



ISSN: 2350-0328

**International Journal of Advanced Research in Science,
Engineering and Technology**

Vol. 5, Issue 9 , September 2018

Association of adolescent obesity with risky sexual behaviors: Results from Mississippi YRBS, 2013-2015

LaTonya Lott, Jung Hye Sung, Jae Eun Lee

Mississippi State Department of Health. Mississippi, USA
School of Public Health, Jackson State University. Mississippi, USA
RTRN DTCC, Jackson State University. Mississippi, USA

ABSTRACT: The purpose of this study is to investigate if obesity is related to sexual risk-taking behaviors which may increase risk for sexually transmitted infections among Mississippi high school students. Black adolescents were more likely to have sexual intercourse and more likely to use condom than white adolescents ($p=0.0314$ and $p<0.0001$, respectively). Male adolescents were more likely to have sexual intercourse and more likely to use condom than female adolescents ($p=0.0335$ and $p=0.0099$, respectively). While higher grades were more likely to have sexual intercourse than lower grades, there was no difference in condom use among grades. There was an association between sexual intercourse and obesity after controlling for gender, race, and grade ($OR=1.218$, $p=0.0392$). While there was an association between sexual intercourse and obesity among male adolescents ($OR=1.433$, $p=0.0429$), there was no relationship among other categories (Females: $OR=0.965$, $p=0.871$; Blacks: $OR=1.306$, $p=0.0766$; Whites: $OR=1.072$, $p=0.7212$). Educators and policymakers in Mississippi may need to increase educational interventions designed to increase condom use toward white students in Mississippi.

KEY WORDS: adolescent obesity, risky sexual behaviors, condom use, YRBS

I. INTRODUCTION

The prevalence of obesity and sexually transmitted infections (STIs) in the United States is substantial. About one out of every three adolescents in the country is classified as being either overweight or obese. At the same time, 26% of all new HIV infections in 2010 occurred in people between the ages of 13 and 24 (Centers for Disease Control and Prevention, 2012). Furthermore, about 50% of the nearly 20 million cases of STIs in the United States occur in people between the ages of 15 and 24 (Satterwhite et al., 2013). While the prevalence of obesity and the rate of new HIV infections and STIs in adolescents and young people in the United States are important by themselves, they may also be connected. Researchers have identified a connection between obesity and a variety of psychological problems, including depressive symptoms, increased likelihood of suicidal ideation, and generally low self-esteem (Kalarchian & Marcus, 2012). Young people who are depressed have been found to be less likely to use a condom during their last sexual relationship, as well as engaging in sexual activities with five or more people (Ores et al., 2012).

Beyond the national and international trends and relationships between obesity and sexual risk-taking in young people, Mississippi is a state that has a higher level of both obesity and sexually transmitted infections than the national average. In 2013, 13.7% of all students in grades 9 through 12 were obese in the United States, but 15.4% of students in grades 9 through 12 in Mississippi were obese. In addition, 59.1% of students in grades 9 through 12 reported that they used a condom during their last sexual intercourse, which is in stark contrast to Mississippi in which 64.6% of adolescents reported not using a condom during their last sexual intercourse (Centers for Disease Control and Prevention, 2015; Kahn et al., 2014).

While the lack of inclusion of underweight adolescents in research regarding the connection between obesity and sexual risk-taking may not seem important, it is important because the literature is not conclusive about whether obesity is associated with sexual risk-taking among adolescents. There is research that shows that obesity in adolescents is



ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 5, Issue 9 , September 2018

actually associated with a decrease in the likelihood of engaging in any type of sexual activity (Cheng & Lansdale, 2010). The small amount of research that does exist is not conclusive at all, and there are methodological issues that raise questions about whether the full story is even known about any relationship between obesity and sexual risk-taking and HIV and STIs in adolescents.

The purpose of this study is to investigate if obesity is related to sexual risk-taking behaviors which may increase risk for sexually transmitted infections among Mississippi high school students.

II. LITERATURE REVIEWS

While there are studies about the relationship between BMI and sexual risk-taking among adolescents, the results are not conclusive as to whether obese adolescents engage in more or less sexual activity and risky sexual behaviors. Becnel et al. (2016) found that among a sample of 13 to 18 years old females, those who were severely obese reported having engaged in fewer sexual behaviors than the females who were normal. However, a subsample of the severely obese females in the study reported a greater likelihood of engaging in risky sexual behaviors, such as not using a condom or contraception every time they had sex or contracting an STI. Other studies also found that while obese adolescents were less likely to engage in sexual activities, they were more likely to engage in risky sexual behaviors when they do engage in sexual activities (Lowry, Kann&Galuska, 2014; Ratcliff et al., 2011; Cheng & Lansdale, 2010).

Another issue that has been raised within the academic literature about the relationship between BMI and sexual activity and sexual risk-taking is race. Ali et al. (2012) found their study conducted using data from children in grades 7 through 12 that obese White girls were less likely to have had sex as compared to non-obese white girls. However, the researchers found that among African-American girls, there was no difference in the likelihood that obese and non-obese girls had engaged in sexual activities.

Gordon et al. (2015) found that 860 sexually active adolescent obese girls were associated with engaging with risky sexual behaviors. This study does not prove that obese African-American adolescents engage in more sexual activity because of a lack of stigma about obesity. Instead, it indicated that race might be an issue worth considering as a mediating factor in potential differences in the relationship between BMI and sexual risk-taking behaviors. Akers et al. (2009) found that while there was not a statistically significant difference between BMI and sexual risk-taking behaviors among White girls, among African-American girls who were overweight, there was an increased likelihood of engaging in sexual risk-taking behaviors.

Leech and Dias (2012) found that 340 adolescents who were 16 and 17 years old that obese White adolescents had significantly higher numbers of sexual partners and were less likely to use condoms during sexual activities. In contrast, African-American adolescents in the sample did not show differences in numbers of sexual partners or the likelihood of using condoms during sexual activities based on weight.

III. METHODS

Study Population: Data from the 2013 and 2015 Mississippi YRBS were combined to increase sample size adequately to allow for gender or race stratified analysis of the associations between the full gamut of BMI and the sexual and non-sexual risk behaviors among sexually active students. School response rates for these two years of surveys were 85% for the year 2013 and 90% for the year 2015. The response rates for students were 94%, and 79%, respectively. The overall response rates (defined as school response rate x student response rate) were 80%, and 71%, respectively. Sample sizes for each year are as follows: 1,584 students in 2013 and 2,154 students in 2015. Therefore, a total of 3,738 students provided usable data for this study.

Sexual Risk Behaviors. To assess risky sexual behaviors, two questions selected were the following: "Have you ever had sexual intercourse?" and "The last time you had sexual intercourse, did you or your partner use a condom?"

Obesity. To calculate obesity, questions capture the self-reported height and weight was used. In this case, body mass index (BMI) was calculated and is expressed as body weight in kilograms divided by the square of the height in meters



(kg/m²). Using age- and age specific reference data from growth charts provided by the Centers for Disease Control and Prevention (CDC), students with a BMI < 5th percentile were considered to be underweight; students with 5th percentile ≤ BMI < 85th percentile are considered normal weight; students with 85th percentile ≤ BMI < 95th percentile are considered overweight; and students with BMI ≥ 95th percentile are considered obese (Barlow, 2007). For this study, BMI was assigned to those two categories: obese (BMI ≥ 95th percentile) and non-obese (BMI < 95th percentile).

Demographic Characteristics. Demographic characteristics included race/ethnicity (White, Black, Hispanic, and Other), grade level (9th, 10th, 11th, and 12th), gender.

Statistical analysis: Adjusted and weighted prevalence rates were conducted using a weighting factor in YRBSS to provide nationally representative estimates and using PROC SURVEYFREQ in SAS version 9.4 (SAS Institute, Cary, NC) to account for complex sample design, 3-stage cluster sampling design. A weighting factor in YRBSS data was made to adjust for school and student nonresponse, sex, grade, and race/ethnicity. Rao-Scott chi-square tests, which are adjusted for the complex sample design, using PROC SURVEYFREQ and multiple logistic regression analyses using PROC SURVEYLOGISTIC were conducted to access if there were any demographic differences in sexual risk behaviors and in non-sexual behaviors; and if obesity was associated with sexual risk behaviors.

IV. RESULTS

Table 1 presents the differences in prevalence of sexual intercourse and condom use by demographic categories among high school students, Mississippi, 2013 and 2015. Black adolescents were more likely to have sexual intercourse and more likely to use condom than white adolescents (p=0.0314 and p<0.0001, respectively). Male adolescents were more likely to have sexual intercourse and more likely to use condom than female adolescents (p=0.0335 and p=0.0099, respectively). While the higher grades were more likely to have sexual intercourse than lower grades, there was no difference in condom use among grades. Obesity was not related to either sexual intercourse or condom use in bivariate analysis that did not control for any demographic variables.

Table 1. Prevalence of sexual intercourse and condom use by demographic categories among high school students, Mississippi, 2013 and 2015

Characteristics	Sexual Intercourse			Condom Use		
	NO n (%)	YES n (%)	p-value*	NO n (%)	YES n (%)	p-value*
Race						
Black	898(59.9)	500(40.1)	0.0314	225(31.5)	475(68.5)	<0.0001
White	847(65.9)	389(34.1)		217(45.7)	272(54.3)	
Gender						
Female	1186(65.5)	503(34.5)	0.0335	286(42.5)	373(57.5)	0.0099
Male	895(60.5)	533(39.5)		239(34.9)	489(65.1)	
Grade						
9th grade	1076(76.0)	336(24.0)	<0.0001	170(35.4)	320(64.6)	0.431
10th grade	493(67.2)	226(32.8)		126(38.1)	195(61.9)	
11th grade	243(56.9)	185(43.1)		89(37.1)	150(62.9)	
12th grade	263(48.5)	287(51.5)		139(43.0)	196(57.0)	
Obesity Status						
Obese	362(66.2)	160(33.8)	0.165	81(35.8)	144(64.2)	0.3205
Non-obese	1611(63.0)	802(37.0)		405(38.8)	665(61.2)	

* p-value from Rao-Scott χ^2

Table 2. Association of sexual intercourse and obesity stratified by gender and race among Mississippi high school students, 2013 and 2015

	Odds Ratio	95% CI	p-value
Overall*			
Obese	1.218	(1.010-1.469)	0.0392
Non-obese	Reference		
Females			
Obese	0.965	(0.623-1.496)	0.8710
Non-obese	Reference		
Males			
Obese	1.433	(1.012-2.029)	0.0429
Non-obese	Reference		
Blacks			
Obese	1.306	(0.971-1.757)	0.0766
Non-obese	Reference		
Whites			
Obese	1.072	(0.723-1.590)	0.7212
Non-obese	Reference		

*Multiple logistic model was conducted after controlling for gender, race, and grade.

Table 2 presents association of sexual intercourse and obesity stratified by gender and race among Mississippi high school students, 2013 and 2015. Overall, there was an association between sexual intercourse and obesity after controlling for gender, race, and grade (OR=1.218, p=0.0392). While there was an association between sexual intercourse and obesity among male adolescents (OR=1.433, p=0.0429), there was no relationship among other categories (Females: OR=0.965, p=0.871; Blacks: OR=1.306, p=0.0766; Whites: OR=1.072, p=0.7212).

V. DISCUSSION

Our study investigated if sexual risk-taking behavior was related to obesity among Mississippi high school students. Overall, while obese adolescents were more likely to engage in sexual intercourse than non-obese adolescents, there was no difference in condom use between obese and non-obese adolescents in Mississippi. Black and male adolescents were more likely to have sexual intercourse and more likely to use condom than white and female adolescents, respectively. While higher grades were more likely to have sexual intercourse than lower grades, there was no difference in condom use among grades.

The significance of this study was that it was one of the first empirical studies, and certainly the most recent study, to be conducted regarding obesity and sexual activity among adolescents in Mississippi. The results of this study have shown that it is not possible to argue that all obese high school students or all non-obese high school students in Mississippi are more likely to engage in risk sexual behaviors. While the data showed that obese students were indeed more likely to engage in more sexual intercourse than non-obese students, the data also showed that there was no difference in actual condom use between obese and non-obese students. This may be the most important finding of this study because what is demonstrated is that obese high school students in Mississippi may engage in more sexual intercourse, but there are not more or less likely to use condoms than their non-obese counterparts.

The cultural and social issue might explain the findings of this study. It is possible in a state with such a high rate of obesity that being obese is not considered to be detrimental to one's self-esteem. The question might be asked as to why obese high school students in Mississippi overall were shown to engage in more sexual intercourse than non-obese students. While it is certainly not possible to answer this question with the data that were analyzed in this study, one reason that obese high school students in Mississippi engage in more sexual intercourse than non-obese students might be that they are actually viewed as being more sexually desirable. With a high likelihood that a person in Mississippi will be obese, high school students, particularly obese male high school students who were found to engage in more sexual intercourse, might be considered more attractive or desirable than non-obese males.



ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 5, Issue 9 , September 2018

One of the reasons for conducting this study was to provide results that could be used can be used by parents, educators, and policymakers in Mississippi to address the issue of the high rate of non-condom use and other risk-taking behaviors in a state with a high level of adolescent obesity. Based on the results of this study, it would seem possible to advice parents, educators, and policymakers in Mississippi that the condom use among high school students in something that needs to be addressed across all students, and not an issue with a strong connection to obesity. In other words, only targeting obese students with information and interventions designed to increase condom use is not likely to be a good use of resources. Instead, the data used in this study showed no major difference in condom use based on obesity. Even more, the students who were more likely to engage in sexual activity were also the students who were more likely to use condoms.

The fact that the students who were more likely to engage in sexual intercourse were more likely to use condoms is an indication that efforts to increase condom use in Mississippi need to be targeted to students who are less likely to engage in sexual intercourse. Black male students in this study were more likely to have intercourse and more likely to use condoms. Educators and policymakers in Mississippi may need to increase educational interventions designed to increase condom use toward white students in Mississippi.

REFERENCES

1. Ali, M. M., Rizzo, J. A., Amialchuk, A., & Heiland, F. (2014). Racial differences in the influence of female adolescents' body size on dating and sex. *Economics & Human Biology*, 12, 140-152.
2. Becnel, J. N., Zeller, M. H., Noll, J. G., Sarwer, D. B., Reiter-Purtill, J., Michalsky, M., Biro, F. M. (2016). Romantic, sexual, and sexual risk behaviours of adolescent females with severe obesity. *Pediatric Obesity*, 1-10.
3. Centers for Disease Control and Prevention. (2012). Vital signs: HIV infection, testing, and risk behaviors among youths—United States. *MMWR. Morbidity and Mortality Weekly Report*, 61(47), 971.
4. Centers for Disease Control and Prevention. (2015). Mississippi – 2015 State Health Profile. Retrieved from https://www.cdc.gov/nchhstp/stateprofiles/pdf/mississippi_profile.pdf.
5. Cheng, Y. H. A., & Landale, N. S. (2010). Teen overweight, weight stigma, and intimate relationship development from adolescence to young adulthood. *Max Planck Institute for Demographic Research Working Paper*, 2010-008.
6. Gordon, L. P., Diaz, A., Soghomonian, C., Nucci-Sack, A. T., Weiss, J. M., Strickler, H. D., & Ochner, C. N. (2016). Increased Body Mass Index Associated with Increased Risky Sexual Behaviors. *Journal of Pediatric and Adolescent Gynecology*, 29(1), 42-47.
7. Kalarichian, M. A., & Marcus, M. D. (2012). Psychiatric comorbidity of childhood obesity. *International Review of Psychiatry*, 24(3), 241-246.
8. Kann, L., Kinchen, S., Shanklin, S. L., Flint, K. H., Kawkins, J., Harris, W. A., ... & Whittle, L. (2014). Youth risk behavior surveillance—United States, 2013. *MMWR Surveill Summ*, 63(Suppl 4), 1-168.
9. Leech, T. G., & Dias, J. J. (2012). Risky sexual behavior: a race-specific social consequence of obesity. *Journal of Youth and Adolescence*, 41(1), 41-52.
10. Lowry, R., Robin, L., Kann, L., & Galuska, D. A. (2014). Associations of body mass index with sexual risk-taking and injection drug use among US high school students. *Journal of Obesity*, 2014, 1-10.
11. Ores, L. D. C., Quevedo, L. D. A., Jansen, K., Carvalho, A. B. D., Cardoso, T. A., Souza, L. D. D. M., ... & Silva, R. A. D. (2012). Suicide risk and health risk behavior among youth between the ages of 18 and 24 years: a descriptive study. *Cadernos de Saúde Pública*, 28(2), 305-312.
12. Ratcliff, M. B., Jenkins, T. M., Reiter-Purtill, J., Noll, J. G., & Zeller, M. H. (2011). Risk-taking behaviors of adolescents with extreme obesity: normative or not?. *Pediatrics*, 127(5), 827-834.
13. Satterwhite, C. L., Torrone, E., Meites, E., Dunne, E. F., Mahajan, R., Ocfemia, M. C. B., .& Weinstock, H. (2013). Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. *Sexually Transmitted Diseases*, 40(3), 187-193.

AUTHOR'S BIOGRAPHY

Dr. Jung Hye Sung is an Associate Professor in the Department of Epidemiology and Biostatistics, School of Public Health at the Jackson State University. She has been the PI of grant funded by MSDH for analyzing the MS Delta CHES, the PI of grant funded by JHCHC for developing a program tool to convert E.H.R. data to OMOP required tables. Dr. Sung serves as a corresponding author in this paper (email: jung.h.lee@jsums.edu).