The Association between Self-Identified Sexual Orientation and Diagnosis of STIs Modified by Sex: A Cross Sectional Study

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Background:
In the US, men and women are diagnosed with STIs at equal rates, but diagnoses vary within LGBT populations. Elevated risk among MSM populations is well documented in scientific literature; however, little research has investigated STI risk among non-heterosexual women. Using NHANES survey data between 2009-2014, we studied the association between sexual orientation and odds of STI diagnoses in adults aged 18-59. We hypothesize the association is modified by sex, controlling for age.

Methods:
We analyzed data from the NHANES population-based survey from 2009-2014. The exposure variable was created by categorizing the question "Describe sexual orientation" into "Homosexual", "Bisexual" and "Heterosexual", which was used as the reference category. The remaining respondents were excluded. We dichotomized the outcome using self-reported diagnoses in four common STIs: herpes, genital warts, gonorrhea, and chlamydia. We excluded HIV and HPV due to their tendency to fall along gendered lines. Those who responded "Yes" to any of the four STIs were categorized as "1 or more". Those who responded "No" to all were labeled "None". The remaining respondents were excluded. Sex was dichotomized by self-report and age was analyzed as a continuous variable. We used logistic regression to assess the odds of STI diagnoses among differing sexual orientations, modified by gender, and adjusted by age. We used the Wald Test to determine significance of associations.

Sexual Orientation Classifications and Frequency					
		N	Heterosexual	Homosexual	Bisexual
Total		9,877	9,390 95.07%	170 1.72%	317 3.21%
Sex	Male	4,929	4,760 48.19%	99 1%	70 0.71%
	Female	4,948	4,630 46.88%	71 0.72%	247 2.50%
Age	Mean	37.79	38.02	35.43	32.05
	(SD)	12.12	12.09	12.49	11.27

Findings:
9,877 US Adults aged 18-59 were included in the analysis. In our crude model, bisexual adults have 119% (95% CI: 1.60 to 3.00) higher odds of having an STI diagnosis and homosexual adults have no significant odds (95% CI: 0.62, 1.87), both compared to heterosexual respondents (p-value<0.001).

In our age-adjusted model including interaction, we found significant effect measure modification between sex and sexual orientation (χ^2=12.13, p-value=0.0023). The odds ratio comparing bisexual to heterosexual men is larger 4.18 (95% CI: 2.21, 7.91) but an association remains comparing bisexual to heterosexual women 1.61 (95%CI: 1.11, 2.31). Homosexual men have 2.32 (95%CI: 1.19, 4.53) times the

odds of an STI diagnosis compared to heterosexual men. There was no statistically significant association in STI diagnoses comparing homosexual to heterosexual women.

Interpretation:
The unadjusted association between sexual orientation and STI diagnoses shows that bisexual adults have higher odds of an STI diagnosis than heterosexuals. After stratifying by sex and adjusting for age, we see a greater effect in bisexual males than females, although an association remains for bisexual females. Additionally, homosexual men have higher odds of reporting an STI diagnosis than heterosexual men, while homosexual women have no significant association. Our analyses relied heavily on self-reported data, outdated classifications of sexual orientation, and a rare exposure of interest. We used six years of NHANES data to increase our sample size.

Conclusions:
The age-adjusted association between sexual orientation and STI diagnosis is significantly modified by sex. Future research should include more non-heterosexual participants and better diversity in asking about sexual orientation.