



## Self-reported body weight perception and dieting practices in community-dwelling patients with schizophrenia

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### Abstract

**Introduction:** Many patients with schizophrenia are exposed to serious health risks associated with their excess body weight. Evidence exists that even a moderate amount of weight loss may have significant health benefits. Thus, weight control in schizophrenia patients has become an important treatment goal. Although studies in the general population show that satisfaction with body weight is an important predictor for engagement in various weight loss measures, the perspective of schizophrenia patients has not been assessed.

**Method:** Information on self-reported weight perception, desire to lose weight as well as weight loss attempts was obtained according to methods employed in the National Health and Nutrition Examination Survey, Cycle III (NHANES III). Body weight and height were measured and body mass index (BMI) was calculated.

**Results:** Perception of body weight and desire to lose weight were correlated to BMI. Both obese female and male subjects ( $BMI \geq 30$ ) were aware of their weight status. However, whereas overweight females ( $BMI > 25 \leq 29.9$ ) accurately perceived themselves so, males in this category had difficulties perceiving themselves overweight, and consequently neither wanted to lose weight, nor tried to lose weight. As means of weight loss, caloric restriction (diet) was most frequently employed (by more than 80% of study subjects); yet only a third of study subjects (34.4%) engaged in the recommended combination of diet and exercise to lose weight. Questionable weight loss practices were also frequently employed, especially among women.

**Conclusions:** Obese patients ( $BMI \geq 30$ ) were generally aware of their excess body weight and wanted to lose weight. Only non-obese, yet overweight males ( $BMI > 25 \leq 29.9$ ) did not perceive themselves as overweight and consequently did not try to lose weight. Weight loss practices did not always follow established recommendations. Especially women were likely to approach weight loss with questionably appropriate and unsafe methods.

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**Keywords:** Weight perception; Obesity; BMI; Schizophrenia; Diet; Body image

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## 1. Introduction

There is evidence that the increasing prevalence of obesity seen over the past decade is continuing at a rapid pace. Data from the recent 1999–2000 National Health and Nutrition Examination Survey (NHANES; available online) show that nearly 65% of the adult US population are overweight, as defined by a body mass index (BMI) greater than 25 kg/m<sup>2</sup>, as compared to 56% seen in NHANES III, which was conducted between 1988 and 1994 (Flegal et al., 2000). Serious health risks can be associated with excess body weight (National Task Force on the Prevention and Treatment of Obesity, 2000). Enormous public health implications derive from these facts, with almost 7% of the US health care budget spent on medical treatment of obesity-related conditions (Colditz, 1999).

Most studies state that schizophrenic patients tend to be overweight (Gopalaswamy and Morgan, 1985; Strassnig et al., 2003a). However, Allison et al. (1999) found this to be true primarily in women. It appears even more worrisome that adolescent and young adult patients with schizophrenia already carry more body weight than their corresponding healthy peers (Theisen et al., 2001). Weight gain in schizophrenia patients may well be attributed to medication effects (Ganguli, 1999), such as through appetite increase, sedation, or hormonal effects (Baptista, 1999; Taylor and McAskill, 2000). Lifestyle factors, e.g. poor diet, also contribute (Strassnig et al., 2003a,b; Brown et al., 1999). There is also some evidence that obesity is an independent risk factor for antipsychotic noncompliance (Weiden et al., 2003), leaving the individual more vulnerable to relapse (Weiden and Olfson, 1995).

Even a moderate degree of weight reduction is beneficial to the overweight person (Blackburn, 1995) and significantly decreases health risks (Ross et al., 2000; Willet et al., 1999). Overweight schizophrenia patients may also benefit from weight loss, as they usually carry numerous additional risk factors for medical diseases, including a higher prevalence of smoking and diabetes (Brown et al., 2000).

A disturbed body size and body weight perception has long been noted in psychiatric patients, especially in patients with eating disorders (Becker et al., 1999; Warah, 1989; Birtchnell et al., 1985). Some evidence exists that patients with schizophrenia also mispercept their body size, but findings have been controversial

(Fischer, 1986; Priebe and Röhrich, 2001) and may rather represent a specific feature of acute psychopathology in a distinct subset of patients (Rohricht and Priebe, 2002). Apart from the latter trials, it is notable that outside of the literature focusing on eating disorders, few studies have examined the relationship of weight perception and dieting behaviors in the psychiatric population.

In mentally healthy persons, there is a relationship between satisfaction with body size and engagement in weight loss efforts. Indeed, the strongest predictor of engagement in weight loss efforts in a healthy population has been the perceived body size (Anderson et al., 2002). It seems important to assess whether this is true for schizophrenia patients as well. We therefore decided to examine the relations, if any, between measured BMI, self-reported weight perception, expressed desire to lose weight and dieting behavior of schizophrenia patients.

## 2. Methods

### 2.1. Subjects

Patients with a DSM-IV diagnosis (APA, 1994) of Schizophrenia, Schizoaffective Disorder and Psychotic Disorder NOS were recruited from the outpatient clinic and partial hospital at the Comprehensive Care Services at the Western Psychiatric Institute and Clinic, Pittsburgh, PA. Patients were approached by one of the investigators during regular clinic hours, either before or after their scheduled therapist or psychiatrist appointment, and asked whether they were interested in participating in a comprehensive nutritional assessment consisting of a 24-h diet recall, evaluation of social and emotional well-being related to their body weight, body weight perception, and dieting practices (details are provided elsewhere; Strassnig et al., 2003a). Interested patients were either provided with an appointment for an assessment right away, or, in case they needed more time to decide, were provided with a telephone number to call for an appointment. No attempts to randomize subjects or select specific populations (such as overweight patients) were made. Rather, every eligible patient was approached and asked whether he or she was interested in participation. Patients were recruited over a 4-month period.

Assessments were carried out after obtaining written informed consent according to procedures approved by the University of Pittsburgh Biomedical Institutional Review Board. Diagnoses were confirmed by patient chart review. The procedure to elicit body weight perception and weight loss measures took about 20 min per participant and yielded information in different domains: (i) sociodemographics, (ii) self-reported weight perception, desire to lose weight and weight control measures and (iii) anthropometric measurements.

## 2.2. Data collection

(i) Sociodemographic data was obtained by open-ended questions and in case of missing information, was completed by patient chart review.

(ii) A standardized interview as used previously in the National Health and Nutrition Survey, Cycle III (National Center for Health Statistics, 1996) was employed to elicit information concerning self-perceived body weight status and weight loss practices among the study participants. The NHANES III represents the seventh in a series of large health surveys conducted in the United States since the 1960s.

A structured interview was employed by trained staff. The subjects were asked specific questions regarding their weight-related behavior and perception including (1) “Do you consider yourself now being underweight, about acceptable weight, slightly overweight, very overweight or extremely overweight?” and (2) “Would you like to weigh more, weigh less, or stay about the same?” as well as (3) “Have you been trying to lose weight in the past month?” Information on the actual measures employed to lose weight (4), i.e., overall caloric restriction (diet), physical activity (exercise) or other practices (including skipping meals, fasting, use of diet pills, use of over the counter weight-control medication; laxatives, or vomiting) was also obtained.

(iii) Weight and height were recorded in kilograms (kg) to the nearest 0.5 kg and meters (m) and BMI was calculated ( $\text{kg}/\text{m}^2$ ). BMI categories adopted by the National Institute of Health, i.e., overweight, BMI 25 to 29.9  $\text{kg}/\text{m}^2$ , and obesity, BMI of more than 30  $\text{kg}/\text{m}^2$ , were used to categorize individuals in the

study sample (National Institutes of Health, National Heart, Lung, and Blood Institute, 1998).

## 2.3. Statistics

SPSS (for windows) software was used for data analysis. Descriptive analysis including mean, range and standard deviation for continuous variables was carried out to determine whether the variables were normally distributed and frequency counts for categorical data (for example gender, race, etc.) were done to examine the proportions of various socio-demographic characteristics. The measures obtained through patients self-report were examined for the whole group and for groups defined by different demographic characteristics (for males and females, Caucasians and African-Americans). Student's *t*-tests and chi-square tests were employed to look for statistical differences between the means of two or more variables. For purposes of analysis, data derived from question (1) was categorized as follows: (a) not overweight (including underweight and acceptable weight); and (b) overweight (including slightly; very; and extremely overweight). Similarly, the various other weight loss practice variables derived from the respective single NHANES III items (4) were cumulatively treated as one variable in the analysis.

## 3. Results

We studied 143 patients with a diagnosis of schizophrenia, schizoaffective disorder, and psychotic disorder NOS. Average age in the study sample was 43.3 ( $\pm 8.6$ ) years. Seventy-seven patients (53.8%) were male, and 66 (46.2%) were female. Regarding ethnicity, 77 (53.8%) were Caucasian and 66 (46.2%) were African-American. Sixty-seven study subjects (46.9%) carried a diagnosis of DSM IV Schizophrenia, 52 (36.3%) of Schizoaffective Disorder, and 24 (16.8%) a diagnosis of Psychotic Disorder NOS. Twelve patients (8.2%) were married, and 134 patients (91.8%) were either single, divorced or widowed. Forty-three patients (30.1%) lived independently, and 100 (69.9%) lived in supervised housing (boarding homes, halfway houses, supervised group homes, skilled nursing facilities). At time of the interview,

35 (24.5%) were employed, and 108 (75.5%) were unemployed. Educational status was diverse: 22 subjects (15.4%) had not finished high school, 65 (45.2%) had graduated from high school or obtained a GED (high school equivalent), and 56 (39.2%) reported at least some college attendance or a college degree. Mean body mass index of subjects interviewed for the study was 32.8 ( $\pm 7.8$ ). Male subjects had a mean BMI of 30.8 ( $\pm 7.3$ ), and female subjects 35.1 ( $\pm 8$ ).

Table 1 shows data on self-perception of body weight, desire to lose weight and engagement in current weight loss efforts across BMI categories.

In the whole study sample, self-perception of being overweight was significantly correlated to body weight ( $r=0.49$ ,  $p\leq 0.001$ ), BMI ( $r=0.65$ ,  $p\leq 0.001$ ) and inversely correlated to height ( $r=-0.36$ ,  $p\leq 0.001$ ).

Of the 118 overweight or obese persons (BMI $\geq 25$ ), 98 (83%) perceived themselves as weighting too much, and 20 (17%) subjects perceived themselves as being of normal weight. Significant gender differences existed in self-perception of weight status. Males tended to misclassify their weight status significantly more often than females ( $r=0.41$ ,  $p\leq 0.001$ ). In fact, of the 20 overweight subjects (BMI $>25\leq 29.9$ ) who considered themselves of normal weight, 18 were males and only 2 were females. No ethnic differences in self-perceived weight status were found.

When looking at the relation of the three BMI categories healthy weight, overweight, and obese to the desired weight, there was a significant correlation of body mass index and the desire to lose weight

( $r=0.63$ ,  $p\leq 0.001$ ). In addition, significant gender differences existed in the desire change one's body weight: Significantly more females ( $n=62$ ) than males ( $n=39$ ) desired to weigh less ( $p\leq 0.005$ ). Of interest, only one ( $n=1$ ) female in the whole study sample expressed the desire to gain weight, whereas more than half of the subjects ( $n=13$ , 52%) in the healthy BMI range (BMI $\leq 24.9$ ) wanted to weigh more, all of which were males. There were no ethnic differences with respect to BMI status and desired weight.

There were significant inverse correlations between the perception of body weight status and reported weight loss efforts ( $r=-0.79$ ,  $p\leq 0.001$ ), dieting ( $r=-0.27$ ,  $p\leq 0.001$ ), exercise ( $r=-0.17$ ,  $p\leq 0.05$ ), and other weight loss practices ( $r=-0.24$ ,  $p\leq 0.005$ ). Table 2 shows actual weight loss behavior among study subjects trying to lose weight.

Of the 143 subjects enrolled in the study, 81 (56.7%) currently used various weight loss measures. Obese subjects (BMI $\geq 30$ ) were significantly more likely to engage in weight loss than either overweight (BMI $>25\leq 29.9$ ) or healthy weight subjects (BMI $\leq 24.9$ ;  $r=-0.39$ ,  $p\leq 0.001$ ). Among the 118 overweight subjects, 76 (64.4%) were currently engaged in weight loss, and 42 (35.6%) were not doing anything about their weight. Again, significant gender differences were present. Significantly more females ( $n=48$ ) than males ( $n=33$ ) were actively trying to lose weight ( $p\leq 0.005$ ), and significantly more males ( $n=4$ ) than females ( $n=18$ ) were not doing anything about their weight ( $p\leq 0.005$ ). No ethnic differences were found.

Table 1  
Weight perception, weight goals and weight loss efforts across BMI categories

	Group	BMI categories			$\chi^2$ , <i>df</i>	<i>p</i>
		BMI $\leq 24.9$	BMI 25–29.9	BMI $\geq 30$		
Total no. (%)	143 (100)	25 (17.5)	32 (22.4)	86 (60.1)		
Weight perception						
“Overweight”	102 (71.3)	4 (16)	16 (50)	82 (95.3)	68.8, 2	$\leq 0.001$
“Not overweight”	41 (28.7)	21 (84)	16 (50)	4 (4.7)		
Weight goal						
“Weigh more”	19 (13.3)	13 (52)	6 (19.4)	0 (0)	62.57, 3	$\leq 0.001$
“Weigh less”	101 (70.6)	4 (16)	19 (61.3)	78 (90.7)		
“Stay about the same”	22 (15.4)	8 (32)	6 (19.4) <sup>a</sup>	8 (9.3)		
Weight loss efforts	81 (56.7)	5 (20)	15 (46.9)	61 (70.9)	22.06, 2	$\leq 0.001$
No weight loss efforts	62 (33.6)	20 (80)	17 (53.1)	25 (29.1)		

<sup>a</sup> One patient could not decide about his weight goal.

Table 2  
Weight loss behavior among subjects trying to lose weight

	Total no. (%)	Weight loss measures		
		Caloric restriction	Physical activity	Other practices <sup>a</sup>
Group	81 (100)	67 (82.7)	39 (48.1)	24 (29.6)
Gender				
Male	33 (40.7)	27 (40.9)	20 (51.3)	7 (30.4)
Female	48 (59.3)	39 (59.1)*	19 (48.7)	17 (69.6)*
Ethnicity				
White	42 (51.9)	36 (53.7)	22 (56.4)	14 (58.3)
Black	39 (48.1)	31 (46.3)	17 (43.6)	10 (41.7)
Body mass index				
Healthy weight (BMI $\leq$ 25)	5 (6.2)	5 (7.5)	2 (5.1)	2 (8.3)
Overweight (BMI 25–29.9)	15 (18.5)	12 (17.9)	8 (20.5)	4 (16.7)
Obese (BMI $\geq$ 30)	61 (75.3)	50 (74.6)	29 (74.4)	18 (75)

<sup>a</sup> Other practices include skipping meals, fasting periods, use of diet pills, use of over the counter weight-control medication, laxatives use, or vomiting.

\*  $p < 0.05$ .

Of note, among the subjects trying to lose weight, one third ( $n=28$ , 34.6%) used a combination of diet and exercise. No ethnic differences in weight loss measures among study participants were found.

#### 4. Discussion

The perception of body weight was a function of body mass index. In contrast to popular belief, weight perception of obese schizophrenia patients enrolled in the study (those with a BMI $\geq$ 30) was fairly accurate. Meyer (2002) found a similar pattern among inpatients who suffer from schizophrenia; obese inpatients understood that they weighted too much. They were also aware of the fact that something needed to be done about their body weight.

Only non-obese males (BMI category  $\leq$ 29.9) had trouble perceiving their weight correctly: most overweight males (BMI $>$ 25 $\leq$ 29.9) did not think they were overweight, and most males of healthy weight (BMI $\leq$ 24.9) thought they needed to gain weight. In contrast, female subjects showed accurate perception of their body weight status across the different BMI categories. Similar gender differences have been previously noted in large population studies (Neumark-Sztainer et al., 1999; Levy and Heaton, 1993):

whereas females have good perception of their weight status, many overweight males do not accurately perceive themselves as overweight (Blockstra et al., 1999), do not seem to be particularly concerned about weight loss (Crawford and Campbell, 1999) and may even express the desire to gain weight (Chang and Christakis, 2003). Not surprisingly, a similar pattern has also been found in male physician's perception of their overweight male patient's weight status (Cacamese et al., 2002).

More overweight or obese females than males expressed the desire to lose weight. Females used more different weight loss measures; they were also more likely to skip meals, not eat at all, use diet pills or over-the-counter weight-control medication; laxatives, or vomiting as means to lose excess body weight. The latter methods, although frequently used, may prove detrimental to weight loss at best (Kennedy et al., 2001), and are associated with certain health risks at worst (Ahmed et al., 2001; Polivy, 1996).

Still, dieting was the primary weight loss measure used among study subjects trying to lose weight, as slightly more than 80% ( $n=67$ ) employed some form of caloric restriction. Exercise was less often reported: less than one half of subjects trying to lose weight (45.7%) exercised as a means of weight loss. Yet, translating even this statement into actual behavior is a difficult task, as a recent survey among otherwise healthy overweight people and their pattern of physical activity has found. Only a quarter of overweight persons who stated they exercised, actually did so for the recommended amount of time (MMWR April, 2000). Even more worrisome, only one third ( $n=27$ ; 34.6%) of the sample subjects trying to lose weight reported using diet and exercise in combination, proven to be the safest and most effective way in long-term weight management (Executive Summary of the Clinical Guidelines on the Identification, Evaluation and Treatment of Overweight and Obesity in Adults, 1998).

Clinicians need to be especially aware of the needs of patients suffering from schizophrenia. While medication management or sociotherapeutic approaches have been the primary focus of treatment, excess body weight often remain out of focus in the clinical setting, and usually becomes center of attention only after weight-related comorbidities occur (Kendrick, 1996).



However, even for non-schizophrenic obese subjects, weight loss is difficult to achieve; this may arguably contribute to the reluctance of clinicians to effectively address weight issues. In fact, less than half of mentally healthy obese adults report being advised to lose weight by health care professionals (Galuska et al., 1999) and important opportunities to counsel mildly overweight individuals to lose weight and therefore prevent comorbidities (Sciamanna et al., 2000) are missed. Furthermore, brief counseling interventions are usually not sufficient to ascertain sustained weight loss (Eden et al., 2002; Stevens et al., 2002). Rather, time-consuming moderate- to high-intensity counseling interventions are necessary to produce changes in dietary behavior (Pignone et al., 2003), which may be difficult to implement in routine practice.

Patients with schizophrenia often lack the necessary knowledge about effective weight loss measures and, at the same time, there also appears to be lack of effective clinician counseling in this area (Meyer, 2002). However, there is preliminary evidence that antipsychotic-induced weight gain in schizophrenia patients may be reversible to some extent (Ball et al., 2001; Wirshing et al., 1999) and high-intensity structured weight loss programs may not only be efficacious in the treatment of overweight, yet otherwise healthy subjects, but also in patients with schizophrenia (Ganguli et al., 2002; Vreeland et al., 2003). Undoubtedly, there is a need to develop structured and easy-to administer weight loss programs for schizophrenia patients.

Gender-specific interventions also need to be employed in order to effectively counsel overweight schizophrenia patients. Females seem to require dietary and lifestyle counseling, since they are prone to employ unhealthy dieting practices. In addition to that, males may benefit from interventions that focus on correct awareness of their weight status, before dieting and weight loss can be addressed as important goals for their physical health. (Hankey et al., 2002).

Comprehensively, there is not enough knowledge about proper weight loss in the study population; patients may not employ the most appropriate, safe and successful weight loss measures. There is a need for structured weight loss and physical exercise programs.

Possible drawbacks of the study: The study subjects were mainly overweight or obese. However, this was not a representative sample drawn by random

sampling, but rather a sample of convenience made up of volunteers from an outpatient and partial hospital program. Another limitation is that any data about attempts to lose weight and methods employed to do so, were unconfirmed self-reports. On the other hand, in contrast to many other studies, BMI was calculated on actual measured height and weight rather than on self-reports of these measures. Therefore, the results may not be applicable to the whole population of schizophrenics, but may be appropriate for the large number of overweight and obese patients.

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