

Association between Obesity and Depression and Anxiety disorders: Results from the 2008 National Health Interview Survey

Dr. Monica R. Gaidhane
drgaidhane@gmail.com

THE FACTS :

- Obesity is considered to be an epidemic of the 21st century
- 30% of the adults age 18 years and over are obese
- Overweight or obesity is associated with increased risk of diabetes, cardiovascular diseases, certain cancers and a shorter life expectancy
- Recent studies show that obesity increases the risk of mood and anxiety disorders
- 18.8 million adults suffer from depression, while 40 million adults have an anxiety disorder

MAJOR FINDINGS FROM THIS STUDY :

- The purpose of this study was to evaluate the impact of Obesity on the prevalence of Depression, Anxiety Disorder and Panic Disorder
- Respondents were asked if they ever had depression, anxiety or panic disorder
- Obesity was significantly associated with an increased prevalence of depression, anxiety disorder and panic disorder
- Obese individuals were 35% more likely to suffer from depression, 22% more likely to suffer from anxiety disorder and 34% more likely to suffer from panic disorder
- Morbidly obese people (BMI above 40) were 85% more likely to suffer from depression, 27% more likely to suffer from anxiety disorder and 34% more likely to suffer from panic disorder
- The presence of hypertension or diabetes did not modify this association

IMPLICATIONS OF THIS STUDY :

- Depression, anxiety disorder and panic disorder more commonly occurred in persons who were obese
- More longitudinal studies are needed to establish causal relationship
- Screening for depression, anxiety disorder and panic disorder in obese persons may be prudent
- Public health & medical professionals need to curb the rising rates of obesity to reduce the incidence and prevalence of particular mental disorders

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Dr. Monica R. Gaidhane , MPH Candidate

Department of Epidemiology and Community Health, Virginia Commonwealth University, Richmond , Virginia

INTRODUCTION

- Over 60% of the adults in the U.S. are either overweight or obese
- With over 300,000 adult deaths related directly or indirectly to obesity, obesity is a major cause of morbidity and mortality
- Recent epidemiological data shows that apart from being a risk factor for atherosclerosis, hypertension, diabetes, cardiovascular diseases, arthritis and certain cancers; obesity also increases the risk of several mental disorders
- Positive associations have been found between higher BMI and depression and anxiety disorders
- Studies also suggest that hypertension and diabetes increase the risk of depression and anxiety disorders

STUDY PURPOSE

To examine the impact of higher Body Mass Index (BMI) on the prevalence of Depression, Anxiety disorder and Panic Disorder

METHODS

Inclusion Criteria:

- 2008 National Health Interview Survey (NHIS) respondents
- One adult per family was randomly selected to participate
- Non-institutionalized adult respondents who had given valid responses to variables considered in this study (N = 20,593)

Determinant Definition:

Body mass index (kg/m²): Underweight (BMI <18.50), Normal Weight (BMI 18.50 – 24.99), Overweight (BMI 25.00 – 29.99), Obese (BMI 30.00-39.99) and Morbidly Obese (BMI > 40.00)

Outcome Definition:

Respondents were asked if they ever had depression, anxiety disorder or panic disorder. Presence or absence of depression, anxiety disorder or panic disorder were considered as outcomes in this study

Potential Confounders:

- Age , Gender , Race , Marital Status and Employment Status

Effect Measure Modifiers:

- Hypertension and Diabetes

ANALYSIS

- Logistic regression models provided crude and adjusted estimates of the association between BMI and mental disorders. Analyses were done using SAS v. 9.2
- Potential confounders were retained in the model if their presence resulted in greater than 10% change in the estimate.
- Departures from additivity were evaluated to determine the extent to which effect measure modification was present

RESULTS

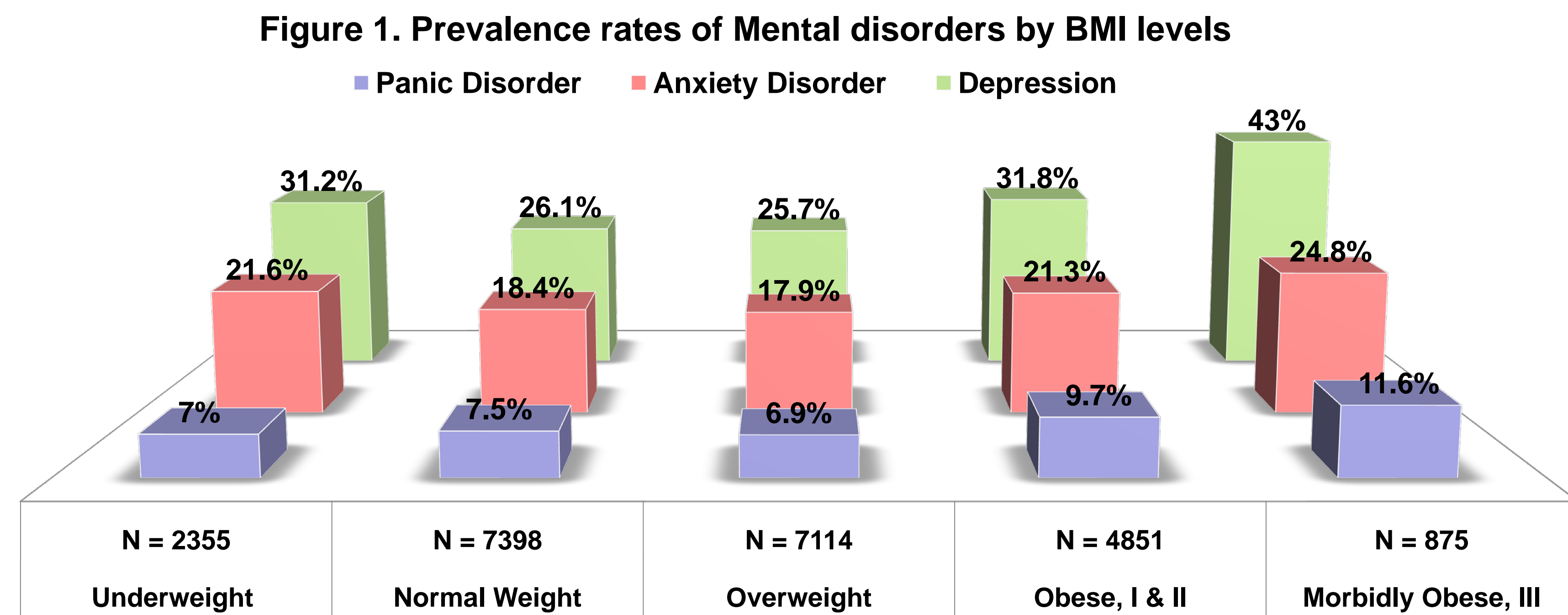


Table 1. Characteristics by Body Mass Index (BMI) levels

	Underweight <18.50 N = 2355 WtN = 3740691	Normal Weight 18.50 - 24.99 N = 7398 WtN = 77494142	Overweight 25.00-29.99 N = 7114 WtN = 73938706	Obese, I & II 30.00-39.99 N = 4851 WtN = 49482537	Morbidly Obese, > 40.00 N = 875 WtN = 9079704
Region					
Northeast	20.1	17.2	17.6	15.4	12.2
Midwest	26	23.6	23.5	24.9	28.5
South	35.2	35.4	35.4	38.6	38.3
West	18.8	23.8	23.5	21.1	21.1
Age					
18-24 years	33.4	18.8	9.8	7.6	8.2
25-44 years	28.2	35.8	37	37	40.3
45-65 years	18	29.3	31.2	40	42
More than 65 years	20.4	16.1	18	15.4	9.6
Gender					
Women	71.1	59	40.7	49.4	63.7
Race					
White	73.8	78.3	77.2	75.2	74.4
Black	9.8	9.6	11.2	15.1	17.5
Native American	1.2	0.6	0.7	1.5	1.6
Asian	5	4.7	2.9	1.1	0.7
Other, Multiracial	10.3	6.7	8	7.1	5.6
Marital Status					
Married / Living with Partner	42.5	58.5	65.9	65.2	53.9
Employment Status					
Employed	52	63.1	67.4	63.7	58.1
Comorbid Conditions					
Suffering from Diabetes	3.9	3.6	7	14.7	23.6
Suffering from Hypertension	16.8	18.9	19.1	41.9	53.2

Data Source: CDC/NCHS, National Health Interview Survey, 2008

Key Findings :

- 60% of the respondents were either overweight or obese
- Depression was the most prevalent disorder with 28% of the sample suffering from it
- Obesity was significantly associated with an increased prevalence of depression, anxiety disorder and panic disorder.**
- Obese individuals were **35%** more likely to suffer from depression, **22%** more likely to suffer from anxiety disorder and **36%** more likely to suffer from panic disorder
- Morbidly obese people were **85%** more likely to suffer from depression, **27%** more likely to suffer from anxiety disorder and **34%** more likely to suffer from panic disorder
- The presence of hypertension or diabetes did not modify the association between BMI and depression, anxiety disorder and panic disorder.
- Age, gender, race, marital status and employment status confounded the association between BMI and the three mental disorders

RESULTS

Table 3. Association between Body Mass Index and Depression

BMI Levels	Depression Crude OR [95% CI]	Depression Adjusted OR [95% CI]
Underweight	1.28 [0.96 - 1.72]	1.23 [0.91 - 1.65]
Normal weight	1.00 [Reference]	1.00 [Reference]
Overweight	0.98 [0.89 - 1.08]	1.09* [0.99 - 1.20]
Obese	1.32 [1.21 - 1.45]	1.35 [1.22 - 1.49]
Morbidly Obese	2.14 [1.80 - 2.55]	1.85** [1.56 - 2.21]

Table 3. Association between Body Mass Index and Anxiety Disorder

BMI Levels	Anxiety Disorder Crude OR [95% CI]	Depression Adjusted OR [95% CI]
Underweight	1.22 [0.90 - 1.66]	1.21 [0.89 - 1.64]
Normal weight	1.00 [Reference]	1.00 [Reference]
Overweight	0.97 [0.87 - 1.07]	1.06 [0.95 - 1.18]
Obese	1.20 [1.08 - 1.33]	1.22 [1.09 - 1.35]
Morbidly Obese	1.46 [1.22 - 1.75]	1.27** [1.06 - 1.53]

Table 4. Association between Body Mass Index and Panic Disorder

BMI Levels	Panic Disorder Crude OR [95% CI]	Panic Disorder Adjusted OR [95% CI]
Underweight	0.93 [0.59 - 1.45]	0.87 [0.55 - 1.37]
Normal weight	1.00 [Reference]	1.00 [Reference]
Overweight	0.91 [0.78 - 1.06]	1.03* [0.88 - 1.20]
Obese	1.33 [1.13 - 1.57]	1.36 [1.15 - 1.60]
Morbidly Obese	1.62 [1.22 - 2.17]	1.34** [1.00 - 1.77]

* Adjusted for Sex
** Adjusted for Sex , Age, Marital Status, Employment Status & Race

DISCUSSION

- Depression, anxiety disorder and panic disorder more commonly occurred in persons who were obese
- Screening for depression, anxiety disorder and panic disorder in obese persons may be prudent
- Public health and medical professionals need to curb the rising rates of obesity to reduce the incidence and prevalence of particular mental disorders

STRENGTHS / LIMITATIONS

- Strengths :** Large national probability sample, high response rate, personal interviews and exclusive assessment of effect measure modification due to the presence of hypertension or diabetes
- Limitations :** Inclusion of only three mental disorders as outcomes. Self-reported BMI and outcome responses may have resulted in non-differential misclassification causing diluted estimate of effects; inability to determine temporal sequence of events.

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