



Occupational factors associated with obesity and leisure-time physical activity among nurses: A cross sectional study



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ABSTRACT

Background and objective: Adverse working conditions contribute to obesity and physical inactivity. The purpose of this study was to examine the associations of occupational factors with obesity and leisure-time physical activity among nurses.

Methods: This study used cross-sectional data of 394 nurses (mean age 48 years, 91% females, 61% white) randomly selected from the California Board of Registered Nursing list. Data on demographic and employment characteristics, musculoskeletal symptom comorbidity, physical and psychosocial occupational factors, body mass index (BMI), and physical activity were collected using postal and on-line surveys from January to July in 2013. **Results:** Of the participants, 31% were overweight and 18% were obese; 41% engaged in regular aerobic physical activity (≥ 150 min/week) and 57% performed regular muscle-strengthening activity (≥ 2 days/week). In multivariable logistic regression models, overweight/obesity ($\text{BMI} \geq 25 \text{ kg/m}^2$) was significantly more common among nurse managers/supervisors ($\text{OR} = 2.54$, 95% CI: 1.16–5.59) and nurses who worked full-time ($\text{OR} = 2.18$, 95% CI: 1.29–3.70) or worked ≥ 40 h per week ($\text{OR} = 2.53$, 95% CI: 1.58–4.05). Regular aerobic physical activity was significantly associated with high job demand ($\text{OR} = 1.63$, 95% CI: 1.06–2.51). Nurses with passive jobs (low job demand combined with low job control) were significantly less likely to perform aerobic physical activity ($\text{OR} = 0.49$, 95% CI: 0.26–0.93). Regular muscle-strengthening physical activity was significantly less common among nurses working on non-day shifts ($\text{OR} = 0.55$, 95% CI: 0.34–0.89). Physical workload was not associated with obesity and physical activity.

Conclusions: Our study findings suggest that occupational factors significantly contribute to obesity and physical inactivity among nurses. Occupational characteristics in the work environment should be considered in designing effective workplace health promotion programs targeting physical activity and obesity among nurses.

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What is already known about the topic?

- The increasing prevalence of obesity is a major public health problem in the U.S. and worldwide.

- The vast majority of U.S. adults does not engage in regular physical activity.
- Research shows adverse working conditions contribute to obesity and physical inactivity.

What this paper adds

- Nurses are faced with the high prevalence of overweight/obesity and their leisure-time physical activities are far from optimal.

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- Overweight/obesity and leisure-time physical inactivity among nurses were associated with occupational factors, such as job title, full-time work, long work hours, shift work, and high job demand.

1. Introduction

The increasing prevalence of obesity is a major public health problem in the United States (U.S.) and worldwide (Flegal et al., 2012; Ogden and Carroll, 2010; World Health Organization, 2004). According to a recent study using 2011–2012 National Health and Nutrition Examination Survey data, two out of three adults in the U.S. are overweight or obese (Ogden et al., 2014). Obesity is linked to type 2 diabetes, mental health, and cardiovascular disease morbidity and mortality, which result in substantial health care costs (National Heart Lung and Blood Institute, 2003; U.S. Department of Health and Human Services (USDHHS), 2001; Wang et al., 2008). The cause of obesity is multifactorial, including unhealthy eating, sleep deprivation, psychological, genetic, environmental, and behavioral factors (Institute of Medicine, 2006; USDHHS, 2001). Physical activity is one of the major factors targeted in obesity prevention and management and also produces various health benefits. Engaging in physical activity offsets the adverse health effects of overweight or obesity, reducing the risk of cardiovascular disease (Centers for Disease Control and Prevention [CDC], 2011; Li et al., 2006; Sofi et al., 2008; Thompson et al., 2003), and the protective effects of physical activity hold true even after controlling for body mass index (BMI) (Kriska et al., 1993; Wareham et al., 2000). However, the vast majority of U.S. adults do not engage in regular physical activity, and only 21% meet recommended levels for both aerobic and muscle-strengthening physical activity (CDC, 2013a).

Research suggests that occupational factors contribute to obesity and physical inactivity. Adverse working conditions such as long work hours, high job demands, and exposure to hostile work environments are significantly associated with obesity (Han et al., 2011; Jaaskelainen et al., 2015; Luckhaupt et al., 2014). Individuals with highly stressful jobs require more recovery time and are less likely to engage in physical activity (Fransson et al., 2012; Lallukka et al., 2008a,b; McVicar, 2003; Sveinsdottir and Gunnarsdottir, 2008). Furthermore, studies demonstrated that obesity is associated with high absenteeism and low workplace productivity, which lead to rising costs to businesses and society (Goetzel et al., 2010; Thompson, 2007; Zapka et al., 2009).

In a recent study, health care employment was significantly associated with increased prevalence of obesity (Luckhaupt et al., 2014). Nurses are the largest health care occupation group, and the prevalence of overweight/obesity among U.S. nurses ranges from 30% to 55% depending on geographical area, race and ethnicity, and work settings (Han et al., 2011; Miller et al., 2008; Tucker et al., 2010; Zapka et al., 2009). Nursing jobs involve shift work and long work hours and are often reported as highly stressful from physically and psychologically demanding patient care (McVicar, 2003; Sveinsdottir and Gunnarsdottir, 2008). Also, work-related musculoskeletal injuries and

pain are common among nurses due to patient handling (Lee et al., 2013). Such factors may be associated with reduced leisure-time physical activity, which, in turn, contributes to overweight/obesity among nurses (Atkinson et al., 2008; Keller, 2009; Lallukka et al., 2008a,b; Zhao et al., 2012).

Previous studies of obesity among nurses have often focused on the relationship between shift work and irregular meal or disrupted sleep patterns (Field et al., 2007; Geiger-Brown et al., 2011). There is limited research on the effect of occupational factors other than shift work on obesity among nurses. Also, little is known about leisure-time physical activity among nurses and associated occupational risk factors. The purpose of this study was to describe the prevalence of overweight/obesity and leisure-time physical activity among nurses and to examine the relationships of occupational factors with obesity and physical activity.

2. Methods

2.1. Study design and participants

This study analyzed cross-sectional survey data of 394 California registered nurses. The survey data were collected through mail and internet from January to July in 2013. The study initially invited 2000 nurses randomly selected from a list of actively licensed nurses by the California Board of Registered Nursing by sending mail surveys. Respondents were given an alternative response option of on-line completion following log-on information provided in the study information letter. A total of 526 nurses responded, and 394 nurses were eligible for the analysis in the present study. Excluded were 102 retired or not working, 14 currently on disability leave, and 11 employed less than one year. Additionally, three subjects with more than 50% missing data, and two subjects with missing data on both BMI and physical activity were excluded.

2.2. Measures

2.2.1. Outcomes

2.2.1.1. Overweight/obesity. Overweight and obesity were determined by using BMI, which is calculated by weight in kilograms divided by height in meters squared (kg/m^2). BMI was categorized as underweight ($<18.5 \text{ kg}/\text{m}^2$), normal ($18.5\text{--}24.9 \text{ kg}/\text{m}^2$), overweight ($25\text{--}29.9 \text{ kg}/\text{m}^2$), and obese ($\geq 30 \text{ kg}/\text{m}^2$) (CDC, 2012). We divided the categories into two groups as follows: underweight/normal ($<25 \text{ kg}/\text{m}^2$) and overweight/obese ($\geq 25 \text{ kg}/\text{m}^2$).

2.2.1.2. Leisure-time physical activity. Leisure-time aerobic physical activity and muscle-strengthening physical activity were measured by questions from the Behavioral Risk Factor Surveillance System (CDC, 2013b).

Aerobic physical activity was measured by the following two questions: "During the past month, other than your regular job, how many times per week did you take part in any physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise?"

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