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Work productivity among adults with varied Body Mass Index: Results from a Canadian population-based survey

Arnaldo Sanchez Bustillos [a,*], Kris Gregory Vargas III [a], Raul Gomero-Cuadra [b]

[a] School of Population and Public Health, University of British Columbia, Vancouver, BC, Canada
[b] Occupational Medicine Post-graduate Program, Faculty of Medicine, Cayetano Heredia University, Lima, Peru

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Abstract *Background:* The relationship between Body Mass Index (BMI) and work productivity, including absenteeism and presenteeism remains unclear. The objective of this study was to examine work productivity among adults with varied BMI using population-based data.

Methods: Data source was the 2009–2010 Canadian Community Health Survey. The outcomes reflected work absence (absenteeism) and reduced activities at work (presenteeism). The key explanatory variable was BMI in six categories. Logistic regressions were used to measure the association between outcome and explanatory variables adjusting for potential confounders.

Results: The sample consisted of 56,971 respondents ranging in age from 20 to 69 years. Relative to normal BMI, the odds of absenteeism were higher for those in the obesity class III (OR = 1.60, 95% CI: 1.39; 1.83). Presenteeism was weakly associated with all obesity categories (OR = 1.49, 95% CI: 1.38; 1.61, for obesity class I). Overweight was marginally associated with absenteeism and presenteeism. Underweight was inversely associated with absenteeism.

Conclusions: This study found that obesity is an independent risk factor for reduced work productivity. Both absenteeism and presenteeism were associated with obesity. However, being overweight was weakly associated with work productivity.

* Corresponding author. Address: 4th Floor, 2206 East Mall, Vancouver, BC V6T1Z3, Canada. Tel.: +1 604 822 6962.
E-mail address: arnaldo.sb@alumni.ubc.ca (A. Sanchez Bustillos).

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1. Introduction

Obesity is an increasing public health problem that imposes a significant burden to healthcare systems. Overweight and obesity are factors of higher mortality and morbidity [1], and several of the most common chronic medical conditions in adults, including cardiovascular diseases, type 2 diabetes mellitus and cancer, are associated with obesity [2]. Obesity is independently associated with elevated healthcare costs being responsible for approximately 4% and 6% of the total health expenditures in Canada and the United States, respectively [3,4]. In addition to the direct economic burden of obesity, costs outside medical expenditures related to decreased work productivity have been previously recognized [5,6].

Work productivity losses are mainly measured by absenteeism and presenteeism [7]. Absenteeism is defined as the days of absence from work because of illness. Cross-sectional studies have found an association between absenteeism and obesity [8—11]. Prospective studies performed in different industrial settings found that obese employees had a higher illness-absence rate and a longer duration of absence [12,13]. However, a large cohort study found that central abdominal fatness, but not BMI, was a risk factor of sickness absence [14]. Two systematic reviews have documented a positive relationship between obesity and the number of sick leave days. For overweight workers data are not conclusive, but the evidence points to either a increased or a neutral level of absenteeism compared with normal weight [15,16]. Presenteeism occurs when an employee chooses to be present at work despite feeling ill or when sick leave would be appropriate. This may cause the employee to work at a reduced capacity with subsequent productivity losses [17]. Obese employees report higher presenteeism rates. Moderately and severely obese workers showed limitations with respect to the time needed to complete tasks and the ability to perform physical job demands, whereas mildly obese employees were found to have no or fewer health-related loss in productivity [18—20].

Although prospective studies have addressed the question of relationship between BMI and work productivity, the relationship between overweight and work productivity remains unclear. A population-based study can test whether the association is consistent in a large sample representative of a variety of workplaces and geographic locations, adding external validity to the conclusions about this association. Thus, the primary objective of the present study was to examine the effect of BMI on absenteeism and presenteeism considering adjustment for the possible confounding variables.

2. Materials and methods

2.1. Data source and sample selection

Participants were respondents to the Canadian Community Health Survey (CCHS) 2009—2010. The CCHS is a national survey of people aged 12 and over that is conducted by Statistics Canada on an ongoing basis with data released every year [21]. The CCHS has a cross-sectional design and collects information using a complex stratified multistage cluster sampling method. The CCHS 2009—2010 collected responses from people living in private occupied dwellings in 121 health regions covering all provinces in Canada. The sampling frame excluded individuals living in Indian reserves and Crown lands, institutional residents, full-time members of the Canadian armed forces, and residents of certain remote regions. Data were collected by using in-person and phone interviews. Interviewers underwent extensive training and a system of monitoring and validation ensured quality data. The 2009—2010 CCHS provided a sample of 124,188 individuals with an overall response rate of 72.3%. A detailed description of the survey methodology has been published elsewhere [21].

In the CCHS 2009—2010, respondents were asked questions related to their working status and the reduction of activities at work due to health problems [22]. From the 2009—2010 CCHS database, an analytical sample was extracted consisting of individuals aged 20—69 years who reported having a job in the week prior to the survey administration and who provided valid responses regarding working status, reduced activity at work, height and weight, physical activity and any chronic conditions. Questions related to age, sex, education, income, physical activity and chronic diseases were considered for possible confounder factors. Invalid responses to all of these questions were excluded from the analysis.

2.2. Study variables

Absenteeism and presenteeism were separately examined and considered in different models. The two primary outcome variables of interest were absenteeism and presenteeism, both coded as binary variables (yes/no). Absenteeism was derived from the CCHS question: ''Last week, did you have a job or business from which you were absent?'' with two possible responses — yes or no. Absenteeism was defined as those who