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## Does Clinical Depression Affect the Accuracy of Self-Reported Height and Weight in Obese Women?

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### Abstract

**Objective**—Recent research from a self-report survey showed a strong association between obesity and clinical depression in women. The present analysis assessed whether differential bias in self-reports of height and weight as a function of depression influences the apparent strength of the association.

**Method**—Accuracy of self-reported height and weight was assessed in 250 obese [mean BMI=38.7 kg/m<sup>2</sup>] women, 135 of whom met American Psychiatric Association DSM-IV diagnostic criteria for clinical depression.

**Result**—Depressed and non-depressed women underreported their weight by 1.5 and 1.2 kg, respectively. They underreported their height by 0.002 and 0.003 m, respectively.

**Conclusion**—Bias in self-report of body weight and height is similar in depressed and non-depressed obese women. The underreporting of weight in both groups is similar in magnitude to that seen in normal weight women. Thus, using self-reports of height and weight seems unlikely to bias estimates of the association between obesity and clinical depression in women.

### Keywords

Mood; BMI; report; bias

### Introduction

A growing body of research has linked depression and obesity in women (1-5). Obese women report more depressive symptomatology (6,7). Depressive symptomatology and body weight co-vary over time (8,9). Also, obese women who are not depressed are at increased risk of developing depression, and women who are depressed but not obese are at increased likelihood of developing obesity (2).

In an ongoing research, obese middle-aged women were three times as likely to have clinical depression than non-obese women, a stronger relationship than that found in previous studies (Simon GE, Ludman EJ, Linde JA, et al., “Association between obesity and depression in

middle-aged women,” unpublished manuscript). Because this study assessed height and weight by self-report, and self-reported weight is known to be underestimated in women versus men and in the obese versus the non-obese (10-17), the current study assessed whether clinical depression influences self-report bias in obese women. If depressed women underreport their weight more than non-depressed women (e.g. because they wish to avoid negative information), the strength of the association between obesity and clinical depression would be less when using self-reported weight. If depressed women underreport their weight less than non-depressed women (e.g. because their depression exaggerates negative information), the true strength of association between depression and obesity would be overestimated. No previous studies have addressed the question of how depression affects self-report bias in this domain.

## Methods

Data used in this paper were measured and self-reported heights and weights of 250 women participating in the Epidemiology and Care of Comorbid Obesity and Depression Study. The study was conducted with women members of the Group Health Cooperative, a group model prepaid health plan serving approximately 500,000 members in Washington and Idaho. The study has two parts: 1) a telephone survey to establish the prevalence of obesity and clinical depression in women  $\geq 40$  years old; and, 2) an intervention study examining whether depression counseling facilitates weight loss treatment in obese women who are also clinically depressed.

Women were identified for the telephone survey from a database of women 40 years and older who had previously completed mailed surveys (18). Seven thousand five hundred and sixteen (7,516) women were selected for the telephone survey, and 4,660 (62%) completed it. The survey included information on height, weight, and demographic characteristics. Clinical depression was assessed by the Patient Health Questionnaire (PHQ-9), a measure that asks respondents to indicate how often they experience each of the nine DSM-IV criteria for clinical depression. To meet criteria for current major depression, a respondent must have reported one of the core depression symptoms (depressed mood or loss of interest) as well as a total of at least five symptoms, all present at least half of the time during the last two weeks. Validation studies of the PHQ-9 have shown excellent agreement in comparison to structured interviews in identifying clinical depression (19-22).

Direct measures of height and weight were obtained from 250 obese women (BMI  $\geq 30$ ) who were invited to participate in phase 2 of this research project. The delay between the phone survey and direct weight measurement averaged  $26 \pm 19$  days. The response rate to the invitation was 68%, 54% (N=135) of whom met criteria for clinical depression.

## Statistical analyses

Data analyses were conducted using SAS statistical software, version 8.2 (23). Linear regression models (proc GLM) were used to compare the demographic characteristics of depressed and non-depressed women in the sample, and to examine whether there was a difference in height/weight self-report accuracy as a function of depression.

## Results

Women agreeing to participate in the weighing assessment did not differ from those declining in demographic characteristics but weighed slightly more (BMI = 36.7 versus 38.3 kg/m<sup>2</sup>,  $p < .05$ ). Sample characteristics are shown in Table 1. Average age was approximately 52 years, 80% reported Caucasian ancestry, 40% reported that they had completed a four-year college

education, about half were married, and average reported monthly income was approximately \$3,000. Average measured BMI was 38.7 kg/m<sup>2</sup>.

On average, depressed women underreported their height by 0.002 meters (SE=0.003) and underreported their weight by 1.47 kg (SE=0.04). Underreports of height and weight in non-depressed women averaged 0.003 meters (SE=0.002) and 1.21 kg (SE=0.4), respectively. Differences between groups were not statistically significant. Additionally, the magnitude of the difference in self-report bias was not large enough to appreciably influence obesity prevalence rate comparisons between obese and non-obese women (i.e. the BMI cut point would change by <0.2%). Additional analyses that included covariates known to be related to body weight (i.e., age, education, income, and sociodemographic characteristics) were also not statistically significant. Delay time between measured and self-reported weight was unrelated to weight underreporting. Treating depression as a continuous rather than a dichotomous variable also did not influence the results. The Spearman correlations between self-reported and measured height and weight were  $r=0.95$  and  $r=0.92$ , respectively.

## Discussion

This investigation examined the accuracy of self-reported height and weight among obese women with and without clinical depression. Self-reports of height and weight were very accurate in general and accuracy was unrelated to depression status. Thus, the stronger than typical relationship between obesity and depression among these women cannot be explained by a measurement artifact due to the use of self-reported height and weight to define obesity.

### Study strengths and limitations

Strengths of this study include a relatively large number of obese women with clinical depression. The generalizability of the study findings is limited by a limited range of sociodemographic characteristics and body weights.

## Conclusions

Clinical depression is unrelated to bias in self-reports of height and weight in women interested in weight loss treatment and thus may be used in research on obesity and depression without undue concern about differential accuracy or intentional bias in these reports as a function of the psychiatric condition itself.

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**Table 1**

Characteristics of obese women members of a Seattle, Washington-based managed care organization volunteering for a study of obesity, depression and weight loss in 2006.

N	Depressed 135	Not depressed 115
Age (y)	52.0 (0.54)*	51.7 (0.59)
Race (% white)	78	84
Education (% college)	33	43
Married (% yes)	48	57
Income (\$/month)	2932 (132)	2921 (132)
Height (m)	1.64 (0.006)	1.64 (0.006)
Weight (kg)	104.8 (1.7)	103.9 (1.9)
BMI	38.8 (0.7)	38.5 (0.6)

\* Standard error.