


ORIGINAL PAPER

Impact of binge eating disorder on functional impairment and work productivity in an adult community sample in the United States

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Summary

Aim: This study compared functioning and productivity in individuals meeting *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)* diagnostic criteria for binge eating disorder (BED) to those without BED.

Methods: A sample of US adults from the National Health and Wellness Survey completed an Internet survey in October 2013. In addition to BED diagnostic criteria, the survey assessed functional impairment and productivity, respectively, using the Sheehan Disability Scale (SDS) and Work Productivity and Activity Impairment (WPAI) questionnaire. Differences between BED and non-BED respondents were assessed using multivariate models controlling for factors, including age, sex and comorbidities.

Results: Of 22 397 respondents, 344 were categorised as BED respondents and 20 437 as non-BED respondents. Compared with non-BED respondents, BED respondents exhibited significantly (all $P < .001$) greater functional impairment on the SDS, as measured by mean \pm SD total (14.04 \pm 9.46 vs 3.41 \pm 6.36), work/school (3.86 \pm 3.62 vs 1.01 \pm 2.21), social life/leisure activities (5.29 \pm 3.49 vs 1.22 \pm 2.33) and family life/home responsibilities (4.89 \pm 3.44 vs 1.18 \pm 2.26) scores. Adjusted odds ratios (95% CIs) indicated that BED respondents were more impaired than non-BED respondents on the work/school (4.24 [3.33–5.40]), social life/leisure activities (6.37 [4.97–8.15]) and family life/home responsibilities (5.76 [4.51–7.34]) domains of the SDS. On the WPAI, BED respondents reported significantly (all $P < .001$) higher percentages (mean \pm SD) of absenteeism (9.59% \pm 19.97% vs 2.90% \pm 12.95%), presenteeism (30.00% \pm 31.64% vs 10.86% \pm 20.07%), work productivity loss (33.19% \pm 33.85% vs 12.60% \pm 23.22%) and activity impairment (43.52% \pm 34.36% vs 19.94% \pm 27.22%) than non-BED respondents.

Conclusions: The findings suggest individuals with BED experience considerable impairment in functioning and work productivity compared with individuals without BED.

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1 | BACKGROUND

Binge eating disorder (BED), the most common eating disorder,^{1,2} received designation as a distinct eating disorder in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*.³ Although previous studies indicate that BED is associated with impaired daily functioning and productivity, the data are limited. In the World Health Organization (WHO) Mental Health Surveys, role impairment based on the Sheehan Disability Scale (SDS), which assesses functional impairment in three domains (work/school, social life/leisure activities and family life/home responsibilities),⁴ was reported by 46.7% of individuals meeting *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)* diagnostic criteria for BED, with 13.2% reporting severe role impairment.² The WHO surveys also reported that early-onset BED (ie, onset before completion of one's education) was associated with a reduced likelihood of being married among women and a reduced likelihood of being employed among men.⁵ On the Work Productivity and Activity Impairment (WPAI) scale,⁶ individuals who reported binge eating behaviour also reported greater impairment in work productivity and non-work activities, as well as increased rates of absenteeism than individuals who did not report binge eating.^{7,8}

Because BED only received formal diagnostic status in 2013,³ there are no published studies describing daily functioning and productivity impairment in individuals who meet *DSM-5* BED criteria. A large community-based Internet survey (Validate Attitudes and Lifestyle Issues in Depression, ADHD and Troubles with Eating [VALIDATE]) reported that the projected 12-month prevalence of BED in the United States based on *DSM-5* criteria was 1.64% in a representative population of adults.⁹ Although the primary objective of the VALIDATE survey was to estimate the prevalence of BED, the survey also collected detailed information on daily functioning and work productivity/daily activity using the SDS and WPAI, respectively. In the current report, levels of impaired functioning and productivity in individuals who met BED *DSM-5* diagnostic criteria are described and compared with those in individuals who did not meet BED criteria.

2 | METHODS

2.1 | Sample and procedures

The overall survey procedures and recruited sample have previously been described.⁹ In brief, the National Health and Wellness Survey (NHWS) is a self-administered Internet survey completed by approximately 75 000 US adults each year.¹⁰ A total of 69 972 respondents from the 2012 and 2013 NHWS (n=71 157 from January to December 2012 and n=75 000 from January to September 2013) were sent invitations to participate. A stratified random sample framework was implemented to ensure representation across sex, age and ethnicity. The demographic profile of NHWS respondents has been shown to approximate that of the Current Population Survey of the US Census Bureau.^{11,12}

What's known

- The World Health Organization Mental Health Surveys reported role impairment in 46.7% of individuals meeting *DSM-IV-TR* diagnostic criteria for binge eating disorder, as measured by the Sheehan Disability Scale.
- Binge eating is associated with impaired work productivity and decreased productivity of individuals with BED leads to increased employer costs.

What's new

- On the Sheehan Disability Scale, survey respondents meeting *DSM-5* criteria for binge eating disorder exhibited significantly more impairment across all functional domains and significantly higher numbers of days lost and underproductive days.
- On the Work Productivity and Activity Impairment questionnaire, survey respondents meeting *DSM-5* criteria for binge eating disorder reported significantly higher levels of absenteeism, presenteeism, work productivity loss and daily activity impairment.

The VALIDATE survey was conducted between 9 October and 29 October 2013. The survey protocol was approved by an Institutional Review Board (Sterling, Institutional Review Board #4509) before initiation, and participants provided consent before completing the survey. The survey included questions designed to assess *DSM-5* and *DSM-IV-TR* criteria for BED (Table 1), demographics, general health, self-esteem, diagnosed psychiatric disorders, functioning and productivity. The results of some of these assessments have already been described.⁹

2.2 | Respondent groups

Based on initial survey responses, 344 respondents were categorised as BED respondents (ie, those who met all *DSM-5* diagnostic criteria for BED in the past 12 months) and 20 437 were categorised as non-BED respondents. Non-BED respondents may or may not have reported periods during which they ate large amounts of food; if they did report the consumption of a large amount of food, they did not acknowledge a feeling of loss of control during the overeating episode. A total of 1616 respondents were excluded from the analyses because they met some, but not all, of the *DSM-5* criteria for BED in the past 12 months. Individuals who did not meet all of the *DSM-5* BED criteria in the past 12 months were excluded from the analyses because it was deemed to be the most conservative way to conduct the analyses. By excluding individuals who exhibited any level of eating disorder symptomatology, levels of disability and functional impairment in non-BED respondents would not be compromised.

TABLE 1 Sample survey questions related to DSM-5 BED diagnostic criteria^{a,b}

Question	Response
During the past 3 months, were there times you ate an amount of food within 2 hours that was definitely larger than most people would eat in a similar period of time under similar circumstances?	<ul style="list-style-type: none"> • Yes • No
Considering the times in the past 3 months when you ate an unusually large amount of food, did you feel that you could not stop eating or control what or how much you were eating?	<ul style="list-style-type: none"> • Yes • No
Thinking about past 3 months, how long have these periods of eating unusually large amounts of food and feeling that your eating was out of control been occurring?	<ul style="list-style-type: none"> • Less than 1 month • 1 month • 2 months • 3 months
You previously answered that in the past 3 months you ate unusually large amounts of food and felt that your eating was out of control. During the weeks that you ate in this manner (ie, ate unusually large amounts and felt out of control), how many times per week did you do so?	<ul style="list-style-type: none"> • Less than once a week • 1 day per week • 2-3 days per week • 4-5 days per week • 6-7 days per week
During the past 3 months, how upset were you by the feeling that you couldn't stop eating or control what or how much you were eating?	<ul style="list-style-type: none"> • Not at all • Slightly • Moderately • Greatly • Extremely
Considering the time(s) in the past 3 months you ate an unusually large amount of food and felt that your eating was out of control, did you also experience any of the following?	<ul style="list-style-type: none"> • Yes or No for each of the following: <ul style="list-style-type: none"> ○ Feeling disgusted with yourself, depressed, or very guilty after eating ○ Eating much more rapidly than normal ○ Eating alone because you feel embarrassed about how much you are eating ○ Eating large amounts of food when not feeling physically hungry ○ Eating until feeling uncomfortably full

^aSimilar questions were asked for 12-month and 1-year timeframes. ^bCossrow N, Pawaskar M, Witt EA, Victor TW, Herman BK, et al. Estimating the prevalence of binge eating disorder in a community sample from the United States: comparing DSM-IV-TR and DSM-5 criteria, *The Journal of Clinical Psychiatry*. 2016;78(8):e968-974. Copyright 2016, Physicians Postgraduate Press. Adapted by permission.

2.3 | Measures

All respondents provided self-reported information related to demographics and socioeconomic status. They were also asked whether they were aware of or had ever been diagnosed with a number of psychiatric comorbidities (including anxiety, attention-deficit/hyperactivity disorder [ADHD], bipolar disorder, major depressive disorder, obsessive compulsive disorder and panic disorder) and medical conditions (including diabetes, hypertension and migraines) by a healthcare professional. Self-reported comorbidity levels were categorised using the 1987 version of the Charlson Comorbidity Index (CCI),¹³ which did not include depression. Based on previously described procedures,¹³ each reported comorbidity was assigned a score of 1, 2, 3 or 6; based on a total comorbidity score, each individual was then assigned to 1 of 4 categories (0, 1, 2 or ≥3).

Functional impairment was assessed using the SDS, a validated measure of functional impairment involving work, family and social life.¹⁴ Participants rated the impact of their illness on work/school, social life/leisure activities and family life/home responsibilities in the past month using an 11-point scale (0 [no impairment] to 10 [most severe]); the total score range for the combined scales ranges from 0 to 30.⁴ The SDS also measures the number of work days lost and the number of underproductive work days.¹⁵

Work productivity and daily activity impairment were evaluated using the WPAI, a measure consisting of four metrics, with higher scores indicating greater impairment and lower productivity.^{6,16} The WPAI was used to assess absenteeism (ie, the percentage of work time missed because of one's health), presenteeism (ie, the percentage of impairment experienced while at work because of one's health), overall work productivity loss (ie, an overall impairment estimate consisting of the sum of absenteeism and presenteeism) and activity impairment (ie, the percentage of impairment in daily activities because of one's health) in the past 7 days. Only respondents who reported being employed full- or part-time provided data for absenteeism, presenteeism and overall work impairment; all respondents provided daily activity impairment data.

2.4 | Data analysis and statistics

Unadjusted SDS and WPAI scores are reported using descriptive statistics. In addition, the percentage of respondents who scored ≥5 on any of the SDS domains is reported because this is considered a clinically significant level of impairment.¹⁴ Categorical variables were analysed using chi-squared tests or two-sided tests of equality for proportions; continuous variables were analysed using *t* tests.

Multivariate models controlling for age, body mass index (BMI), sex, income, education, pregnancy status, anxiety diagnosis, ADHD/attention-deficit disorder (ADD) diagnoses, depression diagnosis and CCI scores were conducted. Generalised linear models with negative binomial distributions were used to assess continuous variables, and estimated means are reported. Logistic regressions were used to assess categorical variables (ie, SDS domain impairment) and odds ratios with 95% CIs are reported. Unadjusted odds ratios were calculated from 2x2 frequency tables (BED vs non-BED respondents by SDS domain impairment vs no impairment). Adjusted odds ratios were calculated via logistic regression models controlling for age, BMI, sex, income, education, pregnancy status, anxiety diagnosis, ADHD/ADD diagnosis, depression diagnosis and the CCI.

3 | RESULTS

3.1 | Respondent demographics

Demographics have previously been reported in detail.⁹ In brief, a higher proportion of respondents were women (54.4% [12 182/22 397]), White (82.7% [18 515/22 397]) and ≥40 years (72.8% [16 315/22 397]). Compared with non-BED respondents, BED respondents had a significantly higher mean±SD BMI (33.71±9.36 vs 27.96±6.68 kg/m²; *P*<.001).

TABLE 2 Demographics

	Non-BED respondents, n (%) (n=20 437)	BED respondents, n (%) (n=344)	<i>P</i> values
Mean±SD age ^a	51.59±15.80	46.01±14.32	<.001
Female ^a	10 968 (53.7)	242 (70.3)	<.001
Race			.854
White	16 946 (82.9)	286 (83.1)	
Black	1798 (8.8)	32 (9.3)	
Other	1693 (8.3)	26 (7.6)	
College degree	11 539 (56.5)	161 (46.8)	<.001
Labour force participation			
Unemployed	8598 (42.1)	124 (36.0)	NS
Employed	10 771 (52.7)	190 (55.2)	NS
Disabled	1068 (5.2)	30 (8.7)	<.05
Income range, \$			
<25 000	3405 (16.7)	72 (20.9)	NS
25 000 to <50 000	5423 (26.5)	96 (27.9)	NS
50 000 to <75 000	4418 (21.6)	79 (23.0)	NS
≥75 000	5814 (28.4)	87 (25.3)	NS
Declined to answer	1377 (6.7)	10 (2.9)	<.05
Psychiatric comorbidities ^a			
Depression (lifetime diagnosis)	3518 (17.2)	181 (52.6)	<.001
Anxiety (lifetime diagnosis)	3098 (15.2)	149 (43.3)	<.001
ADHD (past 6 months)	1400 (6.9)	142 (41.3)	<.05
Bipolar disorder (lifetime diagnosis)	356 (1.7)	36 (10.5)	<.001

ADHD, attention-deficit/hyperactivity disorder; NS, not significant. ^aPreviously reported.⁹

Table 2 summarises demographics related to age, sex, race, education, income distribution, employment and psychiatric comorbidities. BED respondents were significantly younger (*P*<.001) than non-BED respondents and a significantly greater percentage of BED than non-BED respondents were women (*P*<.001). A significantly higher proportion of BED than non-BED respondents were disabled (*P*<.05) and had diagnoses of depression (lifetime; *P*<.001), anxiety (lifetime; *P*<.001), ADHD (past 6 months; *P*<.05) and bipolar disorder (lifetime; *P*<.001). Significantly fewer BED than non-BED respondents had received a college degree (*P*<.001). There were no significant differences in employment status or in any single income level between BED and non-BED respondents, but a significantly higher percentage of BED respondents declined to provide income information. Mean±SD scores on the CCI were significantly higher in BED than non-BED respondents (0.64±1.24 vs 0.43±1.24; *P*=.002).

3.2 | Sheehan Disability Scale

Compared with non-BED respondents, BED respondents had significantly higher (all *P*<.001) unadjusted mean±SD scores for SDS total, work/school, social life/leisure activities and family life/home responsibility impairments in the past month (Table 3). For all SDS domains, significantly higher proportions of BED than non-BED respondents were classified as impaired (ie, scored ≥5) (Table 3; all *P*<.001). BED

TABLE 3 Unadjusted SDS and WPAI scores

	Non-BED respondents (n=20 437)	BED respondents (n=344)	P values
SDS work/school impairment			
Mean±SD	1.01±2.21	3.86±3.62	<.001
Impaired (score ≥5), n (%)	2161 (10.6)	153 (44.5)	<.001
SDS social life/leisure activities impairment			
Mean±SD	1.22±2.33	5.29±3.49	<.001
Impaired (score ≥5), n (%)	2566 (12.6)	205 (59.6)	<.001
SDS home life/family responsibilities impairment			
Mean±SD	1.18±2.26	4.89±3.44	<.001
Impaired (score ≥5), n (%)	2443 (12.0)	194 (56.4)	<.001
SDS total score, mean±SD	3.41±6.36	14.04±9.46	<.001
SDS days lost (past month), mean±SD	0.82±4.00	3.08±7.03	<.001
SDS underproductive days (past month), mean±SD	1.31±4.80	6.03±9.29	<.001
WPAI, mean±SD			
Percent absenteeism ^a	2.90±12.95	9.59±19.17	<.001
Percent presenteeism ^a	10.86±20.07	30.00±31.64	<.001
Percent work productivity loss ^a	12.60±23.22	33.19±33.85	<.001
Percent daily activity impairment	19.94±27.22	43.52±34.36	<.001
WPAI hours missed from work (last 7 days), mean±SD			
Because of health problems, including sick days	0.85±4.48	2.52±6.25	<.001
Because of any other reasons, including vacation	1.35±5.04	2.31±8.58	.138
WPAI hours actually worked (last 7 days), mean±SD	35.48±14.22	30.69±14.85	<.001

BED, binge eating disorder; SDS, Sheehan Disability Scale; WPAI, Work Productivity and Activity Impairment questionnaire. ^aEmployed respondents only (non-BED respondents, n=9456; BED respondents, n=178).

respondents also reported significantly more days lost and underproductive days in the past month than non-BED respondents (Table 3; both $P<.001$). Based on the distribution of SDS domain responses (Figure 1A-C), BED respondents were more likely than non-BED respondents to report moderate to extreme impairment levels across all SDS domains.

Compared with non-BED respondents, BED respondents continued to show significantly more impairment on SDS total score ($P<.001$),

SDS domain scores (all $P<.001$) and the number of days underproductive in the past month ($P<.01$) (Figure 2A) after adjusting for age, BMI, sex, income, education, pregnancy status, anxiety diagnosis, ADHD/ADD diagnoses, depression diagnosis and CCI scores. However, the number of days lost in the past month was no longer significantly different after adjusting for these covariates. In all cases, unadjusted and adjusted odds ratios indicated that BED respondents were more impaired than non-BED respondents (Figure 2B). Across all SDS domains, adjusted odds ratios (controlling for age, BMI, sex and the other variables noted previously) were smaller than unadjusted odds ratios.

3.3 | Work Productivity and Activity Impairment Scale

Among employed respondents, unadjusted levels of absenteeism, presenteeism and work productivity loss were significantly higher in BED respondents than in non-BED respondents (Table 3; all $P<.001$). When all respondents were considered, unadjusted daily activity impairment was significantly greater in BED than non-BED respondents (Table 3; $P<.001$). Compared with non-BED respondents, BED respondents also reported significantly more work hours missed in the last 7 days because of health problems and significantly fewer total hours worked in the last 7 days (Table 3; both $P<.001$). After adjusting for covariates (as described previously), levels of presenteeism, work productivity loss and activity impairment remained significantly greater in BED than non-BED respondents (Figure 3). The mean±SEM number of hours missed in the last 7 days because of health problems (non-BED respondents, $0.99±0.89$; BED respondents, $1.97±7.84$) and in the total number of hours actually worked in the last 7 days (non-BED respondents, $30.44±0.40$; BED respondents, $30.19±1.71$) were not significant ($P=.866$ and $.885$, respectively) after adjusting for covariates.

4 | DISCUSSION

To our knowledge, this is the first and the largest study to assess impairments in functioning, work productivity and daily activities in a representative sample of US adults meeting DSM-5 diagnostic criteria for BED. The key findings of significantly higher impairment in functioning in the past month, as measured by the SDS, and impairment in work productivity and daily functioning in the past 7 days, as measured by the WPAI, highlight the burden of BED.

On the SDS, BED respondents exhibited significantly more impairment across all functional domains, with the most pronounced impairment being in the social life domain, and significantly higher numbers of days lost and underproductive days. On the WPAI, BED respondents reported significantly higher levels of absenteeism, presenteeism, work productivity loss and daily activity impairment. The observed impairments in functionality and productivity among BED respondents largely persisted after adjusting for covariates, with only differences in the number of days lost (on the SDS) and absenteeism, the number of hours missed because of health problems and the total number of hours worked (on the WPAI) not being statistically significant.

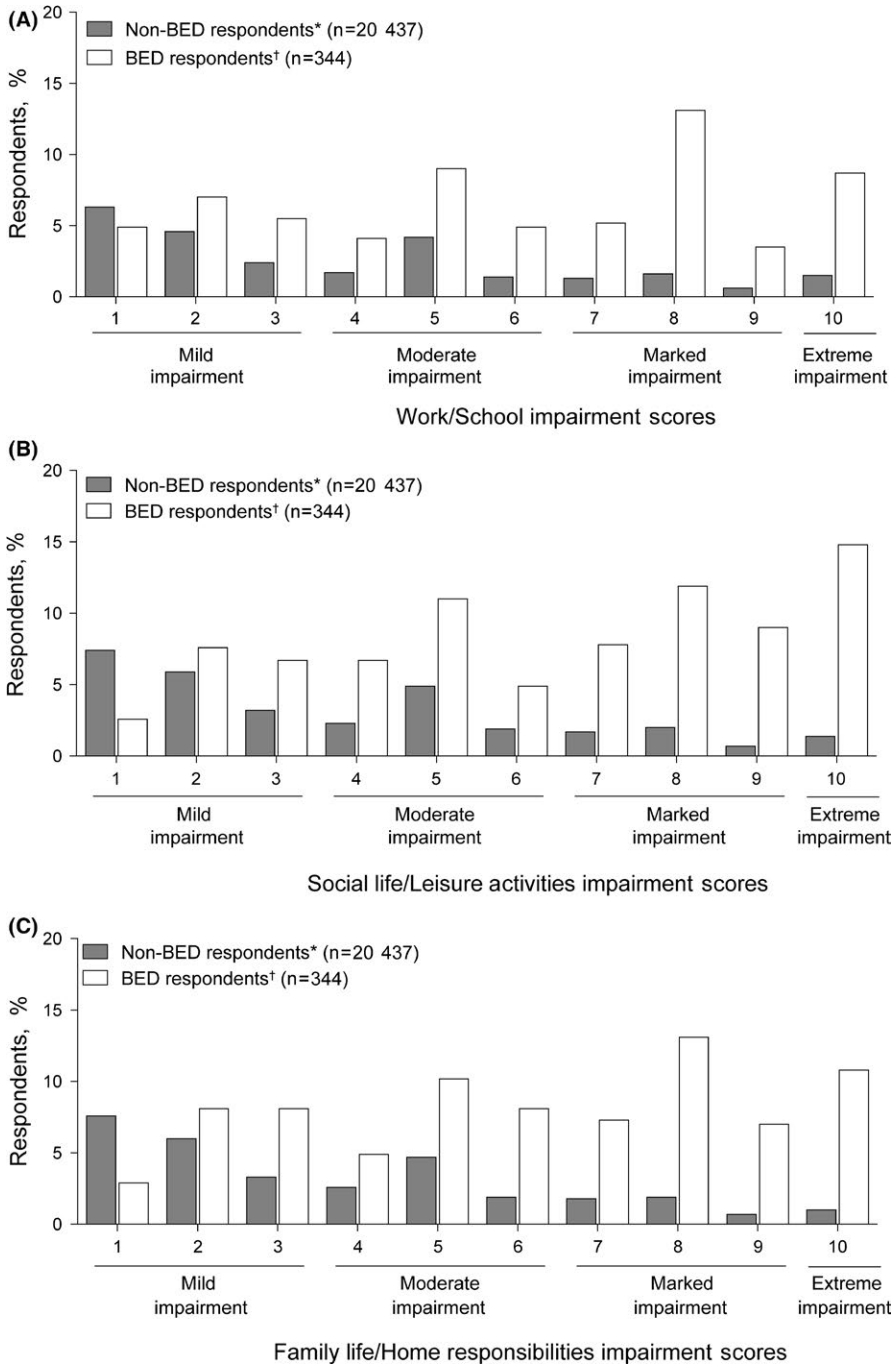


FIGURE 1 Unadjusted SDS (A) work/school, (B) social life/leisure activities and (C) family life/home responsibilities score distributions. BED, binge eating disorder; SDS, Sheehan Disability Scale. *Non-BED respondents reporting 0/not at all impaired (work/school, 74.4%; social life, 68.5%; family life, 68.5%). †BED respondents reporting 0/not at all impaired (work/school, 34.0%; social life, 16.9%; family life, 19.5%)

The degree of functional impairment (mean±SD SDS total score) in the past month reported here in BED respondents (14.04±9.46) is of a similar magnitude to reports in individuals with major depressive disorder (13.0±7.4), generalised anxiety disorder (11.0±8.2) and posttraumatic stress disorder (11.0±6.6).¹⁷ In contrast, the degree of work productivity impairment in the past 7 days, as measured by the WPAI, reported in BED respondents (absenteeism: 9.59%±19.17%; presenteeism: 30.0%±31.64%) tended to be smaller in magnitude than in individuals with moderate to severe depressive symptoms (absenteeism + presenteeism: 46.9%–51.3%)¹⁸ or with moderate to severe anxiety (absenteeism: 16%±20%; presenteeism: 45%±30%).¹⁹

The observed functional impairment on the SDS in BED respondents is consistent with previous reports. In two large-scale epidemiologic studies that included individuals meeting *DSM-IV* diagnostic criteria for BED, the percentages of individuals who reported extreme impairment on the SDS ranged from 13.2% to 18.5%.^{1,2} In these same studies, the percentages of individuals with BED reporting extreme impairment on SDS domains ranged from 5.8% to 9.4% for home management, from 0% to 4.3% for work, from 5.4% to 5.7% for personal/close relationships and from 8.2% to 15.9% for social life.^{1,2} While the absolute percentages of BED respondents reporting impairment on the SDS in this study cannot be directly compared with previous studies because of differences in the assessment period (past month

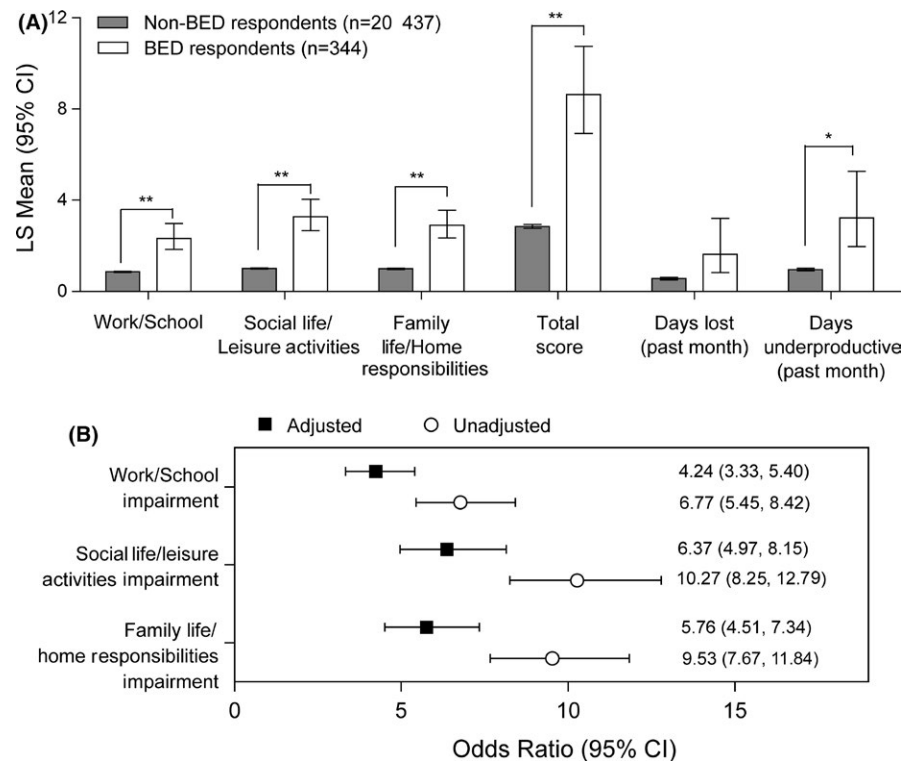
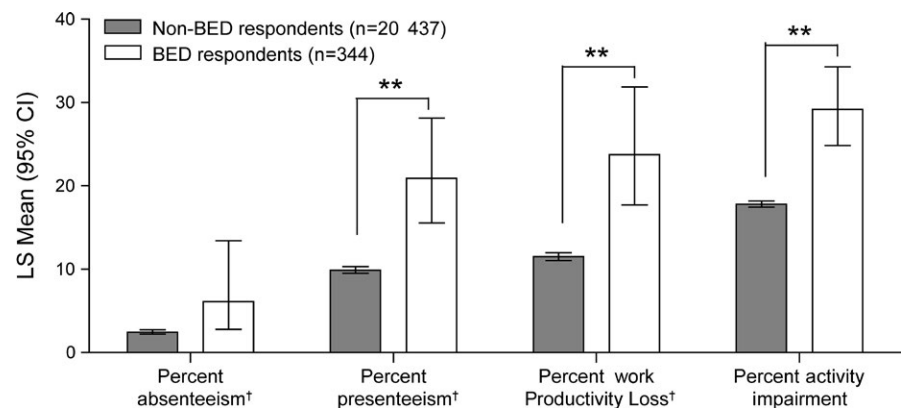


FIGURE 2 A, Adjusted SDS scores, and B, SDS subscale score odds ratios (BED relative to non-BED). BED, binge eating disorder; LS, least squares; SDS, Sheehan Disability Scale. * $P < .01$; ** $P < .001$

FIGURE 3 Adjusted LS mean \pm SD WPAI scores. BED, binge eating disorder; LS, least squares; WPAI, Work Productivity and Activity Impairment questionnaire. ** $P < .001$. †Based on employed respondents only (non-BED respondents, $n = 9456$; BED respondents, $n = 178$)



vs past 7 days), the overall findings across the studies are consistent and indicate that BED is associated with substantial functional impairment. Furthermore, the observation that impairment is most pronounced in the social life/leisure activities domain is consistent across all studies.

The present results in individuals meeting DSM-5 diagnostic criteria for BED are also consistent with previous studies that demonstrated significant impairments in work productivity and daily activity, as measured on the WPAI, in individuals who exhibit binge eating behaviour.^{7,8,20} Bedrosian et al. reported that binge eating was significantly associated with impaired work productivity after controlling for obesity and multiple risk factors (eg, depression and stress); those patients with BED who reported binge eating ≥ 4 times in the past week cost employers an estimated \$1296 each year in lost productivity.²⁰ In a cross-sectional analysis of employees who participated in an online health-risk assessment questionnaire, binge eating was associated

with significantly higher rates of impaired work productivity, non-work-activity impairment, absenteeism and presenteeism regardless of sex or obesity status.⁸

After adjusting for covariates, the number of days lost in the past month reported on the SDS, and absenteeism, the number of hours missed in the last 7 days because of health problems, and the total number of hours worked in the last 7 days reported on the WPAI did not differ significantly between BED and non-BED respondents. However, BED respondents were significantly more likely than non-BED respondents to have unproductive work days, as measured by the SDS, and to report presenteeism, as measured by the WPAI. These findings suggest that lost workplace productivity associated with BED may not be attributable to individuals missing work. Rather, it is the result of these individuals being unproductive while at work.

The key strengths of this study are that it consisted of a large, representative sample of US adults with respect to age, sex, race/

ethnicity and region. Furthermore, it is the first study to evaluate functioning, work productivity and daily activity in individuals who meet DSM-5 diagnostic criteria for BED. However, the current findings need to be considered in the light of some study limitations that could limit the ability to generalise these findings. First, all collected information, including diagnosis, was self-reported and could not be clinically confirmed within the context of the survey. Because comorbidities were based on self-report, it is also not possible to fully understand their severity. As such, some level of functional impairment attributed to BED might be related to the self-reported comorbidities, even though their presence was included as a covariate in the analyses. Second, temporal or causal relationships cannot be determined because of the cross-sectional nature of the study. Third, absolute levels of impairment on the SDS cannot be directly compared with previous studies because of differences in the recall period. Fourth, differences between BED and non-BED respondents may have been reduced if individuals who did not meet strict diagnostic criteria for BED were included in the non-BED respondent group instead of being excluded from the analyses. Lastly, interpretation of the adjusted models is complicated by the fact that there may be complex relationships between the predictor variables. As such, caution is required when interpreting the adjusted results. It should be noted, however, that multicollinearity was examined among all of the covariates used in the regression models. This analysis did not provide evidence for multicollinearity, with all covariates having a tolerance of ≥ 0.73 (most commonly ≥ 0.90) and all variance inflation factors were ≤ 1.38 (most commonly ≤ 1.1).

5 | CONCLUSIONS

Individuals from a large representative sample of US adults who met full DSM-5 diagnostic criteria for BED reported significantly more impairment in functioning, work productivity and daily activities than individuals without BED. These findings highlight the significant burden of BED on functioning and productivity and emphasise the need to recognise and treat BED in the clinical setting.

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AUTHOR CONTRIBUTIONS

MP and DS designed the survey, interpreted the results and contributed to the development of the manuscript. EAW contributed to the design of the survey, conducted the data analyses, assisted in interpretation of the results and contributed to the development of the manuscript. BKH and TAW contributed to the design of the survey, interpreted the results and contributed to the development of the manuscript. All authors critically reviewed the manuscript and approved the submission of the final manuscript.

DISCLOSURES

Manjiri Pawaskar is a former employee of Shire and is now an employee of Merck; she holds stock and/or stock options in Shire and Merck. Dylan Supina is a former employee of Shire and holds stock and/or stock options in Shire. He is currently the Principal at Main Line Analysis LLC (Malvern, PA). Barry Herman is a former employee of Shire and holds stock and/or stock options in Shire; he is currently an employee of Ironshore Pharmaceuticals and Development, Inc (Wayne, PA). Edward A. Witt is a former employee of Kantar Health, which conducted the data collection for the VALIDATE survey and analysed the data on behalf of and with funding from Shire Development LLC. Thomas A. Wadden is an employee of the Perelman School of Medicine at the University of Pennsylvania. Dr. Wadden serves on the advisory boards for Novo Nordisk, Nutrisystem, Orexigen and Weight Watchers. He has received grant support, on behalf of the University of Pennsylvania, from these organisations. He served as a consultant to Shire Pharmaceuticals and Boehringer and as an advisor to Johns Hopkins University on a proprietary weight loss programme (Innergy™).

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