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Sexual orientation and mental health among adults in four U.S. cities

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ABSTRACT

Sexual minorities have higher risk for psychological distress than heterosexual populations. However, this disparity remains under-studied in urban settings, and there likewise has been minimal prior research of potential interactions with gender and race/ethnicity. The present study aimed to examine mental health correlates of sexual minority identification in conjunction with gender and race/ethnicity. A community sample of 1,615 adults from four eastern cities in the United States was used. A series of regression analyses were conducted to examine differences in psychological distress and suicidal ideation across different sexual orientation populations. The results showed that only bisexual individuals had significantly higher psychological distress and risk for suicidal ideation than heterosexual individuals even after adjusting for age and income. The associations were consistent across gender and race/ethnicity. No significant differences between homosexual and heterosexual individuals were found. Health professionals working with people of bisexual orientation in urban settings should attend to potential psychological distress and recent suicidal ideation.

1. Introduction

According to a review on sexual minority statistics from population-based studies in the United States (U.S.), about 3.5% adults identified themselves as lesbian, gay, or bisexual (LGB) between year 2005 and 2009 (Gates, 2011). In society where heterosexuality is dominant, LGB individuals are subject to stigma based on their sexual orientation (Herek, 2009) and experience more psychological distress than heterosexual individuals (King et al., 2008). It has been reported that mental disorders, such as depression and anxiety, are more common among sexual minorities than heterosexual populations (Bostwick et al., 2010; Flentje et al., 2016). Additionally, suicidal thoughts and attempts are also significantly more prevalent among sexual minorities (Conron et al., 2010; Fergusson et al., 2005; Herrell et al., 1999). A systematic review on mental disorders among sexual minorities revealed that LGB individuals showed at least 1.5 times higher risk for depression and anxiety disorders and approximately 2.5 times greater risk for suicide attempt compared to heterosexual individuals (King et al., 2008). Although limited, some prior research examining subgroup differences among LGB populations found that bisexual individuals are at the greatest risk for psychological distress compared to lesbian and gay individuals in Australia (Jorm et al., 2002). More recent systematic reviews on bisexuality and health disparities (Feinstein and Dyar, 2017; Semlyen et al., 2016) supported Jorm et al.'s (2002) findings such that bisexual individuals were at greater risk than monosexual individuals (i.e., heterosexual and gay/lesbian) in anxiety, depression, substance abuse, and suicidal ideation. In another study, bisexual individuals reported more barriers to health care services than heterosexual individuals (Conron et al., 2010).

The Minority Stress Model (Brooks, 1981; Meyer, 1995, 2003) posits that stigma, prejudice, and discrimination may increase psychological distress in sexual minority populations. As individuals develop a sense of self and well-being by interacting with others in society, repeated exposure to negative social interactions and stigma may place sexual minority populations at greater risk for psychological distress. As predicted by the Minority Stress Model, stigma, sexual identity distress, and heterosexist experiences were significantly associated with increased psychological distress among lesbian, gay, bisexual, or transgender (LGBT) youth in the previous studies (Kelleher, 2009; Lehavot and Simoni, 2011; McCabe et al., 2010).

Despite a growing body of research documenting associations between sexual minority status and psychological distress, the majority of previous studies have not been sufficiently powered to explore the relationship while accounting for gender and racial/ethnic differences, due to small sample sizes or the overall low prevalence of sexual minorities in the general population (Meyer, 2003). The impact of

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sexual minority status on mental health should be studied in conjunction with gender and race/ethnicity, given that various demographic groups experience different levels of social discrimination and stigma in a variety of settings, including the labor market (Roscigno et al., 2007) and health services (McGuire et al., 2008). For example, prior studies showed that women experienced more discrimination in hiring (Gorman, 2005), promotion (Olson and Becker, 1983) and appearance such as weight and height (Puhl et al., 2008), and gender discrimination was associated with life stress (Shaffer et al., 2000). Similarly, racial/ethnic minorities are exposed to greater mistreatment at work and it was negatively associated with emotional and physical well-being (Deitch et al., 2003). However, the extent to which mental health outcomes between sexual minority subpopulations (i.e. gay, lesbian, and bisexual) differ by gender and race/ethnicity has not been clearly understood. In addition, very few studies have examined the relationship between sexual orientation and mental health particularly among individuals living in urban settings. One empirical study showed that urban residents had significantly higher psychiatric morbidity and drug/alcohol dependence, greater overall life stress, and adverse living circumstances than rural residents (Paykel et al., 2000). These findings suggest that the needs of individuals with mental health conditions in urban settings may differ from those in rural settings; however, existing research has not fully examined mental health of sexual minorities living in urban settings, including the extent to which outcomes vary by gender and race/ethnicity in urban communities. Although a growing number of studies have examined the intersectionality between sexual orientation and race/ethnicity (Jayaratne et al., 2006; Mereish and Bradford, 2014; Parks et al., 2004; Veenstra, 2011), additional study is needed to better understand the mental health needs and experiences of LGB populations based on gender and race/ethnicity living in urban settings.

In addition, previous studies have shown that bisexual individuals should not be combined with gay/lesbian individuals as sexual minority because bisexual individuals face “double discrimination” from both heterosexual and gay/lesbian individuals (Friedman et al., 2014; Mulick and Wright, 2002; Ochs, 1996). Another study showed that bisexual individuals experienced more sexual minority stress and it could result in poorer mental health outcomes; bisexual individuals not only had significantly higher anxiety and depression than heterosexual and homosexual individuals, but also experienced significantly more negative life experiences and financial difficulties (Jorm et al., 2002). However, there is limited research on the difference between gay/lesbian and bisexual individuals in mental health outcomes.

Therefore, the present study examines mental health outcomes among sexual minority populations (i.e. lesbian, gay, and bisexual) from four cities in the U.S. Based on prior studies and theoretical explanations in the Minority Stress Model, we hypothesized that sexual minority individuals would have higher psychological distress and suicidal ideation than heterosexual individuals, and bisexual individuals may be at the greatest risk. We also explored whether associations between sexual orientation and mental health outcomes vary by gender and race/ethnicity. Based on research documenting higher levels of discrimination and stigma associated with particular demographics (i.e. female, racial/ethnic minority) in the general population, we hypothesized that psychological distress and suicidality would be higher among LGB individuals from female and racial/ethnic minority populations.

2. Methods

2.1. Procedure and sample

Adults (18 years or older) from four cities in the Eastern U.S. (Baltimore, New York City, Philadelphia, and Washington D.C.) were recruited for this study. We used Qualtrics Panels to obtain a demographically representative sample of residents in each city in terms of age, gender, and race/ethnicity. Although the survey was intended to achieve a sample that fell within ± 10% of 2010 census distributions regarding age, gender, and race/ethnicity from each city, White, female, and individuals aged 25–44 years were over-represented in the final sample (detailed procedure and sample characteristics can be found in DeVylder et al., 2016). Data were collected between March and April 2016. In the introductory screen, participants were informed that participation in this study was entirely voluntary, and the survey focused on understanding the experiences of people living in major cities, with a special focus on mental health and distress. Eligibility screening left a final sample size of 1615 adults and the current study used this sample. Pre-specified financial compensation was given to participants and it did not exceed $10/participant to prevent potential financial coercion. Study procedures received approval by the university Institutional Review Board.

2.2. Measurement

2.2.1. Sexual orientation

A single item was used to identify respondent's sexual orientation. Respondents were asked to endorse any one of the following categories: (1) heterosexual, (2) gay/lesbian, (3) bisexual, (4) sexual orientation not specified. Due to a small subsample size ($n = 20$), those who responded “sexual orientation not specified” were excluded from the analyses as the subsample size became even smaller when stratified by gender and race/ethnicity. For the regression analyses, heterosexual individuals were used as a reference first, and then homosexual individuals were used as a reference to compare differences between homosexual and bisexual individuals.

2.2.2. Psychological distress

The six-item K6 scale (Kessler et al., 2002) was administered to measure psychological distress. K6 was first developed for the U.S National Health Interview Survey (NHIS) to capture comprehensive psychological distress rather than disorder-specific diagnostics. Sum scores with a potential range of 0–24 were used for the regression analyses. Internal consistency of the scale in this study was excellent (Cronbach's $\alpha = 0.90$) and it demonstrated a good test-retest reliability in this sample ($r = 0.83$, $p < 0.001$; DeVylder et al., 2016).

2.2.3. Suicidal ideation

Respondents were asked, “In the past 12 months, have you ever seriously thought about committing suicide?”, and three response options were given: yes, no, or unsure. However, in order to take into account under-reporting of suicidal ideation (Klonsky et al., 2016; Prinstein, 2008), “unsure” and “yes” were collapsed into yes (1) yielding a dichotomized variable.

2.2.4. Covariates

Age and household income were included as covariates. Age was measured as a continuous variable. Household income was measured as a categorical variable with six response options from (1) less than $19,999 to (6) more than $100,000, with $20,000 intervals. Household income was dummy coded and the first group (under 20,000) was used as the reference. Responses missing on household income were also dummy coded and included in the analyses to retain maximum cases for the multivariate analyses.

To compare differences in associations between sexual orientation and mental health, the sample was stratified by gender and race/ethnicity. Gender was measured as (1) male, (2) female, (3) transgender, male to female, (4) transgender, female to male, (5) transgender, not further specified, and (6) other. Due to low frequency ($n = 11$), transgender (3–5) and other (6) were excluded from the analyses as there was insufficient power to test hypotheses among transgender/other respondents. Race was identified as (1) White, (2) Black or African American, (3) Native American or American Indian, (4) Asian or Pacific

Islander, (5) more than one race, and (6) Other, and participants were asked if they identified themselves as Hispanic or Latino in the following question. Using the two questions on race/ethnicity, race/ethnicity variable was recoded into White, Black/African American, Hispanic/Latino, and other for descriptive purpose. Due to a small sample size for some racial/ethnic groups, race/ethnicity variable was then dichotomized into White and non-white for the multivariate analyses.

2.3. Data analysis plan

Descriptive analyses were conducted to describe the characteristics of the study sample. Bivariate relationships between sexual orientation and major study variables were examined using Chi-square test and analysis of variance (ANOVA). To examine the association between sexual orientation, psychological distress (K6), and suicidal ideation, a series of multiple regressions (for K6) and logistic regressions (for past-year suicidal ideation) were performed by gender and race/ethnicity, adjusting for age and income. To compare differences in mental health outcomes between all pairs of sexual orientation populations, heterosexual individuals were used as the reference in the first model and gay/lesbian individuals were used as the reference in the second model with same covariates. The Bonferroni correction (α/the number of comparisons on the dependent variable) was applied to account for multiple comparisons on the dependent variable, and statistical significance was set at $p < 0.0125$ (0.05/4) for multivariate analyses. All statistical data analyses were performed using SPSS for Macintosh, v.21.0 (IBM Corp, 2012).

3. Results

3.1. Descriptive characteristics of the study sample

Descriptive characteristics of the study sample by sexual orientation are represented in Tables 1 and 2. The study sample was predominantly female (58.1%) and non-Hispanic White (54.3%). The majority of respondents identified themselves as heterosexual (90.5%), followed by bisexual (5.5%), and gay/lesbian (4.0%). In terms of the intersection between demographic variables and sexual orientation, bisexual identity was more prevalent among women than men. More Hispanic/Latino respondents identified themselves as gay/lesbian or bisexual compared to other racial/ethnic groups (Table 1). The bisexual individuals were, on average, significantly younger than other sexual orientations.

In the bivariate analyses, the bisexual individuals reported significantly higher K6 scores than gay/lesbian and heterosexual individuals (Table 2). Past-year suicidal ideation showed a similar pattern. Gay/lesbian and bisexual individuals showed significantly higher suicidal ideation rate than heterosexual individuals in the past 12 months (Table 2). The prevalence of past-year suicidal ideation was highest among bisexual individuals (41.9%), followed by gay/lesbian individuals (15.9%).

3.2. Sexual orientation and mental health outcomes by gender and race/ethnicity

Results of multivariate analyses on psychological distress and past-year suicidal ideation are displayed in Tables 3 and 4. Across all analyses, the bisexual individuals showed higher psychological distress and past-year suicidal ideation consistently across all gender and race/ethnicity even after adjusting for age and income. In particular, bisexual men had significantly higher psychological distress and past-year suicidal ideation than heterosexual men, but there was no statistically significant difference between heterosexual men and gay men in both mental health outcomes. Similar to male respondents, bisexual women had significantly higher psychological distress and past-year suicidal ideation than heterosexual women, but no significant difference was found between heterosexual women and lesbian women (Table 3).

With regard to race/ethnicity, bisexual individuals showed significantly higher distress and greater risk for past-year suicidal ideation than heterosexual individuals regardless of their race/ethnicity. On the other hand, there was no significant difference between heterosexual individuals and gay/lesbians in either mental health outcomes (Table 4). Stratified analyses for both mental health outcomes adjusting for age and income are presented in Fig. 1.

4. Discussion

The present study investigated associations between sexual orientation and mental health outcomes in a sample of urban adult

Table 1
Descriptive characteristics by sexual orientation.

Categorical variable % (n)		Heterosexual	Gay/lesbian	Bisexual	Total	χ^2 (df), p
Gender	Male	91.1 (603)	5.6 (37)	3.3 (22)	(662)	17.24 (2)
	Female	90.1 (827)	2.8 (26)	7.1 (65)	(918)	$p = 0.000$
Race/ethnicity	White	90.7 (778)	4.2 (36)	5.1 (44)	(858)	
	Black	93.6 (425)	2.2 (10)	4.2 (19)	(454)	20.13 (6)
	Hispanic/Latino	82.3 (149)	7.2 (13)	10.5 (19)	(181)	$p = 0.003$
	Other	89.7 (78)	4.6 (4)	5.7 (5)	(87)	
Income	Less than $19,999	85.3 (133)	4.5 (7)	10.3 (16)	(156)	13.93 (10)
	$20,000–39,999	89.8 (239)	3.4 (9)	6.8 (18)	(266)	$p = 0.176$
	$40,000–59,999	89.5 (264)	5.1 (15)	5.4 (16)	(295)	
	$60,000–79,999	91.4 (266)	4.1 (12)	4.5 (13)	(291)	
	$80,000–99,999	90.6 (173)	3.1 (6)	6.3 (12)	(191)	
	More than $100,000	93.0 (348)	3.7 (14)	3.2 (12)	(374)	

Continuous variable *M* (SD)	Heterosexual (a)	Gay/lesbian (b)	Bisexual (c)	Overall	*F* (df1, df2)
Age	40.05 (14.68)	39.68 (14.00)	29.23 (9.42)	39.43 (18.33)	23.04 (2, 1577) a, b > c[1] $p = 0.000$

[1] Results of post-hoc analysis (Turkey's HSD).

Table 2
Bivariate level association between sexual orientation and mental health.

Continuous variable	Group	*N*	Mean	SD	*F* (df), *p*
K6	Heterosexual (a)	1430	4.66	5.10	34.87 (2,1577)
	Gay/lesbian (b)	63	5.86	5.69	a, b < c[1]
	Bisexual (c)	87	9.38	6.26	*p* = 0.000
	Total	1580	5.01	5.32	

Categorical variable	Group	*N*	Yes[2]	%	χ^2 (df), *p*
Suicidal ideation	Heterosexual	1430	131	9.2	88.58 (2)
	Gay/lesbian	63	10	15.9	*p* = 0.000
	Bisexual	86	36	41.9	
	Total	1579	177	11.2	

[1] Results of post-hoc analysis (Turkey's HSD).
[2] The number of respondents who endorsed yes on suicidal ideation.

Table 3
Sexual orientation and mental health by gender.

K6	Male						Female					
	Model 1			Model 2			Model 1			Model 2		
	B	*p*	95% CI	*B*	*p*	95% CI	*B*	*p*	95% CI	*B*	*p*	95% CI
Heterosexual	Ref.	–	–	−1.24	0.124	[−2.81, 0.34]	Ref.	–	–	−0.94	0.356	[−2.93, 1.05]
Gay/lesbian	1.24	0.124	[−0.34, 2.81]	Ref.	–	–	0.94	0.356	[−1.05, 2.93]	Ref.	–	–
Bisexual	3.34*	0.001	[1.32, 5.37]	2.11	0.100	[−0.40, 4.62]	3.40*	0.000	[2.08, 4.73]	2.47	0.038	[0.14, 4.80]
R^2	0.14*						0.14*					
F (df1, df2), *p*	11.57 (9, 652), *p* = 0.000						16.88 (9, 908), *p* = 0.000					

Suicidal ideation	Male						Female					
	Model 1			Model 2			Model 1			Model 2		
	OR	*p*	95% CI	OR	*p*	95% CI	OR	*p*	95% CI	OR	*p*	95% CI
Heterosexual	Ref.	–	–	0.52	0.211	[0.19, 1.44]	Ref.	–	–	0.45	0.145	[0.16,1.32]
Gay/lesbian	1.91	0.211	[0.69, 5.29]	Ref.	–	–	2.21	0.145	[0.67, 6.43]	Ref.	–	–
Bisexual	8.12*	0.000	[3.13, 21.11]	4.25	0.032	[1.13, 15.95]	3.85*	0.000	[2.13, 6.95]	1.74	0.352	[0.54, 5.60]
−2 Log likelihood	372.19						582.09					

Note. Age and income are adjusted in all models.
* $p < 0.0125$.

residents from four major cities in the Eastern U.S., including the extent to which outcomes vary by gender and race/ethnicity. Previous research has reported that sexual minorities are at higher risk for mental disorders (Bostwick et al., 2010; Conron et al., 2010; Fergusson et al., 2005; Flentje et al., 2016; Herrell et al., 1999; King et al., 2008); however, few studies have examined differences in mental health outcomes between sexual minority subpopulations (i.e. lesbian, gay, and bisexual). The present study found that bisexuals were at the highest risk for psychological distress and recent suicidal ideation in comparison to all other sexual orientation populations, even when age and income were adjusted. These findings are consistent with previous studies showing that bisexuals were at the greatest risk for anxiety, depression, and suicidality compared to heterosexual and gay/lesbian populations (Feinstein and Dyar, 2017; Jorm et al., 2002). However, heterosexual and gay/lesbian individuals did not significantly differ regardless of their demographic characteristics, which are different from Jorm et al.'s (2002) findings. Results of the present study may imply that stigma on homosexuality has diminished over the past decade and internal support from gay/lesbian communities has increased since the Jorm et al. (2002) study. Inclusion of respondents at a wide range of age (18–84) in this study may have also generated different results than Jorm et al.'s study (2002) which included only two discrete age groups (20– 24 years and 40– 44 years).

Additionally, this particular finding may appear to be contrasting to previous studies which have documented that sexual minorities, in general, present with greater mental health problems than heterosexual populations (Bostwick et al., 2010; Cochran and Mays, 2000; Gilman et al., 2001). However, many previous studies have not distinguished between gay/lesbian and bisexual respondents despite the fact that individuals with bisexual orientation may have more exposure to social and interpersonal stressors than gay/lesbian individuals. For example, some studies found that both heterosexual and gay/lesbian individuals present a moderate to severe range of negative attitudes towards bisexuality and bisexual individuals (Mulick and Wright, 2002). As a result, bisexual individuals experience “double discrimination” and biphobia not only from heterosexual populations but also from gay and lesbian communities (Brewster and Moradi, 2010; Flanders et al., 2015; Mulick and Wright, 2002; Ochs, 1996; Roberts et al., 2015). Bisexual individuals also experience microaggression (e.g., slights, insults, hostility, denial/dismissal, dating exclusion, pressure to change), financial difficulties, and significant adverse life events more often than gay/lesbian individuals (Bostwick and Hequembourg, 2014; Jorm et al., 2002). Keeping in mind the Minority Stress Model (Brooks, 1981; Meyer, 1995, 2003), the social atmosphere and living environments

Table 4
Sexual orientation and mental health by race/ethnicity.

K6	White						Non-white					
	Model 1			Model 2			Model 1			Model 2		
	B	*p*	95% CI	*B*	*p*	95% CI	*B*	*p*	95% CI	*B*	*p*	95% CI
Heterosexual	Ref.	–	–	−1.14	0.154	[−2.71, 0.43]	Ref.	–	–	−1.08	0.288	[−3.08, 0.92]
Gay/Lesbian	1.14	0.154	[−0.43, 2.71]	Ref.	–	–	1.08	0.288	[−0.92, 3.08]	Ref.	–	–
Bisexual	2.93*	0.000	[1.47, 4.40]	1.79	0.093	[−0.30, 3.89]	3.40*	0.000	[1.77, 5.02]	2.32	0.070	[−0.19, 4.82]
R^2	0.17*						0.13*					
F (df1, df2), *p*	19.30 (9, 848), $p = 0.000$						11.82 (9, 712), $p = 0.000$					

Suicidal Ideation	White						Non-white					
	Model 1			Model 2			Model 1			Model 2		
	OR	*p*	95% CI	OR	*p*	95% CI	OR	*p*	95% CI	OR	*p*	95% CI
Heterosexual	Ref.	–	–	0.38	0.048	[0.15, 0.99]	Ref.	–	–	0.71	0.545	[0.23, 2.18]
Gay/Lesbian	2.64	0.048	[1.01, 6.91]	Ref.	–	–	1.42	0.545	[0.46, 4.38]	Ref.	–	–
Bisexual	4.33*	0.000	[2.11, 8.88]	1.64	0.397	[0.52, 5.16]	4.30*	0.000	[2.14, 8.64]	3.03	0.088	[0.85, 10.84]
−2 Log Likelihood	488.46						460.10					

Note. Age and income are adjusted in all models.
* $p < 0.0125$.

may be particularly more hostile towards bisexual individuals, and this adverse social atmosphere can lead to increased mental health symptomology among this subpopulation. In addition, ambiguity imposed in social environments by having neither a clear heterosexual nor gay/lesbian orientation may result in greater stress among people with bisexual orientation (Jorm et al., 2002). Lack of distinct supportive groups, which commonly exist for gay and lesbian individuals in major cities, may make bisexual individuals more vulnerable to psychological distress in the face of bisexual minority stress (Mereish et al., 2017). Therefore, mental health professionals in urban areas interacting with sexual minorities may benefit from exploring distinct sexual orientation identities rather than dichotomously (i.e. sexual minority/heterosexual) assessing the sexual orientation of their clients. Assessing stressors and social stigma associated with bisexuality can also assist

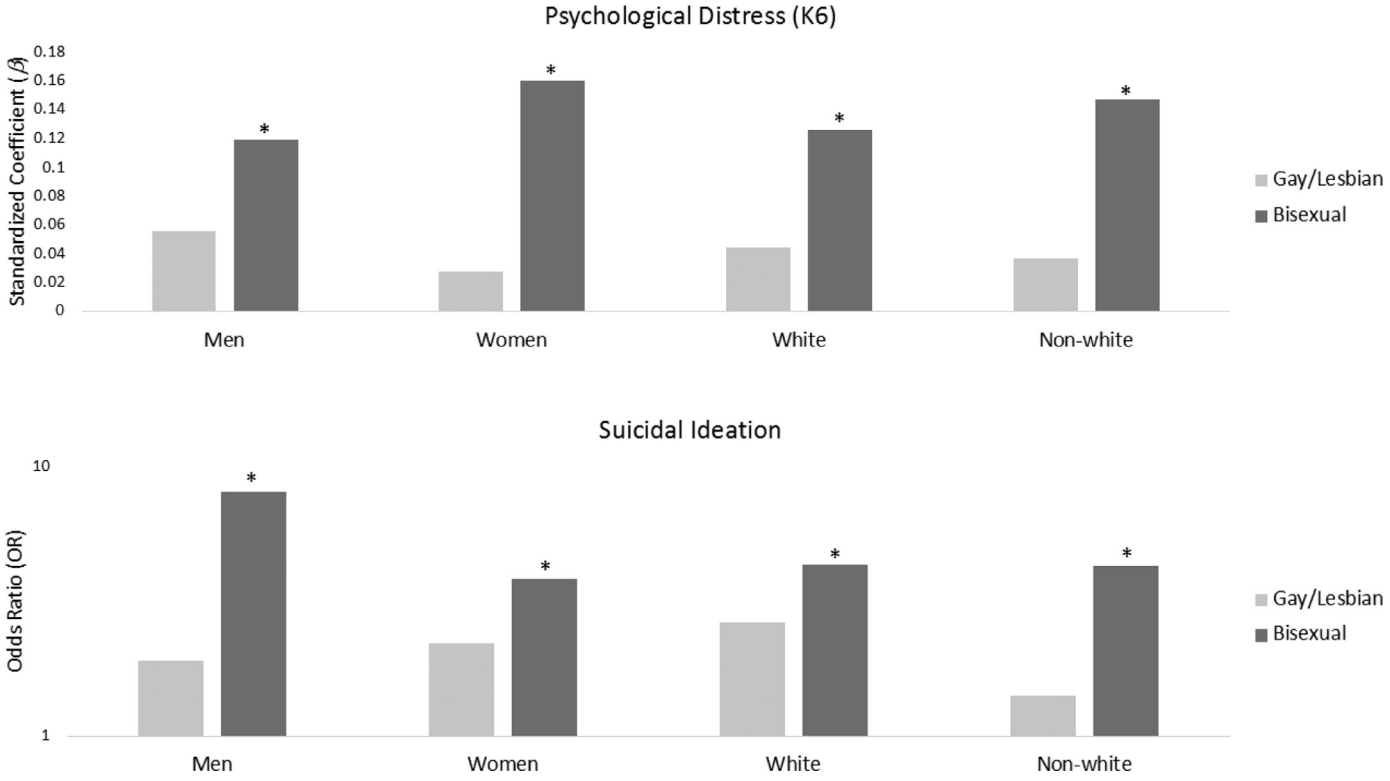

Fig. 1. Sexual orientation and mental health outcomes by gender and race/ethnicity. The results are displayed by gender and race/ethnicity. Standardized coefficients (β) are shown in the figure for psychological distress (K6) and Odds Ratios (OR) are shown on log scale in the figure for suicidal ideation. Heterosexual individuals were used as the reference. Asterisk (*) indicates significance ($p < 0.0125$).

mental health professionals in planning treatment and interventions for bisexual individuals living in urban communities.

4.1. Limitations and conclusions

The present study has several strengths including the large sample size from four different cities, which provided sufficient power to examine psychological distress between subpopulations of sexual minorities and its intersectionality with demographic characteristics. Despite significant findings of the present study, there are several limitations to consider. First, the identified association between sexual orientation and mental health outcomes may not be retained in samples with different demographic characteristics by using a nonprobability sample from four cities in the Eastern U.S. In addition, the small subgroup sample size especially for sexual minority populations may limit generalizability of the study findings to the larger population. However, the possibility seems minimal regarding that the association between sexual orientation, psychological distress, and suicidal ideation did not substantially differ between various demographic characteristics. Although the Minority Stress Model (Brooks, 1981; Meyer, 1995, 2003) provided a framework for explaining the association between sexual minority status and mental distress, we were not able to directly test the roles of social stigma, prejudice, and discrimination in explaining poor mental health outcomes among sexual minorities. In addition, local policy and social support resources that could influence mental health among sexual minorities were not examined in the present study. Future studies examining the role of community-level risk and protective factors may help understand differences in mental health outcomes of sexual minorities between cities. Findings of the present study are limited to correlations rather than causation due to a cross-sectional study design.

Despite these limitations, the findings of this study suggest a need for further investigations in mental health among the subpopulations of sexual minorities instead of using a binary classification (heterosexual vs. LGB populations). Therefore, the mechanisms for explaining the relationship between sexual orientation and mental distress, including the role of stigma, discrimination, state or local-level policy geared toward LGB populations, and LGB community resources, should be further studied between subpopulations of sexual minority individuals.

Declarations of interest

None.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.12.092.

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