



## Research Article

# Major Depressive Disorder and Condom Use in Young Adult Females

Tiffany Cooke\*, Gilberte Bastien, Junjun Xu, Jurine Owen, Kurstie Cunningham and George Rust

Department of Clinical Psychiatry, Morehouse School of Medicine, Atlanta, Georgia, USA

### Abstract

Major Depressive Disorder (MDD) is a leading cause of disability and can contribute to risky sexual behavior, potentially leading to Sexually Transmitted Infections (STIs). Young adult women face unique STI risks, along with gender prevalence for MDD.

#### Aim

The aim of this study is to assess the association between moderate to severe MDD and inconsistent condom use in U.S. women aged 18-25.

#### Methods

We examined National Health and Nutrition Examination Survey (NHANES) data from 2011-2013. Our study focuses on responses to the depression screener and "sexual behavior" questions.

#### Results

A total of 302 women, aged 18-25 responded to the depression screener and the "never had sex without a condom question". Of these, 270 had no or mild MDD and 32 had moderate to severe MDD. Of the women with moderate-severe MDD, 1 consistently used condoms, and 31 used condoms inconsistently. On both bivariate and multivariate analysis this association between moderate-severe MDD and inconsistent condom use was significant ( $p = .004$ , OR 10.260 95% CI 1.371- 76.801). After using the complex samples module, this association remained significant, even after controlling for race ( $p = 0.032$ ; OR = 7.677, 95% CI = 1.202-49.048).

#### Conclusion

Moderate-severe MDD is significantly associated with inconsistent condom use in 18-25 year-old women. This suggests a need for further research and interventions geared toward treating MDD, but also in counseling young adult women with MDD regarding healthy sexual behaviors.

**Keywords:** Condom use; Major depressive disorder; NHANES; PHQ-9; Sexual health

\*Corresponding author: Tiffany Cooke, Department of Clinical Psychiatry, Morehouse School of Medicine, 720 West view Dr SW, Atlanta, Georgia, USA, Tel: +1 4047528661; E-mail: drcooke@innovationsbh.com

**Citation:** Cooke T, Bastien G, Xu J, Owen J, Cunningham K, et al. (2016) Major Depressive Disorder and Condom Use in Young Adult Females. J Psychiatry Depress Anxiety 2: 006.

**Received:** May 11, 2016; **Accepted:** August 08, 2016; **Published:** August 22, 2016

### Introduction

Major Depressive Disorder (MDD) is a leading cause of disability in the U.S. and worldwide [1,2]. In the U.S. alone, MDD has a lifetime prevalence of 16.2 percent, and an annual prevalence of 6.6 percent [3]. Literature suggests that symptoms of MDD have been linked to risky sexual behaviors, which may increase an individual's risk for Sexually Transmitted Infections (STIs) [4-6]. There are approximately 20 million new cases of STIs annually in the U.S. with associated healthcare costs exceeding billions [7-8].

Young people are at high risk for developing STIs. Specifically, young women have a high risk of subsequent long term health sequelae after contracting an STI [9]. Since women are twice as likely as men to develop MDD, and young women have high STI rates in the U.S., it is important to understand the association between MDD and condom use in young adult females [10].

Previous studies have demonstrated an association between symptoms of depression and high risk sexual behavior [5,11]. These studies have typically utilized adolescent populations. Although Khan and colleagues examined depression and condom use in young adults, depression was not stratified according to severity level. Other studies have examined the association between depression and multiple forms of hormonal contraceptive use [12].

What has not been examined is the relationship between varying severity of MDD and contraceptive condom use, particularly in a young adult female subset. Therefore, we undertook this study in order to determine the association between moderate to severe MDD and consistent condom use in a sample of 18-25 year-old women.

### Aim

In this study we examined the relationship between moderate-severe MDD and consistent condom use over the last 12 months in young adult women. Using validated data from a sample of the U.S. population, we examined PHQ-9 scores and the number of times condoms were used over the last 12 months.

### Methods

#### Study design and subjects

We analyzed 2011-2012 National Health and Nutrition Examination Survey (NHANES) data to determine the association between MDD and consistent condom use in females aged 18-25. NHANES is conducted by the National Center for Health Statistics (NCHS) and the Centers for Disease Control and prevention (CDC) and assesses the health and nutritional status of U.S. adults and children. The NHANES sample size is nationally representative, and oversamples persons of minorities for reliability. NHANES utilizes both interview and physical examination. Our study focused on interview data, which consists of demographics, socioeconomic, dietary and health related data [13]. Survey content and operations are available on the NHANES website.

The 2011-2012 interviews were administered to 9,756 participants. The sexual behaviors public data set contained information on the

sexual behaviors of persons aged 18-69, with persons over 60 being asked some of the questions on sexual behavior. Public data for the question “number of times had sex without a condom/year” consisted of responses from persons aged 18-59. Of the 4,796 person asked about their sexual behavior, 2580 submitted a response. Our analytic cohort consisted of the 302 females aged 18-25, who answered this question.

### Main outcome measures

MDD was measured using the PHQ-9, a 9-item screening tool assessing the frequency of depression over the previous 2 weeks. Responses to each question include “not at all”, “several days”, “more than half the days”, and “nearly every day” with each response being scored from 0-3. Response totals  $\geq 10$  indicate moderate, moderately severe or severe MDD [14].

### Statistical analysis

Analyses of cross-sectional survey data were performed using SPSS 22 and its complex sampling module to account for complex sampling design and population weights. The outcome variable was inconsistent condom use based on answers to the question “number of times had sex without a condom/year”. The responses were dichotomized and respondents who answered “never” were placed in the consistent condom use subset. Respondents who answered “less than half the time”, “about half the time”, “not always but more than half the time”, “always”, “refused”, “don’t know” were placed into the inconsistent condom use group. The predictor variable, moderate-severe MDD, was dichotomized such that respondents with PHQ-9 scores  $\geq 10$  were placed into the moderate-severe MDD subset and those with PHQ-9 scores of  $\leq 9$  were placed in the no MDD-mild MDD subset.

Bivariate analysis consisted of the chi square test for differences in condom use among subsets. Logistic regression models controlling for race were used to estimate the association between predictor and outcome variables. All analyses were conducted using SPSS 22 software.

### Results

Our analytic cohort of 302 was representative of 12,137,981 young adult females in the US population. In our cohort, 270 females (89.4 %) had no or mild MDD, and 32 (10.6%) had moderate-severe MDD. A total of 71 (23.5%) comprised the consistent condom use subset, and the inconsistent condom use subset encompassed 231 females (76.5%). Estimated by complex sampling, 24.7% (95% CI 17.1%-34.4%) of women with no or mild MDD reported consistent condom use, while among women with moderate to severe MDD, 4.0% (95% CI 0.6%-22.3%) reported never having unsafe sex. Across race/ethnicity subgroups, 19.5% (95% CI 17.0%-22.2%) of white females reported consistent condom use, while 42.6% of Mexican females reported never had risky sex (95% CI 36.6%-48.9%). On bivariate analysis, using Pearson chi square, the association between moderate-severe MDD and inconsistent condom use was significant ( $p = .004$ ; OR 10.85; 95% CI 1.454-80.96). The association remained significant after controlling for race ( $p = 0.023$ ; OR 10.260; 95% CI 1.37-76.80).

Upon complex sampling, the association between moderate-severe MDD and inconsistent condom use remained significant (OR = 7.80, 95% CI = 1.18-51.50). Similar to the data sample, on complex sampling, this association remained significant when controlling for

race (OR = 7.677, 95% CI = 1.20-49.05) (Table 1). Please see table 1, for racial characteristics.

		Crude OR (95% CI)	Adjusted OR (95% CI)
Race	White	Reference	
	Black	1.179 (0.42-3.31)	1.158 (0.41-3.32)
	Mexican	1.202 (0.36-3.99)	1.338 (0.40-4.46)
	Hispanic	1.451 (0.45-4.71)	1.414 (0.45-4.41)
	Asian	0.739 (0.31-1.75)	0.818 (0.35-1.90)
	Other	2.839 (0.44-18.42)	2.752 (0.41-18.62)
MDD	No-Mild	Reference	Reference
	Moderate-Severe	7.797 (1.18-51.50)	7.677 (1.20-49.05)

Table 1: MDD and condom use by race and MDD.

### Discussion

The key findings of our study include a significant association between moderate-severe MDD and inconsistent condom use in 18-25 year old females. This relationship remained significant when controlling for race. This finding is especially noteworthy given that, among adults, the percentage having an episode of MDD within the past year was highest among 18-25 year olds [15]. When this is considered, along with the gender prevalence of MDD and the unique STI concerns of young adult females, these facts may suggest a need to further understand the association between MDD and consistent condom use.

Our study confirms previous findings from a longitudinal cohort study of 689 women age 18-20, in which depressed women had a 47 percent reduced odds of weekly contraceptive consistency on multivariate logistic regression.(OR 0.53; 95% CI 0.31-0.91) [12]. Our research also supports Islam and Laugen’s findings that depression significantly decreased the odds of condom use during last sex in females aged 15-49 (adjusted OR:0.81, 95% CI: 0.66-0.99) [16]. Our findings conflict with data in which recent and chronic depression were not associated with inconsistent condom use in 18-25 year old females. However, our study specifically evaluated the association with moderate-severe depression, as defined by PHQ-9, as opposed to all depression, without classification [17].

Although there is a paucity of literature elucidating the precise reasons why MDD is associated with inconsistent condom use, possible explanations for this association may include decreased condom negotiation skills. Younger women may have less power to negotiate precautionary sexual behaviors in general [18]. Additionally, MDD has been found to lower women’s risk perception of susceptibility to the outcomes of pregnancy and STIs and to lower benefit perception of methods such as contraception [19].

It is also possible that feelings of guilt, hopelessness, helplessness, and passive thoughts of death (all symptoms associated with MDD) may further diminish condom negotiation skills. Similarly, condom use self-efficacy (i.e., belief in the capability and likelihood of condom use) and perceived control over a sexual encounter are lower in women [20-22]. The diminished memory, anhedonia, and altered psychosocial functioning associated with MDD may lead to risky sexual behaviors [17]. The impact of specific symptoms of MDD on specifically lowering these beliefs is worthy of exploration.

The literature regarding treatment of MDD as a means to reduce STI risk is minimal in comparison to the vast body of literature detailing interventions for reducing STIs in young adult females.

Most of the literature regarding treatment of MDD in the context of STIs focuses on reducing the prevalence of MDD in persons already infected with STIs. However, Brody et al; suggest that increasing self-advocacy, self-care, assertiveness and lessening traditional gender roles in the context of depression may help decrease HIV risk for women and their partners [23].

There are limitations to our study. Although the complex samples module allowed for testing of association on a large scale, the NHANES cohort and subsample size utilized were small. Additionally, condom consistency and MDD symptoms were based on self-report, which may result in recall error. While the PHQ-9 is a validated instrument used for assessing MDD, our diagnoses of MDD were not validated against clinical records. Thus, findings may lack clinical specificity. In addition, individuals with bipolar depression may score  $\geq 10$  on PHQ-9, which may lead to overestimation of the association between MDD and inconsistent condom use. Our study controlled for race, but we did not control for other confounders such as income and educational level, which may influence decisions about condom use [24,25]. Co-morbid health, substance use and relationship status, which may also affect consistent condom use, were not evaluated.

## Conclusion

Despite these limitations, our study represents an investigation of MDD and consistency of condom use in U.S. young adult women, using nationally representative and validated cross-sectional data. Our findings suggest a need to incorporate safe sex counseling into treatment of young adult females with MDD. This also suggests the need for providers to screen for MDD in young adult females that report inconsistent condom use. Given the enormous public health issues presented by both MDD and STIs, further studies are needed to understand the relationship between MDD and inconsistent condom use. Additionally, further investigations are needed to inform the development of interventions to treat MDD as an individual public health concern and to reduce STIs in young adult women.

## Acknowledgement

Funding for this project included support from the following federal grants: career development support (Rust) from the Agency for Healthcare Research and Quality (AHRQ) grant #K18HS022444; and institutional support from the NIH Center of Excellence on Health Disparities (CEHD) grant #1P20MD006881-02 and NIH/RCMI grant #8U54MD007588.

## References

- González HM, Vega WA, Williams DR, Tarraf W, West BT, et al. (2010) Depression care in the United States: too little for too few. *Arch Gen Psychiatry* 67: 37-46.
- World Health Organization (2016) Depression Fact Sheet. World Health Organization, Geneva, Switzerland.
- Shim RS, Baltrus P, Ye J, Rust G (2011) Prevalence, treatment, and control of depressive symptoms in the United States: results from the National Health and Nutrition Examination Survey (NHANES), 2005-2008. *J Am Board Fam Med* 24: 33-38.
- Chen YW, Stiffman AR, Cheng LC, Dore P (1997). Mental health, social environment and sexual risk behaviors of adolescent service users: a gender comparison. *Journal of Child and Family Studies* 6: 9-25.
- Burns JJ, Cottrell L, Perkins K, Pack R, Stanton B, et al. (2004) Depressive symptoms and health risk among rural adolescents. *Pediatrics* 113: 1313-1320.
- Brooks TL, Harris SK, Thrall JS, Woods ER (2002) Association of adolescent risk behaviors with mental health symptoms in high school students. *J Adolesc Health* 31: 240-246.
- Satterwhite CL, Torrone E, Meites E, Dunne EF, Mahajan R, et al. (2013) Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. *Sex Transm Dis* 40: 187-193.
- Owusu-Edusei K Jr, Chesson HW, Gift TL, Tao G, Mahajan R, et al. (2013) The estimated direct medical cost of selected sexually transmitted infections in the United States, 2008. *Sex Transm Dis* 40: 197-201.
- U.S. Department of Health and Human Services (2013) Sexually Transmitted Disease Surveillance. Centers for Disease Control and Prevention, Atlanta, Georgia, USA.
- U.S. Department of Health and Human Services (2011) Mental illness surveillance among adults in the United States. *MMWR*, Centers for Disease Control and Prevention 60: 1-32.
- Lehrer JA, Shrier LA, Gortmaker S, Buka S (2006) Depressive symptoms as a longitudinal predictor of sexual risk behaviors among US middle and high school students. *Pediatrics* 118: 189-200.
- Stidham Hall K, Moreau C, Trussell J, Barber J (2013) Young women's consistency of contraceptive use--does depression or stress matter? *Contraception* 88: 641-649.
- U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (2012) About the National Health and Nutrition Examination Survey, Maryland, USA.
- Kroenke K, Spitzer RL, Williams JB (2001) The PHQ-9: validity of a brief depression severity measure. *J Gen Intern Med* 16: 606-613.
- U.S. Department of Health and Human Services (2013) Results from the 2012 National Survey on Drug Use and Health: Mental Health Findings, Substance Abuse and Mental Health Services Administration, Washington, D.C., USA.
- Islam N, Laugen C (2015) Gender differences in depression and condom use among sexually active Canadians. *J Affect Disord* 174: 511-515.
- Khan MR, Kaufman JS, Pence BW, Gaynes BN, Adimora AA, et al. (2009) Depression, sexually transmitted infection, and sexual risk behavior among young adults in the United States. *Arch Pediatr Adolesc Med* 163: 644-652.
- Brown JL, Young AM, Sales JM, DiClemente RJ, Rose ES, et al. (2014) Impact of Abuse History on Adolescent African-American Women's Current HIV/STD-associated Behaviors and Psychosocial Mediators of HIV/STD Risk. *J Aggress Maltreat Trauma*. 23: 151-167.
- Hall KS, Moreau C, Trussell J, Barber J (2013) Role of young women's depression and stress symptoms in their weekly use and nonuse of contraceptive methods. *J Adolesc Health* 53: 241-248.
- Farmer MA, Meston CM (2006) Predictors of condom use self-efficacy in an ethnically diverse university sample. *Arch Sex Behav* 35: 313-326.
- Bryan AD, Aiken LS, West SG (1997) Young women's condom use: the influence of acceptance of sexuality, control over the sexual encounter, and perceived susceptibility to common STDs. *Health Psychol* 16: 468-479.
- Gerteisen GM, HIV/AIDS risk perceptions, health beliefs, perceived self-efficacy and sexual issues related to young women's condom use.
- Brody LR, Stokes LR, Dale SK, Kelso GA, Cruise RC, et al. (2014) Gender Roles and Mental Health in Women With and at Risk for HIV. *Psychol Women Q* 38: 311-326.
- Anderson JE, Wilson R, Doll L, Jones TS, Barker P (1999) Condom use and HIV risk behaviors among U.S. adults: data from a national survey. *Fam Plann Perspect* 31: 24-28.
- Anderson DM, Pörtner CC (2014) High School Dropouts and Sexually Transmitted Infections. *South Econ J* 81: 113-134.