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PHYSICAL ACTIVITY AND WELLNESS LAB

SUNY Cortland

Weight Status, Depression, and Physical Activity in Adults (NHANES 2017-2018)

Ian C. Macali[1], Erik Lind[2], Megan E. Holmes[1]
Mississippi State University[1], Starkville, MS; State University of New York - Cortland[2], Cortland, NY

ABSTRACT

Prevalence of obesity and depressive continue to increase in adults (Greenberg et. al., 2021). Previous research suggests a modest relationship between body mass index (BMI) and depression (DEP) with recommendations for analysis of additional covariates for more accurate inferences (Atlantis & Baker, 2008). Physical activity (PA) provides mental health benefits for depressed people, even at levels lower than that of current PA recommendations. (Pearce et. al., 2022). PURPOSE: This study examined the relationship between BMI and DEP and the potential moderation of health covariables on the obesity-depression relationship. METHODS: National Health and Nutritional Examination Survey (NHANES) (2017-2018) data was used. Descriptive statistics were calculated for all variables. Multiple linear regression analysis was used to examine the relationship between BMI and DEP and to determine if PA may play a potential moderating effect on the BMI-DEP relation. Covariates included smoking status, sex, and socioeconomic status measured by monthly poverty index. Significance was set at p=0.05. RESULTS: 5856 participants, 2840 males 50.23 yrs. (±18.90) and 3016 females e 49.56 yrs. (±18.65) were included in the present analysis. Mean BMI was 29.72 kg/m² (±7.44 kg/m²). Mean PA was 130.41 min/week-1 (±179.61 min/week-1) and mean family monthly poverty index was 2.79 (±1.54). Smoking status was categorized as smoker, occasional smoker and non-smoker, which represented 34.1%, 9.2%, and 56.7% of participants, respectively. Mean score on the DEP screening tool was 3.37 (±4.58). A significant model (R^2=.112, F=63.4, p=< 0.0001) emerged with main effects of BMI (β=0.008, p= 0.0008), PA (β=-0.002, p= 0.0027), family monthly poverty index (β= -0.316, p= 0.0112), sex (β= 1.187, p=0.0001), and smoking status (β= -0.874, p=<0.0001) contributing to the overall model. The interaction between PA and BMI was non-significant. CONCLUSION: The relatively weak association between BMI and depression suggests BMI plays a small but significant role in people exhibiting depressive symptoms. Practitioners working with individuals with obesity may find it beneficial to screen for DEP and refer to mental health professionals. Likewise, depression interventions should address physical activity and efforts to improve weight status.

BACKGROUND & PURPOSE

- Weight gain is a by-product of prolonged depression, and obesity and depression are cyclically related (Luppino et al., 2010).
- Depression is elevated in those who are obese and overweight (Opel et al., 2015).
- Physical activity (PA) provides mental health benefits for depressed people, even at levels lower than that of current PA recommendations (Pearce et. al., 2022).
- A modest relationship between body mass index and depression exists, but analysis of additional covariates is needed for more accurate inferences into causality (Atlantis & Baker, 2008).
- This study examined the relationship between BMI and depression and the potential moderation of health covariables on the obesity-depression relationship.

METHODS

- National Health and Nutrition Examination Survey (NHANES) 2017-2018 data was used for the present investigation and all data was collected by NHANES technicians.
- BMI was calculated from height and weight measurements.
- Screening for depressive symptoms was performed using the Patient Health Questionnaire (Kroenke and Spitzer, 2002; Kroenke et al., 2001) which measures symptoms of depression over a 2-week period, values ranged 0 – 20.
- Physical activity was measured via self-report, both moderate and vigorous physical activity were assessed and recorded as minutes per week.
- Poverty score was defined as the ratio of one's monthly income to the poverty line and is based on poverty levels from 2017 and 2018 Department of Health and Human Services guidelines for poverty.
- Multiple regression analysis was used to determine the influence of BMI and depression and if physical activity moderated the effect.

RESULTS

Table 1. Participant characteristics.

	Total	Male	Female
Participants	(n=5856)	(n=2840)	(n=3016)
Depression Score	3.24 (4.2)	2.7 (4.0)	3.7 (4.4)
PA Total (min)	113 (179)	132 (197)	96 (160)
BMI (kg/m^2)	29.7 (7.4)	29.22 (6.6)	30.1 (8.1)
% Obese	39%	43%	41%
% Non-Smoker	58.8%	53.5%	56.7%
Poverty Score	2.31 (1.5)	2.4 (1.5)	2.26 (1.5)
% Non-White	65.3%	31.2%	34.1%

PA: Physical Activity, BMI: Body Mass Index
Continuous variables are presented as mean (SD), Categorical variables are presented as %

RESULTS (cont.)

Table 2. Linear regression predicting depression.

	β	*p*
Total PA (min/wk)	-0.0018	0.0027*
Smoking Status	-0.8744	<.0001*
BMI (kg/m^2)	0.0821	0.0008*
Poverty Score	-0.3156	0.0112*
Gender	1.1872	0.0001*

F= 63.40*, R^2 =0.1119; *p<0.05
PA: Physical Activity, BMI: Body Mass Index
Values are standardized beta coefficients

Table 3: Linear regression predicting depression with physical activity BMI interaction.

	β	*p*
Total PA (min/wk)	0.0004	0.9320
Smoking Status	-0.8727	<.0001*
BMI (kg/m^2)	0.0891	0.0034*
Poverty Score	-0.3163	0.0111*
Gender	1.1913	0.0001*
PA*BMI (kg/m^2)	<.0001	0.6200

F= 55.34*, R^2 =0.1123; *p<0.05
PA: Physical Activity, BMI: Body Mass Index
Values are standardized beta coefficients

CONCLUSIONS

- BMI plays a small but significant role in the degree to which people exhibited depressive symptoms.
- Practitioners working with individuals with obesity may find it beneficial to screen for depression and refer to mental health professionals.
- No interactive effect of physical activity and obesity on depression.
  - Depression interventions should still address physical activity and other efforts to improve weight status.

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