July 2020

Sexual Experiences and Association with Depression and Anxiety Among Sexual Minority Women

Brie Engelbrecht
University of Massachusetts Amherst

Sexual Experiences and Association with Depression and Anxiety Among Sexual Minority Women

A Thesis Presented

By

BRIE ENGELBRECHT

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE

May 2020

Public Health

Sexual Experiences and Association with Depression and Anxiety Among Sexual Minority Women

A Thesis Presented

by

Brie Engelbrecht

Approved as to style and content by:

_____
Nicole VanKim, Chair

_____
Elizabeth Bertone-Johnson, Member

_____
Paula Stamps, Graduate Program Director
Department of Biostatistics and Epidemiology

ABSTRACT

SEXUAL EXPERIENCES AND ASSOCIATION WITH DEPRESSION AND ANXIETY AMONG SEXUAL MINORITY WOMEN

MAY 2020
BRIE ENGELBRECHT, B.S., SPRINGFIELD COLLEGE

M.S., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Dr. Nicole VanKim

Depression and anxiety are among the most prevalent forms of mental illness in the U.S, affecting an estimated 18% of the population. Recent studies have shown that sexual minority women may undergo sexual experiences that affect their risk of anxiety and depression. However, prior studies of this association are sparse and have largely been conducted among sexual majorities and have yet to examine differences between vulnerable sexual orientation groups. Therefore, we evaluated the relationship between sexual experiences (i.e., sexual assertiveness, sexual self-efficacy, and outness) and anxiety and depression among young sexual minority women in a cross-sectional study (N=328) from the Young Sexual Minority Women's Experiences with Sexual Violence study, 2017-2018. We used multivariable linear regression models to examine the relationship between sexual experiences and anxiety and depression while adjusting for important risk factors. Overall, findings indicate that sexual minority women who reported low sexual experiences reported more anxiety and depression. Bisexual/pansexual/fluid women had higher sexual assertiveness, sexual self-efficacy, anxiety, and depression scores and lower outness scores compared to lesbian women.

Among both lesbian and bisexual/pansexual/fluid individuals, those who had higher sexual assertiveness scores also had lower anxiety scores Interventions aiming to improve mental health of sexual minority women should utilize the promotion of sexual experiences.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

Anxiety and depression are among the most prevalent mental illnesses in the United States and can lead to major health consequences such as serious health issues, alcohol and drug dependency, and suicide.[1] Anxiety and depression often occur simultaneously in an individual, making it common for someone with an anxiety disorder to also suffer from depression or vice versa.[1] It is estimated that around half of the individuals who have one of these mental illnesses also has the other.[1]

Anxiety is estimated to effect roughly 40 million adults or 18% of the total United States population each year and is estimated to be the most common mental illness in the United States.[1] There are numerous forms of anxiety disorders that include generalized anxiety, social anxiety, panic disorder, and obsessive compulsive disorder.[2] An anxiety disorder is classified as persistent feelings of excessive worry about everyday situations and activities.[2] When measured annually, it is estimated that 19.1% of adults in the United States have an anxiety disorder, however, the prevalence in women is higher (23.4%) compared to men (14.3%).[3]

Depression is classified as a persistent feeling of hopelessness and sadness lasting 2 weeks or more. Depression comes in many forms including postpartum depression, persistent depressive disorder, seasonal defective disorder, and bipolar depression.[4] Between the years of 2013-2016, it was estimated that 10.4% of adult women in the United States had depression in any given 2-week period.[5] According to the National Institute of Mental Health, 16.2 million adults in the United States are affected by

depressive episodes each year.[4] Major depression, which is a more severe form of depression, can result in severe impairments on mental health and lead to suicide.[4] Of the estimated 17.3 million adults or 7.1% of the total U.S. population that have at least one major depressive episode each year, depressive episodes are higher among adult females (8.7%) than adult males (5.3%). [4]

There are several risk factors for anxiety and depression including experiencing traumas, physical illness, stress, other diagnoses of mental disorders, family history of anxiety disorders or depression, and use of drugs or alcohol. Certain medications like corticosteroids, medicines with caffeine, or some asthma medicines such as albuterol or physical illnesses such as gastrointestinal disorders, respiratory illness, or heart disease[6] can also contribute to anxiety and depression. Traumatic life events may increase the risk of severe forms of anxiety and major depression.[4] Examples of traumatic life events that can increase an individual's risk of developing anxiety or depression include experiences of abuse, sexual trauma, or minority-related stress such as experiencing discrimination and harassment.[4,7]

Sexual minority, including identifying as lesbian, gay, or bisexual (LGB), women are at greater risk for depression and anxiety compared to heterosexual women.[8] Recent data has shown a higher prevalence in psychiatric disorders like anxiety and depression among sexual minority women, specifically lesbian, gay, and bisexual (LGB) individuals compared to heterosexual women.[8] A recent report documents that 58.7% of bisexual women and 44.4% of lesbian women report a lifetime history of mood disorders including anxiety and depression.[9] When compared to heterosexual women, the rate of anxiety and depression among lesbian and bisexual women is 1.5-2.5 times higher.[9–11]

One study found that bisexual women had 2.9 increased odds of depression when compared to the exclusively heterosexual group.[12]

The Minority Stress Model

One possible explanation for these disparities among sexual minority women is social stress that can translate into feelings of low sexual assertiveness, low sexual self-efficacy, or low outness.[8,12] Minority-related stress such as stigmatization, discrimination, and the marginalization of sexual minorities contributes to internalized homophobia, challenges with disclosing a sexual minority identity, and isolation from social supports.

The minority stress model suggests that life stressors directly associated with an individual's minority position, such as experiences of prejudice and stigma, bring about unique stressors which effect the health of these individuals more severely than majority group members.[13,14] Experiences of victimization and discrimination centered around sexual identity can increase feelings of vulnerability, especially in regards to sex, resulting in an individual's low sexual assertiveness or low sexual self-efficacy.[15] After an individual is told that they deserve less than equal treatment, it becomes harder for them to believe that they deserve better. Experiences of social exclusion mediate hesitation around being open about one's sexual identity and therefore result in low outness levels.[15] In a large national sample study, 89% of LGB students reported experiencing derogatory remarks, verbal remarks, or physical assaults on a college campus within the past year; these can translate into feelings of wanting to keep sexual identity more concealed.[16]

Sexual assertiveness is the ability to communicate sexual needs such as what an individual wants during intercourse, a desire for safer sex methods, or the verbal ability to

state when sexual acts are too rough or undesired. It has been looked at by numerous studies and low levels of sexual assertiveness have been linked to increases in experiences of sexual violence.[17–20] Women are more likely to participate in unwanted sex and report lower sexual assertiveness as compared to men due to gender norms and the expectation that women are supposed to be sexually compliant.[21] Women may report engaging in unwanted sexual acts or report lower sexual assertiveness due to a desire or obligation to please a partner's needs or out of fear of losing the relationship.[22,23] The psychological distress of anxiety and depression can stem from a lack of assertiveness in sexual situations that may leave an individual feeling worried, hopeless and vulnerable.[18] Bisexual/pansexual/fluid individuals face specific stigmas such as hypersexuality, or the thought that all bisexual/pansexual/fluid individuals want to have sex with everyone.[24] Fighting this stigma could result in a lower sexual assertiveness level in bisexual/pansexual/fluid women compared to lesbian women.[24] Few studies have looked at the effects of sexual assertiveness on mental health outcomes.[17–23,25] Results varied from being nonsignificant[20] to observing a slight decrease in sexual assertiveness associated with social anxiety.[19] Among the studies that assessed sexual assertiveness and depression, results suggested that higher levels of sexual assertiveness correlate with lower risk of depression among individuals.[18,25]

Sexual self-efficacy is defined as one's confidence in the ability to practice safer sex consistently.[26] Sexual self-efficacy is a health behavior that requires cognitive effort, self-control, and a repetitive consistency.[26] The feelings of pressure and worry an individual can feel from not being able to exhibit the high requirement of effort to continually display sexual self-efficacy can lead to feelings of lack of self-worth or

nervousness in situations among individuals that can increase anxiety and depression.[26] Bisexual/pansexual/fluid women who are engaging in sex with more than one gender could potentially have more knowledge about safer sex methods and more practice in demonstrating sexual self-efficacy, compared to lesbian women.[24] Among the previous literature that has examined sexual self-efficacy, studies have varied from nonsignificant findings to seeing a mediated link between feelings of anxiety[22], depression[27] and other risk factors.[26]

Outness is describe as how open an individual is about their sexual identity and how comfortable they are speaking about their sexual identity with different groups of people. Outness is thought to relieve an individual of the stress associated with hiding one's true identity and also allow better access to social supports and therefore lower the risk mental health outcomes.[28] Being less open about an individual's sexual identity could inhibit access to social support and resources. Not being able to seek help or share experiences can result in feelings of vulnerability, anxiousness, and a feeling of hopelessness, translating into outcomes of anxiety and depression. When examining outness by sexual identity, compared to lesbian women, there is often more stigma associated with being bisexual/pansexual/fluid that could inhibit an individual from disclosing sexual identity information so easily.[29] Among previous studies that assessed anxiety related to outness as an exposure [28–32], bisexual individuals who were more out also exhibited increased risky behaviors and higher rates of depression. Lesbian individuals who displayed higher levels of outness showed decreased number of risky behaviors.[28] Studies looking at depression[28–30] concluded that higher levels of outness

was associated with less depression for lesbian women, but a greater association in bisexual individuals.[28–31,33]

The higher rates of anxiety and depression among sexual minority women may be due to sexual experiences that affect sexual minority women differently than heterosexual women. These sexual experiences include sexual assertiveness, sexual self-efficacy, and outness. Few studies have looked at sexual assertiveness, outness, and sexual self-efficacy and risk of mental health outcomes, specifically anxiety and depression. Therefore, we propose to investigate the relationship between sexual experiences and these mental health outcomes among sexual minority women using data from the Young Sexual Minority Women's Experiences with Sexual Violence study between 2017 to 2018.

CHAPTER 2

METHODS

Study Design and Study Population

Data are from a mixed-methods project investigating the sexual victimization experiences and mental health of young sexual minority women who resided in Western Massachusetts, United States and Toronto, Ontario, Canada.[29] Eligible participants were aged 18-25 years and identified with a sexual minority label or experienced attraction towards women. Participants also had to identify as a woman or feel that the label 'woman' applies to their life experiences. Other eligibility requirements included currently residing in the United States or Canada. Participants were recruited through convenience sampling, predominantly through the online social media sites Facebook and Twitter. Fliers were also posted in physical locations in Western Massachusetts and in Toronto. The fliers stated that the researchers were looking for young sexual minority women to participate in the study on sexual health and that the study included questions regarding experiences of sexual violence. Interested participants accessed the study through a link included on the recruitment flier and were directed to an informed consent page. If they consented to participate, participants were routed to the survey. Upon completion of the survey, participants received a $15 gift card to Amazon. All procedures were reviewed and approved by the Institutional Review Board of Mount Holyoke College.

Assessment of Sexual Assertiveness

The Sexual Assertiveness Scale (SAS)[34] is a 5-item scale that was first validated

through the Canadian Sexual Health Indicator Survey.[35] Participants reported how likely they were to communicate sexual needs: sexual desires, safer sex options, unwanted sex. A sample item, "I am the type of person who insists about having my sexual needs met". Responses are made on a 5-point Likert-scale ranging from 1 (completely disagree) to 5 (completely agree). Responses were then summed to calculate total sexual assertiveness scores ranging from 5-25 with higher scores reflecting greater sexual assertiveness.

Assessment of Sexual Self-Efficacy

Sexual self-efficacy was measured on the Sexual Communication Scale (SCS), a 23-item measure that was first used and validated through the Canadian Sexual Health Indicator Survey.[35] Participants reported how likely they would be to speak out regarding a sexual decision, using a 5-point scale. A sample item, "I feel confident I would be able to go out with someone without feeling obligated to engage in sexual activity". Responses are made on a 5-point Likert-scale ranging from 1 (completely disagree) to 5 (completely agree). Responses were then summed to calculate total sexual self-efficacy scores ranging from 5-115 with higher scores reflecting greater sexual self-efficacy.

Assessment of Outness

The Outness Inventory, an 11-item measure, was used to evaluate how open a participant was regarding their sexual orientation.[36] Participants report which groups of people in their lives were knowledgeable about their sexual orientation and how frequently they have conversations about it with these people. Groups of people include parents, siblings, and work peers. Response options range from 1 (person definitely does not know about your sexual orientation status) to 7 (person definitely knows about your sexual orientation status, and it is openly talked about). Consistent with recommendations

by Mohr & Fassinger, responses were averaged into three subscales and each subscale score was summed and averaged for a total outness score ranging from 1-7. Lower scores indicate a lower level of outness.

Assessment of Anxiety Symptoms

Anxiety was assessed through the use of the Overall Anxiety Severity and Impairment Scale (OASIS), a 5-item measure of the frequency and severity of anxiety symptoms in the past week.[29] Responses were reported on a 4-point rating scale, ranging from 0 (No anxiety in the past week) to 4 (constant anxiety). A total anxiety score was derived from the summed participant responses resulting in a possible total anxiety score ranging from 0-20. A participant's total anxiety score of 0 indicated a low level of anxiety compared to scores of 20 indicating high levels of anxiety.

Assessment of Depressive Symptoms

The Patient Health Questionnaire (PHQ-9) was used in order to assess a participant's depressive symptoms.[37] The PHQ is a validated[37], 9-item measure of depressive symptoms that asked participants to reflect how frequently they have experienced certain symptoms over the past 2 weeks such as "little interest or pleasure in doing thing". Responses were on a 4-point scale, ranging from 0 (not at all) to 3 (nearly every day). The measure was scored through summing all of a participant's response resulting in a total score ranging from 0-27. After summing, 0 indicates no depressive symptomatology and 27 indicates major depressive symptoms.

Covariates

We investigated established risk factors for anxiety and depression as potential confounders, including sexual identity (lesbian vs. bisexual/pansexual/fluid), gender

identity, number of sexual partners within the last year (continuous), relationship status, age, race/ethnicity, and education. Sexual identity was measured using a screening question that forced participants to select one identity: lesbian, bisexual/pansexual/fluid, heterosexual. Any individual who selected heterosexual was excluded from the current study. Additional covariates included gender identity (woman vs. transgender, gender fluid, gender queer), relationship status (single vs. any type of relationship), education (less than some college vs, greater than completed college), race/ethnicity (white vs. person of color vs. white and person of color) , sexual activity (yes vs. no) , age (range: 18-25) and number of sexual partners within the last year (range: 1-30).

Statistical Analysis

All 328 participants had information on sexual experiences and outcome measures. We did not exclude any additional participants. Although no covariates were missing substantial numbers of responses, sample sizes of individual models may vary due to missing data on covariates.

Sexual orientation differences in demographic characteristics were assessed using Wald chi-square tests for categorical variables and t-tests for continuous variables. To assess the association between sexual experiences and mental health, linear regression models were fit. For both mental health outcomes, unadjusted and adjusted models were fit.

Sensitivity analysis was performed to examine categorical differences between high and low sexual assertiveness scores and major mental illness using logistic regression to model the unadjusted and adjusted relationships between the low sexual experiences and dichotomized outcomes (Supplemental Table). Score-based exposures

were collapsed to form dichotomous variables (High vs. Low). No prior literature used dichotomous variables for sexual assertiveness, sexual self-efficacy, or outness scores, so the 75th percentile was used as a cutoff point. The sexual assertiveness score used a cutoff point of 22: a score below 22 indicated low sexual assertiveness. The sexual self-efficacy score cutoff point was 101: a score below 101 indicated low sexual self-efficacy. The outness score used a cutoff point of 3.33: a score below 3.33 indicated low outness. Anxiety scores were dichotomized using a cut-off point of 8 and depression scores used a cutoff point of 10, which was consisted with previous literature.[38,39] Anxiety scores above 8 indicated severe anxiety, while depression scores above 10 indicated major depression[38,39]. The findings were largely similar and are available in the supplemental table.

CHAPTER 3

RESULTS

The majority of the sample identified as bisexual/pansexual/fluid [n=219 (66.8%)], as a woman or cisgender woman [n=265 (81.5%)], were currently in a relationship [n=242 (74.7%)], had less than some college education [n=195 (62.1%)], were white [n=220 (71%)], and sexually active [n=259 (85.8%)] (Table 1). The mean age of participants was 22.5 years (SD: 11.5) and the mean number of sexual partners within the last 12 months was 3.1 (SD: 4.1). Bisexual/pansexual/fluid participants had a higher number of past year sexual partners [3.5 (SD:4.6)] compared to lesbian participants. There were no statistically significant differences between lesbian and bisexual/pansexual/fluid participants for the remaining covariates (gender identity, relationship status, education, race/ethnicity, and sexually active).

The distribution of main study variables by sexual identity are presented in Table 2. The average sexual assertiveness score was 19.0; there was no statistically significant difference in sexual assertiveness score between lesbian and bisexual/pansexual/fluid individuals. Compared to bisexual/pansexual/fluid participants, lesbian participants had statistically significantly lower sexual self-efficacy scores (87.8 vs. 92.6) and higher outness scores (3.2 vs. 2.5). Additionally, compared to bisexual/pansexual/fluid individuals, lesbian individuals had lower depression scores (10.1 vs. 11.8) and lower anxiety scores (12.5 vs. 13.6).

The associations between sexual assertiveness, sexual self-efficacy, and outness and anxiety and depression are presented in Table 3. Overall, higher sexual assertiveness

and sexual self-efficacy scores were statistically significantly associated with lower anxiety and depression scores in both unadjusted and adjusted models. Higher sexual assertiveness scores were associated with a 0.28 unit decrease in anxiety score (95% CI: -0.42, -0.14), and higher sexual self-efficacy scores were associated with a 0.09 unit decrease in depression score (95% CI: -0.16, -0.02) in the adjusted models. Higher outness scores were associated with a 0.84 unit decrease in anxiety scores in the unadjusted model (95% CI: -0.84- -0.03).

Table 3 also includes models adjusted for all 3 exposure variables (i.e., sexual assertiveness, sexual self-efficacy, and outness) along with previously adjusted covariates. Higher sexual assertive scores were associated with lower anxiety and depression scores. Higher sexual self-efficacy scores and outness scores were not significantly associated with anxiety and depression scores in either unadjusted or adjusted models.

To determine if there were differences in sexual experiences and mental health by sexual orientation, we stratified analyses (Table 4). There was only significant interaction between sexual identity and sexual self-efficacy for anxiety (p=0.01). In the adjusted models among both lesbian and bisexual/pansexual/fluid individuals, those who had higher sexual assertiveness scores also had lower anxiety scores [ß (95% CI): lesbian: -0.33 (-0.62, -0.05); bisexual/pansexual/fluid: -0.26 (-0.43, -0.09)]. Only among lesbian individuals were higher sexual assertiveness scores associated with lower depression scores [ß (95% CI): lesbian: -0.66 (-1.14, -0.19)]. Among bisexual/pansexual/fluid individuals, sexual self-efficacy scores were associated with lower anxiety [ß (95% CI): -0.11 (-0.16, -0.07)] and depression scores [ß (95% CI): -0.1 (-0.18, -0.02)]. In the

adjusted model, Higher outness scores were associated with lower depression scores among bisexual/pansexual/fluid individuals [ß (95% CI): -1.03 (-2.01, -0.05)]. Outness scores were associated with lower anxiety scores only in the unadjusted model among bisexual/pansexual/fluid individuals [ß (95% CI): -0.61 (-1.17, -0.06)].

CHAPTER 4

DISCUSSION

The findings of this study, consistent with findings from previous literature,[18–21] indicate that sexual minority women who reported lower sexual assertiveness and sexual self-efficacy also reported higher anxiety and depression scores. However, outness was not associated with lower anxiety or depression scores. Among sexual minority women, bisexual/pansexual/fluid women had higher sexual assertiveness, sexual self-efficacy, anxiety, and depression scores, and lower outness scores compared to lesbian women. Among both lesbians and bisexual/pansexual/fluid individuals, higher sexual assertiveness scores were associated with lower anxiety scores, while sexual self-efficacy and lower mental health scores were only associated with depression among bisexual/pansexual/fluid participants.

It was not surprising that bisexual/pansexual/fluid women had lower outness scores than lesbian women for the reasons around stigma. There is often more stigma associated with being bisexual/pansexual/fluid that could inhibit an individual from disclosing sexual identity information so easily. Previous literature has found that bisexual women are often at increased vulnerability of lifetime prevalence and microaggressions including denial/dismissal and questioning legitimacy.[24,29] It can be considered more difficult for bisexual/pansexual/fluid individuals to come out about their sexuality than lesbian individuals. Also, consistent with previous literature, bisexual/pansexual/fluid women had higher depression and anxiety scores when

compared to lesbian women. A growing body of evidence indicates that mental health outcomes disproportionately effect bisexual/pansexual/fluid women when compared to both heterosexual and lesbian women due to additional microaggressions like dating exclusion and pressure to change sexual identity.[24,29]

Sexual assertiveness and sexual self-efficacy scores were associated with mental health scores. Sexual assertiveness and sexual self-efficacy scores were moderately correlated in this sample (R=0.59), and the findings were consistent with previous research. Low levels of sexual assertiveness and sexual self-efficacy, meaning an individual feels they cannot speak up about their wants and needs during sex, can lead to significant feelings of vulnerability and guilt that can translate into anxiety and depression.[18,22,25–27] It was surprising that outness was not associated with mental health outcomes. Being out is generally assumed to be associated with better mental health due to the diminished pressure to hide one's identity and the potential to connect with like LGB community members.[40]Additonally, feelings of forced concealment, harassment, and stigma are associated with feelings of isolation, emotional distress and negative self-esteem which can increase rates of depression and anxiety.[40,41]

Among lesbian participants, sexual assertiveness score was the only significant aspect of sexual experiences in relation to depression and anxiety. Given that sexual self-efficacy centers around practicing safer sex methods, lesbian women may be given a safe sex narrative that does not encompass and teach them about the needs of lesbian women, which could result in sexual self-efficacy not being significantly associated with mental health.[42] Additionally, outness, which is often thought to be more difficult among bisexual/pansexual/fluid women, may have less impact on mental health due to the higher

acceptance into the LGB community.[40,41] It was surprising that outness was only associated with depression among bisexual/pansexual/fluid women since lesbian women must also navigate the coming out process and the vulnerability it comes with. However, being more out and surpassing the fear of sexual identity denial and lesbian/gay legitimacy can lead to higher self-esteem and better mental health outcomes.[40,41]

The study adds to the sparse literature on sexual health disparities among sexual minority women by looking at multiple aspects of sexual experiences among sexual minority woman. The study population consisted of participants who identified with a sexual minority label and with being a woman. As a result, we were able to identify important differences between lesbian women and bisexual/pansexual/fluid women. Moreover, our large sample of bisexual/pansexual/fluid women was a substantial strength, given that previous literature has described bisexual women being a more vulnerable population when compared to heterosexual and lesbian women.[18] Limitations of this study include the small sample size. Furthermore, we are unable to solidify temporality in this study due to the cross-sectional design, but attempts were made to minimize the effects through question design: asking about lifetime sexual experiences and mental health only within the last week or 2 weeks. Possible confounders that were not included in analysis but could have effect on the associations include anti-depressant or anxiolytics use, substance abuse, and trauma history. These confounders could have all lead to a bias away from the null through overestimation. Lastly, the results of the study are generalizable to sexual minority women between the ages of 18-25 and who are living in developed countries such as the United States or Canada.

CHAPTER 5

CONCLUSION

Findings from this study suggest that sexual minority women may have lower sexual assertiveness that is associated with anxiety and depression scores. Findings also showed that bisexual/pansexual/fluid women may have experiences of sexual assertiveness and sexual self-efficacy differing from lesbian women that affect their anxiety and depression symptoms, suggesting that it is important to understand the differences between sexual minority groups. Our study did not find statistically significant evidence that outness is associated with anxiety or depression, however, more research is needed to corroborate these findings in order to understand a sexual experiences specifically related to this population. Additional research utilizing longitudinal design are necessary to examine these issues further and provide insight for temporality. Future research should continue to examine the sexual experiences of sexual minority women, given that existing research has documented that sexual minority women's disparities with mental health. Given the relationship, additional longitudinal research and interventions aiming to increase the knowledge around sexual assertiveness, sexual self-efficacy, and outness among this population could aid in the improvement of mental health outcomes.

Table 1: Prevalence of demographic characteristics by sexual identity

	Total (n=328)	Lesbian (n=109)	Bisexual/Pansexual/Fluid (n=219)	p-value[a]
Gender Identity				0.49
Woman	265 (81.5%)	85 (79.4%)	180 (82.6%)	
Non-Binary, Trans, Gender Fluid, Gender Queer	60 (18.5%)	22 (20.6%)	38 (17.4%)	
Relationship Status				0.07
Single	82 (25.3%)	21 (19.3%)	61 (28.4%)	
Any relationship	242 (74.7%)	88 (80.7%)	154 (71.6%)	
Education				0.07
<=Some College	195(62.1%)	56 (54.9%)	139 (65.6%)	
>= Completed College	119 (37.9%)	46 (45.1%)	73 (34.4%)	
Race/Ethnicity				0.26
White	220 (71.0%)	77 (74.8%)	143 (69.1%)	
POC	60 (19.4%)	20 (19.4%)	40 (19.3%)	
White and POC	30 (9.7%)	6 (5.8%)	24 (11.6%)	
Sexually Active				0.93
Yes	259 (85.8%)	86 (86.0%)	173 (85.6%)	
No	43 (14.2%)	14 (14.0%)	29 (14.4%)	
	Mean(SD)	Mean(SD)	Mean(SD)	p-value[b]
Age	21.9(2.0)	22.0(1.9)	21.8(2.0)	0.49
Past Year Sexual Partners	3.1(4.1)	2.3(2.89)	3.5(4.6)	0.03

[a] calculated from a Wald Chi-square test; compared lesbian to bisexual/pansexual/fluid women.

[b] calculated from a t-test; compared lesbian to bisexual/pansexual/fluid women.

Table 2: Distribution of Sexual Experiences and Mental Health by Sexual Identity, N=328

		Total (n=328)	Lesbian (n=109)	Bisexual, Pansexual, Fluid (n=215)	p-value[a]
Sexual Experiences		Mean (SD)	Mean (SD)	Mean (SD)	
	Sexual Assertiveness *Range:5-25*	19.0(3.9)	18.7(3.8)	19.1(4.0)	0.45
	Sexual Self-Efficacy *Range:5-115*	91.2(14.8)	87.8(14.4)	92.9(14.7)	0.003
	Outness *Range:0-7*	2.7(1.2)	3.2(1.1)	2.5(1.1)	<0.001
Mental Health					
	Depression *Range:0-27*	11.2(7.0)	10.1(6.5)	11.8(7.2)	0.04
	Anxiety *Range:0-20*	13.3(4.6)	12.5(4.5)	13.6(4.6)	0.04

[a] calculated from scheffe anova test; compared lesbian to bisexual/pansexual/fluid women.

Table 3: Associations Between Sexual Experiences and Mental Health, N=328

	Anxiety		Depression	
	Model 1[a] (n=324) β (95%CI)	Model 2[b] (n=234) β (95%CI)	Model 1[a] (n=325) β (95%CI)	Model 2[b] (n=233) β (95%CI)
Sexual Assertiveness	-0.27 (-0.39, -0.14)***	-0.28 (-0.42,-0.14)***	-0.35 (-0.54,-0.16)***	-0.40 (-0.64, -0.17)***
Sexual Self-Efficacy	-0.07 (-0.10,-0.04)***	-0.07 (-0.11,-0.03)***	-0.09 (-0.14,-0.04)***	-0.1 (-0.17,-0.03)**
Outness	-0.40 (-0.84,-0.03)	-0.14 (-0.63,0.35)	-0.92 (-1.59,-0.26)**	-0.63 (-1.43,0.17)
	Model 3[c] (n=287) β (95%CI)	Model[d] (n=234) β (95%CI)	Model 3[c] (n=286) β (95%CI)	Model[d] (n=233) β (95%CI)
Sexual Assertiveness	-0.16 (-0.31,-0.01)*	-0.20 (-0.37,-0.03)*	-0.24 (-0.49,0.01)	-0.31* (0.60,0.02)
Sexual Self-Efficacy	-0.03 (-0.07,0.01)	-0.04 (-0.09,0.01)	-0.04 (-0.11,0.02)	-0.04 (-0.13,0.04)
Outness	-0.15 (-0.58,0.28)	-0.02 (-0.50,0.46)	-0.61 (-1.30,0.08)	-0.48 (-1.27,0.31)

[a]Unadujusted

[b]Adjusted for education, race/ethnicity, relationship status, age, sexual activity, number of sexual partners within the last year, and sexual orientation.

[c]Adjusted for sexual assertiveness, sexual self-efficacy, and outness.

[d]Adjusted for Sexual Assertiveness, sexual self-efficacy, outness, education, race/ethnicity, relationship status, age, sexual activity, number of sexual partners within the last year, and sexual orientation.

*p<0.05, **p<0.01, ***p<0.001

Table 4:Associations of Sexual Experiences and Mental Health, Stratified By Sexual Identity, N=328

	Anxiety						Depression					
	Unadjusted			Adjusted			Unadjusted			Adjusted		
	N	β	95% CI	N	β	95% CI	N	β	95% CI	N	β	95% CI
Sexual Assertiveness												
Lesbian	108	-0.43 (-0.65,-0.22)***		75	-0.33 (-0.62, -0.05)*		109	-0.51 (-0.82, -0.19)**		75	-0.66 (-1.14,-0.19)**	
Bisexual, Pansexual, Fluid	216	-0.20 (-0.36,-0.05)**		159	-0.26 (-0.43,-0.09)*		216	-0.29 (-0.53,-0.06)*		158	-0.27 (-0.55,0.02)	
Sexual Self-Efficacy												
Lesbian	108	-0.03 (-0.09,0.03)		75	-0.02 (-0.07, 0.08)		109	-0.07 (-0.15,0.02)		75	-0.09 (-0.22,0.03)	
Bisexual, Pansexual, Fluid	216	-0.1 (-0.14,-0.06)***		159	-0.11 (-0.16,-0.07)***		216	-0.12 (-0.18,-0.06)***		158	-0.1 (-0.18,-0.02)*	
Outness												
Lesbian	103	0.23 (-0.53, 0.99)		75	0.14 (-0.69,0.96)		103	0.14 (-0.997,1.27)		75	0.11 (-1.30,1.52)	
Bisexual, Pansexual, Fluid	215	-0.61 (-1.17,-0.06)*		159	-0.3 (-0.01,0.32)		214	-1.30 (-2.17,-0.43)**		158	-1.03 (-2.01, -0.05)*	

Adjusted for education, race/ethnicity, relationship status, age, sexual activity, number of sexual partners within the last year, and sexual id

*p<0.05, **p<0.01, ***p<0.001

Table 5: Sensitivity Analysis: Logistic Regression Model Estimates for Association Between Low Sexual Experiences and Mental Health, N=328

	Anxiety				Depression			
	Unadjusted (N=287)		Adjusted (N=234)		Unadjusted (N=286)		Adjusted (N=233)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sexual Assertiveness								
High	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Low	2.95**	(1.37,6.37)	3.18	(1.20,8.45)	1.26	(0.75,2.13)	1.27	(0.69,2.32)
Sexual Self-Efficacy								
High	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Low	2.1	(0.96,4.59)	3.07*	(1.14,8.27)	1.44	(0.84,2.45)	1.49	(0.8,2.79)
Outness								
High	1.00	Referent	1.00	Referent	1.00	Referent	1.00	Referent
Low	0.41	(0.14,1.22)	0.57	(0.17,1.92)	1.87	(1.09, 3.18)	2.11*	(1.11,4.01)

Adjusted for sexual assertiveness, sexual self-efficacy, outness, education, race/ethnicity, relationship status, age, sexual activity, number of sexual partners within the last year, and sexual id

*p<0,05, **p<0.01, ***p<0.001

BIBLIOGRAPHY

1. Anxiety and Depression Association of America. Anxiety and Depression. ADAA. adaa.org/about-adaa/press-room/facts-statistics. Published 2019. Accessed November 5, 2019.

2. National Institute of Mental Health. Anxiety Disorders. NIMH. https://www.nimh.nih.gov/health/topics/anxiety-disorders/index.shtml. Published 2018. Accessed November 5, 2019.

3. National Institute of Mental Health. Anxiety Statistics. NIMH. nimh.nih.gov/health/statistics/any-anxiety-disorder.shtml. Published 2017. Accessed September 10, 2019.

4. National Institute of Mental Health. Depression. NIMH. nimh.nih.gov/health/topics/depression/index.shtml#part_145396. Published 2018. Accessed November 5, 2019.

5. Blanco C, Okuda M, Markiwitz JC, Liu S-M, Grant BF, Hasin DS. The Epidemiology of Chronic Major Depressive Disorder and Dysthymic Disorder: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2010;71(12):1645-1656. doi:10.4088/JCP.09m05663gry.The

6. Harvard Health. Anxiety and Physical Illness. Hardvard Health Publishing. https://www.health.harvard.edu/staying-healthy/anxiety_and_physical_illness. Published 2018. Accessed March 3, 2020.

7. Mayo Clinic. Anxiety Disorders. Mayo Foundation for Medical Education and Research. https://www.mayoclinic.org/diseases-conditions/anxiety/symptoms-causes/syc-20350961. Published 2019. Accessed November 5, 2019.

8. Björkenstam C, Björkenstam E, Andersson G, Cochran S. Anxiety and Depression Among Sexual Minority Women and Men in Sweden : Is the Risk Equally Spread Within the Sexual Minority Population ? *J Sex Med*. 2017;14(3):396-403. doi:10.1016/j.jsxm.2017.01.012

9. Bostwick WB, Boyd CJ, Hughes TL, McCabe SE. Dimensions of sexual orientation and the prevalence of mood and anxiety disorders in the United States. *Am J Public Health*. 2010;100(3):468-475. doi:10.2105/AJPH.2008.152942

10. Brenner B. Understanding Anxiety and Depression for LGBTQ People _ Anxiety and Depression Association of America, ADAA. https://adaa.org/learn-from-us/from-the-experts/blog-posts/consumer/understanding-anxiety-and-depression-lgbtq. Accessed November 5, 2019.

11. NAMI. LGBTQ NAMI National Alliance on Mental Illness. https://www.nami.org/find-support/lgbtq. Accessed November 5, 2019.

12. Hughes TL, Johnson TP, Steffen AD, Wilsnack SC, Everett B. Lifetime victimization, hazardous drinking and depression among heterosexual and sexual minority women. *LGBT Heal*. 2014;1(3):192-203. doi:10.1016/j.physbeh.2017.03.040

13. Meyer IH. Minority stress and mental health in gay men. *J Health Soc Behav*. 1995;36(1):38-56.

14. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and rrsearch evidence. *Psychol Bull*. 2003;129:674-697.

15. Martin-Storey A, Fromme K. Mediating Factors Explaining the Association Between Sexual Minority Status and Dating Violence. *J Interpers Violence*. 2017:1-28. doi:10.1177/0886260517726971

16. Szymanski DM, Bissonette D. Perceptions of the LGBTQ College Campus Climate Scale : Development and Psychometric Evaluation Perceptions of the LGBTQ College Campus Climate Scale : Development and Psychometric Evaluation. *J Homosex*. 2019;0(0):1-17. doi:10.1080/00918369.2019.1591788

17. Katz J, May P, Sörensen S, Deltosta J. Sexual Revictimization During Women ' s First Year of College : Self- Blame and Sexual Refusal Assertiveness as Possible Mechanisms. 2010. doi:10.1177/0886260509354515

18. Livingston JA, Testa M, Vanzile-tamsen C. The Reciprocal Relationship Between Sexual Victimization and Sexual Assertiveness. *Violence Against Women*. 2007;13(3):298-313.

19. Schry AR, White SW. Sexual Assertiveness Mediates the Effect of Social Interaction Anxiety on Sexual Victimization Risk Among College Women. *Behav Ther*. 2013;44(1):125-136. doi:10.1016/j.beth.2012.09.001

20. Brassard A, Dupuy E, Bergeron S, Shaver PR. Attachment Insecurities and Women ' s Sexual Function and Satisfaction : The Mediating Roles of Sexual Self-Esteem , Sexual Anxiety , and Sexual Assertiveness. 2015;52(1):110-119. doi:10.1080/00224499.2013.838744

21. Lee J. Predictors of Female College Students ' Relationship Satisfaction : Attachment and Sexual Assertiveness. 2017;62(March):70-74. doi:10.1007/s12646-017-0389-7

22. Tracy JL, Shaver PR, Albino AW, Cooper ML, Tracy JL. Attachment Styles and Adolescent Sexuality. *Adolesc Roman Sex Behav Theory, Res Pract Implic*.:1-33.

23. Impett EA, Peplau LA. WHY SOME WOMEN CONSENT TO UNWANTED SEX WITH A DATING PARTNER : INSIGHTS FROM ATTACHMENT THEORY. 2002;26:360-370.

24. Bostwick W, Hequembourg A. "Just a little hint": Bisexual-specific microaggressions and their connection to epistemic injustices. *Cult Health Sex*. 2014;16:488-503.

25. Morokoff P, Redding CA, Harlow LL, et al. Associations of sexual victimization, depression, and sexual assertiveness with unprotected sex: A test of multifaceted model of HIV risk across gender. *J Appl Biobehav Res*. 2009;14(1):30-54. doi:10.1111/j.1751-9861.2009.00039.x.Associations

26. Alvy LM, Mckirnan DJ, Mansergh G, Koblin B, Colfax GN, Flores SA. Depression is Associated with Sexual Risk Among Men Who Have Sex with Men , but is Mediated by Cognitive Escape and Self-Efficacy. 2011:1171-1179. doi:10.1007/s10461-010-9678-z

27. Tucker A, Liht J, De Swardt G, et al. An exploration into the role of depression and self-efficacy on township men who have sex with men's ability to engage in safer sexual practices. *AIDS Care - Psychol Socio-Medical Asp AIDS/HIV*. 2013;25(10):1227-1235. doi:10.1080/09540121.2013.764383

28. Feinstein BA, Dyar C, Li DH, Whitton SW, Newcomb ME, Mustanski B. The Longitudinal Associations Between Outness and Health Outcomes Among Gay / Lesbian Versus Bisexual Emerging Adults. *Arch Sex Behav*. 2019;48(4):1111-1126. doi:10.1007/s10508-018-1221-8

29. Anderson RE, Tarasoff LA, Vankim N, Flanders C. Differences in Rape Acknowledgment and Mental Health Outcomes Across and Cisgender Bisexual Youth. 2019. doi:10.1177/0886260519829763

30. Ploderl M, Sellmeier M, Fartacek C, Pichler E-M, Fartacek R, Kralovec K. Explaining the Suicide Risk of Sexual Minority Individuals by Contrasting the Minority Stress Model with Suicide Models. *Arch Sex Behav*. 2014;43(1):1559-1570. doi:10.1007/s10508-014-0268-4

31. Kosciw JG, Palmer NA, Kull RM. Reflecting Resiliency : Openness About Sexual Orientation and / or Gender Identity and Its Relationship to Well-Being and Educational Outcomes for LGBT Students. 2015:167-178. doi:10.1007/s10464-014-9642-6

32. Mohr J, Fassinger R. Measuring Dimensions of Lesbian and Gay Male Experience. *Meas Eval Couns Dev*. 2000;33(2):60-90.

33. Beals KP, Peplau LA, Gable SL. Stigma Management and Well-Being : The Role of Perceived Social Support , Emotional Processing , and Suppression. 2009:867-879. doi:10.1177/0146167209334783

34. Morokoff PJ, Quina K, Harlow LL, et al. Sexual Assertiveness Scale (SAS) for Women : Development and Validation. *J Pers Soc Psychol*. 1997;73(4):790-804.

35. Clarke B, Smylie L, Folz K, Yovetich T, Seto Jo. — *PILOT TEST AND VALIDATION PHASE A Report on Results from the Pilot-Testing and Validation of the Canadian Sexual Health Indicators Survey*.

36. Mohr J, Fassinger R. No Title. *Meas Eval Couns Dev*. 2000;33(2):66-90.

37. Kroenke K, Spitzer RL, Williams JB. Validity of a brief depression severity measure. *J Gen Intern Med*. 2001;16(9):606-613.

38. Norman SB, Campbell-Sills L, Hitchcock CA, et al. Psychometrics of a Brief Measure of Anxiety to Detect Severity and ImpairmentL The Overall Anxiety Severity and Impairment Scale (OASIS). *J Psychiatr Res*. 2011;45(2):262-268.

39. Manea L, Gilbody S, McMillan D. Optimal cut-off score for diagnosing depression with the Patient Health Questionnaire (PHQ-9): a meta-analysis. *Can Med Assoc J*. 2012;184(3):191-196.

40. Morris JF, Waldo CR, Rothblum ED. A Model of Predictors and Outcomes of Outness Among Lesbian and Bisexual Women. *Am J Orthopsychiatry*. 2001;71(1):61-71.

41. Wolff JR, Himes HL, Soares SD, Kwon EM. Sexual Minority Students in Non-Affirming Religious Higher Education: Mental Health, Outness, and Identity. *Psychol Sex Orientat Gend Divers*. 2016;3(2):201-212.

42. Hutchinson MK, Thompson AC, Cederbaum JA. Multisystem Factors Contributing to Disparities in Preventive Health Care Among Lesbain Women. *J Obstet Gynecol Neonatal Nurs*. 2006;35(3):393-402.