

# Correlates of Co-Occurring Diabetes and Obesity Among Community Mental Health Program Members With Serious Mental Illnesses

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**Objective:** This study examined the prevalence and correlates of co-occurring obesity and diabetes among community mental health program members.

**Methods:** Medical screenings of 457 adults with serious mental illnesses were conducted by researchers and peer wellness specialists in four U.S. states. Body mass index was measured directly. Diabetes was assessed via glycosylated hemoglobin and interview self-report. Multivariable logistic regression analysis examined associations with known predictors.

**Results:** In the sample, 59% were obese, 25% had diabetes, and 19% had both conditions. When gender, diagnosis, and

site were controlled, co-occurring diabetes and obesity was almost three times as likely among African Americans (OR=2.93) as among participants from other racial groups and half as likely among smokers as among nonsmokers (OR=.58). Older persons and those with poorer self-rated physical health also were more likely to have these co-occurring conditions.

**Conclusions:** Results support the need for culturally competent treatment and for smoking cessation options with sensitivity to the potential for weight gain.

*Psychiatric Services in Advance* (doi: 10.1176/appi.ps.201500219)

Adults with serious mental illnesses have greater health disparities, higher medical morbidity, and shorter lifespans than the general population (1). Their greater risk of having conditions such as obesity and diabetes is attributed to such factors as use of psychotropic medications, high fat–low fiber diets, and sedentary lifestyles (2). We sought to examine the prevalence and correlates of co-occurring obesity and diabetes in this population in order to better target interventions for treating both when they co-occur.

Comorbidity of diabetes and obesity among adults with serious psychiatric disorders is well known (2–4), but research on the prevalence and correlates of this co-occurrence is lacking. We identified only one published study of 92 adult outpatients with major mental disorders that assessed the co-occurrence of diabetes and obesity; in that study, 85% of those with diabetes or prediabetes were also obese (5). Yet knowledge regarding who is likely to experience co-occurrence is essential for tailoring treatment. Among those who already have a diagnosis of diabetes, obesity is an independent risk factor for developing cardiovascular disease, and the morbidity and mortality attributable to cardiovascular disease are major challenges in diabetes management (6). Evidence suggests that weight loss positively affects management of blood glucose, blood pressure, and lipid levels among those with diabetes (7). However, comparatively few obese patients with diabetes are routinely offered structured weight

management interventions as an integral part of treatment (6), and this occurs even less frequently for those with serious mental illnesses and co-occurring diabetes and obesity (1).

Given the foregoing gaps in our knowledge, we sought to establish the prevalence and correlates of co-occurring diabetes and obesity in a diverse and sizable population of community mental health program members with serious mental illnesses.

## METHODS

Eligibility criteria included serious mental illness as defined by state statute (that is, *DSM-IV* diagnoses such as schizophrenia, bipolar disorder, and depression with moderate to severe functional impairment), age over 17, and community mental health program patient. The study used a “controlled intervention” design common in health screening research (8), which targets specific communities—here, outpatient programs for people with serious mental illnesses. Research procedures, including written informed consent, were approved by the University of Illinois at Chicago Institutional Review Board.

Participants were 457 adults in four U.S. states—Georgia, Illinois, Maryland, and New Jersey—who were screened for eight common general medical conditions with industry-standard testing procedures. Screening occurred during health fairs designed and operated by a university research center and a

mental health peer-run collaborative (9). Body mass index (BMI) was calculated by using measured height and weight. Glycosylated hemoglobin (HbA1c) was obtained from 434 individuals with the Bayer AICNow system. Diabetes diagnosis and smoking status were assessed via in-person interviews by using items from the National Health and Nutrition Examination Survey Questionnaire (10). Presence of diabetes was defined as HbA1c >6.5 or self-reported diagnosis by a health professional. Physical health was rated by participants on a Likert scale ranging from 1, excellent, to 5, poor (from the 12-Item Short-Form Health Survey).

## RESULTS

Around half (N=247, 54%) of the participants were female. Forty-nine percent (N=223) were white, 39% (N=178) were African American, 4% (N=18) were multiracial, 1% (N=5) were Asian American, 1% (N=5) were American Indian/Alaska Native, and 6% (N=28) were from other racial backgrounds. Seven percent (N=32) were Hispanic/Latino. Twenty percent (N=89) had less than a high school education. Schizophrenia spectrum diagnosis was reported by 44% (N=201), bipolar disorder by 23% (N=105), depression by 25% (N=114), anxiety disorder by 4% (N=18), and personality disorder by 1% (N=5), and the remainder reported other diagnoses. Most (N=420, 92%) reported Medicaid or Medicare health insurance, 10% (N=46) reported private insurance, 2% (N=9) reported care from the Veterans Health Administration, and 4% (N=18) reported "other"; 15% (N=68) reported no health insurance.

Respondents were highly representative of the agencies from which they were drawn, with no significant differences by sex, race, Hispanic/Latino ethnicity, education, age, diagnosis, and health insurance status, except that males were underrepresented in New Jersey (46% study and 59% agency) and those with schizophrenia were overrepresented in Georgia (40% study and 25% agency). Compared with a nationally representative sample of adults with serious mental illnesses (11), the study population was similar (<10% difference) in terms of gender, education, Hispanic ethnicity, age over 60, Medicare, Medicaid, and lack of health insurance coverage; however, the study population had lower proportions of whites, those ages 18 to 39, and those with private health insurance and higher proportions of African Americans, those ages 40 to 59, and those with dual Medicare and Medicaid coverage.

Of 457 individuals screened, 22% (N=100) were overweight (BMI=25.0–29.9), and 59% (N=270) were obese (BMI ≥30), including 18% (N=83) who were morbidly obese (BMI ≥40). Two percent (N=7) were underweight, and 17% (N=75) were normal weight. One-quarter (N=112, 25%) had diabetes. Co-occurrence of obesity and diabetes was 19% (N=87); 78% of those with diabetes were obese, and 32% of obese participants also had diabetes. Although no underweight participants had diabetes, it occurred among 8% (N=6) of normal-weight participants, 19% (N=19) of overweight participants, 29% (N=55) of obese participants, and 39% (N=32) of morbidly obese participants ( $\chi^2=25.96$ ,  $df=4$ ,  $p<.001$ ).

Our multivariable logistic regression model included demographic factors (gender, race, and age), health behaviors

**TABLE 1. Multivariable logistic regression predicting co-occurring diabetes and obesity among 457 individuals with serious mental illness<sup>a</sup>**

Variable	OR	95% CI	p
Female (reference: male)	1.60	.94–2.73	.080
African American (reference: not African American)	2.93	1.73–5.02	.001
Age (years)	1.03	1.01–1.06	.007
Smoker (reference: nonsmoker)	.58	.34–.99	.049
Schizophrenia diagnosis (reference: no schizophrenia diagnosis)	1.79	.72–4.47	.209
Mood disorder diagnosis (reference: no mood disorder diagnosis)	1.40	.53–3.39	.449
Poorer self-reported health <sup>b</sup>	1.52	1.16–2.00	.002

<sup>a</sup> The analysis controlled for study site.

<sup>b</sup> Higher scores indicate worse health.

(smoking), diagnosis (mood disorder and schizophrenia), and perceived health (self-rated physical health) and controlled for study site (Table 1). Compared with participants from other racial groups, African Americans were almost three times as likely (odds ratio [OR]=2.93) to have co-occurring diabetes and obesity. Smokers were about half as likely (OR=.58) as nonsmokers to have co-occurring diabetes and obesity. Older individuals (OR=1.03) and those with poorer self-rated physical health (OR=1.52) were also significantly more likely to have co-occurring obesity and diabetes. Psychiatric diagnoses and gender were not significantly associated with co-occurring obesity and diabetes.

We also tested whether model variables were associated with diabetes and obesity separately (versus co-occurrence). Zero-order correlations (data not shown) showed that African Americans and smokers were not more likely than their comparison groups to have diabetes alone, and older individuals were not more likely than younger ones to have obesity alone. Being female was associated with obesity alone; however, it was not associated with co-occurring diabetes and obesity or with diabetes alone. The only variable associated with co-occurring diabetes and obesity and with each condition alone was poorer self-reported health.

## DISCUSSION

Ours is the first study to report the prevalence and correlates of co-occurring obesity and diabetes in a multistate population of community mental health program members with serious mental illnesses. Research on a nationally representative U.S. adult household population found that 6% of participants reported a diagnosis of diabetes (12), compared with 25% of our respondents. Obesity prevalence in the representative population was 24%, compared with 59% among our participants. Although 31% of the general population with diabetes were obese or morbidly obese, in our study group, 78% of those with diabetes were obese or morbidly obese. Thus the co-occurrence of obesity and diabetes was exponentially higher in our study population than in a nationally representative group of U.S. adults.

The high prevalence of co-occurring obesity and diabetes supports the need for integrated health care, including

screening for both conditions in mental health settings, to enable prevention and early detection. Once identified, people with these co-occurring conditions should be offered diabetes self-management education in tandem with weight reduction interventions. The critical importance of tandem treatment is supported by a 12-year follow-up study of 4,970 overweight individuals with diabetes, which found that intentional weight loss was associated with a 25% reduction in total mortality and a 28% reduction in mortality specific to cardiovascular disease and diabetes (13). Achieving similar mortality reductions for people with mental illnesses is a potentially achievable and worthy target.

Given our finding of a significant association between smoking and co-occurring diabetes and obesity, tandem treatment should offer smoking cessation options with sensitivity to the potential for weight gain, including relapse prevention interventions for former smokers who experience weight increases. Complex challenges faced by this group make it unlikely that traditional smoking cessation treatments (nicotine replacement therapy and psychosocial groups), and traditional weight loss interventions (calorie reduction and increased physical activity) will be successful without tailoring and enhancement.

Another example of how our study's findings can inform tandem interventions is the strong association between being African American and having co-occurring obesity and diabetes. This suggests that culturally competent efforts are needed, such as programs teaching people how to prepare traditional African-American dishes with less salt and fat and programs that involve family members in promoting better nutrition and smoking cessation (14). A final finding with implications for intervention design is the association between poor self-perceived health status and co-occurring obesity and diabetes. This suggests that weight management programs should include physical activities, such as low-impact exercise, for those with less energy and stamina.

Our sample was not derived from population-based or representative sampling, but it has many of the same relevant characteristics as those drawn by using these methods. Other limitations include lack of data on psychiatric medications and lack of information on family history, dietary habits, and levels of physical activity.

## CONCLUSIONS

The combination of obesity, mental illness, and general medical illness is especially costly. In one study of adults with obesity and physical illness, after the analysis controlled for multiple factors, people with mental illnesses were more likely than those without mental illnesses to use emergency services and had higher total, outpatient, and pharmaceutical expenditures (15). Addressing co-occurring diabetes and obesity has the potential to lower health care costs, reduce morbidity and mortality, and enhance quality of life. We hope that our results can be used to inform these efforts.

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This research was funded by the National Institute on Disability, Independent Living, and Rehabilitation Research, U.S. Department of Health and Human Services, Administration on Community Living; and by the Center for Mental Health Services, Substance Abuse and the Mental Health Services Administration, under cooperative agreement 90RT5012 and 90RT5038. The views expressed do not necessarily reflect the policy or position of any federal agency.

The authors report no financial relationships with commercial interests.

Received June 1, 2015; revisions received November 1, 2015, and April 4, 2016; accepted April 25, 2016; published online June 15, 2016.

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