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Association between Socioeconomic Status and BMI among People with Schizophrenia and Bipolar Disorder

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by

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ASSOCIATION BETWEEN SOCIOECONOMIC STATUS AND BMI AMONG PEOPLE WITH SCHIZOPHRENIA AND BIPOLAR DISORDER

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Background: Many health disparities among individuals with schizophrenia and bipolar disorder are due to obesity-associated diseases. Several causes of obesity have been discovered, but few risk factors are known. In the general public, low socioeconomic status (SES) is associated with obesity.

Objective: Examine the relationship between SES and body mass index (BMI) among people with schizophrenia and bipolar disorder.

Design: A secondary analysis of the Collaborative Psychiatric Epidemiology Surveys dataset. The psychiatric group (N=480) included individuals with symptoms of schizophrenia or bipolar disorder. Those reporting no symptoms were controls (N=5,161). Childhood SES variables included mother and father education and profession, government assistance, having gone hungry, and not having received needed medical care. Adult SES variables included food security, financial security, and government assistance. SES and BMI were examined using descriptive statistics and t-tests.

Results: BMI was higher in the psychiatric group than controls (28.3 v. 27). Age, sex, occupation, and education were associated with BMI for controls. Age, sex, financial insecurity, and receiving government assistance elevated BMI in the psychiatric group.

Conclusion: Findings suggest monitoring patients with low SES most closely.

Key Words: socioeconomic factors, body mass index, schizophrenia, bipolar disorder

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People with schizophrenia and bipolar disorder die an average of 16-18 years and 12-13 years, respectively, earlier than the general population (Laursen, 2011). Premature death rates have declined in the general public, but one study found that that the mortality ratio attributed to natural causes among people with schizophrenia increased from 1.2 in 1999 to 1.7 in 2006 (Hoang, Stewart, & Goldacre, 2011). Systematic reviews have found that obesity-associated diseases such as diabetes, heart disease, and stroke account for a significant amount of the health disparity between people with schizophrenia or bipolar disorder and the general population (Roshanaei-Moghaddam & Katon, 2009; Saha, Chant, & McGrath, 2007). As a result, much of the excess mortality associated with these disorders can be attributed to the high rates of obesity seen among people with these conditions. Surveys have found that individuals with schizophrenia and bipolar disorder are at a 3.4 times and 1.7 times, respectively, greater risk for obesity relative to members of the general public (Gurpegui et al., 2012; Petry, Barry, Pietrzak, & Wagner, 2008). Low socioeconomic status (SES) is a significant risk factor for obesity in the overall population, but has yet to be studied sufficiently among people with mental illnesses (Ball & Mishra, 2006). The current article explores low SES as a potential risk factor for the development of elevated body mass index (BMI) among people with schizophrenia and bipolar disorder.

Research has identified a number of reasons people with schizophrenia and bipolar disorder have higher rates of obesity including antipsychotic medications, poor diets, and physical inactivity (Inamura, Izumi, Sakurai, Katsui, & Murayama, 2012; Laursen et al., 2012). In addition, people with schizophrenia and bipolar disorder have higher rates of physical illnesses such as hypothyroidism which are often diagnosed late, increasing the risk for complications including obesity (Nasrallah et al., 2006; Newcomer, 2006).

Among members of the general public, a history of low childhood SES including parental education, occupation, and income has been identified as a predictor of adult obesity (Ball & Mishra, 2006; Kittleson et al., 2006; Zhang & Wang, 2004; Ziol-Guest, Duncan, & Kalil, 2009).

Children raised in low-income homes are 1.8 times more likely to be obese as adults than children raised in high-income homes (Salonen et al., 2009). In addition, studies have found that low SES in adulthood is also a risk factor for obesity. Low SES men have been found to have up to a 2.2 times greater risk for obesity and low SES women up to 3.2 times greater risk (Power et al., 2005).

Although a significant number of studies have identified the reasons people with schizophrenia and bipolar disorder gain weight, research has found few early and significant predictive factors. The identified risk factors for obesity among people with schizophrenia and bipolar disorder have had three limitations. First, a small number of risk factors have been discovered (primarily sex, non-psychiatric illnesses, and age). Second, the effect sizes associated with these risk factors are often fairly low--sometimes as low as OR=0.97 v. 1. Third, broad risk factors such as being female lack the specificity needed to identify individuals for more intensive interventions (Gurpegui et al., 2012). Targeted programs would help ensure the most effective allocation of scarce healthcare resources. Low SES holds great promise in helping identify people with schizophrenia and bipolar disorder at greatest risk for weight gain due to the impact of SES in the general population.

The Collaborative Psychiatric Epidemiology Surveys (CPES) dataset is a rich source of information for this study. Previous studies have used data from the surveys to examine the association of childhood SES with pain and depression in adulthood and adult SES with depression (Goosby, 2013). In addition, the data have been used to examine associations between obesity and psychiatric disorders such as depression (Gavin, Rue, & Takeuchi, 2010) and attention-deficit hyperactivity disorder (Pagoto et al., 2009). However, no studies have used the survey data to examine the relationship between SES and risk for obesity among people with mental illnesses such as schizophrenia or bipolar disorder. As a result, it is evident that the dataset

can provide the needed information to evaluate relationships between SES and obesity among individuals with these conditions.

The conceptualization of SES most applicable to this study is based on a materialist focus on access to goods, services, information, and social resources. Precise operational definitions of SES have varied, but most often include measures of occupation, income, and education (American Psychological Association, 2009). The conceptual model used in this study has been adapted from González, Nazmi, and Victora (2009) (see Appendix A).

The current study examined the relationships between the variables bolded in Figure 1. The original model proposes that parental SES impacts maternal obesity, birth weight, and childhood weight gain. In addition, family SES influences childhood and present nutrition and other behaviors important for weight management. Lastly, parental SES is associated with current SES which also affects adult obesity. In this framework, if a family has a low income that leads to a scarcity of healthy food, the children are at an increased risk of developing eating patterns that promote weight gain (Olson, Bove, & Miller, 2007). The same research indicated that access to programs such as food stamps and Medicaid alone was insufficient to counter the increased risk of obesity associated with low income families.

The adapted model was tailored toward individuals with schizophrenia and bipolar disorder by adding risk factors associated with these disorders, including medications, physical illness, and lifestyle patterns. Schizophrenia and bipolar disorder often reduce an individual's SES (Ramsay, Stewart, & Compton, 2012; Schoeyen et al., 2011). In addition, research has shown that antipsychotic medications, physical illness, and unhealthy lifestyles in people with schizophrenia and bipolar disorder account for much of the increased rates of obesity seen in this population (Inamura, Izumi, Sakurai, Katsui, & Murayama, 2012; Laursen et al., 2012). Although people with schizophrenia and bipolar disorder have a range of symptoms and degrees of

impairment, these disorders are conceptualized as dichotomous conditions in this model for simplicity.

The purpose of the current study was to examine the association of SES with the risk for elevated BMI in people with schizophrenia and bipolar disorder.

The specific aims were:

1. Compare mean BMIs between individuals with schizophrenia or bipolar disorder and people with no psychiatric disorders

2. Identify childhood and adult SES factors including parental work and education, government assistance, hunger, and medical care that are significantly associated with elevated BMI in people with schizophrenia and bipolar disorder and people with no psychiatric disorders

It was hypothesized that individuals with schizophrenia or bipolar disorder would have a higher mean BMI than individuals with no psychiatric disorders. In addition, it was hypothesized that individuals with low childhood or adult SES would have an elevated mean BMI compared to individuals with high childhood or adult SES.

Methods and Procedure

The current study was a secondary analysis of data from the CPES. It employed a descriptive case-control design. The CPES were a series of three surveys conducted using similar methods between 2001 and 2003 focused on different populations (Alegria, Jackson, Kessler, & Takeuchi, 2009). Individuals were interviewed in their homes by lay personnel with the assistance of a computer program. All of the information was collected by self-report. The results were then combined into one dataset. The publically-available dataset with all personal identifying information removed was sufficient for the current study.

Sample

The three CPES collected data on 20,013 community-dwelling non-institutionalized adults 18 years of age or older using multi-stage randomized sampling methods in a total of 252 geographic areas across the United States (Alegria, Jackson, Kessler, & Takeuchi, 2009). As a result of the extensive randomized selection procedures, the resulting sample is likely to be representative of community-dwelling adults in the United States who would report having symptoms of schizophrenia or bipolar disorder in a clinical interview. The current study included all individuals who reported symptoms consistent with schizophrenia or bipolar disorder as established by the Diagnostic and Statistical Manual of Mental Disorders IV-TR (American Psychiatric Association, 2000). In addition, individuals who did not meet criteria for any psychiatric disorder were included as controls.

Measures

The SES and psychiatric information gathered in the CPES was based on the Composite International Diagnostic Interview (CIDI), which was developed for the World Mental Health Survey Initiative and has been in use since the 1990s (Wittchen, 1994). This structured instrument was designed for use by lay individuals in the field to produce diagnoses based on the World Health Organization's International Classification of Disease Criteria and the American Psychiatric Association's Diagnostic and Statistical Manual (Alegria et al., 2009). Haro et al. (2006) found that the concordance between the Structured Clinical Interview for the DSM-IV and the CIDI was 0.76 for mood, anxiety, and substance disorders. The CIDI does not identify individuals who likely have schizophrenia, but these subjects were identified using their responses to questions reflecting DSM criteria.

Instrumentation

Individuals who reported having been diagnosed with or disabled by schizophrenia and those who reported at least two symptoms of hallucinations, delusions, and negative symptoms were included in the mental illness group. Individuals identified by the CIDI as having ever met criteria for bipolar disorder were also included in this group. Individuals never having met criteria for any psychiatric disorder were included in the control group.

SES is a construct that can be defined in different ways and measured with a variety of indicators but educational attainment, occupation, and income are most often central measures employed. Food insecurity is an indicator of economic vulnerability that also has particular importance in this study as it can have a strong influence on eating patterns and future obesity (American Psychological Association, 2009). Consistent with these conceptualizations, a diverse collection of SES measures were employed. Parental SES indicators included paternal and maternal type of occupation and educational achievement. Childhood SES indicators included family history of receiving government assistance, having gone hungry, and having not received needed medical care. Subject-reported occupation and educational achievement were also examined. Additional adult SES indicators were more numerous and were divided into categories including food security, financial security, and government assistance. Measures of food security included six questions focused on resources to buy food, having had to cut meals, and having gone hungry within the past year. Financial security included ten questions about having enough money to pay for various requirements of daily life, having money left after debts, income-to-needs ratio, and household income. The government assistance category had ten questions inquiring about benefits from a variety of programs including social security, unemployment, food stamps, and housing.

Self-reported height and weight used to calculate BMI according to the following formula: weight in kilograms / (height in meters) ^{2} (Alegria et al., 2009). Merrill & Richardson

(2009), found that men tended to overestimate their height and weight whereas women overestimated their height and underestimated their weight. However, they found that BMI was only underestimated by 0.34 units in men and overestimated by 0.82 units in women. As a result, these errors are not likely to skew the overall patterns examined within the current study.

Statistical Analysis

Several of the variables were originally categorical (e.g., type of work done) while most were ordinal (e.g., number of years parents studied, how often went hungry) (Alegria et al., 2009). For purposes of statistical analysis, most of the variables were made dichotomous. Parental and subject profession was narrowed to "professional" (positions that commonly require advanced education) and "non-professional" (positions that rarely require advanced education). Education was converted to "high school or less" and "more than high school." Responses to SES questions of "often" or "sometimes" were entered as "yes" and responses of "rarely" or never" were entered as "no."

The BMI of the psychiatric disorder group was compared to that of the control group using a t-test. Within each group, BMI was compared based on the background variables of sex, profession, education, and marital status using t-tests. The BMI of individuals who reported that their fathers had professional occupations was compared to those who reported that their fathers had non-professional occupations using a t-test. The same procedure was used for other indicators of childhood and adult SES. Continuous exposure variables (e.g., age, household income) were analyzed using Spearman correlations. All statistical analyses were performed using SPSS 22. Effect size calculations were completed by inputting the means and standard deviations into a widely-used online tool (Becker, 1999). Statistical significance was determined by $p \leq 0.05$. Based on the exploratory nature of the study, probability for significance was not adjusted for multiple statistical tests.

Results

Sample Description

The total potential sample included 20,013 individuals. The analysis found that 0.9% (n=181) of the study sample would likely meet criteria for schizophrenia, 1.5% (n=299) for bipolar disorder, and 25.8% (5,161) met criteria for no psychiatric disorder (see Appendix B). The psychiatric disorder group was younger (38.0 years v. 47.2 years, $t(668) = 10.646$, $p < 0.001$), less likely to be married (40.4% v. 59.7%, $\chi^2(1, N = 5,636) = 66.961$, $p < 0.001$), and less likely to have studied beyond high school (45.0% v. 54.8% $\chi^2(1, N = 5,667) = 17.622$, $p < 0.001$). The psychiatric disorder group also had a greater proportion of females (61.9% v. 54.8%, $\chi^2(1, N = 5,636) = 13.549$, $p < 0.001$) and non-white individuals (69.1% v. 53.1%, $\chi^2(1, N = 5,636) = 235.845$, $p < 0.001$).

BMI Results

Aim 1. The psychiatric disorder group had a significantly higher mean BMI than the control group (28.3 v. 27, $t(516) = 5.084$, $p < 0.001$) (see Appendix C). Age was weakly associated with BMI in both groups. Males in the control group had higher BMIs while females in the psychiatric disorder group had a higher mean BMI. Subject occupation, education, and marital status were not related to BMI in the psychiatric disorder group. By contrast, control individuals who had non-professional occupations, did not study beyond high school, and were married had higher mean BMIs. Thus, the hypothesis for Aim 1 was supported.

Aim 2. In both groups, individuals who had fathers in non-professional work had higher mean BMIs than individuals whose fathers had professional work, but the effect size was twice as large in the psychiatric disorder group (d=0.4 v. 0.2). Mother's profession and educational achievement were associated with the individuals' BMI in the control group, but not the psychiatric disorder group. Father's educational achievement was associated with individuals'

BMI in both groups with similar effect sizes. No other childhood SES indicators were associated with BMI in the psychiatric disorder group. In the control group, individuals who reported not having received needed medical care in childhood had a higher mean BMI than those who did not endure this challenge.

Most indicators of current food insecurity in adulthood were not significant or had a lack of data for a sufficiently powerful analysis. Individuals in both groups who reported having had to cut balanced meals in the past year due to lack of finances had a higher mean BMI than those who did not. However, the effect size was almost 2.5 times larger in the psychiatric disorder group than the control group.

Most indicators of financial security were significant in both groups. Individuals in both groups who had difficulty paying bills in the past year or estimate that they would have no money left after paying debts had higher mean BMIs. In addition, not having enough money to meet needs was significantly associated with BMI in the control group. In the psychiatric disorder group income-to-needs ratio was also associated with BMI. Household income was not associated with BMI in either group.

All measures of having received government assistance with sufficient data for analysis were significantly associated with BMI in both groups. However, only two of the questions (currently on a government program and having received welfare since age 18) had enough data for analysis in the control group. In addition, being covered by a government program at the time of the survey was more strongly associated with BMI in the psychiatric disorder group than the control group (d=0.39 v. 0.25). Thus, the hypothesis for Aim 2 was partially supported.

Discussion

The current analysis has a number of significant findings regarding BMI among people with schizophrenia and bipolar disorder. It supports previous research indicating that obesity is

more prevalent among people with mental illness than people without psychiatric disorders (Gurpegui et al., 2012; Petry, Barry, Pietrzak, & Wagner, 2008). Although non-professional occupation, lower education, and being married are all associated with obesity in the general population (albeit sometimes with small effect sizes), these factors were not associated with BMI among people with mental illness in this sample.

Interestingly, psychiatric disorder individuals' occupation and education were not associated with BMI. The reasons for this finding are unclear. It is possible that rather than low SES being a risk factor for elevated BMI, we may conceptualize high SES as a protective factor against weight gain. The negative effects of mental illness (e.g., amotivation, impulsivity, sleep disruption) may be severe enough to render the protective factors of professional work and high educational achievement ineffective in reducing the risk for elevated BMI. Regardless of the mechanisms leading to these results, it is clear that practitioners must remain vigilant helping the patients avoid weight gain. They cannot become lax, expecting the occupational or educational status places them at lower risk for gaining weight.

This study also found that individuals with mental illness whose fathers had non-professional work or low educational achievement may be at an increased risk for elevated BMI. However, other childhood SES factors were not associated with increased BMI in adulthood. The reason for a lack of significance of maternal occupation/education and other childhood SES factors is unclear. As with subject SES factors, it may be that high childhood SES is protective in the general public, but that these factors are outweighed by the effects of mental illness.

Research in the general public has found food insecurity to be a significant risk factor for obesity. Conclusions from this study are somewhat limited due to the fact that some questions in this area were administered to only a limited number of individuals. However, individuals who reported having had to cut balanced meals in the past year due to lack of money had higher mean BMIs than those who did not. The association was significant in both the control and psychiatric

disorder groups, but the effect size was much larger among people with mental illness. As a result, practitioners would serve their patients well by helping them to avoid having to cut balanced meals by referring them to programs such as food stamps, Women Infants and Children, and food banks. Case managers could assist patients in accessing these resources. However, as demonstrated in the government assistance portion of this study, having access to these programs may be a necessary but insufficient measure to reduce the risk for weight gain. Patients may also need to have an understanding of healthy food choices to best utilize the resources offered by assistance programs, which may be an area for future research.

This study found that individuals who reported financial insecurity had higher BMIs. The association between lack of financial resources and elevated BMI is logical and was hypothesized before the start of the study. However, it is unclear why the effect of financial security had a greater impact on BMI in the psychiatric disorder group. Mental illness may make it more difficult for individuals to optimize use of limited financial resources. Regardless of the process affecting this relationship, it is clear that practitioners should devote at least some time to helping ensure that their patients do not fall into extreme poverty by referring them to available assistance programs.

The final section of the study found a significant association between having received government assistance and BMI. Additionally, the two questions with the largest effect sizes in the study asked about SSI and being covered currently by a government program. It must be noted that this study is cross-sectional and cannot suggest that receiving government assistance increases the risk for elevated BMI. Rather, it is likely that the conditions that led to individuals requiring government help also led to high BMI. The primary finding of this section of the study is that people who are in need of assistance are at an increased risk for gaining weight. As a result, practitioners should be aware that they need to be more vigilant in helping their patients on government assistance keep from gaining weight.

This study has a number of limitations. Although the CPES is a rich source of data on the childhood and adult SES of a large number of individuals, a relatively small number of them (n=480) were identified as likely having schizophrenia or bipolar disorder. They survey data is cross-sectional, so causation cannot be inferred. The current study relies on retrospective and self-reported demographic, symptom, and SES data through the CIDI. The use of the existing database does not allow for the control of some potentially-confounding variables such as family history of obesity. Lastly, the use of mental health as a dichotomous variable likely resulted in an underestimation of the associations of many of the variables with BMI.

Relatively simple statistics such as t-tests and correlations were used rather than more complex statistics such as regression models for three reasons. First, the data set contains significant gaps which precludes the use of models that analyze multiple variables. Second, this study was focused on clinical application which is most practical with simple t-tests and correlations. For example, it is relatively easy for a practitioner to tell whether a patient has been exposed to low SES positions and infer some degree of risk for weight gain but rather difficult to assess risk based on complex interactions between a number of variables. Third, this study is the first step in a line of research that will lead to the development of a screening tool. Initially, significant variables will be identified in studies such as this one. Later, the identified variables will be analyzed simultaneously in a study of primary data collection that will allow for sufficiently powerful regression analyses.

Obesity is clearly a significant problem among people with schizophrenia and bipolar disorder. Practitioners must be more active in helping their patients maintain a healthy weight. This study showed that the normally significant factors of age, occupation, and education were not associated with BMI in people with schizophrenia or bipolar disorder. However, individuals who experienced food insecurity, financial insecurity, or received government assistance were at an increased risk for elevated BMI. Practitioners can use these indicators to help identify

individuals at higher risk for weight gain to institute closer monitoring and early intervention when needed.

Further research into the risk factors for the development of obesity among people with mental illness is warranted. Additional factors for analysis may include family history of obesity, insomnia, inactivity, smoking, and medical problems. The CPES could be used to answer a number of these questions, while others such as a family history of obesity would require other sources of data. An intervention study that addresses increasing nutritional knowledge may help determine variables that contribute to the relationship between government assistance and BMI in persons with schizophrenia and bipolar disorder.

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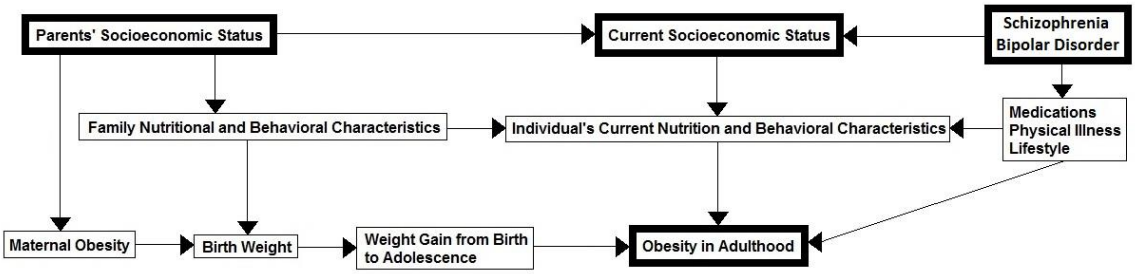
Appendix A



Proposed conceptual framework of SES, schizophrenia/bipolar disorder, and obesity.

Appendix B

	Psychiatric Disorder		Control
n	480 (2.4%)		5,161 (25.8%)
Mean age (SD)	47.2 (13.3)	*$t(668) = 10.646$, $p < 0.001$	38.0 (18.6)
Female	297 (61.9%)	*$\chi^2(1, N = 5,636) = 13.549$, $p < 0.001$	2,742 (51.3%)
Married	194 (40.4%)	*$\chi^2(1, N = 5,636) = 66.961$, $p < 0.001$	3,081 (59.7%)
Studied beyond high school	216 (45.1%)	*$\chi^2(1, N = 5,667) = 17.622$, $p < 0.001$	2,827 (55.1%)
Non-white	304 (63.3%)	*$\chi^2(1, N = 5,636) = 235.845$, $p < 0.001$	1,503 (53.1%)

*=statistically significant at $p < 0.05$

Sample Description (N=5,641)

Appendix C

			Psychiatric disorder	Control
Mean BMI			*28.3 (psychiatric disorder) v. 27 (control), t(516) = 5.084, p <0.001, d=0.22	
Demographics		Age	r=0.18, p <0.001	r=0.088, p <0.001
		Sex	*28.8 (female) v. 27.6 (male) t(452) = 1.986, p <0.05, d=0.18	*27.4 (male) v. 26.5 (female) t(4,585) = 5.942, p =<0.001, d=0.17
		Subject professional	28 (no) v. 27.5 (yes) t(184) = 0.565, p =0.572, d=0.08	*27.5 (no) v. 26.5 (yes) t(1,581) = 3.422, p =0.001, d=0.18
		Studied beyond high school	28.6 (no) v. 28 (yes) t(455) = 0.982, p =0.327, d=0.09	*27.3 (no) v. 26.6 (yes) t(4,151) = 4.209, p <0.001, d=0.13
		Married	29.1 (yes) v. 27.8 (no) t(456) = 1.93, p =0.054, d=0.18	*27.2 (yes) v. 26.4 (no) t(3,863) = 4.606, p <0.001, d=0.14
Childhood SES Indicators		Father professional work	*29 (no) v. 26.3081 (yes) t(310) = 2.129, p =0.034, d=0.4	*27.3 (no) v. 26.2 (yes) t(2,090) = 2.856, p = 0.004, d=0.2
		Mother professional work	28.7 (no) v. 28.6 (yes) t(297) = 0.136, p =0.892, d=0.2	*27.4 (no) v. 25.9 (yes) t(757) = 4.771, p <0.001, d=0.28
		Father studied beyond high school	*29 (no) v. 26.7 (yes) t(172) = 1.992, p <0.048, d=0.33	*27.6 (no) v. 25.9 (yes) t(1,852) = 6.064, p <0.001, d=0.32
		Mother studied beyond high school	28.4 (no) v. 28.3 (yes) t(198) = 0.113, p =0.9, d=0.02	*27.6 (no) v. 25.9 (yes) t(1,139) = 6.243, p <0.001, d=0.3
		Had no medical care	29.5 (yes) v. 27.9 (no) t(226) = 1.255, p =0.211, d=0.21	*29.2 (yes) v. 27.1 (no), t(76) = 3.229 p = 0.001, d=0.37
Adult SES Indicators	Food Security	Had to cut balanced meals	*31 (yes) v. 27.8 (no) p =0.012, d=0.42	*28.4 (yes) v. 27.3 (no) t(1,761) = 2.075, p =0.038, d=0.17
	Financial Security	Difficulty paying bills	*29.1 (yes) v. 26.6 (no) t(263) = 11.924, p <0.01, d=0.35	*28.2 (yes) v. 27 (no) t(964) = 3.939, p <0.001, d=0.21
		Enough money to meet	*28.6 (no) v. 27.2 (yes) t(264) =	*28.5 (no) v. 26.8 (yes) t(614) = 5.622,

		needs	5.307, p =0.1, d=0.19	p <0.001, d=0.27
		Money after debts	*30 (no) v. 27.5 (yes) t(125) = 2.269, p = 0.025, d=0.33	*28.4 (no) v. 27 (yes) t(443) = 4.076, p < 0.001 p <0.001, d=0.25 718-772-1776
		Income-to-needs ratio	*30.2 (low) v. 27.7 (not low) t(195) = 3.111, p = 0.002 p <0.005, d=0.35	27.8 (low), v. 27.1 (not low), t(279) = 1.485, p =0.101, d=0.11
		Received SSI in past year	*33.1 (yes) v. 28.5 (no) t(159) = 3.322, p <0.005, d=0.7	NA
		Received food stamps in past year	*31 (yes) v. 28.5 (no) t(159) = 2.208, p =0.029, d=0.36	NA
	Government Assistance	Covered by government program	*30.2 (yes) v. 27.3 (no) t(293) = 2.506, p = 0.014, d=0.39	*28.6 (yes) v. 27.1 (no), t(106) = 2.589, p <0.05, d=0.25
		Received welfare since age 18	*29.7 (yes) v. 27.5 (no), t(399) = 3.017, p = 0.004, d=0.31	*29.2 (yes) v. 27 (no), t(193) = 4.015, p <0.001, d=0.37

*=statistically significant at $p < 0.05$

Associations of BMI and Sociodemographic Variables by Group (N=5,641)