Preventive Medicine Reports 12 (2018) 268–270

Contents lists available at ScienceDirect

Preventive Medicine Reports

journal homepage: www.elsevier.com/locate/pmedr

Short communication

# Identifying subgroups of Black, Hispanic and Asian men at increased risk for comorbid depression and overweight or obesity☆

Jaclynn Hawkins[a,*], Daphne Watkins[a], Julie Ober Allen[b], Jamie Mitchell[a]

[a] University of Michigan, School of Social Work, United States
[b] University of Michigan, Population Studies Center, United States

ARTICLE INFO

*Keywords:*
Depression
Overweight
Obesity
Men's health
Race
Chronic illness

ABSTRACT

Comorbid depression and overweight or obesity increase risk for developing many chronic diseases. Investigating men of color without using a non-Hispanic White male reference group will capture a more nuanced picture of how socio-demographic factors contribute to increased risk for comorbid depression and overweight or obesity among and between men of color. This study used the U.S.-based 2014 National Health Interview Survey (n = 1363) in May 2018 to examine associations between race/ethnicity and comorbid overweight or obesity and depression in men. Men were more likely to be obese or overweight and depressed if they were older (31–54 years old and 55 + ) [OR = 2.387, 95% CI: 1.526, 3.873, p = 0.000; OR = 2.220, 95% CI: 1.355, 3.635, p = 0.002], Black [OR = 2.745, 95% CI: 1.622, 4.646, p < 0.001], Hispanic [OR = 2.967, 95% CI: 1.762, 4.995, p < 0.001], or earned $35,000–$74,999 [OR = 1.987, 95% CI: 1.255–3.152, p = 0.004]. We identified socio-demographic sub-groups of men at increased risk for comorbid depression and overweight or obesity. Examining intra-group differences among men of color will help clinicians and researchers to address more nuanced socio-demographic characteristics of groups of men who are more at risk for developing a chronic disease.

## 1. Introduction

In the United States, comorbid depression and overweight or obesity is a major public health concern with serious implications for the prevention, diagnosis and treatment of several health conditions (Ogden et al., 2013; Centers for Disease Control and Prevention and Overweight and Obesity, 2018; National Heart, Lung, and Blood Institute, National Institutes of Health, 2018). Separately and combined, both conditions contribute to increased diagnosis and poor management of a range of chronic illnesses such as hypertension, diabetes and cardiovascular disease (Ogden et al., 2013; Centers for Disease Control and Prevention and Overweight and Obesity, 2018). Numerous studies have shown that depression can both contribute to and result from overweight (body mass index (BMI) of 25 kg/m2 or greater but < 30 kg/m2) or obesity (BMI greater than or equal to 30) (Jensen et al., 2013; de Wit et al., 2008; Zhao et al., 2011). To date, research on mood and chronic physical health conditions, such as depression and overweight or obesity, has focused on identifying gender and race-based differences with non-Hispanic white men and women as the reference group(s) (Gavin et al., 2010; Griffith et al., 2011; Johnson-Lawrence et al., 2013). Predictors of comorbid conditions, such as depression and overweight or obesity, have not been fully explored for men of color in the United States who have disparities in diagnosis and management of both conditions (Gavin et al., 2010; Johnson-Lawrence et al., 2013; Thorpe et al., 2015). Similar to non-Hispanic white men, Asian American men generally have lower rates of obesity and depression diagnosis compared to Black and Hispanic men, but as a group, may face unique barriers to achieving optimal health associated with racial minority group membership that warrant further research (Bin Li et al., 2004; Gee et al., 2008; Kim et al., 2010). The objective of this study was to move beyond a non-Hispanic white comparison, to identify intergroup differences among men of color in the U.S. at increased risk for comorbid depression and overweight or obesity.

## 2. Material and methods

Data for this study derive from the 2014 National Health Interview Survey (NHIS), a cross-sectional household survey conducted annually. Weights for the data used in this analysis are based on the 2010 Census population estimates, account for geographically-defined sampling

☆ This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
* Corresponding author at: School of Social Work, 1080 S. University, School of Social Work, University of Michigan, United States.
*E-mail address:* jachawk@umich.edu (J. Hawkins).

https://doi.org/10.1016/j.pmedr.2018.10.022
Received 11 June 2018; Received in revised form 23 October 2018; Accepted 25 October 2018
Available online 27 October 2018

units across the 50 states and the District of Columbia, address non-response, and are post-stratified by race, ethnicity, sex, and age (Parsons et al., 2015). The 2014 NHIS collected data from 34,525 adults, representing a 79.7% response rate of eligible adults. The sample for this study was restricted to Black, Hispanic, and Asian men with and without comorbid depression and overweight or obesity (n = 1363). We did not conduct comparisons to White men because this diverged from the study objective. Asian men were chosen as the reference group because they are documented to have lower rates of depression and overweight or obesity compared to Hispanic and Black men.

*Depression* was assessed using participants' response to a question asking whether a doctor had ever diagnosed them with depression. *Overweight or obesity* was defined as having a BMI at or above 25.0, based on men's self-reported height and weight. Although modified BMI cutoffs for different race/ethnic groups and subgroups have been debated (Burkhauser and Cawley, 2008; Yi et al., 2015), we adhered to established thresholds due to the lack of consensus, evidence, and guidelines for altering cutoffs. *Race/ethnicity* was determined by participants' responses to a series of questions about their race and ethnicity. All participants reporting Hispanic were included in the Hispanic group. Non-Hispanic men who identified their primary race as either Black or Asian (reference group) were categorized accordingly. Demographic variables were self-reported *age group*, *marital status*, *employment status*, *education*, *income* and *poverty status*.

### 2.1. Analysis

All statistical analyses were conducted in Stata version 13 (StataCorp, 2013). Statistical significance was assessed with two-tailed tests and $\alpha = 0.05$. Exploratory data analyses with the variables of interest were conducted, including bivariate analyses to examine the relationships between comorbid depression and overweight/obesity and key variables using Pearson's Chi-square, one-way analysis of variance (ANOVA), and Kruskal Wallis tests, as appropriate. Logistic regression was used to identify subgroups among men of color at greater risk for reporting comorbid depression and overweight or obesity.

## 3. Results

Table 1 presents and compares the descriptive characteristics of the sample, by race/ethnicity. The full sample, n = 1363, includes data from 632 (53% of the sample) Hispanic men, 500 (31%) Black men, and 231 (15%) Asian men. A majority of men in the sample were between the ages of 31 and 54. Hispanic and Asian men were more likely to be married and employed compared to Black men. 44% of Asian men had an undergraduate degree or more compared to their Black (21%) and Hispanic (11%) counterparts. Hispanic and Black men reported the highest rates of comorbid depression and overweight or obesity.

Logistic regression was used to estimate odds ratios (OR) and corresponding 95% confidence intervals (CI) for characteristics of men of color who may be at increased risk for meeting the criteria for comorbid depression and overweight or obesity (Table 2). Results suggested that both groups of older men (31–54 years old and 55 + ) have higher odds of meeting the criteria for comorbid depression and overweight or obesity than their 18–30 year old counterparts, after controlling for race/ethnicity and other socio-demographic characteristics [OR = 2.387, 95% CI: 1.526, 3.873, p = 0.000; OR = 2.220, 95% CI: 1.355, 3.635, p = 0.002]. Men who identified as Black [OR = 2.745, 95% CI: 1.622, 4.646, p < 0.001] or Hispanic [OR = 2.967, 95% CI: 1.762, 4.995, p < 0.001] also reported greater odds of comorbid depression and overweight or obesity when compared to men who identified as Asian. Marital status, employment status, education, and poverty were not statistically associated with comorbid depression and overweight or obesity after taking age group and race/ethnicity into account. Income, however, was independently associated with comorbid depression and overweight or obesity; with men who had annual family incomes in the middle-income bracket of $35,000–$74,999 having higher odds [OR = 1.987, 95% CI: 1.255–3.152, p = 0.004] of reporting comorbid depression and overweight/ obesity than men in the highest income bracket of $75,000 per year and above.

**Table 1**
Sample Characteristics (n = 1363).

| | Black (n = 632) | Hispanic (n = 500) | Asian (n = 231) |
|---|---|---|---|
| Age | | | |
| 18–30 | 98(26%) | 167(35%) | 60(28%) |
| 31–54 | 210(47%) | 310(46%) | 105 (46%) |
| 55 and over | 192(27%) | 155(19%) | 66 (26%) |
| Marital status | | | |
| Not married | 293(47%) | 31(43%) | 104(37%) |
| Married | 175(43%) | 286(51%) | 120(60%) |
| Cohabitating | 32(9%) | 40(6%) | 3(7%) |
| Employment status | | | |
| Unemployed | 44(11%) | 54(10%) | 14(6%) |
| Employed | 275(61%) | 448(72%) | 159(73%) |
| Not in labor force | 181(27%) | 130(18%) | 58(21%) |
| Education | | | |
| Less than HS | 199(11%) | 224(35%) | 10(3%) |
| GED/high school graduate | 158(31%) | 177(27%) | 49(22%) |
| More than HS less than BA/BS | 138(27%) | 151(27%) | 60(30%) |
| BA/BS or More | 91(21%) | 80(11%) | 112(44%) |
| Income | | | |
| $0–$34,999 | 276(46%) | 321(42%) | 88(30%) |
| $35,000–$74,999 | 145(30%) | 189(33%) | 68(28%) |
| $75, 000 and above | 79(24%) | 95(21%) | 75(41%) |
| Poverty | | | |
| At or below poverty threshold | 94(14%) | 154(22%) | 36(12%) |
| Above poverty threshold | 406(86%) | 478(78%) | 195(88%) |
| Comorbid depression & overweight or obesity | | | |
| Yes | 411(81%) | 527(82%) | 154(62%) |
| No | 89(19%) | 105(18%) | 77(38%) |

This study used the U.S.-based 2014 National Health Interview Survey (n = 1363) in May 2018.

## 4. Discussion

Comorbid depression and overweight or obesity was highly prevalent among this representative sample of U.S. men of color, with Black and Hispanic men experiencing significantly higher rates than Asian men. Comorbid depression and overweight or obesity was also significantly associated with household income and older age, potentially representing pathways through which other socio-demographic factors may contribute to the burden of both conditions among men.

Hispanic and Black men in the sample had over 2 times the odds of having comorbid depression and overweight or obesity. This finding is consistent with previous research that in general, Black and Hispanic persons in the US have higher instances of being overweight or obese when compared to Asian men (Ogden et al., 2013). Additionally, men who were in their 30's or older were significantly more likely to have comorbid depression and overweight or obesity. This finding is supported by research finding an increase in weight as age progresses (Newman et al., 2001). Given that being overweight or obese can lead to a variety of chronic diseases, particularly as men age, these findings may partially be explained by the frequency that individuals who are overweight or obese interact with the health care system and thus increase the likelihood of a depression diagnosis.

Study limitations include the cross-sectional design, self-reporting of data, lack of within group analyses (e.g., comparing Hispanic subgroups) due to insufficient subgroup samples, and BMI as a measure of

**Table 2**
Predictors of Comorbid Depression and Overweight/Obesity for U.S. Black, Hispanic and Asian Men (n = 1363).

| | Odds ratio [95% CI] |
|---|---|
| Age | |
| 18–30 | REF |
| 31–54 | 2.387** [1.526, 3.873] |
| 55 and over | 2.220* [1.355, 3.635] |
| Race/Ethnicity | |
| Black | 2.745** [1.622, 4.646] |
| Hispanic | 2.967** [1.762, 4.995] |
| Asian | REF |
| Marital status | |
| Not married | 0.753 [0.499, 1.137] |
| Married | REF |
| Cohabitating | 0.520 [0.262, 1.046] |
| Employment status | |
| Unemployed | 1.173 [0.616, 2.237] |
| Employed | REF |
| Not in labor force | 1.032 [0.636, 1.672] |
| Education | |
| Less than HS | 1.099 [0.648, 1.862] |
| GED/high school graduate | REF |
| More than HS Less than BA/BS | 1.556 [0.944, 2.563] |
| BA/BS or More | 0.955 [0.551, 1.654] |
| Income | |
| $0–$34,999 | 1.270 [0.785, 2.055] |
| $35,000–$74,999 | 1.987* [1.255, 3.152] |
| $75, 000 and above | REF |
| Poverty | |
| Below Poverty Threshold | 1.104 [0.621, 1.963] |
| Above Poverty Threshold | REF |

This study used the U.S.-based 2014 National Health Interview Survey (n = 1363) in May 2018.

* $p < 0.05$.

** $p < 0.001$.

elevated obesity-related health risks. Unlike other racial/ethnic groups, for Asian men, being underweight has been associated with depression (Li, 1017; Hidese et al., 2018), however due to sample size, we were unable to include an underweight category in this analysis. The 2014 NHIS dataset was utilized for this study because it is the most recent dataset that includes a large sample of men from diverse racial/ethnic groups while also asking detailed physical and mental health questions.

This study presents many opportunities for public health interventions to prevent chronic disease in men. To our knowledge, this study is the first to identify subgroups among men of color at increased risk for comorbid depression and overweight or obesity. Again, given the wealth of research on men's health has either primarily focused on or contain disproportionately larger samples of non-Hispanic White men, we focus instead on intragroup differences in men of color exclusively. Because race/ethnicity was associated with having comorbid depression and overweight or obesity, tailoring public health interventions to account for the unique needs of specific subgroups of men of color needs to be explored. It is also critical that future data sets collect larger samples of racial and ethnically diverse men to allow for the examination predictors of comorbid depression and underweight, particularly among Asian men in the US. Programs that target either condition individually also need to be scaled up; weight management and depression programs would benefit from screening for either condition, adopting a multi-condition versus disease specific approach, particularly among men over 30.

## Conflict of interest

The authors declare there is no conflict of interest.

## References


Bin Li, Zhi, Yin Ho, Sai, Man Chan, Wai, et al., 2004. Obesity and depressive symptoms in Chinese elderly. Int. J. Geriatr. Psychiatry 19 (1), 68–74.

Burkhauser, R.V., Cawley, J., 2008. Beyond BMI: the value of more accurate measures of fatness and obesity in social science research. J. Health Econ. 27 (2), 519–529.

Centers for Disease Control and Prevention. Overweight and Obesity. https://www.cdc.gov/obesity/index.html. Accessed May 25, 2018.

Gavin, Rue, Takeuchi, 2010. Racial/ethnic differences in the association between obesity and major depressive disorder: findings from the Comprehensive Psychiatric Epidemiology Surveys. Public Health Rep. 125 (5), 698–708.

Gee, Gilbert C., Ro, Annie, Gavin, Amelia, Takeuchi, David T., 2008. Disentangling the effects of racial and weight discrimination on body mass index and obesity among Asian Americans. Am. J. Public Health 98 (3), 493–500.

Griffith, D.M., Johnson-Lawrence, V., Gunter, K., Neighbors, H.W, 2011. Race, SES, and obesity among men. Race Soc. Probl. 3, 298–306.

Hidese, Shinsuke, Asano, Shinya, Saito, Kenji, Sasayama, Daimei, Kunugi, Hiroshi, 2018. Association of depression with body mass index classification, metabolic disease, and lifestyle: a web-based survey involving 11,876 Japanese people. J. Psychiatr. Res. 102, 23–28.

Jensen, M.D., Ryan, D.H., Apovian, C.M., et al., 2013. AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults. https://doi.org/10.1161/01.cir.0000437739.71477.ee. (Published June 24, 2014. Accessed May 25, 2018).

Johnson-Lawrence, Griffith, Watkins, 2013. The effects of race, ethnicity, and mood/anxiety disorders on the chronic physical health conditions of men from a national sample. Am. J. Mens Health 7 (4_suppl), 58S–67S.

Kim, Ji-Yong, Chang, Hye-Mi, Cho, Jung-Jin, Yoo, Sang-Ho, Kim, Soo-Young, 2010. Relationship between obesity and depression in the Korean working population. J. Korean Med. Sci. 25 (11), 1560–1567.

National Heart, Lung, and Blood Institute, National Institutes of Health. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report. www.nhlbi.nih.gov/health-pro/guidelines/archive/clinical-guidelines-obesity-adults-evidence-report. Published September 1998. Accessed May 25, 2018.

Newman, Yanez, Harris, Enright, Duxbury, Fried, 2001. Weight change in old age and its association with mortality. J. Am. Geriatr. Soc. 49 (10), 1309–1318.

Ogden, C., Carroll, M., Kit, B., Flegal, K., 2013. Prevalence of Obesity Among Adults in the United States, 2011–2012 (Data Brief). National Center for Health Statistics, Atlanta, GA.

Parsons, V.L., Moriarity, C., Jonas, K., Moore, T.F., Davis, K.E., Thompkins, L., 2015. In: Available online (Ed.), Design and Estimation for the National Health Interview Survey, 2006–2015, . https://www.cdc.gov/nchs/data/series/sr_02/sr02_165.pdf (accessed on 15 November 2017).

StataCorp, 2013. Stata Statistical Software: Release 13. StataCorp LP, College Station, TX.

Thorpe, R., Kelley, Bowie, Griffith, Bruce, LaVeist, 2015. Explaining racial disparities in obesity among men: Does place matter? Am. J. Mens Health 9 (6), 464–472.

de Wit, van Straten, Cuijpers, 2008. Obesity and depression: a meta-analysis of community based studies. In: Obesity. vol. 16. pp. S132–S133.

Yi, S.S., Kwon, S.C., Wyatt, L., Islam, N., Trinh-Shevrin, C., 2015. Weighing in on the hidden Asian American obesity epidemic. Prev. Med. 73, 6–9.

Zhao, Guixiang, Ford, et al., 2011. Waist circumference, abdominal obesity, and depression among overweight and obese US adults: National Health and Nutrition Examination Survey 2005–2006. BMC Psychiatry 11 (1), 130.