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Comparing work productivity in obesity and binge eating

Ruth Striegel Weissman
Comparing Work Productivity in Obesity and Binge Eating

Ruth H. Striegel, PhD1*
Richard Bedrosian, PhD2
Chun Wang, PhD2

ABSTRACT
Objective: To examine productivity impairment in individuals with obesity and/or binge eating.

Method: Based on current weight and eating behavior, 117,272 employees who had completed a health risk appraisal and psychosocial functioning questionnaire were classified into one of four groups. Gender-stratified analyses compared groups on four measures: absenteeism, presenteeism, total work productivity impairment, and (non-work) activity impairment.

Results: Overall group differences were statistically significant for all measures with lowest impairment in non-obese men and women without binge eating (n = 34,090, n = 39,198), higher levels in individuals without binge eating (n = 15,570, n = 16,625), yet higher levels in non-obese men and women with binge eating (n = 1,381, n = 2,674), and highest levels in obese men and women with binge eating (Group 4, n = 2,739, n = 4,176).

Discussion: Health initiatives for obese employees should include screening and interventions for employees with binge eating. © 2012 by Wiley Periodicals, Inc.

Keywords: work productivity; binge eating; obesity; depression

Introduction

To date, few economic burden-of-illness studies in the obesity field have focused on individuals who report binge eating. Research has found that individuals who binge eat report diminished health-related quality of life and psychosocial functioning compared to individuals who do not binge eat.1–3 Binge eating may contribute to functional impairment because individuals who binge eat tend to be obese1 and/or because binge eating is associated with general distress and psychiatric comorbidity.2–3

To disentangle the respective contributions of obesity and disordered eating to diminished psychosocial functioning, two recent studies classified participants into four groups based on obesity and eating disorder status.4–5 An Australian study of 4,643 women found that obesity and eating disorder status each were associated significantly with role impairment.4 Because the study combined various eating disorder symptoms, specific conclusions about the association between binge eating and impairment cannot be drawn. Another study classified women and men based on meeting lifetime criteria for binge eating disorder (BED). Although the non-obese/BED group and the obese/BED group reported more “days out of role” (i.e., days when they were impaired in fulfilling responsibilities arising from major life roles such as being a worker, student, or parent) in the past 30 days than individuals without BED these differences did not reach statistical significance.5 It is possible that by using “lifetime” rather than “current” BED this study underestimated the association between BED and work productivity impairment.

The present study expanded upon these studies by (1) including women and men; (2) focusing specifically on binge eating (rather than a mix of symptoms); (3) asking whether any current binge eating would be associated with elevated work productivity impairment; (4) examining two aspects of role impairment: work productivity impairment and non-work activity impairment. We hypothesized that individuals meeting criteria for obesity and binge eating would report the highest levels of impairment and non-obese individuals with no binge eating would report the least impairment. Given the limited prior data, we refrained from formulating hypotheses about possible differences between

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*Correspondence to: Ruth H. Striegel, Ph.D., Department of Psychology, Wesleyan University, 207 High Street, Middletown, CT 06459. E-mail: rstriegel@wesleyan.edu
the obese/no binge eating and non-obese/binge eating groups.

Method

Study Sample

The sample included 117,272 adults (53.4% female) aged ≥ 18 and < 65 years who completed an online health risk assessment questionnaire and measures of psychosocial functioning, worked for pay in the past 4 weeks ≥ 20 h/week, and were not pregnant or had not given birth in the past three months. A majority of participants reported being white (87.7%), married (73.3%), and in a white collar job (75.7%); 49.6% held a college degree; and 20.1% met study criteria for current depression.

Instrument and Procedure

Binge eating was measured using up to four questions. (1) "Do you ever eat what other people would consider an unusually large amount of food?" ("overeating"; yes/no; if no, question 3 was not offered); (2) "In the past month did you feel like you lost control of your eating?" ("loss of control"; yes/no; if no, question 4 was not offered); (3) "In the past month, how many times have you eaten what other people would consider an unusually large amount of food?" and (4) "In the past month, how many times did you feel you lost control of your eating?" Binge eating was coded "present" only if the participant reported overeating and loss of control ≥ 1/month.

Participants were classified as currently depressed if they scored ≥ 1 on the 10-item Center for Epidemiological Studies-Depression Scale (CES-D) or reported currently being treated for depression (in which case they did not receive the CES-D).

A modified Work Productivity Activity Impairment questionnaire (WPAI) was used: to minimize the impact of transient sickness on productivity, questions referred to the past 4 weeks (rather than the past 7 days). The WPAI includes questions measuring how many work hours the participant had missed for health reasons (Q1); work hours missed for non-health reasons (Q2); hours actually worked (Q3); and how much health problems affected productivity while working (on a scale from 0 = no effect to 10 = "health problems completely prevented me from working") ("presenteeism") (Q4). Absenteeism = Q1/(Q1 + Q3), presenteeism = Q4/10, and overall work productivity impairment due to health = Q1/(Q1+Q3) + [(1-Q1/(Q1+Q3)) × (Q4/10)]. Non-work activity impairment ("activity impairment") was measured as the average of an 11-point scale, asking whether "health problems affect your ability to do your daily activities, other than work or a job" (0 = no effect, 10 = health problems completely prevented me from doing my daily activities). Responses were recoded as Q5/10 and expressed in percent (i.e., a score of 1 means the individual is 100% impaired in non-work activities).

Data Analysis

Based on obesity (body mass index ≥ 30) and binge eating status (≥ one episode/past month), four mutually exclusive groups were created. Group differences in work productivity and non-work activity impairment were examined separately for men and women, using General Linear Model (GLM) adjusted for age, ethnicity, education level, marital status, type of job, and depression. Post hoc pair-wise tests were performed with Bonferroni adjustment for multiple comparisons. Given the large sample size, a p value < .001 (two-sided) was adopted. Each pair-wise comparison was tested at a significance level of 0.00017 (0.001/6 pairs). Effect sizes were assessed by Partial Eta Squared, \( \eta^2 \) (0.01, 0.06, 0.14 being small, medium, and large effects). PASW Statistics 18 for WINDOWS (SPSS Inc. Chicago) was used.

Results and Discussion

Over half of the sample was non-obese and did not report binge eating (63.9% men, 62.5% women); about one-third met criteria for obesity (28.5% men, 26.5% women); roughly 10% reported binge eating (7.5% men, 11% women); and binge eating was more common among obese men (5%) and women (6.7%) than non-obese men (2.5%) and women (4.3%). In men and women, depression was least common in the non-obese/no binge eating group (11.5%, 20.1%), second lowest in the obese/no binge eating group (14.6%, 27.8%), second highest in the non-obese/binge eating group (34.4%, 44.7%), and most common in the obese/binge eating group (37.7%, 49.6%). These patterns of prevalence of binge eating by gender and obesity status are consistent with published findings.

As shown in Table 1, among men and women, overall group differences were significant for all four impairment indicators in models adjusted for depression (a major correlate of productivity impairment and of binge eating). Hence, the impairments observed in those who reported binge eating did not appear to be simply a function of depressive symptoms. We cannot rule out that the higher levels of impairment reported by individuals with binge eating were attributable to more general psychiatric symptoms. We believe that by adjusting for depression we offer initial evidence that binge eating is associated with psychosocial impairment in its own right yet we acknowledge that future
TABLE 1. Work productivity and nonwork activity impairment in men and women classified according to obesity and binge eating status

<table>
<thead>
<tr>
<th></th>
<th>Nonobese, Binge No, (N = 34,909)</th>
<th>Obese, Binge No, (N = 15,570)</th>
<th>Nonobese, Binge Yes, (N = 1,381)</th>
<th>Obese, Binge Yes, (N = 2,739)</th>
<th>(F)</th>
<th>(p), Effect Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Work-productivity Impairment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>6.36%</td>
<td>7.46%</td>
<td>9.28%</td>
<td>11.92%</td>
<td>(F(3, 54,589) = 156.81)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.009)</td>
</tr>
<tr>
<td>SE</td>
<td>0.07%</td>
<td>0.11%</td>
<td>0.37%</td>
<td>0.27%</td>
<td>(F(3, 54,589) = 26.18)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.001)</td>
</tr>
<tr>
<td><strong>Absenteeism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(F(3, 54,589) = 152.90)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.008)</td>
</tr>
<tr>
<td>Mean</td>
<td>0.73%</td>
<td>0.91%</td>
<td>0.68%</td>
<td>1.24%</td>
<td>(F(3, 54,589) = 26.18)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.001)</td>
</tr>
<tr>
<td>SE</td>
<td>0.02%</td>
<td>0.03%</td>
<td>0.09%</td>
<td>0.07%</td>
<td>(F(3, 54,589) = 152.90)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.008)</td>
</tr>
<tr>
<td><strong>Presenteeism</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(F(3, 54,589) = 26.18)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.001)</td>
</tr>
<tr>
<td>Mean</td>
<td>5.82%</td>
<td>6.96%</td>
<td>8.75%</td>
<td>11.07%</td>
<td>(F(3, 54,589) = 152.90)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.008)</td>
</tr>
<tr>
<td>SE</td>
<td>0.07%</td>
<td>0.11%</td>
<td>0.36%</td>
<td>0.26%</td>
<td>(F(3, 54,589) = 26.18)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.001)</td>
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<tr>
<td><strong>Non-Work Activity Impairment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(F(3, 54,589) = 26.18)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.001)</td>
</tr>
<tr>
<td>Mean</td>
<td>7.34%</td>
<td>9.01%</td>
<td>11.92%</td>
<td>15.24%</td>
<td>(F(3, 54,589) = 262.13)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.014)</td>
</tr>
<tr>
<td>SE</td>
<td>0.08%</td>
<td>0.12%</td>
<td>0.41%</td>
<td>0.30%</td>
<td>(F(3, 54,589) = 262.13)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.014)</td>
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<td></td>
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<td></td>
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<td></td>
<td>(F(3, 54,589) = 262.13)</td>
<td>(p &lt; .0001), (\eta^2_p = 0.014)</td>
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</table>

Studies are needed to further explore this association in light of other forms of psychiatric comorbidity. Of further note, we found significant associations between binge eating status and impairment despite using a low threshold (one episode/past month) and not requiring additional symptoms for case designation or full-syndrome BED. This result, if replicated in independent studies, suggests that even low frequency occurrence of binge eating is associated with impairment in work and non-work related activities. Effect sizes were small, however, suggesting that other variables not measured in this study are important for a full understanding of work productivity and non-work activity impairment in individuals reporting binge eating.

The overall pattern of findings regarding obesity, binge eating, and work productivity- and activity impairment was quite similar in men and women. In both genders, increasing levels of impairment in presenteeism and in non-work activities were observed across the four groups with lowest impairments in non-obese individuals who did not report binge eating and highest levels in obese individuals who reported binge eating. This pattern of a progression of impairment from non-obese, no binge eating to obese, no binge eating to non-obese with binge eating and, finally, greatest impairment among obese individuals with binge eating is consistent with results of the Collaborative Psychiatric Epidemiology Survey. There were a few exceptions to this overall pattern. Among men, obese individuals who did not binge eat reported less presenteeism than did non-obese individuals with binge eating; in contrast, these group comparisons were not significant among women. Post hoc comparisons on activity impairment showed that among men, all groups differed significantly and binge eating in non-obese men was associated with greater disturbance than obesity in the absence of binge eating. In contrast, for women no significant differences were observed when comparing obese women who did not binge eat versus non-obese women who did binge eat. Others have found that gender moderates the association between obesity and clinical correlates.

Limitations included the fact that the sample comprised mostly white, highly educated employees in white-collar jobs, limiting generalizability of results to more diverse employee samples; data were based on self-report which is subject to bias and recall error; binge eating was inferred from two separate questions whereby the second question (whether the respondent experienced a sense of loss of control over eating) was not specifically tied
to the first question (whether the respondent experienced episodes of overeating); and, as noted by others,\textsuperscript{13–14} measurement of presenteeism remains a challenge. These limitations are offset by several strengths, including a non-clinical sample and the large number of individuals who reported binge eating. Given the focus on the relationship between obesity and binge eating on work productivity impairment, inclusion of an employed sample ensured that the questions about work productivity were applicable to everyone in the sample.

In conclusion, to our knowledge, ours is the first study to focus specifically on work productivity in individuals with binge eating. Its findings suggest significant associations of binge eating and work productivity impairment and the diminished work productivity does not appear to simply be a function of depressed mood. Our findings need to be replicated in independent studies.

Dr. Striegel is a paid consultant of Wellness and Prevention, Inc., a Johnson & Johnson company.

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References