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Review Article

Obesity as a Possible Risk Factor for Lost-time Injury in Registered Nurses: A Literature Review

Gillian Jordan [1], Behnam Nowrouzi-Kia [2,*], Basem Gohar [3], Behdin Nowrouzi [3]

[1] School of Occupational and Public Health and Safety, Ryerson University, Toronto, Ontario, Canada
[2] Michael G. Degroote School of Medicine, McMaster University, Hamilton, Ontario, Canada
[3] Centre for Research in Occupational Safety and Health, Laurentian University, Sudbury, Ontario, Canada

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ABSTRACT

Time-loss injuries are still a major occurrence in Canada, injuring thousands of Canadian workers each year. With obesity rates on the rise across the country, as well as around the world, it is important that the possible effects of obesity in the workplace be fully understood, especially those effects linked to lost-time injuries. The aim of this paper was to evaluate predictors of workplace lost-time injuries and how they may be related to obesity or high body mass index by examining factors associated with lost-time injuries in the health care sector, a well-studied industry with the highest number of reported time loss injuries in Canada. A literature review focusing on lost-time injuries in Registered Nurses (RNs) was conducted using the keywords and terms: lost time injury, workers' compensation, occupational injury, workplace injury, injury, injuries, work, workplace, occupational, nurse, registered nurse, RN, health care, predictors, risk factors, risk, risks, cause, causes, obese, obesity, and body mass index. Data on predictors or factors associated with lost-time injuries in RNs were gathered and organized using Loisel's Work Disability Prevention Management Model and extrapolated upon using existing literature surrounding obesity in the Canadian workplace.

1. Introduction

Occupational illness and injury remain important issues in today's workplace. The International Labor Organization states that each year it is estimated that 313 million accidents resulting in worker injury occur in workplaces around the world, equivalent to 160 workers injured every 15 seconds [1]. In Canada, approximately one million occupational injury claims are reported to provincial and territorial governments each year across the country [2]. In 2012, > 245,000 of these applications were accepted as lost-time injuries by worker compensation (WC) boards across Canada for compensation [3]. These injuries directly cost the Canadian economy approximately 9.7 billion dollars in 2008, with more current estimates of annual costs expected to exceed 19 billion dollars in 2010 [2].

Of the 245,000 lost-time injuries compensated in Canada in 2012, > 41,000 were reported by the health care industry, more than any other identified industry in Canada [3]. The health care industry employs 10% of Canada's working population, accounting for > 1.6 million Canadian jobs in 2006 [4]. In 2013, the Canadian Federation of Nurses Unions reported that > 365,000 nurses were employed across the country [5], making them the largest regulated body of health care professionals within Canada. In 2012 alone, the Canadian Federation of Nurses Unions reported that the cost of absenteeism due to illness, injury and disability in Canadian Nurses exceeded 734 million dollars, > 20 million dollars more than the cost of absenteeism in 2010 [6]. Nursing is associated with a wide variety of hazards, including various biological, chemical, and physical hazards that may cause occupational illness, as well as ergonomic and psychological hazards due to the highly demanding nature of the profession [7].

As occupational injury in the health care industry is a well-studied area, nurses are an ideal body of workers to examine when attempting to identify trends in lost-time injury incidents. In

* Corresponding author. Centre for Research in Occupational Safety and Health, Laurentian University, 935 Ramsey Lake Rd, Sudbury, Ontario P3E 2C6, Canada.
E-mail address: bx_nowrouzi@laurentian.ca (B. Nowrouzi-Kia).

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the Statistics Canada National Survey of the Work and Health of Nurses, it was identified that 45% of nurses surveyed were classified as overweight, and 14.4% were classified as obese on the body mass index (BMI) scale [8]. BMI uses a person's body weight in kg divided by the square of their height in m to obtain a number that can then be referenced to set standards. A BMI $\geq$ 25 kg/m^2 is considered to be overweight, and $\geq$ 30 kg/m^2 is considered to be obese by the World Health Organization [9].

In 2005, more than two million working Canadians were classified as obese [10], and with national obesity rates rising since then, it can be expected that the number is higher in the workforce today, with roughly 4.7 million Canadian adults' self-reported height and weight classifying them as obese on the BMI scale in 2012 [11]. Globally, it is expected that $>$ 500 million adult men and women are also obese, with obesity rates doubling over the past 3 decades [9]. Obesity is defined by World Health Organization as "abnormal or excessive fat accumulation that may impair health" [9]. As those who are classified as obese are known to have higher levels of illness from diseases such as cancer and heart disease [9], as well as to suffer from some functional limitations due to their body weight, including reduced flexibility, limited range of movement, and decay in endurance [12], it is important to understand how obesity affects working Canadians, including nurses, especially when lost-time injuries are concerned.

There is a limited amount of current research directly examining BMI and obesity as predictors of lost-time injuries, although a fair amount of research has been done in the way of investigating lost-time and WC injuries, especially within the health care sector. The purpose of this paper is to examine the current literature surrounding lost-time injuries involving Registered Nurses (RNs), those where the RN has sought compensation through a WC board, and the predictors of these injuries, paying particular attention to those predictors that are linked to body weight and obesity. Understanding the predictors of lost-time illness and how they relate to obesity will help to provide more information on how obesity and high BMIs may affect workplace injury rates and workers' compensation claims and subsequent costs to the Canadian workforce and the economy. As health care, obesity, and occupational illness and injury are prevalent subjects beyond the Canadian border, findings from this study may help to increase interest and action surrounding obesity in the workplace abroad, specifically within the field of nursing, by demonstrating the need for prevention and intervention strategies focused on weight and weight management within the workplace, and may help to guide the creation and implementation of evidence-based prevention and intervention programs dealing with obesity and injury.

2. Materials and methods

Data were gathered using Google Scholar, Pub Med, Medline, CINAHL, PsycInfo, Social Science Abstracts, and Embase/Cochrane databases. Searches were conducted using the keywords and terms: lost-time injury, workers' compensation, occupational injury, workplace injury, injury, injuries, work, workplace, occupational, nurse, registered nurse, RN, health care, predictors, risk factors, risk, risks, cause, causes, obese, obesity, BMI, and body mass index. These searches were performed in May–August, 2014. Data were also gathered through utilizing the reference lists of articles retrieved using the aforementioned search terms to identify more material related to the topic. Current statistics on obesity and lost time injuries in Canada were gathered from online government resources. Nursing specific statistics were collected through the Canadian Federation of Nurses Unions and the Ontario College of Nursing.

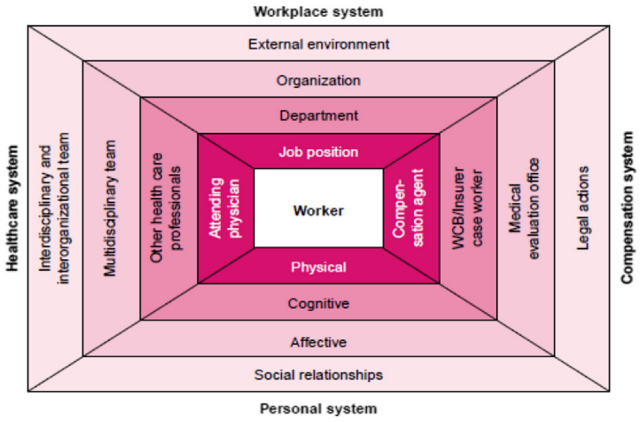

Fig. 1. Work disability prevention management model [13].

For the purpose of this paper, only articles published within the past 10 years were utilized. Literature surrounding lost-time injuries involving RNs, those nurses in possession of a license from a national association such as the Canadian Nurses Association was examined. Studies where the RN has sought compensation through a workers' compensation board, and the predictors of these injuries were the main focus of this study, though other studies which measure injury or illness in other manners were also examined, though with caution. Research including measures and predictors linked to body weight, especially obesity were of particular interest and were included in this review.

Data on predictors or factors associated with lost-time injuries in nurses were gathered and organized using Loisel's Work Disability Prevention Management Model, illustrated in Fig. 1, to guide classification of the various factors identified.

2.1. Loisel's disability prevention management model

Workplace injury is a multifactorial problem, with injury and illness stemming from multiple conditions and causes of different varieties. This model was developed to facilitate a better understanding of the problem of occupational injury, specifically disability due to back pain, by stakeholders, as well as research on the subject [13]. This model acknowledges the contribution of factors related to the person, workplace, health care, and WC systems on the worker that may influence disability in the workplace. These factors must be acknowledged and dealt with in an organized manner if disability prevention is to be achieved [13].

To assist in better evaluating and understanding factors identified within the literature, Loisel's disability paradigm was used to classify predictors into two distinct categories, personal systems, and workplace systems, elements Loisel recognized must be considered when attempting to comprehend workplace injury. These systems interact with the health care system, as well as WC boards, and influence illness, injury, and disability at the worker level.

3. Review

A summary of literature reviewed on the topic of RNs and workplace injury is in Table 1. Other relevant studies addressed in this review involving other occupations are in Table 2.

In Whitaker's 2001 article examining the management of sickness absence, lost-time illness/injury/disease is operationalized as "an absence from work that is attributed to sickness by the employee and approved by the employer" [14]. In Canada, a time-loss injury is one for which a worker is compensated for their