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Relationship Between Employment Characteristics and Obesity Among Employed U.S. Adults

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Abstract

Purpose—This study examined associations between employment characteristics and obesity among a sample representing civilian noninstitutionalized U.S. adults.

Design—Quantitative, cross-sectional study.

Setting—Workplace.

Subjects—The 2010 National Health Interview Survey data for 15,121 employed adults (≥18 years).

Measures—The outcome variable was weight status, and exposure variables were employment characteristics (number of employees, work hours, paid by the hour, paid sick leave, and health insurance offered).

Analysis—Multivariate logistic regression was used to estimate adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for employment characteristics associated with obesity (body mass index [BMI] ≥ 30 kg/m^2) after controlling for age, sex, race/ethnicity, education, family income, fruit/vegetable intake, physical activity, smoking, and occupations.

Results—Nationwide, 28% of employed adults were obese. From multivariate logistic regression, the odds of being obese was significantly greater among adults who worked at a company with 100 to 499 employees (OR = 1.19, 95% CI = 1.02–1.39) vs. 1 to 24 employees and those who worked >50 hours/week (OR = 1.32, 95% CI = 1.05–1.65) vs. <30 hours/week.

Conclusion—Approximately 3 out of 10 employees were obese and 6 out of 10 were overweight or obese. A better understanding of why these employment characteristics are

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associated with obesity could help employers better develop and target interventions for obesity prevention and treatment in the worksites.

Keywords

Employment; Obesity; Weight Status; Adults; Employees; Worksite; Workplace; Prevention Research

PURPOSE

The high prevalence of obesity in the United States is a major public health problem because of adverse health and economic consequences.[1-4] One of the objectives of Healthy People 2020 is to reduce the proportion of adults who are obese.[5] Based on the National Health and Nutrition Examination Survey in 2009–2010, approximately 36% of U.S. adults aged ≥20 years were classified as obese [body mass index [BMI] ≥ 30 kg/m^2].[6] Previous studies showed that obesity is linked to increased risk for various chronic diseases such as coronary heart disease, stroke, hypertension, type 2 diabetes, and certain types of cancer.[3,4] Furthermore, in 2008, the annual payer medical costs related to obesity were estimated to be about $147 billion.[7] Medical expenses for obese adults are estimated to be 42% higher than for normal-weight adults.[7,8]

In 2011, about 111.5 million U.S. adults were full-time employees,[9] and most full-time U.S. employees work 8 to 10 hours per day.[10,11] Given that behavioral and environmental factors, such as high consumption of sugar-sweetened beverages (SSBs), low consumption of fruits and vegetables, food and beverage access, availability, and affordability, and physical activity opportunities, have been shown to be important determinants of obesity,[12-15] and given that employees spend much of their day in the workplace, work conditions and its environment may influence weight-related behaviors among employees.[16,17] Worksites are therefore among important adult settings to promote and support behaviors associated with healthful weight control. Additionally, one of the objectives of Healthy People 2020 is to increase the proportion of worksites that offer nutrition or weight management classes or counseling.[5]

Previous studies have investigated the association between certain employment characteristics and obesity among workers. For example, a cross-sectional study showed that mean BMI increased with the number of hours worked per week among 1086 transit workers in the United States.[11] Another U.S. study using national data reported that the prevalence of obesity varied by occupations, in which the obesity prevalence rates in 2002 were highest for officials/administrators (38%) among men and material-moving equipment operators (53%) among women.[18] From the 2005 National Health Survey in Australia, men in managerial/administrative, professional, tradesperson, elementary clerical sales/service worker, and laborer occupations had significantly lower odds for being overweight or obese (BMI ≥ 25 kg/m^2) than men without occupations, after controlling for socioeconomic and behavioral characteristics. Similarly, women in managerial/administrative, advanced clerical/service worker, and intermediate clerical sales/service worker occupations had significantly lower odds for being overweight or obese (BMI ≥ 25 kg/m^2) than women without occupations, after controlling for socioeconomic and behavioral characteristics.[19]

Moreover, low physical activity at their worksite was a significant risk factor for obesity in middle-aged male workers but not in female workers.[17] However, these studies used small and nonnationally representative samples.[11,17] Given that only limited employment characteristics have been examined in previous studies (e.g., number of hours worked per week and occupations), there is a need for corroborating previous findings as well as identifying novel employment characteristics by using national data. Such information could help employers better develop and target interventions for obesity prevention and control in the workplaces. The purposes of this exploratory, cross-sectional analysis were to assess weight status by demographic and behavioral characteristics, as well as socioeconomic status (SES), and to examine associations between employment characteristics and obesity prevalence among a sample representing the civilian noninstitutionalized employed U.S. adults in 2010.

METHODS

Sample and Survey Administration

For this cross-sectional study, we used publicly available data from the 2010 National Health Interview Survey (NHIS).[20] The NHIS is a household survey conducted continuously since 1957 by the Centers for Disease Control and Prevention's (CDC's) National Center for Health Statistics (NCHS). The NHIS was approved by the Research Ethics Review Board at CDC's NCHS. The NHIS used a multistage sampling design with face-to face interviews in a sample of households representative of the civilian noninstitutionalized U.S. population. Information on health status and other characteristics of each family member was obtained via face-to-face interviews. Some data were collected about all members of the family and more detailed data were collected from one randomly selected child (the "sample child") or one randomly selected adult (the "sample adult"). Every year, several supplements appeared on the NHIS questionnaire. A Cancer Control Supplement in 2010 NHIS included dietary intake data, and it was administered to a sample of adults. In our study, we analyzed data from the survey's Sample Adult File, Cancer Control File, Family File, and Person File. The final 2010 Sample Adult Module response rate was 60.8% and included a total of 27,157 sample adults aged ≥18 years.

We limited our analysis to respondents who reported being employed during the previous week. "Employed" was defined as "working for pay at a job or business," "with a job or business but not at work," or "working, but not for pay, at a family-owned job or business."[21] Of those 15,649 respondents classified as "employed," we excluded 528 adults who did not have BMI data, leaving an analytic sample of 15,121 employed adults. The analytic sample had a higher proportion of younger adults and males than did the excluded NHIS respondents, but the two groups did not differ significantly by race/ethnicity. In addition, unknown values or missing data for exposure variables ranged from 0.1% to 5.2% and were excluded from analyses when the variable was used.

Weight Status

The main outcome measure was weight status. BMI was calculated from weight and height (kg/m^2) reported by respondents during a face-to-face interview and categorized as

underweight (BMI < 18.5), normal weight (BMI 18.5 to <25), overweight (BMI 25 to <30), or obese (BMI ≥ 30).[22]

Employment Characteristics

Five employment characteristics captured in NHIS were the main exposure variables, and mutually exclusive response categories were created for each. The number of employees was categorized as 1 to 24, 25 to 99, 100 to 499, or ≥500 employees.[23,24] Hours worked during the last week were categorized as <30, 30 to <40, 40, >40 to 50, and >50 hours/week. Paid by the hour, paid sick leave, and health insurance offered at workplace were all categorized as "yes" or "no." We included number of employees on the basis of a previous study showing that wellness programs at worksites vary by number of employees.[25] We included hours worked in the last week to corroborate previous findings that did not use national data.[11] Although previous studies did not include payment schedule, paid sick leave, and health insurance status, we included these novel exposure variables to explore their potential association with BMI on the basis that most employers recognize that health benefits are one of top factors that prospective employees consider.[26,27] Of note, a previous study using nationally representative data examined occupations with obesity and found significant associations,[18] so we controlled for occupations in our analysis.

Demographic and Behavioral Characteristics and SES of Workers

Mutually exclusive response categories were created for variables on demographic and behavioral characteristics and SES of workers. Demographic and SES variables included were age (18–24, 25–39, 40–59, or ≥60 years), sex, race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, or other/multiracial), and marital status (married/domestic partnership or not married). Not married included widowed, divorced, separated, or never married. Education level was categorized as below high school, high-school graduate, or recipient of a General Education Development (GED) Certificate, some college, or college graduate. Annual family income was categorized as,<$35,000, $35,000 to $74,999, $75,000 to $99,999, or ≥$100,000. Regions of residence were categorized as Northeast, Midwest, South, and West.

SSBs included regular soda, fruit drinks, sports/energy drinks, and sweetened coffee/tea drinks with added sugars during the previous month, and their consumption was categorized as 0, >0 to <1, 1 to <2, or ≥2 times/day. The consumption of fruits (including fresh, frozen, or canned fruit and 100% fruit juice) and vegetables (green leafy salad, potatoes, cooked dried beans, and other vegetables) during the previous month was categorized as <5 or ≥5 times/day to be consistent with previous analyses.[28,29] Vigorous and/or light/moderate leisure-time physical activity at least 10 minutes was categorized as none, >0 to 3, >3 to 5, >5 times/week (combined the following two questions: "How often do you do vigorous leisure-time physical activities for at least 10 minutes that cause heavy sweating or large increases in breathing or heart rate?" and "How often do you do light or moderate leisure-time physical activities for at least 10 minutes that cause only light sweating or a slight to moderate increase in breathing or heart rate?"). Smoking status was categorized as never, former, or current smokers.

Analysis

Chi-square tests were used to examine the bivariate relationships between weight status and the variables described above. $p < .05$ was the cutoff for statistical significance. Multivariate logistic regression modeling was used to estimate the adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for the relationships between the employment characteristics and the likelihood of obesity, using normal weight as the reference group. Of note, although the likelihood of underweight or overweight was estimated in the multivariate logistic regression model, for the purpose of this study we only presented the OR for being obese. The multivariate logistic regression model included all five employment characteristics in one model and controlled for age, sex, race/ethnicity, education level, annual family income, fruit and vegetable intake, leisure-time physical activity, smoking status, and occupations (n = 13,335). Employed adults who were included in the model had higher proportions of adults aged 25 to 39 years and females than employed adults who were not included in the model, but there was no difference in race/ethnicity. Based on previous studies, aforementioned sociodemographic and behavioral variables and occupations were associated with obesity, and thus we included them as covariates in the current study.[15-18,30,31] The sample weight variable from the Sample Adult File was applied to all analyses to provide valid estimates for the civilian noninstitutionalized U.S. population. All statistical analyses were performed with SAS software version 9.3 (2011, SAS Institute, Cary, North Carolina) and incorporated appropriate procedures to account for the complex sample design.

RESULTS

The distribution of demographic and behavioral characteristics and SES, as well as their associations with weight status, are shown in Tables 1 and 2. Nationally, 1.4% of employed adults were underweight, 34.8% were normal weight, 36.1% were overweight, and 27.7% were obese. Weight status varied by all demographic and behavioral characteristics and SES (χ^2 tests, $p < .05$ for all variables). The prevalence of obesity was highest among adults aged 40 to 59 years, males, non-Hispanic blacks, those who were married or lived with a partner, those with a high school/GED education, those with an annual family income of $35,000 to $74,999, adults living in the South or Midwest, those who did not consume SSBs daily, those who consumed fruits and vegetables <5 times/day, physically inactive individuals, and former smokers.

Table 3 illustrates the distribution of employment characteristics and their associations with weight status. Weight status varied by all five employment characteristics (χ^2 tests, $p < .05$ for all variables). The prevalence of obesity was highest among those who worked at a company with 100 to 499 employees, those who worked >50 hours/week, those who were paid by the hour, those with paid sick leave, and those who worked at a company offering health insurance.

Results of the multivariate logistic regression analysis are shown in Table 4. Using the normal-weight employees as the reference group, the odds of being obese were greater among employees who worked at a company with 100 to 499 employees (OR = 1.19, 95% CI = 1.02–1.39) vs. with 1 to 24 employees and those who worked >50 hours/week (OR = 1.32, 95% CI = 1.05–1.65) vs. <30 hours/week after controlling for age, sex, race/ethnicity,

education level, annual family income, fruit and vegetable intake, any leisuretime physical activity, smoking status, and occupations.

DISCUSSION

Our findings indicated that almost two-thirds of employed U.S. adults nationwide were overweight or obese, with 28% being obese. Similar to our study, the prevalence of obesity among workers ranged from 24% to 30% in previous studies based on measured or self-reported data.[17,32-34] Since excess weight has been associated with increased medical expenditures, absenteeism, and productivity loss,[33] intervention efforts, including those in the workplace, can help support employees in making healthier choices and thus help control and prevent obesity and its subsequent disease risks.

We found that working at a midsize company (i.e., 100–499 employees) compared to a smaller size company, was significantly associated with increased odds of obesity. However, working at a larger-size company (i.e., ≥500 employees) was not significantly associated with obesity in the present study. The underlying reasons for these differences are unclear. Because this cross-sectional study was based on self-reported data, we cannot make conclusions on the causal relationship between company size and obesity. A further clinical trial that investigates obesity based on measured weight and height is needed to identify the disparities in obesity prevalence by company size. Nonetheless, because midsize and large-size companies may have the ability to offer employees food and physical activity options on-site, they may want to consider implementing worksite wellness guidelines or policies, such as nutrition guidelines for their food service facilities. They could increase their options for foods and beverages through healthful choices and differential pricing, consider offering wellness programs that promote healthy eating and active living, or consider providing incentives for weight-management programs.[35] For example, results from the 2004 National Worksite Health Promotion Survey reported that among employers with ≥750 employees, only 43% offered nutrition programs and 66.1% offered physical activity programs to their employees.[25] Increased attention to improving the nutritional quality of food prepared, served, and purchased may be important to consider for larger employers who offer dining or vending options within the workplace. Guidelines for the health and sustainability of federal food service operations have been recently published and can be adapted for nonfederal venues.[36]

Consistent with previous studies,[11,17] we found that employees who worked >50 hours/week had 32% higher odds of obesity than those who worked <30 hours/week. It is possible that prolonged working hours might increase stress-induced overeating, skipping meals, snacking, purchasing lunch, occupational sitting time, and leave less time for physical activity, which has all been associated with obesity.[17,37,38] For example, one U.S. study showed that workers with stress-induced overeating were about 3 times more likely to be obese than their counterparts.[17] Another U.S. study reported that obese workers had 37% higher odds for purchasing lunch ≥2 times/week than underweight/normal-weight workers, and the typical source for purchasing lunch was a fast-food restaurant.[38] Additionally, an Australian study reported that workers with occupational sitting time ≥6 hours/day had 48% higher odds for being overweight and obese compared to those with occupational sitting

time <45 minutes/day among 1306 full-time workers (≥18 years).[37] Church et al[31] showed that the prevalence of light/sedentary-intensity occupation has increased, but moderate-intensity occupation has decreased from 1960 to 2010 among U.S. adults. Also, occupation-related daily energy expenditure has decreased more than 100 calories in both men and women, and this decrease in energy expenditure might be responsible for a substantial portion of the increase in mean body weight for both men and women during the past 5 decades.[31]

We found no significant associations between employees with paid sick leave or those with health insurance offered in the workplace and obesity after controlling for sociodemographic and other employment characteristics. In-consistent with our findings, health benefits were one of the key factors that prospective employees cogitate,[26,27] and one study showed that obese workers were significantly more likely to have jobs with employment-based health insurance than normal-weight workers.[39] Furthermore, in that study, a company offering employment-based health insurance was more likely to have a mid-employment size (>100 employees).[39] Employers may want to encourage their employees to use health insurance options for obesity screening and counseling and other services such as referrals to trained nutrition and physical activity specialists.

As most U.S. adults are employed,[40] worksites are important settings for obesity prevention and control for their employees. Worksite obesity prevention programs can be a way for employers to decrease the prevalence of obesity, reduce their obesity-related medical insurance expenses, and increase productivity of employees.[41] In addition to providing worksite obesity prevention programs for employees, employers can consider increasing access to healthier food and beverage options in their worksites. A study of transit workers found that two-thirds of workers disagreed that it is easy to eat healthy at work and more than half of workers agreed that it is hard to get fruits and vegetables at work.[11]

In the present study, the prevalence of obesity was lower among employees who consumed SSBs than those who did not consume SSBs during the previous month. It is possible that obese employees might underreport their SSB consumption or decrease their SSB consumption as a strategy for losing weight. These concepts are supported by other studies, which reported that obese adults were more likely to underreport their energy intake[42] and adults who were trying to lose weight were less likely to drink SSB.[43]

The major strengths of our study are that it is based on a large, nationally representative sample of employed U.S. workers with a relatively high response rate. However, our results are subject to limitations. First, because the study was cross-sectional, we could not determine the directionality of the associations we found between obesity and employment characteristics. Second, because BMI data are based on self-reported weight and height, our results were potentially subject to reporting bias. Weight is usually underreported and height is usually overreported, and this bias is larger among overweight and obese adults than underweight/normal-weight adults.[44,45] Thus, the prevalence of obesity may be underestimated in this study. However, measured and self-reported BMI are shown to be highly correlated among adults (coefficient >.9).[46] Third, we were not able to assess the existence of worksite wellness policies or worksite obesity prevention programs because

NHIS did not collect this information. Lastly, there might be bias due to differences in respondents and nonrespondents for the five employment characteristics.

In conclusion, our results indicated that about 3 out of 10 employed U.S. adults were obese and, moreover, 6 of 10 were overweight or obese. We also found that working at a midsize company and working more than 50 hours per week were associated with being obese. A better understanding of why these employment characteristics are associated with obesity could help employers better develop and target interventions for obesity prevention and control in the worksites.

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References

1. Wang YC, McPherson K, Marsh T, et al. Health and economic burden of the projected obesity trends in the USA and the UK. Lancet. 2011; 378(9793):815–825. [PubMed: 21872750]
2. Finkelstein EA, Ruhm CJ, Kosa KM. Economic causes and consequences of obesity. Annu Rev Public Health. 2005; 26:239–257. [PubMed: 15760288]
3. National Heart Lung and Blood Institute. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults—the evidence report; National Institutes of Health. Obes Res. 1998; 6(suppl 2):51S–209S. [PubMed: 9813653]
4. US Dept of Health and Human Services. The Surgeon General's call to action to prevent and decrease overweight and obesity. US Public Health Service, Office of the Surgeon General; Rockville, Md: Available at: http://www.surgeongeneral.gov/topics/obesity/calltoaction/CalltoAction.pdf [Accessed May 29, 2013]
5. US Dept of Health and Human Services. [Accessed May 29, 2013] Healthy People Objective 2020. Available at: http://healthypeople.gov/2020/topicsobjectives2020/default.aspx
6. Flegal KM, Carroll MD, Kit BK, Ogden CL. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999-2010. JAMA. 2012; 307:491–497. [PubMed: 22253363]
7. Finkelstein EA, Trogdon JG, Cohen JW, Dietz W. Annual medical spending attributable to obesity: payer-and service-specific estimates. Health Aff (Millwood). 2009; 28:w822–w831. [PubMed: 19635784]
8. Goetzel RZ, Pei X, Tabrizi MJ, et al. Ten modifiable health risk factors are linked to more than one-fifth of employer-employee health care spending. Health Aff (Millwood). 2012; 31:2474–2484. [PubMed: 23129678]
9. US Dept of Labor. Bureau of Labor Statistics. [Accessed May 29, 2013] Household data annual averages, Table 8: employed and unemployed full- and part-time workers by age, sex, race, and Hispanic or Latino ethnicity. Available at: http://www.bls.gov/cps/cpsaat08.pdf
10. US Dept of Labor. Bureau of Labor Statistics. [Accessed May 29, 2013] American Time Use Survey— 2010 results. Available at: http://www.bls.gov/news.release/atus.nr0.htm
11. Escoto KH, French SA, Harnack LJ, et al. Work hours, weight status, and weight-related behaviors: a study of metro transit workers. Int J Behav Nutr Phys Act. 2010; 7:91. [PubMed: 21172014]
12. Malik VS, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systematic review. Am J Clin Nutr. 2006; 84:274–288. [PubMed: 16895873]
13. Malik VS, Hu FB. Sweeteners and risk of obesity and type 2 diabetes: the role of sugar-sweetened beverages. Curr Diab Rep. 2012; 12:195–203.
14. Swinburn BA, Sacks G, Hall KD, et al. The global obesity pandemic: shaped by global drivers and local environments. Lancet. 2011; 378(9793):804–814. [PubMed: 21872749]

15. Ledikwe JH, Blanck HM, Kettel Khan L, et al. Dietary energy density is associated with energy intake and weight status in US adults. Am J Clin Nutr. 2006; 83:1362–1368. [PubMed: 16762948]
16. Brown WJ, Miller YD, Miller R. Sitting time and work patterns as indicators of overweight and obesity in Australian adults. Int J Obes Relat Metab Disord. 2003; 27:1340–1346. [PubMed: 14574344]
17. Choi B, Schnall PL, Yang H, et al. Sedentary work, low physical job demand, and obesity in US workers. Am J Ind Med. 2010; 53:1088–1101. [PubMed: 20737422]
18. Caban AJ, Lee DJ, Fleming LE, et al. Obesity in US workers: The National Health Interview Survey, 1986 to 2002. Am J Public Health. 2005; 95:1614–1622. [PubMed: 16051934]
19. Allman-Farinelli MA, Chey T, Merom D, Bauman AE. Occupational risk of overweight and obesity: an analysis of the Australian Health Survey. J Occup Med Toxicol. 2010; 5:14. [PubMed: 20550716]
20. Centers for Disease Control and Prevention. National Health Interview Survey (NHIS) Public Use Data Release. NHIS Survey Description. National Center for Health Statistics; Hyattsville, Md: 2010. Availableat:ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2010/srvydesc.pdf [Accessed May 29, 2013]
21. Driscoll, AK.; Bernstein, AB. Health and Access to Care Among Employed and Unemployed Adults: United States, 2009-2010: NCHS Data Brief. National Center for Health Statistics; Hyattsville, Md: 2012. p. 83
22. National Heart, Lung, and Blood Institute. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: the evidence report. National Institutes of Health; 1998. NIH Publication No. 98-4083Available at: http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf [Accessed May 29, 2013]
23. US Dept of Health and Human Services. [Accessed May 29, 2013] Small businesses and the Affordable Care Act. Available at: http://www.healthcare.gov/news/factsheets/2011/08/small-business.html
24. US Small Business Administration. [Accessed May 29, 2013] Summary of size standards by industry. Available at: http://www.sba.gov/content/summary-size-standards-industry
25. Linnan L, Bowling M, Childress J, et al. Results of the 2004 National Worksite Health Promotion Survey. Am J Public Health. 2008; 98:1503–1509. [PubMed: 18048790]
26. Heinen L, Darling H. Addressing obesity in the workplace: the role of employers. Milbank Q. 2009; 87:101–122. [PubMed: 19298417]
27. National Business Group on Health. [Accessed May 29, 2013] Employees and their health benefits: perceptions, values and trade-offs. 2007. Available at: http://www.businessgrouphealth.org/resources/topics/publications.cfm?tid=66
28. Lutfiyya MN, Chang LF, Lipsky MS. A cross-sectional study of US rural adults' consumption of fruits and vegetables: do they consume at least five servings daily? BMC Public Health. 2012; 12:280. [PubMed: 22490063]
29. Fang J, Keenan NL, Ayala C, et al. Fruits and vegetables intake and physical activity among hypertensive adults in the United States: behavioral risk factor surveillance system, 2003 and 2007. Am J Hypertens. 2010; 23:762–766. [PubMed: 20300071]
30. Tate DF, Turner-McGrievy G, Lyons E, et al. Replacing caloric beverages with water or diet beverages for weight loss in adults: main results of the Choose Healthy Options Consciously Everyday (CHOICE) randomized clinical trial. Am J Clin Nutr. 2012; 95:555–563. [PubMed: 22301929]
31. Church TS, Thomas DM, Tudor-Locke C, et al. Trends over 5 decades in US occupation-related physical activity and their associations with obesity. PLoS One. 2011; 6:e19657. [PubMed: 21647427]
32. Ostbye T, Dement JM, Krause KM. Obesity and workers' compensation: results from the Duke Health and Safety Surveillance System. Arch Intern Med. 2007; 167:766–773. [PubMed: 17452538]
33. Finkelstein EA, DiBonaventura M, Burgess SM, Hale BC. The costs of obesity in the workplace. J Occup Environ Med. 2010; 52:971–976. [PubMed: 20881629]

34. Hertz RP, Unger AN, McDonald M, et al. The impact of obesity on work limitations and cardiovascular risk factors in the US workforce. J Occup Environ Med. 2004; 46:1196–1203. [PubMed: 15591970]
35. Centers for Disease Control and Prevention. [Accessed May 29, 2013] The CDC Worksite Health ScoreCard: an assessment tool for employers to prevent heart disease, stroke, & related health conditions. Available at: http://www.cdc.gov/dhdsp/pubs/docs/HSC_Manual.pdf
36. Centers for Disease Control and Prevention. [Accessed May 29, 2013] Health and sustainability guidelines for federal concessions and vending operations. Available at: http://www.cdc.gov/chronicdisease/pdf/Guidelines_for_Federal_Concessions_and_Vending_Operations.pdf
37. Mummery WK, Schofield GM, Steele R, et al. Occupational sitting time and overweight and obesity in Australian workers. Am J Prev Med. 2005; 29:91–97. [PubMed: 16005804]
38. Blanck HM, Yaroch AL, Atienza AA, et al. Factors influencing lunchtime food choices among working Americans. Health Educ Behav. 2009; 36:289–301. [PubMed: 17602103]
39. Fong RL, Franks P. Body mass index and employment-based health insurance. BMC Health Serv Res. 2008; 8:101. [PubMed: 18471293]
40. US Dept of Labor, Bureau of Labor Statistics. [Accessed May 29, 2013] Household data annual averages: Table 1, employment status of the civilian noninstitutional population, 1941 to date. Available at: http://www.bls.gov/cps/cpsaat01.pdf
41. Centers for Disease Control and Prevention. [Accessed May 29, 2013] CDC's LEAN Works!: a workplace obesity prevention program. Available at: http://www.cdc.gov/leanworks/
42. Hill RJ, Davies PS. The validity of self-reported energy intake as determined using the doubly labelled water technique. Br J Nutr. 2001; 85:415–430. [PubMed: 11348556]
43. Bleich SN, Wang YC, Wang Y, Gortmaker SL. Increasing consumption of sugar-sweetened beverages among US adults: 1988-1994 to 1999-2004. Am J Clin Nutr. 2009; 89:372–381. [PubMed: 19056548]
44. Merrill RM, Richardson JS. Validity of self-reported height, weight, and body mass index: findings from the National Health and Nutrition Examination Survey, 2001-2006. Prev Chronic Dis. 2009; 6:A121. [PubMed: 19754997]
45. Nieto-Garcia FJ, Bush TL, Keyl PM. Body mass definitions of obesity: sensitivity and specificity using self-reported weight and height. Epidemiology. 1990; 1:146–152. [PubMed: 2073502]
46. McAdams MA, Van Dam RM, Hu FB. Comparison of self-reported and measured BMI as correlates of disease markers in US adults. Obesity (Silver Spring). 2007; 15:188–196. [PubMed: 17228047]

SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known on this topic?

In a cross-sectional study, mean body mass index increased with number of hours worked per week among transit workers. Another study reported that the prevalence of obesity varied by occupation. Low physical activity at their worksite was a significant risk factor for obesity in middle-aged male workers, but not in female workers.

What does this article add?

Nationwide, about 3 out of 10 employees were obese and 6 out of 10 were overweight or obese. The odds of being obese were significantly greater among adults who worked at a company with 100 to 499 employees vs. with 1 to 24 employees and those who worked >50 hours/week vs. <30 hours/week.

What are the implications for health promotion practice or research?

The prevalence of overweight or obesity is high among U.S. employees. Certain employment characteristics might be associated with a higher prevalence of obesity among U.S. employees. A better understanding of why these employment characteristics are associated with obesity could help employers better develop and target intervention efforts for obesity prevention and control in the workplaces.

Table 1

Sociodemographic Characteristics of the Study Population and Their Associations With Weight Status Among Employed U.S. Adults*—National Health Interview Survey, 2010

	Weighted, % (SE)					
		Weight Status				
Sociodemographic Characteristic	All	Underweight	Normal Weight	Overweight	Obese	*p* †
Total (unweighted, N = 15,121)	100	1.4 (0.1)	34.8 (0.5)	36.1 (0.5)	27.7 (0.4)	
Age, y (n = 15,121)						
18–24	12.9 (0.4)	3.2 (0.6)	53.3 (1.5)	25.3 (1.4)	18.2 (1.1)	<0.0001
25–39	32.6 (0.5)	1.4 (0.2)	37.3 (0.8)	35.4 (0.8)	25.9 (0.7)	
40–59	43.7 (0.5)	0.9 (0.1)	29.1 (0.7)	38.4 (0.7)	31.7 (0.7)	
≥60	10.8 (0.3)	1.2 (0.2)	28.7 (1.3)	42.1 (1.4)	28.1 (1.2)	
Sex (n = 15,121)						
Male	53.7 (0.5)	0.7 (0.1)	27.5 (0.7)	43.5 (0.7)	28.2 (0.6)	<0.0001
Female	46.3 (0.5)	2.1 (0.2)	43.4 (0.7)	27.5 (0.6)	27.0 (0.6)	
Race/ethnicity (n = 15,121)						
White, non-Hispanic	68.7 (0.6)	1.4 (0.1)	36.6 (0.6)	35.5 (0.6)	26.5 (0.5)	<0.0001
Black, non-Hispanic	10.6 (0.4)	0.9 (0.3)	26.0 (1.3)	35.5 (1.5)	37.7 (1.4)	
Hispanic	14.2 (0.4)	0.6 (0.2)	26.8 (0.9)	42.1 (1.1)	30.5 (1.0)	
Other/multiracial	6.6 (0.3)	3.4 (0.6)	48.1 (2.0)	30.3 (1.7)	18.2 (1.4)	
Marital status (n = 15,097)						
Married/domestic partnership	64.8 (0.5)	0.9 (0.1)	32.4 (0.6)	38.2 (0.6)	28.4 (0.6)	<0.0001
Not married	35.2 (0.5)	2.2 (0.3)	39.3 (0.8)	32.3 (0.7)	26.3 (0.6)	
Education level (n = 15,086)						
<High school	9.5 (0.3)	0.7 (0.2)	30.5 (1.5)	40.2 (1.4)	28.6 (1.3)	<0.0001
High school/GED	24.9 (0.4)	1.6 (0.3)	30.7 (1.0)	35.8 (1.0)	31.9 (0.9)	
Some college	31.5 (0.5)	1.6 (0.2)	33.2 (0.8)	34.8 (0.9)	30.4 (0.8)	
≥College graduate	34.1 (0.6)	1.1 (0.2)	40.5 (0.9)	36.5 (0.8)	21.9 (0.8)	
Annual family income (n = 14,480)						
≤$34,999	24.1 (0.5)	1.7 (0.2)	37.2 (0.9)	33.6 (0.8)	27.5 (0.8)	<0.0001
$35,000-$74,999	34.5 (0.5)	1.4 (0.2)	32.3 (0.8)	35.6 (0.8)	30.7 (0.7)	
$75,000-$99,999	15.0 (0.4)	1.4 (0.3)	31.8 (1.3)	37.4 (1.3)	29.5 (1.2)	
≥$100,000	26.4 (0.6)	0.9 (0.2)	37.6 (1.1)	38.1 (1.1)	23.4 (1.0)	
Region of residence (n = 15,121)						
Northeast	17.6 (0.6)	1.0 (0.3)	37.7 (1.4)	36.1 (1.4)	25.2 (1.2)	<0.0001
Midwest	23.8 (0.7)	1.5 (0.2)	34.1 (1.1)	34.8 (1.0)	29.5 (0.8)	
South	35.1 (0.7)	1.5 (0.2)	32.4 (0.7)	36.3 (0.8)	29.8 (0.7)	
West	23.5 (0.6)	1.3 (0.2)	37.1 (1.1)	37.2 (0.9)	24.4 (1.0)	

*Employment was defined as having worked at a job during the previous week. GED indicates General Education Development.

†Chi-square tests were used for each variable to examine differences across categories.

Table 2

Behavioral Characteristics of the Study Population and Their Associations With Weight Status Among Employed U.S. Adults[*]—National Health Interview Survey, 2010

	Weighted, % (SE)					
		Weight Status				
Behavioral Characteristic	All	Underweight	Normal Weight	Overweight	Obese	*p* [†]
Sugar-sweetened beverage intake[‡] (unweighted, n = 14,341)						
0 times/d	9.6 (0.3)	1.3 (0.3)	35.0 (1.6)	32.6 (1.4)	31.0 (1.5)	0.03
>0 to <1 time/d	25.9 (0.5)	1.6 (0.3)	35.0 (1.0)	35.7 (1.0)	27.7 (0.9)	
1 to <2 times/d	33.7 (0.5)	1.1 (0.2)	36.0 (0.8)	36.7 (0.8)	26.3 (0.8)	
≥2 times/d	30.8 (0.5)	1.6 (0.2)	33.4 (0.9)	36.8 (0.9)	28.2 (0.8)	
Fruit and vegetable intake (n = 15,121)						
<5 times/d	92.8 (0.3)	1.3 (0.1)	34.5 (0.5)	36.2 (0.5)	28.0 (0.4)	0.001
≥5 times/d	7.2 (0.3)	2.4 (0.5)	39.2 (1.9)	34.7 (1.7)	23.7 (1.5)	
Any leisure-time physical activity ≥ 10 min (n = 14,910)						
None	26.3 (0.5)	1.7 (0.2)	31.8 (0.8)	32.9 (0.9)	33.6 (0.9)	<0.0001
>0 to 3 times/wk	24.9 (0.5)	1.4 (0.2)	32.0 (0.9)	36.1 (0.9)	30.5 (0.9)	
>3 to 5 times/wk	14.6 (0.4)	1.0 (0.3)	35.4 (1.3)	40.4 (1.3)	23.3 (1.1)	
>5 times/wk	34.2 (0.6)	1.3 (0.2)	39.0 (0.8)	36.7 (0.8)	23.0 (0.7)	
Smoking status (n = 15,105)						
Never smoked	61.3 (0.5)	1.3 (0.1)	35.9 (0.6)	35.8 (0.7)	27.0 (0.6)	<0.0001
Former smokers	19.4 (0.4)	0.8 (0.2)	27.7 (0.9)	39.4 (1.1)	32.1 (1.0)	
Current smokers	19.2 (0.4)	2.2 (0.4)	38.9 (1.1)	33.6 (1.0)	25.3 (1.0)	

[*] Employment was defined as having worked at a job during the previous week.

[†] Chi-square tests were used for each variable to examine differences across categories.

[‡] Includes nondiet soda, fruit drinks, sports and energy drinks, and sweetened coffee/tea drinks.

Table 3

Employment Characteristics and Their Associations With Weight Status Among Employed U.S. Adults*—National Health Interview Survey, 2010

	Weighted, % (SE)					
		Weight Status				
Employment Characteristic	All	Underweight	Normal Weight	Overweight	Obese	*p* †
No. of employees (unweighted, n = 14,631)						
1–24	41.4 (0.6)	1.7 (0.2)	35.3 (0.7)	35.8 (0.7)	27.1 (0.7)	0.01
25–99	22.2 (0.5)	1.4 (0.3)	36.9 (1.1)	34.9 (1.0)	26.8 (1.0)	
100–499	18.8 (0.4)	1.0 (0.2)	32.5 (1.1)	36.4 (1.1)	30.1 (1.0)	
≥500	17.5 (0.4)	0.9 (0.2)	33.8 (1.1)	37.4 (1.1)	27.9 (1.0)	
Hours worked during the last week (n = 14,846)						
<30 h/wk	16.8 (0.4)	2.5 (0.4)	39.5 (1.1)	33.6 (1.1)	24.3 (1.1)	<0.0001
30 to <40 h/wk	14.2 (0.4)	2.1 (0.4)	39.4 (1.2)	32.4 (1.2)	26.1 (1.1)	
40 h/wk	41.7 (0.5)	1.1 (0.2)	33.8 (0.7)	37.1 (0.7)	27.9 (0.6)	
>40 to 50 h/wk	16.1 (0.4)	0.8 (0.2)	31.5 (1.2)	38.4 (1.2)	29.3 (1.2)	
>50 h/wk	11.3 (0.3)	0.6 (0.2)	29.9 (1.3)	38.4 (1.4)	31.1 (1.3)	
Paid by the hour (n = 15,084)						
Yes	57.7 (0.5)	1.6 (0.2)	34.6 (0.6)	35.0 (0.6)	28.8 (0.6)	0.0004
No	42.3 (0.5)	1.1 (0.1)	35.1 (0.7)	37.7 (0.8)	26.2 (0.7)	
Paid sick leave (n = 14,991)						
Yes	54.2 (0.5)	0.8 (0.1)	33.9 (0.7)	36.7 (0.7)	28.6 (0.6)	<0.0001
No	45.8 (0.5)	2.0 (0.2)	35.9 (0.7)	35.5 (0.7)	26.6 (0.6)	
Health insurance offered at workplace (n = 14,989)						
Yes	66.1 (0.5)	1.0 (0.1)	33.4 (0.6)	36.9 (0.6)	28.8 (0.5)	<0.0001
No	33.9 (0.5)	2.1 (0.2)	37.6 (0.9)	34.7 (0.8)	25.6 (0.7)	

*Employment was defined as having worked at a job during the previous week.

†Chi-square tests were used for each variable to examine differences across categories.

Table 4

Associations Between Employment Characteristics and Obesity Among Employed U.S. Adults[*]—National Health Interview Survey, 2010 (n = 13,335)

Employment Characteristic	Being Obese (BMI ≥ 30 kg/m^2)[†]	
	Adjusted Odds Ratio[‡]	95% Confidence Interval
No. of employees		
1–24	Reference	
25–99	0.96	0.83–1.11
100–499	**1.19**[§]	1.02–1.39
≥500	1.08	0.92–1.27
Hours worked during the last week		
< 30 h/wk	Reference	
30 to <40 h/wk	0.96	0.78–1.16
40 h/wk	1.06	0.88–1.27
>40 to 50 h/wk	1.20	0.96–1.49
>50 h/wk	**1.32**[§]	1.05–1.65
Paid by the hour		
Yes	1.10	0.97–1.24
No	Reference	
Paid sick leave		
Yes	1.04	0.90–1.19
No	Reference	
Health insurance offered at workplace		
Yes	1.14	0.97–1.33
No	Reference	

[*] Employment was defined as having worked at a job during the previous week. BMI indicates body mass index.

[†] Reference group was normal-weight (BMI, 18.5 to <25 kg/m^2) employed adults.

[‡] Controlled for age, sex, race/ethnicity, education, family income, fruit and vegetable intake, leisure-time physical activity, smoking, and occupations.

[§] Confidence intervals for bolded odds ratios did not include 1.