Sexual Orientation Differences in ADHD in Adolescents in the Southeastern United States
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Abstract

The present study investigated the difference in ADHD prevalence by sexual orientation. Participants (n=78) completed a survey containing *ADHD Self-Report Scale Symptoms Checklist-Adolescent Version* (Sonnby et al., 2014). LGB teens are 5.16 times more likely to meet the criteria for ADHD than non-LGB teens after controlling for relevant covariates. More research is needed to investigate the possible difference in ADHD prevalence by sexual orientation through gold-standard diagnostic methods for ADHD.

Keywords: ADHD, Sexual Minority, Adolescent, Health Disparities

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Sexual minorities have both mental and physical health disparities. Research has consistently shown that sexual minorities have higher rates of mood disorders (e.g., Sandfort et al., 2014; King et al., 2008; Plöderl & Tremblay, 2015; Kerridge et al., 2017; Frisell et al., 2010; Wittgens et al., 2022), substance use disorder (e.g., Plöderl & Tremblay, 2015; Kerridge et al., 2017; Sandfort et al., 2014; Frisell et al., 2010; King et al., 2008; Donahue et al., 2017; Wittgens et al., 2022), anxiety disorders (e.g., King et al., 2008; Plöderl & Tremblay, 2015; Passell et al., 2022; Wittgens et al., 2022), suicides (e.g., King et al., 2008; Plöderl & Tremblay, 2015; Rafiman et al., 2020; Wittgens et al., 2022), personality disorders, (e.g., Plöderl & Tremblay, 2015; Sandfort et al., 2014; Kerridge et al., 2017), PTSD (e.g., Kerridge et al., 2017; Plöderl & Tremblay, 2015), ADHD (e.g., Strutz et al., 2015; Wang et al., 2014; Frisell et al., 2010; Donahue et al., 2017; Plöderl & Tremblay, 2015; Blum et al., 2020), and eating disorders (e.g., Calzo et al., 2017; Frisell et al., 2010; Plöderl & Tremblay, 2015; Donahue et al., 2017). Research has also consistently shown that sexual minorities have higher rates of cardiovascular disorders (e.g., Caceres et al., 2019), asthma (e.g., Fredirksen-Goldsen et al., 2023), hypertension (e.g., Sharma et al., 2022), and other risk factors for physical health issues (e.g., Beach et al., 2018; Ancheta et al., 2021; Strutz et al., 2015; Fredirksen-Goldsen et al., 2024; Ancheta, 2022).

The minority stress model (Meyer, 2003) has been the primary scientific explanation for the health disparities seen in sexual minorities (Meyer et al., 2021). The minority stress model (Meyer, 2003) argues that societal stigma is the main reason for the health disparities seen in sexual minorities. Although the minority stress model (Meyer, 2003) has been well-established within the literature, it has been criticized. Bailey (2020) argued that genetics and personality traits like neuroticism are better predictors of health disparities in sexual minorities. This leads to a conflict in the literature. This paper seeks to address the conflict by proposing a new theory. However, this study will not be a direct test of the theory but rather an underlying premise of the theory.

Attention deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder that hampers executive function and emotional regulation (e.g., Barkley, 1997; Barkley, 2015/2018b; Solanto, 2015/2018; Roberts et al., 2015/2018; Faraone et al., 2021). ADHD is associated with numerous psychiatric and medical disorders (e.g., Barkley, 2015/2018a; 2015/2018d; Pliszeka, 2015/2018; Faraone et al., 2021). Many of those disorders are the same ones that research has shown sexual minorities to have a higher prevalence of. The theory that this study seeks to test is that ADHD will be a predictor of health disparities in sexual minorities. This theory helps combine the genetic hypothesis (Bailey, 2020) with the minority stress model (Meyer, 2003). However, there is a gap in the evidence supporting the theory, the gap being whether sexual minority adolescents have higher rates of ADHD than heterosexual adolescents. This paper seeks to address this gap through the research question: What is the difference in the prevalence of ADHD in LGB and non-LGB adolescents aged 13-17 in the Southeastern United States?

Literature Review

Minority Stress Model

The minority stress model (Meyer, 2003) posits that societal discrimination and stigma are responsible for the health disparities seen in sexual minorities. Meyer (2003) set up the minority stress model in a distal-proximal fashion. Distal stressors are events that do not require interpretation (e.g., hate crimes, victimization, direct discrimination) (Meyer, 2003). Proximal stressors require more interpretation concerning identity (i.e., internalized homophobia, concealment of sexual orientation, and expectation of rejection) (Meyer, 2003). Meyer (2003) argued that all of these stressors then lead to health issues in sexual minorities.

There has been a plethora of evidence supporting the minority stress model. Pachankis et al. (2020) conducted a meta-analysis of 193 studies and found that the concealment of sexual orientation is significantly associated with mental health issues. Pachankis et al. (2018) conducted an 8-year-long longitudinal study in which they found that stigma significantly predicted mental health issues in the future. Dürrbaum & Sattler (2020) conducted a meta-analysis of minority stress research in youths and found that minority stress is again significantly associated with mental health issues. Numerous other studies have found an association between minority stress factors and mental health issues (e.g., Dürrbaum & Sattler, 2020; Meyer, 2003; Meyer et al., 2021; Pachankis et al., 2018; Xu et al., 2022; Frisell et al., 2010; Donahue et al., 2017; Sharma, 2023; Ancheta, 2022; Pachankis & Link, 2017). The minority stress model (Meyer, 2003) is well-established in the literature.

The Genetic Model

However, despite the minority stress model (Meyer, 2003) being well-established, there have been critiques of the model in the literature. Bailey (2020) argued that genetics and personality traits better predict psychopathologies in sexual minorities, and the failure of minority stress research to control for this possible confounding variable makes the model not well-substantiated. Bailey (2020) also implied that if his theory is indeed correct, the minority stress model would be incorrect. Some empirical evidence supports this theory. Zietsch et al. (2012) found that genetics accounted for around 60% of the variance in depression in sexual minorities. Multiple studies have found that controlling for personality traits or genetics help reduce the association between sexual orientation and psychopathologies (e.g., Frisell et al., 2010; Wang et al., 2014; Donahue et al., 2017). Xu et al. (2022) found that neuroticism helps mediate the association between sexual minority and depression.

However, currently, it is still unclear whether the higher prevalence of psychopathologies in sexual minorities is due to internal factors (e.g., genetics and personality traits; Bailey, 2020) or external factors (e.g., minority stress; Meyer et al., 2021; Meyer, 2003). However, recent research suggest that it is likely that both internal and external factors plays a role in the higher prevalence of psychopathologies in sexual minorities (e.g., Borgogna & Aita, 2023; Xu et al., 2022; Donahue et al., 2017; Frisell et al., 2010). Both Bailey (2021) and Meyer et al. (2021)

have conceded on this point. This dispute and uncertainty in the literature lead to the theoretical framework behind this study.

Theoretical Framework

The theoretical framework behind this study is that ADHD helps explain the health disparities in sexual minorities. This framework helps combine the genetic model (Bailey, 2020) with the minority stress model (Meyer, 2003), as this framework includes both genetic and environmental factors like stigma. ADHD is a largely genetic disorder (Barkley, 2015/2018c; Faraone & Larsson, 2019; Faraone et al., 2021). Faraone & Larsson (2019) found that ADHD had a heritability of 77% to 88%. This theory includes the social aspect as well, as individuals with ADHD are more likely to suffer from bullying or other kinds of discrimination (e.g., Fogler et al., 2022). Geiger (2019) expanded the minority stress model to include individuals with learning disability and ADHD. Strang et al., (2023) stated, "Therefore, a potential over-representation of AD/HD among transgender youth, in addition to the established ASD overrepresentation, might explain a portion of mental health evaluations in gender-diverse young people" (p. 244). This framework could be applied to LGB teens, as around 90% of transgender individuals have an LGB identity (Reisner et al., 2023).

There is preliminary evidence to support the framework. Research has found that sexual minorities had a higher rate of ADHD. Strutz et al. (2015), using nationally representative data, found that sexual minority females were 1.78 times to 2.5 times more likely to have ADHD than heterosexual females, even after controlling for possible covariates. Multiple other studies have similar findings (e.g., Wang et al., 2014; Frisell et al., 2010; Donahue et al., 2017; Plöderl & Tremblay, 2015; Blum et al., 2020). Plöderl & Tremblay (2015) also found that sexual minorities are more likely to have ADHD in their systematic review. One study found no significant difference in ADHD between sexual minorities and heterosexual individuals (Sandfort et al., 2014)—-however, Sandfort et al. (2014) are limited by power limitations due to a small sample size of sexual minorities. All of this literature helps demonstrate the possibility of sexual minorities having a higher prevalence of ADHD.

The Gap in Current Research and Hypothesis

No studies have ever explored the prevalence rate of ADHD in sexual minority adolescents versus heterosexual adolescents. This study will help fill this gap. It is essential to study this issue, as Meyer (2001) wrote, ". . . the promise of focusing on LGBT health is clear: It can bring much-needed resources, improved research methodologies, and knowledge to bear on the search for innovative approaches to health promotion and disease treatment" (p. 858). This type of research also helps us reduce health disparities and the associated economic and social consequences. Meyer et al. (2021) pointed out that research into this issue and minority stress has led to the development of new treatments and social policies to help address this grave issue. Without understanding disparities and causes, we cannot develop proper solutions. ADHD treatments (e.g., medication) are effective in treating ADHD and its associated issues (e.g., Conner 2015/2018; Faraone et al., 2021). Therefore, the potential solution here would be treatments for ADHD.

This study hypothesizes that LGB teens have a higher rate of ADHD than non-LGB teens. This hypothesis is based on previous research, the theoretical framework behind this study, and ADHD being a neurodevelopmental disorder. Neurodevelopmental disorders begin in childhood, and if LGB adults have a higher prevalence of ADHD, it does not follow, based on our current understanding of the developmental course of ADHD, that LGB teens would not have a higher prevalence of ADHD as well.

Method

Research Design

The researcher used a quantitative approach with a cross-sectional design. As part of the approach, the researcher distributed a survey. A survey was chosen as a part of the method as it allows for quick data collection and statistical analysis. It also provides for using standardized clinical rating scales, a reliable method for efficiently sorting the participants into categories.

The researcher consulted two expert advisors for the study. First, he contacted an AP Statistics teacher for advice on statistical analysis and sampling methods. Then, the researcher contacted Dr. Walter Roberts, PhD., an Assistant Professor of Psychiatry at Yale University School of Medicine, for advice on the study's methodology.

Participants

The researcher used convenience sampling in this study, as it was the only feasible method with the researcher's resources. After IRB approval, the researcher distributed the survey to participants through teachers he knew at his institution, LGBTQ+ groups or organizations, and other online teens or LGBTQ+ groups on social media sites like Reddit. The researcher also contacted the GSA organization at his institution. The researcher specifically targeted LGBTQ+ groups to maximize LGB participants in the study and reduce possible statistical power issues. The study had the following inclusion criteria: Between the ages of 13 and 17 and currently live in the Southeastern United States. The inclusion criteria are taken from the research question population.

A total of ninety-five individuals completed the survey. However, seventeen individuals had to be excluded from the analysis. Thirteen of those individuals did not meet the inclusion criteria of the study, while four did not complete the required demographic information, leaving a sample size of seventy-eight individuals available for analysis.

1.28% (n=1) of participants are 13 years old, 2.56% (n=2) are 14 years old, 10.26% (n=8) are 15 years old, 33.33% (n=26) are 16 years old, and 52.56% (n=41) are 17 years old (Table 1). 38.46% (n=30) of participants are White/Caucasian, 32.05% (n=25) are Asian/Indian Subcontinent, and 29.49% (n=23) are other races/ethnicities (Table 1). 33.33% (n=26) of the participants are male, 48.72% (n=38) are female, and 17.95% (n=14) are other gender identities (Table 1).

Table 1: Demographic Characteristics of Participants

Demographic Characteristics	n	Percentages
Age		
13	1	1.28%
14	2	2.56%
15	8	10.26%
16	26	33.33%
17	41	52.56%
Race/Ethnicity		
White/Caucasian	30	38.46%
Asian/Indian Subcontinents	25	32.05%
Other	23	29.49%
Gender Identity		
Male	26	33.33%
Female	38	32.05%
Other	14	29.49%
Sexual Orientation		
Non-LGB Teens	43	55.13%
LGB Teens	35	44.87%

Measures

All materials can be found on OSF (https://osf.io/ra753/). The survey contained an informed consent statement, screener questions for eligibility, demographic questions (i.e., race, gender, sexual orientation, age), and the *ADHD Self-Report Scale Symptoms Checklist-Adolescent Version* (Sonnby et al., 2015). Sexual orientation was measured with two questions in the survey inquiring about attraction and identity. Participants were classified as LGB if they reported attraction to the same gender or both genders or an LGB identity. This is done per the standard definition of sexual orientation, which includes identity, attraction, and behavior. Survey responses were scored using a different form for data analysis.

The *ADHD Self-Report Scale Symptoms Checklist-Adolescent Version* (Sonnby et al., 2015) is a 6-question self-report scale measuring the symptoms of ADHD. It is reliable and valid (Sonnby et al., 2015). The scale is scored dichotomously, with a cut-off score of ≥4. The researcher used this cut-off score to determine the categories in which participants were placed. Participants who scored a score ≥4 were put in the group that met the criteria for ADHD, and participants who scored a score <4 were put in the group that did not meet the criteria for

ADHD. The requirements here were not following the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), as the researcher could not determine whether ADHD was the clinical explanation for the symptoms reported. This is due to the researcher being unable to utilize interviews and other clinical rating scales due to issues with the length of the survey.

The researcher set up another form to score the responses to the survey. The form contained all the study variables and allowed the researcher to quantify the responses for statistical analysis.

Procedure

Once a participant clicks on the link to the survey, the participant is taken to the study, where they are presented with the informed consent form. Once the participant completes the informed consent form, they are taken to the demographic information. Then, they are taken to the ADHD questionnaire. Once the participants complete the ADHD questionnaire, they are taken to the survey submission page.

Data Analysis

The researcher conducted all the statistical analysis using the statistical software JASP. The researcher decided to conduct a logistic regression, which was chosen to test for association and possible significant differences in ADHD between sexual orientations. It also helps demonstrate the amount of difference. The researcher also decided to conduct a Shapiro-Wilk test of normality to see if the distributions of different categorical variables follow a normal distribution. This can show sampling bias, as a skewed distribution means that a particular characteristic is more prevalent than others in the study.

The researcher meticulously set up a form to score responses after the survey. The researcher then scored the responses using the form, initiating the data analysis. The researcher's first step was to categorize the data by all the demographic characteristics, a methodical approach that ensured the data was well-organized for analysis. The decision not to further separate sexual orientation beyond LGB teens and non-LGB teens was due to the small sample size in the subgroups. Similarly, the researcher combined specific subgroups in gender and race/ethnicity due to the small sample size in those subgroups. Finally, the researcher conducted the statistical analyses and interpreted the results with the guidance of an AP Statistics expert advisor.

In the regression analysis, the researcher entered sexual orientation, gender, and race/ethnicity as the explanatory variable and ADHD as the response variable. The researcher then coded the data in the following ways: race/ethnicity (0=White/Caucasian, 1=Asian/Indian Subcontinent, 2=Other), gender (0=Male, 1=Female, 2=Other), sexual orientation (0=Non-LGB, 1=LGB), and ADHD (0=Does not meet the criteria for ADHD, 1=Meet the criteria for ADHD).

Covariates

The researcher listed race/ethnicity and gender as covariates in this study, the reason being that ADHD is known to have both gender and racial disparities (e.g., Roberts et al., 2015/2018; Faraone et al., 2021). These covariates were controlled for in the regression analysis. The researcher will present both unadjusted and adjusted analyses.

Results

Response Distribution

11.54% (n=9) of participants have a score of 0 (Table 2). 6.14% (n=5) have a score of 1 (Table 2). 11.54% (n=9) have a score of 2 (Table 2). 15.39% (n=12) have a score of 3 (Table 2). 21.80% (n=17) have a score of 4 (Table 2). 10.26% (n=8) have a score of 5 (Table 2). 23.08% (n=18) have a score of 6 (Table 2). 44.87% (n=35) of participants do not meet the criteria for ADHD, while 55.13% (n=43) meet the criteria for ADHD (Table 2).

Table 2: Distribution for Scale Score and ADHD Category

Scale Score	N	Percentages
0	9	11.54%
1	5	6.41%
2	9	11.54%
3	12	15.39%
4	17	21.80%
5	8	10.26%
6	18	23.08%
ADHD Category		
Does Not Meet the Criteria for ADHD	35	44.87%
Meet the Criteria for ADHD	43	55.13%

The results of the Shapiro-Wilk test of normality on all categories are significant (p=<.001; Table 3).

Table 3: Results of the Shapiro-Wilk Test

Variables	P-Value
Age	**<.001**

Race/Ethnicity	**<.001**
Gender Identity	**<.001**
Scale Score	**<.001**
ADHD Category	**<.001**

Note: Bold P-Value means statistical significance at an alpha level of 0.05.

62.79% (n=27) of non-LGB teens do not meet the criteria for ADHD, while 37.21% (n=16) meet the criteria for ADHD (Table 4). 22.86% (n=8) of LGB teens do not meet the criteria for ADHD, while 77.14% meet the criteria for ADHD (Table 4). 57.69% (n=15) of males do not meet the criteria for ADHD, while 42.31% (n=11) do meet the criteria for ADHD (Table 4). 52.63% (n=20) of females do not meet the criteria for ADHD, while 47.37% (n=18) meet the criteria for ADHD (Table 4). 0% (n=0) of other genders do not meet the criteria for ADHD, while 100% (n=14) meet the criteria for ADHD (Table 4). 46.67% (n=14) of White/Caucasians do not meet the criteria for ADHD, while 53.33% (n=16) meet the criteria for ADHD (Table 4). 56% (n=14) of Asian/Indian Subcontinents do not meet the criteria for ADHD, while 44% meet the criteria for ADHD (Table 4). 30.44% (n=7) of other race/ethnicities do not meet the criteria for ADHD, while 69.57 (n=16) meet the criteria for ADHD (Table 4).

Table 4: ADHD Categories by Demographic Characteristics.

Demographic Characteristics	Do Not Meet the Criteria for ADHD	Percentage	Meet the Criteria for ADHD	Percentage
Sexual Orientation				
Non-LGB Teens	27	62.79%	16	37.21%
LGB Teens	8	22.86%	27	77.14%
Gender Identify				
Male	15	57.69%	11	42.31%
Female	20	52.63%	18	47.37%
Other	0	0%	14	100%
Race/Ethnicity				
White/Caucasian	14	46.67%	16	53.33%
Asian/Indian Subcontinent	14	56.00%	11	44.00%
Other	7	30.44%	16	69.57%

Statistical Analysis

LGB teens are around 5.70 times more likely to meet the criteria for ADHD than non-LGB teens (OR: 5.695, 95% CI: 2.090, 15.519, p=<.001; Table 5). Females and other gender identites are 3.10 times more likely to meet the criteria for ADHD than males (OR: 3.100, 95% CI: 1.473, 6.522, p=.003; Table 5). Asian/Indian Subcontinent and other races/ethnicities are around 1.35 times more likely to meet the criteria for ADHD than White/Caucasian, although it is not statistically significant (OR: 1.351, 95% CI: 0.778, 2.345, p=.286; Table 5).

Table 5: Unadjusted Logistic Regression on ADHD Categories.

Demographic Group	OR	95% CI	P-Value
Sexual Orientation	5.70	**(2.090, 15.519)**	**<.001**
Gender Identity	3.10	**(1.473, 6.522)**	**.003**
Race/Ethnicity	1.35	(0.778, 2.345)	.286

Note: Odd ratios have been rounded to the nearest hundredth. Bold confidence interval and p-value indicate statistical significance.

LGB teens are around 5.16 times more likely to meet the criteria for ADHD than non-LGB teens (OR: 5.156, 95% CI: 1.541, 17.257, p=.008; Table 6). Females and other gender identities are around 2.15 times more likely to meet the criteria for ADHD than males (Table 6). However, it is not statistically significant (OR: 2.145, 95% CI: 0.896, 5.135, p=.087; Table 6). Asian/Indian Subcontinent and other races/ethnicities are around 1.95 times more likely to meet the criteria for ADHD than White/Caucasians, although it is not statistically significant (OR: 1.949, 95% CI: 0.965, 3.933, p=.063; Table 6).

Table 6: Adjusted Logistic Regression on ADHD Categories.

Demographic Group	OR	95% CI	P-Value
Sexual Orientation	5.16	(1.541, 17.257)	.008
Gender Identity	2.15	(0.896, 5.135)	.087
Race/Ethnicity	1.95	(0.965, 3.933)	.063

Note: Odd ratios have been rounded to the nearest hundredth. Bold confidence interval and p-value indicate statistical significance.

Discussion

Findings and Implications of Research

The significant results of the Shapiro-Wilk test (Table 3) mean that this study's distributions are skewed. This indicates sampling bias, as the skewed distribution shows that the participants with specific characteristics are more represented in the survey than others. Indeed, specific demographic characteristics are more represented in this study (Table 1).

The results of this study support the hypothesis. The logistic regression found that LGB adolescents are significantly more likely to have ADHD than non-LGB adolescents (Table 6).

Indeed, LGB adolescents are around 5.16 times more likely to meet the criteria for ADHD than non-LGB individuals, even after controlling for covariates (Table 6). These findings are in line with previous literature as it all found that sexual minorities have a higher prevalence of ADHD (e.g., Strutz et al., 2015; Frisell et al., 2010; Donahue et al., 2017; Wang et al., 2014; Blum et al., 2020). However, this finding contradicts Sandfort et al., (2014), as that study found no significant difference in ADHD between sexual orientations. However, this conflict is due to the study's small sample size of LGB teens. Indeed, Sandfort et al. (2014) acknowledged that the small sample size might have caused the analysis to be underpowered, leading to an increased chance of Type II errors. Additionally, the different operational definitions of ADHD might also be a cause of the different results. Sandfort et al. (2014) used a structural interview to measure ADHD, while this study only used a screening measure.

This study is different from previous literature in multiple ways. This study did not use a nationally representative sample (c.f., Strutz et al., 2015; Donahue et al., 2017; Sandfort et al., 2014; Frisell et al., 2010). This study also did not stratify the logistic regression models by gender (c.f., Strutz et al., 2015; Wang et al., 2014; Frisell et al., 2010; Donahue et al., 2017). This study also did not compare sexual orientation subgroups for differences in ADHD prevalence (c.f., Strutz et al., 2015). This is a direction for future research to investigate if there is a difference in ADHD prevalence in sexual minority subgroups.

This study is also different from previous literature as it did not show statistically significant differences in ADHD categories by gender once covariates have been controlled (Table 6), in the case of race before covariates were even controlled (Table 5). This is interesting as it is well-established in the literature that ADHD has both racial and gender disparities in prevalence (e.g., Roberts et al., 2015/2018; Faraone et al., 2021). This conflict might be due to sampling bias, as much of the sample in this study came from the researcher's institution, which had significantly different sociodemographic characteristics than the general population. The sampling bias could also be seen in the highly skewed distribution of all characteristics in the study (Table 3). This shows that certain groups participated in the study more than others. The conflict could also be due to combining race/ethnicity and gender identity subgroups. This potentially has obscured specific significant differences. This could also be due to the different operational definitions of ADHD.

This study helps expand upon previous research on disparities in ADHD by sexual orientation by showing that it exists in adolescents, as well. This study helps support the theoretical framework of this study by showing that sexual minorities have higher rates of ADHD. Indeed, it is unlikely that the theoretical framework would be accurate if sexual minorities do not have a higher prevalence of ADHD, as without the higher prevalence, it would be improbable that ADHD would have a significant impact. This provides new explanations for health disparities in sexual minorities and innovative solutions. If future research finds that ADHD is an explanation for the health disparities in sexual minorities, then the solution would be the treatment for ADHD. This will help reduce the cost of health disparities as treatment for ADHD has been found to be effective (e.g., Conner, 2015/2018; Faraone et al., 2021). The theoretical framework of this study also connects with Strang et al.'s (2023) framework.

Strengths and Limitations of Research

The strength of this study is the use of screening measures. The reliance on self-reported ADHD diagnosis (i.e., Strutz et al., 2015) can be biased as some participants might have ADHD but do not have a diagnosis. This would lead to misclassification and biased estimates. With a screening measure, this is not an issue, as it directly measures the symptoms of ADHD rather than an actual diagnosis. Another strength would be that this study targeted more LGB groups for recruitment. This helped partially address the past issue of small sample size in LGB groups due to difficulty recruiting this population.

However, this study has multiple limitations. One of the limitations is that this study did not utilize probability sampling, meaning that the sample might not represent the general population, leading to limited generalizability.

Another limitation would be that structural interviews and other clinical screeners for comorbid disorders are not used. This limitation means that the results of the study do not represent ADHD as a diagnosis but rather the symptoms of ADHD, as the lack of structural interviews and screening for comorbid disorders means that the researcher cannot be sure whether the symptoms reflect an ADHD diagnosis, as the symptoms could be caused by other disorders that are only mimicking ADHD.

Another limitation is the use of self-reporting, which could lead to possible self-reporting bias. The issue here is that individuals with ADHD tend to overestimate their ability and underestimate the extent or severity of their symptoms (Roberts et al., 2015/2018; Owens et al., 2007). This could lead to misclassification, as some individuals who meet the criteria would be misclassified as not meeting the criteria due to their underestimation. Causality also cannot be determined in this study, as this study is cross-sectional.

Another limitation is collapsing a continuous scoring scale into dichotomous characteristics. This can be problematic as it can reduce statistical power by forcing continuous traits into artificial dichotomies. This might also be a reason for the insignificant findings on race and gender. This limitation is that the study combined subgroups with small sample sizes, which could have had the same effect. However, this limitation is not too impactful on the primary goal of this study, as this study still found significant differences in ADHD categories by sexual orientation.

Lastly, another limitation is that the researcher did not inquire about the behavior aspect of sexual orientation; this could have led to misclassification and potential underestimation. Indeed, the standard definition of sexual orientation is attraction, behavior, and identity. By focusing on attraction and identity, this study missed behavior and could have misclassified participants, leading to inaccurate estimates.

Future Directions of Research and Conclusion

This study demonstrates that sexual minorities are more likely to meet the criteria for ADHD and, in turn, more likely to have ADHD, as defined through a clinical rating scale. Future research should use probability sampling to obtain representative samples. Future research should also target LGB populations more in sampling to allow for better power for statistical analysis and analysis in sexual minority subgroups, as well as utilizing standard operation

definitions for sexual orientation to reduce the risk of misclassification. Future research should also use structural interviews and other clinical scales to measure possible comorbid disorders and ensure that the participants meet the diagnostic criteria for ADHD. It should also utilize parent and teacher reports to control the possibility of self-reporting bias and the potential for misclassification. Future research should use a longitudinal design to allow for the possibility of causal inference. Lastly, future research should explore whether ADHD symptoms and traits help explain the health disparities seen in sexual minorities using rigorous epidemiological methods.

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