally drained from my work.	0	1	2	3	4	5	6
2.	I feel used up at the end of the workday.	0	1	2	3	4	5	6
3.	I feel fatigued when I get up in the morning and have to face another day on the job.	0	1	2	3	4	5	6
4.	Working with people all day is really a strain for me.	0	1	2	3	4	5	6
5.	I feel burned-out from my work.	0	1	2	3	4	5	6
6.	I feel frustrated by my job.	0	1	2	3	4	5	6
7.	I feel I'm working too hard on my job.	0	1	2	3	4	5	6
8.	Working directly with people puts too much stress on me.	0	1	2	3	4	5	6
9.	I feel like I'm at the end of my rope.	0	1	2	3	4	5	6

Appendix B

Breakdown of Lost-time Claims by Nature of Injury for Nurses

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
# Lost-time Claims	4430	4093	3766	3263	3212	2724	2329	2411	2293
Nurses	2612	2510	2390	2131	2029	1805	1579	1684	1586
% of total	59.0%	61.3%	63.5%	65.3%	63.2%	66.3%	67.8%	69.8%	69.2%
Claims with Type of Injury Specified	2612	2510	2390	2131	2029	1804	1573	1681	1586
% of total	100%	100%	100%	100%	100%	99.9%	99.6%	99.8%	100%
Claims by Nature of Injury									
MSI*	1819	1717	1673	1484	1411	1214	986	1073	993
% of total	69.6%	68.4%	70.0%	69.6%	69.5%	67.3%	62.7%	63.8%	62.6%
Burns	19	24	19	19	17	13	26	9	21
% of total	0.7%	1.0%	0.8%	0.9%	0.8%	0.7%	1.7%	0.5%	1.3%
Bruises	303	238	229	179	183	191	161	146	129
% of total	11.6%	9.5%	9.6%	8.4%	9.3%	10.6%	10.2%	8.7%	8.1%
Cuts	95	85	55	57	41	46	48	57	43
% of total	3.6%	3.4%	2.3%	2.7%	2.0%	2.5%	3.1%	3.4%	2.7%
Fractures	58	60	74	58	44	54	55	55	52
% of total	2.2%	2.4%	3.1%	2.7%	2.2%	3.0%	3.5%	3.5%	3.3%
Other/NEC*	255	340	275	283	286	241	268	283	281
% of total	9.7%	13.6%	11.5%	13.3%	14.1%	13.3%	17.1%	16.8%	17.7%
Exp-disease	38	17	30	25	23	24	15	40	43
% of total	1.5%	0.7%	1.3%	1.2%	1.1%	1.3%	1.0%	2.4%	2.7%
Exp-other	25	29	35	26	24	21	14	18	24
% of total	1.0%	1.2%	1.5%	1.2%	1.2%	1.2%	0.9%	1.1%	1.5%

* Musculoskeletal Injury
** Not Elsewhere Classified

Appendix C

Breakdown of Lost-time Claims by Nature of Injury for Non-nurses

	1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
# Lost-time Claims	4430	4093	3766	3263	3212	2724	2329	2411	2293
Non-nurses	1818	1583	1376	1132	1183	919	750	727	707
% of total	41.0%	38.7%	36.5%	34.7%	36.8%	33.7%	32.2%	30.2%	30.8%
Claims with Type of Injury Specified	1768	1577	1376	1132	1181	918	748	723	698
% of total	97.2%	99.6%	100%	100%	99.8%	99.9%	99.7%	99.4%	98.7%
Claims by Nature of Injury									
MSI*	959	883	798	658	709	530	411	387	372
% of total	54.2%	56.0%	58.0%	58.1%	60.0%	57.7%	54.9%	53.5%	53.3%
Burns	88	71	38	34	48	30	22	18	19
% of total	5.0%	4.5%	2.8%	3.0%	4.1%	3.3%	2.9%	2.5%	2.7%
Bruises	244	198	190	141	123	131	73	89	70
% of total	13.8%	12.6%	13.8%	12.5%	10.4%	14.3%	9.8%	12.3%	10.0%
Cuts	140	119	91	69	63	47	40	36	48
% of total	7.9%	7.5%	6.6%	6.1%	5.3%	5.1%	5.3%	5.0%	6.9%
Fractures	69	77	68	56	50	46	46	41	36
% of total	3.9%	4.9%	4.9%	4.9%	4.2%	5.0%	6.1%	5.7%	5.2%
Other/NEC*	238	212	164	157	168	117	140	134	130
% of total	13.5%	13.5%	12.0%	13.8%	14.1%	12.8%	18.7%	18.5%	18.6%
Exp-disease	14	4	9	4	9	7	5	12	8
% of total	0.8%	0.3%	0.7%	0.4%	0.8%	0.8%	0.7%	1.7%	0.8%
Exp-other	16	13	18	13	13	10	11	6	15
% of total	0.9%	0.8%	1.3%	1.1%	1.1%	1.1%	1.5%	0.8%	2.1%

* Musculoskeletal Injury
** Not Elsewhere Classified

Appendix D

Nursing Work Index: Control Over Practice Setting Subscale

For *each* item in this section, please indicate the extent to which you agree that the following items ARE PRESENT IN YOUR CURRENT JOB. Indicate your degree of agreement by circling the appropriate number.

	The following are present in your current job:	**Strongly Agree**	**Somewhat Agree**	**Somewhat Disagree**	**Strongly Disagree**
1.	Adequate support services allow me to spend time with my patients.	1	2	3	4
2.	Enough time and opportunity to discuss patient care problems with other nurses.	1	2	3	4
3.	Enough registered nurses on staff to provide quality patient care.	1	2	3	4
4.	A nurse manager or immediate supervisor who is a good manager and leader.	1	2	3	4
5.	Enough staff to get work done.	1	2	3	4
6.	Opportunity to work on a highly specialized patient care unit.	1	2	3	4
7.	Patient care assignments that foster continuity of care (i.e. the same nurse cares for the patient from one day to the next).	1	2	3	4

Appendix E

Nursing Work Index: Nurse Relations with Physicians Subscale

For *each* item in this section, please indicate the extent to which you agree that the following items ARE PRESENT IN YOUR CURRENT JOB. Indicate your degree of agreement by circling the appropriate number.

	The following are present in your current job:	**Strongly Agree**	**Somewhat Agree**	**Somewhat Disagree**	**Strongly Disagree**
1.	Physicians and nurses have good working relationships.	1	2	3	4
2.	A lot of team work between nurses and physicians.	1	2	3	4
3.	Collaboration between nurses and physicians.	1	2	3	4

Appendix F

Handling Missing Values for Workload

Prior to summing, workload and worked hours were first examined at the level of the functional centre (i.e., inpatient or outpatient unit). Since there were a number of missing workload values at the unit level, rules were developed around handling missing values. These rules involved imputing values using patient-care productivity, which is equivalent to workload divided by UPP worked hours (Ministry of Health and Long-Term Care, 1997). For hospitals where productivity values could not be calculated due to missing workload, the mean productivity for each hospital type (small, community or teaching) for the specific clinical activity was calculated and imputed into the productivity formula for each individual unit. Numerous outliers were apparent in the productivity data, likely reflecting invalid reporting of nursing workload. If left in, these extreme values would have skewed the mean. Therefore, prior to calculating the mean productivity for each hospital type, productivity values that were less than .40 or greater than 1.10 were removed. These ranges were chosen as wide margins since maximum expected total productivity is .93, and one can expect patient-care productivity to be about .15 lower. Using the worked hours reported and the mean productivity for hospital type, the corresponding workload value could be determined. Specifically, when no workload was reported but worked hours were reported (indicating that there was activity in that particular unit) the missing workload values were calculated by rearranging the productivity formula to solve for workload: workload equals worked hours multiplied by productivity.

Appendix G

Letter of Introduction Sent to Hospital CEOs and CNOs

Dear

We are inviting your hospital to participate in the third phase of our study which examines the well-being of nurses as well as the effectiveness and outcomes of nursing work. As members of the Nursing Research Unit, the WHO Collaborating Center for Nursing Leadership and the Workplace Safety and Insurance Board we have been studying this phenomena for several years. One area of research currently being investigated is the determination of factors associated with WSIB injury claims for nurses working in hospitals. Given the increase in WSIB payroll premiums for hospitals, we are conducting a study to identify interventions that could help reverse the trends in hospital and nursing claim rates over the next few years. Our work is exciting and very relevant since, as you know, nurses and nursing work have been the focus of a great deal of media and political attention over the last few years.

The first two phases of this study involved analysis of administrative data bases including WSIB claims rates, the MIS trial balance record from the Ministry of Health and Long-Term Care and data from a large cross-sectional survey of acute care hospital nurses in Ontario. Nurses from your hospital were involved in this large survey. The intent of the third phase is to determine, from the staff nurses' perspective, the validity of the proposed interventions developed from earlier phases and to identify additional interventions that could enhance health and safety in their work environment. To achieve this we would like to meet with staff nurses (RNs and RPNs), excluding nurse managers, who provide direct patient care in your hospital. This informal meeting will involve rating the relevance of research based interventions, identifying additional interventions and participating in a group discussion with respect to the interventions.

The meeting with the nurses will take about one and one-half hours and the information collected will be kept confidential. The session will be recorded, solely for the purposes of accuracy in data transcription and analysis. The recorded and written data will at no time be available to anyone outside the research team and no nurse or hospital will ever be identified by name. The entire list of study sites may be identified during publication of the results, but data will not be linked to any individual site. Approval to conduct this study has been granted from the Workplace Safety and Insurance Board Ethical Review Committee.

In addition to holding a meeting with nurses, we hope to organize a similar meeting with stakeholders such as the Chief Executive Officer, Chief Nursing Officer, Occupational Health and Safety personnel, and the Workplace Safety Committee Chair. We want to hear about health and safety in your hospital from these key individuals.

We will share a final report of the study with you. We will also be delighted to provide your hospital with an honorarium of $_____ for participating in the study. To save time, we will ask that you appoint a staff member to act as our liaison. We will then ask this person to determine a date for our visit, book a room for the meeting, post notices (which we will provide) about the project and arrange for refreshments (for which we will pay) for the meeting participants. We ask you to complete and fax the enclosed form to Valerie Jones, Dr. Shamian's secretary, at (416) 586-8830 by March 16, 2001 indicating whether or not you would like to participate in the study.

If you have any questions about the project, please contact Shirliana Bruce, our project coordinator, at (416) 946-7152. Once you have indicated you would like to participate, a member of our project staff will contact the appointed liaison staff member to determine further details about the meetings. We look forward to your assistance with this important work.

Sincerely,

Judith Shamian, RN, PhD
Executive Director, Nursing Policy
Health Canada, Ottawa and
Former Director
WHO Collaborating Centre for
Nursing Leadership
Mount Sinai Hospital, Toronto

Linda O'Brien-Pallas, RN, PhD
Professor and CHSRF/CIHR National Chair,
Nursing Human Resources and
Unit Co-Principal Investigator,
Nursing Effectiveness, Utilization and
Outcomes Research Unit
Faculty of Nursing, University of Toronto

Appendix H

Advertisement Posted in Hospitals to Recruit Nurses for Focus Groups

"Registered nurses and nursing assistants appear to miss work because of illness and disability more often than those in other occupation groups" (Canadian Institute for Health Information, 2000)

Please help us to find ways to change this. Join us for an upcoming meeting at your hospital.

Who? All staff nurses (RNs and RPNs) employed on all units, involved in direct patient care are invited to participate.

What? Meet with two members of our research team under the direction of Dr. Judith Shamian, Executive Director of Nursing Policy at Health Canada and Dr. Linda O'Brien-Pallas of the Nursing Research Unit at the University of Toronto to discuss some interventions directed at improving the health and safety of nurses in the hospital sector.

This is a study taking place at hospitals across Ontario throughout the spring of 2001. The meeting will consist of a discussion of interventions to improve the workplace safety and health of nurses in your hospital. The meeting will take no more than 1.5 hours of your time. The information provided by individual nurses will be kept confidential and will never be shared with anyone outside of our research team. Those who attend will never be identified by name.

Why? This is a chance to make your voice count and contribute in a to nursing research and its influence on practice in Ontario! We want to keep in close touch with practicing nurses as we attempt to understand how to improve the nursing workplace in Ontario and Canada.

When? Date. Refreshments will be served.

Where? Location

If you have questions, the contact person in your hospital is:

Appendix I

Verbal Introduction to the Nurse Sessions

Hello, My name is Elisabeth Peereboom. I am an RN and a researcher with the Nursing Research Unit at the University of Toronto, and I am happy to have the opportunity to speak with you today about our nursing health study. This is Shirliana Bruce, who is the coordinator for this study and also works with the unit. She will be writing down your responses today.

We will start the session by explaining the study. Once you have heard the explanation, you are free to leave the meeting at any time. If you agree to stay for the session we will ask you in a few minutes to read and sign the consent form. These consents will be kept in a locked cupboard at the University of Toronto.

The purpose of this study is to document the work-related health status of nurses in acute care hospitals in Ontario, and to determine how job strain is affecting the health of nurses, particularly involving musculoskeletal injuries. The ultimate goal is to use the information to develop recommendations for interventions aimed at preventing or reducing work-related risk factors that can be shared with stakeholders.

This study was designed to find out about Ontario nurses' perceptions of the interventions identified from our research and to identify additional interventions that would enhance your health and safety in the workplace. We are traveling to a number of hospitals across Ontario and asking nurses some questions about the importance of these workplace interventions at their specific workplaces.

In addition to participating in the focus group we will ask you to complete a questionnaire that will help us to analyse the data. This form lists the top interventions aimed at preventing injuries and improving the health of nurses that have evolved from our research. We will ask you to choose the most important interventions from the list. Your name will not appear on this form.

In the focus group, we will ask you to share ideas about interventions to reduce injury, improve nurses' health and decrease absenteeism. At the end of the session, you will be offered the opportunity to identify the interventions you think would be most effective on a comment sheet.

Risks and Benefits

We hope this study will benefit all nurses by identifying workplace health and safety interventions that are relevant to the nursing workforce and can be used to influence policy-makers, hospital administrators, nursing leaders, unions, nursing managers and staff to improve the workplace safety of all nurses in Ontario.

Your name will never be identified during the analysis or publication of the results, and the feelings you share will not be linked to your specific workplace. The researchers will at no time make your supervisors aware of what was said in this meeting.

We recognize that talking about your work related health and workplace safety may bring up many different feelings. We hope you will feel free to express your thoughts and talk about them

among your colleagues. At this stage of our research, we are not here to make changes to your specific workplace. Rather, we want to learn from you about *your perceptions* of meaningful workplace interventions, so that we can help improve worklife conditions for *all* nurses in the future.

While you may not directly benefit from involvement in this focus group you will not be harmed in any way. It is anticipated that the results of this study will, in the long term, improve the health and safety of hospital nurses and their work environments.

Taping the Sessions

For the purpose of data analysis, each session will be taped. Each tape will be assigned a code number that corresponds to your hospital. The tapes will *at no time* be available to anyone outside of the research team. The tapes will be kept in a locked cupboard at the Nursing Research Unit at the University of Toronto, and will never be heard by any member of the nursing staff or administration. Once the final report has been completed, the tapes will be kept as per University of Toronto ethics protocol and then erased.

We do not want to take more than an hour and a half of your time. Please feel free to speak up during the meeting. Also, we will be writing down your ideas on the overhead so please be sure that we have transcribed your thoughts correctly. Just speak up if you think we have misinterpreted any of your responses.

Take a couple of minutes to read over the consent form now and if you would like to participate, sign the form and put it in this envelope. If you decide not to participate, you are free to leave at any time. If you would like to keep a copy of this form, we have extra copies here so please take one.

Appendix J

Consent Form for Nurses

I have been asked to participate in a study conducted by a team of researchers led by Dr. Judith Shamian and Dr. Linda O'Brien-Pallas. I understand the purpose of this phase of the study is to comment on the importance of potential workplace safety interventions directed at reducing workplace injury and improving the health of nurses. I understand that I will be asked to identify additional interventions that I think are important.

My participation will involve 1) indicating the presence of specific interventions in my workplace and choosing the interventions that I believe are most important and 2) participating in a group discussion with respect to the interventions and identifying additional interventions.

I am aware that the study may not benefit me specifically but that it will help to advance the understanding of strategies to improve workplace safety.

I understand that participation is voluntary. Refusal to participate will not in any way jeopardize my position at the hospital and no one in my work environment will know if I chose not to participate.

I understand that all information from the intervention form and the taped session will be completely confidential. My name will not be on the intervention form and will not be used in any report of the study. The consent will be stored in a locked cupboard at the Nursing Research Unit at the University of Toronto. I further understand there is no way to link my ratings on the intervention form to the taped discussions.

I have been offered a copy of this form.

If you have any questions or concerns about this study, please feel free to discuss them with the representatives from the research team who are here today. You may also call Dr. Judith Shamian at 416-586-5194 or Dr. Linda O'Brien-Pallas at 416-978-1967.

Thank you for your time.

_____ _____

Nurse's Name (please print) Nurse's Signature

_____ _____

Hospital Name Date

_____

Researcher's Signature

Appendix K

Intervention Rankings for Nurses

Interventions
1. Safe lifting practices (lifting teams, assessing patient and determining necessary equipment prior to lifting, exercising prior to lifting)
2. Adequate nurse staffing levels
3. Input of nurses in selecting and evaluating lifting equipment
4. Educational programs or sessions (e.g., back care, exercise, safe lifting)
5. On-site workplace wellness sessions (e.g., stress management, fitness classes)
6. Adequate layout of workspace to better accommodate safe lifting and equipment
7. Holistic healing offered to decrease stress (e.g., meditation, relaxation, reiki)
8. Modified work programs for nurses returning to work after an injury
9. Reasonable job demands and workload (e.g., physical job demands, number of patients, complexity of patients)
10. Quiet room or space available for nurses to relax
11. Good relations between nurses and management/supervisors
12. Autonomy and control over practice (nurses able to make independent clinical decisions and/or have input into decision making)
13. Nurses are not asked to work unwanted overtime
14. Having access to services that support empowerment of nurses (e.g., professional development programs, mentorship)
15. Availability of adequate patient equipment (e.g., wheelchairs, stretchers)
16. Maintenance of adequate patient equipment (e.g., wheelchairs, stretchers)
17. Access to ergonomic assessment of work stations
18. Adequate general housekeeping (to prevent slips and falls)
19. Orthopedic shoes provided and/or encouragement for nurses to look after their feet

Please choose the 5 interventions from the previous page that you think would be most important in preventing musculoskeletal injuries and improving the health and safety of nurses in your workplace. Write down the corresponding number for each intervention that you choose.
Prioritize them with 1 being most important, 2 being second most important, etc.

Then rate them by placing an X in the appropriate space for the following questions:
a) how likely do you believe each intervention is to be implemented in your hospital? and
b) how successful do you believe each intervention would be if implemented in your hospital?

		a)	b)
	Intervention Number	**How likely is this to be implemented in your hospital?**	**How successful would this be if implemented in your hospital?**
1		____ very unlikely ____ somewhat unlikely ____ neither likely nor unlikely ____ somewhat likely ____ very likely ____ already present (ignore b)	____ very unsuccessful ____ somewhat unsuccessful ____ neither successful nor unsuccessful ____ somewhat successful ____ very successful
2		____ very unlikely ____ somewhat unlikely ____ neither likely nor unlikely ____ somewhat likely ____ very likely ____ already present (ignore b)	____ very unsuccessful ____ somewhat unsuccessful ____ neither successful nor unsuccessful ____ somewhat successful ____ very successful
3		____ very unlikely ____ somewhat unlikely ____ neither likely nor unlikely ____ somewhat likely ____ very likely ____ already present (ignore b)	____ very unsuccessful ____ somewhat unsuccessful ____ neither successful nor unsuccessful ____ somewhat successful ____ very successful
4		____ very unlikely ____ somewhat unlikely ____ neither likely nor unlikely ____ somewhat likely ____ very likely ____ already present (ignore b)	____ very unsuccessful ____ somewhat unsuccessful ____ neither successful nor unsuccessful ____ somewhat successful ____ very successful
5		____ very unlikely ____ somewhat unlikely ____ neither likely nor unlikely ____ somewhat likely ____ very likely ____ already present (ignore b)	____ very unsuccessful ____ somewhat unsuccessful ____ neither successful nor unsuccessful ____ somewhat successful ____ very successful

Appendix L

Verbal Introduction to the Stakeholder Interviews

Hello, My name is Elisabeth Peereboom. I am an RN and a researcher with the Nursing Research Unit at the University of Toronto, and I am happy to have the opportunity to speak with you today about our nursing health study. This is Shirliana Bruce, who is the coordinator for this study and also works with the unit. She will be writing down your responses today.

The Nursing Research Unit is a joint project of the Faculties of Nursing at University of Toronto and Mc Master University and is funded by the Ontario Ministry of Health and Long-Term Care. Researchers from Health Canada, the Workplace Safety and Insurance Board of Ontario, and the Institute for Work and Health in Toronto are also involved in this study.

This purpose of this study is to document the work-related health status of nurses in acute care hospitals in Ontario, and to determine how job strain is affecting the health of nurses, particularly involving musculoskeletal injuries. We are studying this area since we know that health care workers are at high risk for work-related musculoskeletal problems.

In addition to talking to the nurses, we are interested in hearing from a management perspective, what you have to say about nurse health. We hope that you will allow us to tape this interview so we can go back and make sure we heard everything you said correctly. You will never be identified by name and we have assigned your hospital a site code which means that what you say will not be linked to your hospital. The tapes will be kept in a locked closet at the Nursing Research Unit at the University of Toronto.

Once the study report is completed in the fall of 2001, we will be sending a copy to the Chief Nursing Officer. If you would like your own copy, we will give you contact information at the end of the interview.

Appendix M

List of Categories Clustered into Themes

1. Workload
physical demands
psychological/mental/cognitive demands
work expectations
overtime
other workload

2. Mental health/psychosocial factors
lack control
lack of coping
stress
frustration
bitterness/anger
tired
burnout/worn out
afraid/fear
guilt/feeling accountable
personal loyalty
not caring for selves/self-preservation
uncertainty/doubt
other mental health

3. Physical environment
equipment
ergonomics
space/layout issues
physical environment (lighting, carpet)
other physical environment

4. Physical health of nurses
illness
repetitive strain/musculoskeletal
posture/poor body mechanics
physical shape/physical health behavior
other physical health

5. Social support
supervisor support
co-worker support
doctors/hospital staff support
community support
patient support
respect for administration
family support
other support

6. Education
continuing education/college
ergonomics/lifting training
inservices/sessions not defined
nursing school training
other education
education not defined

7. Staffing
nurse shortage
doctor shortage
other staff shortage
OH&S committee
teamwork issues
competence of staff
other staffing
staffing not defined

8. Demographics
age
gender

9. Patient issues
patient actions or behaviors/patient
abuse/unpredictableness of patient
patients' families
patient acuity
patient expectations
patient demographics
other patient issues

10. Standard of care
expectations from others
hospital location
putting patients first
balancing patient care
team approach to care
ideal versus realistic standards
accountability for actions
other standard of care

11. Scheduling
shift issues
part-time/full-time issues
scheduling
other scheduling

12. Benefits
tangible incentives/rewards (coffee, gym, orthotics)
staff programs (EAP, wellness/stress, orientation)
union issues
sick time as a right
mental health/personal days
vacation days
interventions (crisis, conflict management)
job security
benefits for education
incentive to not use sick time
other benefits

13. Respect
respect/valuing nurses
communication
autonomy/decision-making/empowerment
morale/work ethic
meaningful role
other respect

14. Family reasons
child care/elder care
family work conflict
personal or social life
other family reasons not defined

15. Policy issues/political factors/society
government/external funding policies
media/publicity
societal factors
lawsuits
hospital location
modified work policies
other hospital policies
other policies/societal factors

16. Claims process
nurses not reporting injuries
hospital handles claims internally
other claims process issues

17. Workplace environment
workplace culture/hospital attitude
workplace changes
restructuring
commitment to organization
other workplace environment

Other

Yes

No

Appendix N

Percentage of Themes Identified by Nurse Focus Groups for Musculoskeletal Injuries

Theme	High Claim Rate Hospital Factors	High Claim Rate Hospital Solutions	Low Claim Rate Hospital Factors	Low Claim Rate Hospital Solutions
Workload	24.55	10.14	25.64	1.75
Psychosocial	6.36	0	2.56	1.75
Physical work env.	15.45	27.54	16.67	40.35
Physical health	6.36	2.90	5.13	5.26
Social support	0.91	2.90	1.28	0
Education	2.73	10.14	6.41	12.28
Staffing	14.55	18.84	14.10	15.79
Demographics	5.45	0	5.13	1.75
Patient issues	10.00	4.35	12.82	3.51
Standard of care	5.45	1.45	2.56	0
Scheduling	3.64	0	3.85	0
Benefits	0	7.25	0	7.02
Respect	1.82	10.14	2.56	7.02
Family reasons	1.82	0	0	0
Policies/social	0.91	2.90	0	1.75
Claims process	0	0	1.28	0
Workplace env.	0	1.45	0	1.75
Other	0	0	0	0

Appendix O

Percentage of Themes Identified by Stakeholders for Musculoskeletal Injuries

Theme	CEO Factors	CEO Sol'ns	CNO Factors	CNO Sol'ns	OHS Factors	OHS Sol'ns	Oth. Factors	Oth. Sol'ns
Workload	14.29	2.86	17.33	14.29	26.79	10.64	28.13	16.00
Psychosocial factors	0	0	4.00	3.17	1.79	2.13	3.13	4.00
Physical work env.	9.52	28.57	10.67	20.63	10.71	14.89	15.63	4.00
Physical health	4.76	0	14.67	3.17	10.71	8.51	9.38	4.00
Social support	0	2.86	0	0	0	0	3.13	0
Education	9.52	11.43	6.67	12.70	3.57	21.28	3.13	20.00
Staffing	14.29	17.14	8.00	17.46	8.93	14.89	9.38	12.00
Demographics	9.52	0	12.00	0	12.5	0	6.25	0
Patient issues	14.29	2.86	16.00	6.35	12.5	4.26	12.50	0
Standard of care	4.76	0	2.67	1.59	5.36	2.13	3.13	0
Scheduling	0	8.57	2.67	3.17	3.57	2.13	3.13	4.00
Benefits	0	11.43	0	4.76	1.79	8.51	0	12.00
Respect	0	5.71	0	0	0	4.26	0	0
Family reasons	0	0	2.67	0	1.79	0	0	0
Policies/social	9.52	8.57	1.33	9.52	0	6.38	0	20.00
Claims process	0	0	0	0	0	0	0	0
Workplace env.	9.52	0	1.33	3.17	0	0	3.13	4.00
Other	0	0	0	0	0	0	0	0

Appendix P

Percentage of Themes Identified by Nurse Focus Groups for Stress

Theme	High Claim Rate Hospital Factors	High Claim Rate Hospital Solutions	Low Claim Rate Hospital Factors	Low Claim Rate Hospital Solutions
Workload	18.46	7.81	14.13	2.27
Psychosocial	13.08	1.56	9.78	2.27
Physical work env.	2.31	7.81	1.09	9.09
Physical health	0	0	0	0
Social support	11.54	6.25	9.78	9.09
Education	2.31	6.25	3.26	4.55
Staffing	10	15.63	8.70	15.91
Demographics	1.54	0	2.17	0
Patient issues	4.62	0	13.04	2.27
Standard of care	0.77	0	3.26	0
Scheduling	5.38	6.25	3.26	4.55
Benefits	6.15	28.13	4.35	18.18
Respect	6.15	14.06	11.96	22.73
Family reasons	3.85	1.56	3.26	0
Policies/social	4.62	4.69	2.17	4.55
Claims process	0	0	0	0
Workplace env.	9.23	0	7.61	4.55
Other	0	0	2.17	0

Appendix Q

Percentage of Themes Identified by Stakeholders for Stress

Theme	CEO Factors	CEO Sol'ns	CNO Factors	CNO Sol'ns	OHS Factors	OHS Sol'ns	Oth. Factors	Oth. Sol'ns
Workload	9.38	0	4.95	0	17.54	0	17.39	4.55
Psychosocial factors	9.38	6.25	15.84	6.45	10.52	13.33	8.70	0
Physical work env.	0	0	0.99	1.61	0	0	0	0
Physical health	0	0	0.99	1.61	0	13.33	0	0
Social support	0	0	6.93	8.06	1.75	4.44	4.35	9.09
Education	0	0	4.95	4.84	1.75	8.89	0	9.09
Staffing	9.38	12.50	11.88	8.06	7.02	0	13.04	9.09
Demographics	3.13	0	6.93	0	5.26	0	4.35	0
Patient issues	12.50	0	5.94	0	7.02	0	13.04	0
Standard of care	0	0	2.97	1.61	3.51	0	4.35	0
Scheduling	0	12.50	2.97	3.23	3.51	6.67	8.70	13.64
Benefits	3.13	12.50	0.99	17.74	8.77	26.67	0	13.64
Respect	18.75	37.50	2.97	24.19	5.26	13.33	0	22.73
Family reasons	3.13	0	2.97	1.61	8.77	4.44	8.70	4.55
Policies/social	18.75	6.25	14.85	11.29	7.02	4.44	4.35	4.55
Claims process	0	0	0	0	0	0	0	0
Workplace env.	12.50	12.50	12.87	8.06	12.28	4.44	8.70	9.09
Other	0	0	0	1.61	0	0	4.35	0

Appendix R

Percentage of Themes Identified by Nurse Focus Groups for Absenteeism

Theme	High Claim Rate Hospital Factors	High Claim Rate Hospital Solutions	Low Claim Rate Hospital Factors	Low Claim Rate Hospital Solutions
Workload	3.85	0	8.96	1.64
Psychosocial	25.00	2.33	25.37	3.28
Physical work env.	0	2.33	0	1.64
Physical health	13.46	6.98	7.46	6.56
Social support	0	4.65	5.97	9.84
Education	0	0	0	4.92
Staffing	5.77	23.26	7.46	3.28
Demographics	7.69	0	2.99	3.28
Patient issues	3.85	0	4.48	0
Standard of care	0	0	0	0
Scheduling	13.46	20.93	14.92	14.75
Benefits	7.69	27.91	11.94	29.51
Respect	9.62	6.98	1.49	8.20
Family reasons	7.69	0	4.48	8.20
Policies/social	1.92	4.65	0	1.64
Claims process	0	0	0	0
Workplace env.	0	0	4.48	3.28
Other	0	0	0	0

Appendix S

Percentage of Themes Identified by Stakeholders for Absenteeism

Theme	CEO Factors	CEO Sol'ns	CNO Factors	CNO Sol'ns	OHS Factors	OHS Sol'ns	Oth. Factors	Oth. Sol'ns
Workload	7.14	9.09	6.45	6.67	15.56	6.45	4.55	23.53
Psychosocial factors	10.71	0	19.35	2.22	28.89	3.23	18.18	5.88
Physical work env.	0	0	0	0	0	3.23	0	0
Physical health	0	0	16.13	0	13.33	3.23	9.09	0
Social support	3.57	0	1.61	2.22	2.22	6.45	0	5.88
Education	0	0	0	0	0	3.23	0	0
Staffing	10.71	9.09	1.61	6.67	4.44	9.68	9.09	17.65
Demographics	3.57	0	11.29	0	6.67	0	4.55	0
Patient issues	0	0	1.61	0	2.22	0	0	0
Standard of care	3.57	0	0	2.22	2.22	0	0	0
Scheduling	7.14	9.09	9.68	15.56	4.44	9.68	4.55	5.88
Benefits	14.29	27.27	12.90	13.33	6.67	16.13	18.18	11.76
Respect	14.29	18.18	1.61	8.89	0	0	9.09	0
Family reasons	7.14	0	11.29	8.89	8.89	6.45	0	0
Policies/social	10.71	18.18	1.61	22.22	0	19.35	9.09	17.65
Claims process	0	0	0	0	2.22	0	0	0
Workplace env.	7.14	9.09	3.23	8.89	2.22	12.90	13.64	11.76
Other	0	0	1.61	2.22	0	0	0	0

Appendix T

Percentage of Themes Identified by Nurse Focus Groups for Discrepancies in Hospital Claim Rates

Theme	High Claim Rate Hospitals	Low Claim Rate Hospitals
Workload	3.28	3.85
Psychosocial	1.64	5.77
Physical work env.	16.39	21.15
Physical health	1.64	1.92
Social support	4.92	1.92
Education	8.20	5.77
Staffing	14.75	19.23
Demographics	3.28	3.85
Patient issues	4.92	5.77
Standard of care	3.28	1.92
Scheduling	0	0
Benefits	3.28	3.85
Respect	6.56	1.92
Family reasons	0	0
Policies/social	6.56	3.85
Claims process	14.75	9.62
Workplace env.	4.92	9.62
Other	1.64	0

Appendix U

Percentage of Themes Identified by Stakeholders for Discrepancies in Hospital Claim Rates

Theme	CEO	CNO	OHS	Others
Workload	0	3.51	7.69	8.00
Psychosocial factors	0	1.75	3.85	0
Physical work env.	9.52	21.05	7.69	20.00
Physical health	4.76	0	0	4.00
Social support	4.76	1.75	9.62	4.00
Education	9.52	7.02	11.54	8.00
Staffing	9.52	21.05	13.46	16.00
Demographics	0	3.51	0	0
Patient issues	0	8.77	1.92	0
Standard of care	0	0	1.92	0
Scheduling	4.76	0	0	0
Benefits	4.76	3.51	5.77	0
Respect	14.29	3.51	11.54	0
Family reasons	0	0	0	0
Policies/social	23.81	8.77	7.69	28.00
Claims process	0	7.02	3.85	12.00
Workplace env.	14.29	8.77	13.46	0
Other	0	0	0	0