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Impact of the 2016 Election on the Quality of Life of Sexual and Gender Minority Adults: A Difference-in-Differences Analysis

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Abstract

Purpose: The 2016 U.S. election significantly changed the political landscape for sexual and gender minority (SGM) individuals. The current study assessed the consequences of the election and transition to a new overtly discriminatory administration on the health-related quality of life of SGM adults compared with their cisgender and heterosexual counterparts.
Methods: The study used repeated cross-sectional data from the 17 states that administered the sexual orientation and gender identity module in the 2015 and 2018 Behavioral Risk Factor Surveillance System surveys. The sample included 268,851 adult respondents: 12,006 SGM adults (5.35%) and 256,845 cisgender and heterosexual adults (94.65%). Outcomes were frequent (≥14 days in the last month) physical distress, mental distress, limited activity, and/or fair/poor general health. Difference-in-differences estimates were calculated from logistic regression models, controlling for sociodemographic, health care coverage, and chronic medical condition confounders.
Results: Compared with the cisgender and heterosexual population, frequent mental distress among SGM adults increased by 5% points, corresponding to a relative increase of 32.5% ($p < 0.001$) from 2015. Rates of frequent physical distress, limited activity, and fair/poor general health were not significantly altered between the two populations. Gender minority adults were most negatively affected with a relative increase in frequent mental distress of 117.5% ($p < 0.001$).
Conclusions: The 2016 U.S. election and administration changeover were associated with a substantial increase in the proportion of SGM adults reporting frequent mental distress. These data provide empirical evidence as to the psychological effects of an abrupt political realignment on SGM mental health.

Keywords: advocacy, gender identity, mental health, public policy, sexual orientation

Introduction

November 8, 2016, marked the election of Republican Donald J. Trump as the 45th President of the United States along with Vice President Mike Pence, defying exit polls and analyst predictions. Postelection anxiety and dysphoria, nicknamed ''Post-Election Stress Disorder,'' incited a reported upswing in mental health utilization.[1] Symptoms resembled those commonly experienced after a traumatic event—anxiety, irritability, insomnia, fear, and helplessness—and persisted for months following the election.[2–5] Younger age and reliance on new forms of media were among the factors associated with increased psychological distress.[6] Female gender, Democratic party affiliation, and low household income were associated with higher postelection stress and anxiety scores (preprint).[7] Neuroendocrine changes were also observed. Affected individuals displayed dysregulation of the hypothalamic–pituitary–adrenal axis and dopaminergic mesolimbic circuitry, with specifically increased cortisol and suppressed activation of the nucleus

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accumbens, respectively.[8,9] In some cases, these alterations persisted for months after resolution of subjective distress.

Sexual and gender minority (SGM) people were a particular focus of the rhetoric of the Trump–Pence campaign. The pair repeatedly stated intent to repeal the Affordable Care Act (ACA), which had significantly reduced the number of uninsured lesbian, gay, and bisexual persons after its passage in 2010.[10] In addition, ACA Section 1557 had barred discrimination based on gender identity and expanded Medicare/Medicaid coverage for gender-affirming treatments.[11] Trump–Pence advocated to exclude gender identity from Section 1557's protections and promoted state-level legislation to enable denial of services to SGM individuals based on religious or moral convictions, such as the Religious Freedom Restoration Act (RFRA) and the First Amendment Defense Act.[12]

Concerns about increased stigma and rollback of antidiscrimination protections voiced by the SGM community before the election proved highly prescient in the months following the Trump–Pence inauguration on January 20, 2017.[13] Mentions of LGBT issues were removed from the White House, Department of Health and Human Services (HHS), and other government websites.[14] Trump nominated Judge Neil Gorsuch to the Supreme Court, a candidate with a well-documented antiequality record.[15] On December 31, 2016, the U.S. District Court for the Northern District of Texas had filed an injunction against HHS, arguing that the SGM-related antidiscrimination provisions of Section 1557 violated the RFRA and the Administrative Procedure Act.[16] Rather than appeal the decision, on May 2, 2017, the Department of Justice filed a motion on behalf of HHS for a voluntary remand and stay, prohibiting HHS from enforcing the antidiscrimination ruling nationwide.[17] In total, 129 anti-SGM bills were proposed during the 2017 legislative season in 30 states, targeting protections ranging from housing to health care to adoption.[18]

The impact of this concentrated period of rights reversals on the well-being of SGM adults is unknown. Stress in the immediate aftermath of the election is documented. One month after the election, a Gallup poll found a 10% reduction in the number of SGM individuals reported to be ''thriving.''[19] The day after the election, gay men and lesbian women participating in a diary study noted immediate increases in depression and perceived discrimination.[20] Higher levels of stress and sexual orientation rumination were also reported in the months following the election.[21] These studies focused primarily on the immediate mental distress caused by the election and employed small convenience samples. Population-level longitudinal studies have been hindered by the lack of routine collection of sexual orientation and gender identity (SOGI) data in nationally administered surveys.

The current study addresses this gap by investigating the effects of the 2016 election and transition to the Trump–Pence administration on the health-related quality of life of the SGM population, using data from the Behavioral Risk Factor Surveillance System (BRFSS). The study employed a robust difference-in-differences (DID) approach with the cisgender and heterosexual population as a control group, which helped reduce bias of other causal influences on the outcomes. These data uniquely and substantially advance understanding as to the consequences of an abrupt political realignment on SGM mental health.

Materials and Methods

Data sources

The study used public data from the 2015 and 2018 BRFSS.[22] Eligible respondents were adults ≥18 years of age. The sample included data from the 17 states that completed the SOGI module in 2015 and 2018 (Supplementary Table S1). As per the guidelines of the UCLA Institutional Review Board, as employing publicly available deidentified data, the study did not involve human subjects or require board review.

Measures

Respondents were classified as sexual and gender minority (SGM) respondents if they replied lesbian or gay, bisexual, or other to the sexual orientation question or female-to-male, male-to-female, or gender nonconforming to the gender identity question. Participants who reported a ''straight'' sexual orientation and stated ''no'' to identifying as transgender or gender nonconforming were designated as cisgender and heterosexual respondents.

Sociodemographic measures included (1) age (18–24, 25–34, 35–44, 45–54, 55–64, or 65+ years old); (2) race/ethnicity (White, non-Hispanic; Black, non-Hispanic; American Indian/Alaska Native/Other, non-Hispanic; Asian/Native Hawaiian/Pacific Islander, non-Hispanic; and Hispanic); (3) education level (did not complete high school, high school graduate, some college/technical school, or college/technical school graduate); (4) relationship status (married or unmarried couple or single [including never married, widowed, separated, or divorced]); and (5) employment status (yes [included employed or self-employed] or no [included unable to work, retired, homemaker, or student]). Other measures included (1) health care coverage (yes or no) and (2) two or more chronic medical conditions (yes or no). Chronic medical conditions included prior diagnosis of angina/coronary artery disease, arthritis, asthma, cancer, chronic obstructive pulmonary disease, diabetes, and chronic kidney disease, as well as history of myocardial infarction or stroke. Natal sex was excluded from the main analysis due to the known high rate of misclassification in the transgender population in BRFSS collection.[23]

The outcomes evaluated included the following binary, health-related quality-of-life measures: (1) frequent physical distress (≥14 days of poor physical health in the past 30 days); (2) frequent mental distress (≥14 days of poor mental health, including stress, depression, and problems with emotions, in the past 30 days); (3) frequent limited activity (≥14 days during which poor physical or mental health led to activity restrictions in the past 30 days); and (4) fair/poor general health (vs. rating of good/very good/excellent). Fourteen days is a validated cutoff for substantial impairment across continuous health-related quality-of-life measures.[24]

Data analyses

The raw pooled sample included 336,393 respondents. Supplementary Table S2 summarizes the missingness of selected features. Data were defined as missing if they were not collected or marked as ''Refused'' or ''I don't know.'' A total of 46,206 (13.74%) respondents were missing a valid response to the sexual orientation module question and

41,347 (12.29%) were missing a response to the gender identity questions. As missingness among other covariates and outcomes was low (<5%), the analysis used complete cases ($n = 268,851$). Descriptive statistics compared differences between the SGM and cisgender and heterosexual populations at the 2015 baseline.

The DID approach is a quasi-experimental method that uses panel or repeated cross-sectional data to estimate the causal effect of an exposure by calculating the temporal change in an outcome in the exposed treatment group compared with a nonexposed control.[25] For the current analysis, exposure was defined as the period including the 2016 election and first year of changeover to the Trump–Pence administration, with the SGM population as the treatment group, the cisgender and heterosexual population as the control group, 2015 as the pre-exposure period, and 2018 as the post-exposure period.

A logistic regression model was fit for each outcome and the exposure (interaction effect of SOGI status and year, ref: cisgender and heterosexual × 2015), controlling for the main effects of SOGI status and year, as well as other individual-level factors, including age (ref: 65 years or older); race/ethnicity (ref: White, non-Hispanic); education level (ref: did not graduate high school); employment status (ref: employed); relationship status (ref: married or unmarried couple); number of chronic medical conditions (ref: 0 to 1 chronic conditions); and health care coverage (ref: yes). State fixed effects were also included. Robust standard errors were estimated by Taylor series linearization and clustered by state. Sampling weights were adjusted in accordance with BRFSS instructions for aggregation of multiple years of data.[22] The predicted proportion of the SGM and cisgender and heterosexual populations endorsing each outcome in each year was calculated from the model predictions, adjusting for the covariates at observed values. The DID estimate for each outcome was then calculated as regression-adjusted change over time within the SGM population minus the change over time within the cisgender and heterosexual population. The significance of the estimate was determined by the Wald test using the null hypothesis of equality between the observed changes over time in each group.

To determine if differences existed in the effect of the exposure on gender minority respondents compared with sexual minority respondents, the analysis was repeated using separate categories for respondents who identified as lesbian or gay or bisexual or other, but not as a gender minority, or as a gender minority regardless of sexual orientation. The DID estimates were calculated for each group in comparison with the cisgender and heterosexual population, controlling for the same covariates as the primary analysis.

Moderation analysis was performed to examine the effects of natal sex, prior diagnosis of depression, and residence in a state with more or less antidiscrimination protections. The Human Rights Campaign Foundation publishes a State Equality Index (SEI) scorecard annually, which includes a cumulative equality rating of antidiscrimination (''good'') bills passed per state since 2004.[18] The states included in the study had a median cumulative SEI of 11 in 2015 (Supplementary Table S1). For the current analysis, states with an SEI >11 were considered high equality states, whereas states with an SEI <11 were considered low equality states. Of note, states with an SEI <11 in 2015 were still below this threshold in 2018, whereas the scores of high equality states only increased during the same interval.

The primary analysis was repeated with a three-way interaction term comprising SOGI status, year, and moderator, as well as all two-way interaction terms. The models controlled for the same covariates in the primary analysis. For the analysis of the equality status, state fixed effects were removed as they would absorb the variation of interest. The difference-in-difference-in-differences (DDD) estimate for each outcome for each group was then calculated as the regression-adjusted difference in the DID estimates for the SGM and cisgender and heterosexual populations. The significance of the DDD estimate was determined by the Wald test using the null hypothesis of equality between the DID estimates for each group. All analyses were completed using STATA/MP statistical software (Release 16; StataCorp, College Station, TX).

Results

The final analysis sample ($n = 268,851$) consisted of 256,845 cisgender and heterosexual adults (94.65%; population-weighted) and 12,006 SGM adults (5.35%; population-weighted). Table 1 presents a comparison of the characteristics of the two groups at the 2015 baseline. The SGM population differed significantly from the cisgender and heterosexual population across most covariates of interest ($p < 0.05$). SGM respondents tended to be younger (24% vs. 11.4% were 18 to 24 years old), more racially diverse (61.3% vs. 70.8% were White, non-Hispanic), less educated (24.5% vs. 27.4% were college/technical school graduates), single (60.2% vs. 41.9%), unemployed (44.3% vs. 41.3%), and lacking health care coverage (14.4% vs. 10.7%). The SGM respondents also reported higher levels of perceived fair/poor health (21.5% vs. 15.8% $p < 0.001$), frequent physical distress (13.7% vs. 11.1%, $p = 0.003$), frequent mental distress (19.5% vs. 10.4%, $p < 0.001$), and frequent limited activity (7.7% vs. 4.4%, $p < 0.001$).

DID estimates were calculated for each outcome (Table 2). The full logistic regression results used in the calculation of DID estimates for each outcome are found in Supplementary Table S3 and visualized in Supplementary Figure S1. The predicted proportion of SGM and cisgender and heterosexual respondents endorsing fair/poor general health, frequent physical distress, frequent mental distress, and frequent limited activity increased from 2015 to 2018. However, the regression-adjusted differential change between the two populations was only significant for frequent mental distress. In 2015, 15.4% of the SGM population reported frequent mental distress, which increased by 6.1% points by 2018. Within the control population, 10.4% of the respondents endorsed frequent mental distress in 2015, which increased by 1.1% points. The net change between the two populations over this interval was 5% points (95% confidence interval [CI]: 2.8–7.1; $p < 0.001$), corresponding to a 32.5% relative increase in the proportion of the SGM population reporting frequent mental distress that was associated with the election and transition to the Trump–Pence administration.

To explore the impact on gender minority respondents compared with sexual minority respondents, the primary analysis was repeated by subdividing the original SGM treatment group into three treatment groups: (1) cisgender and

Table 1. Baseline (2015) Characteristics of Sexual or Gender Minority and Cisgender and Heterosexual Respondents

	Cisgender and heterosexual %	*Sexual or gender minority %*	*All %*	χ^2 p
Age, years				<0.001
18 to 24	11.4	24.0	12.0	
25 to 34	15.2	21.2	15.4	
35 to 44	16.3	15.8	16.3	
45 to 54	18.3	14.6	18.2	
55 to 64	17.9	13.1	17.7	
65 or older	20.9	11.3	20.5	
Race/ethnicity				<0.001
White, non-Hispanic	70.8	61.3	70.4	
Black, non-Hispanic	10.8	12.1	10.9	
American Indian/Alaska Native/Other, non-Hispanic	2.0	4.6	2.1	
Asian/Native Hawaiian/Pacific Islander, non-Hispanic	3.8	4.9	3.8	
Hispanic	12.6	17.1	12.8	
Education level				<0.001
Did not graduate high school	11.2	16.3	11.4	
Graduated high school	29.6	27.8	29.5	
Some college/technical school	31.8	31.4	31.8	
College/technical school graduate	27.4	24.5	27.2	
Relationship status				<0.001
Single	41.9	60.2	42.7	
Married or unmarried couple	58.1	39.8	57.3	
Employment status				0.044
Unemployed	41.3	44.3	41.4	
Employed	58.7	55.7	58.6	
Chronic medical conditions				0.305
0–1 chronic conditions	80.1	81.3	80.2	
2 or more chronic conditions	19.9	18.7	19.8	
Health care coverage				<0.001
No	10.7	14.4	10.9	
Yes	89.3	85.6	89.1	
Fair/poor general health				<0.001
No	84.2	78.5	83.9	
Yes	15.8	21.5	16.1	
Frequent physical distress				0.003
No	88.9	86.3	88.8	
Yes	11.1	13.7	11.2	
Frequent mental distress				<0.001
No	89.5	80.7	89.3	
Yes	10.4	19.5	10.7	
Frequent limited activity				<0.001
No	95.6	92.2	95.5	
Yes	4.4	7.7	4.5	

Percentages incorporate population survey weights.

lesbian or gay, (2) cisgender and bisexual or other sexual orientation, and (3) transgender or gender nonconforming respondents regardless of sexual orientation. As shown in Table 3 (Supplementary Table S4), compared with the cisgender and heterosexual population, the cisgender and lesbian or gay population experienced an increase of 1.5% points (95% CI −0.3 to 3.4; $p=0.1$), an 11.6% relative increase from 2015, although this was not statistically significant. The cisgender and bisexual or other respondents experienced a 4.8% point increase (95% CI 1.6–7.9; $p<0.01$) relative to the cisgender and heterosexual population, a 27.6% increase from 2015. The transgender or gender nonconforming population experienced a 14.8% point increase (95% CI 10.0–19.6; $p<0.001$) relative to the cisgender and heterosexual population, a 117.5% relative increase from 2015.

To assess the influence of potential moderators of the observed negative impact of the transition to the Trump–Pence administration on frequent mental distress in the SGM population relative to the cisgender and heterosexual population, DDD estimates were calculated (Table 4 and Supplementary Tables S5–S7). Three moderators were examined: (1) prior diagnosis of depression, (2) natal sex, and (3) residing in a state with a higher versus lower number of antidiscrimination policies (or SEI).

Table 2. Changes in Quality-of-Life Outcomes Among Sexual or Gender Minority and Cisgender and Heterosexual Respondents Associated with the 2016 Election and Transition to the Trump–Pence Administration

Outcome	*2015 %*[a]	*2018 %*[a]	*Net change, % points (95% CI)*[b]	*Relative % change from 2015*[c]
Fair/poor general health				
Sexual or gender minority	20.0	22.0	+0.8 (−1.1 to 2.6)	+4.0
Cisgender and heterosexual	15.7	17.0	Reference	Reference
Frequent physical distress				
Sexual or gender minority	13.4	13.8	−0.5 (−2.1 to 1.6)	−3.7
Cisgender and heterosexual	11.0	11.9	Reference	Reference
Frequent mental distress				
Sexual or gender minority	15.4	21.5	+5.0 (2.8 to 7.1)***	+32.5
Cisgender and heterosexual	10.4	11.5	Reference	Reference
Frequent limited activity				
Sexual or gender minority	6.5	8.0	+1.1 (−0.4 to 2.7)	+16.9
Cisgender and heterosexual	4.3	4.7	Reference	Reference

[a]$n = 268{,}851$ for 2015 and 2018 combined. Percentage reporting outcomes determined from predictive margins of logistic regression between the outcome and interaction term between SOGI status and year (both also included as main effects), with control for age, race/ethnicity, education level, employment status, relationship status, health care coverage, and number of chronic medical conditions. Models also included state fixed effects. Standard errors are clustered by state.
[b]DID estimates calculated as net percentage point difference between groups from 2015 to 2018.
[c]Percentage increase in outcomes relative to the 2015 baseline.
***$p < 0.001$.
CI, confidence interval; DID, difference-in-differences; SOGI, sexual orientation and gender identity.

Both SGM and cisgender and heterosexual populations with and without a prior diagnosis of depression experienced an increase in the proportion reporting frequent mental distress from 2015 to 2018. However, the differential increase over time in frequent mental distress among the SGM population relative to the cisgender and heterosexual population was 5.3% points greater among individuals with a prior diagnosis of depression than among those without (DDD = 5.3; 95% CI: 0.5–10.0; $p < 0.05$). Similarly, the estimate associated with SGM status was 6% points higher among female than male respondents (DDD = 6.0; 95% CI: 1.2–10.8; $p < 0.05$). However, the differential change in frequent mental distress over time between the SGM and cisgender and heterosexual populations did not vary significantly by whether the individuals were living in low or high equality states (DDD = 1.0; 95% CI: −2.8 to 4.8; $p = 0.6$).

Sensitivity analyses were performed to assess the robustness of the main results, including (1) falsification check of a behavior hypothesized as not impacted by the exposure of interest (e.g., never/seldom using a seat belt); (2) alternative regression specifications to assess the influence of sociodemographic covariates on the significance of the DID estimates; (3) multiple imputation of missing covariates and outcomes of interest; and (4) leave-one-out validation by state (Supplementary Table S8). The falsification check was negative, and results were unchanged in the remaining analyses (data available upon request). In addition, Supplementary Figure S2 shows the results of randomly permuting 2000 treatment status assignments and conducting a placebo DID regression for each permutation for the frequent mental distress outcome in the main analysis. The true DID estimate fell outside the distribution of placebo permutation coefficients,

Table 3. Changes in Frequent Mental Distress Among Sexual or Gender Minority and Cisgender and Heterosexual Adults Associated with the 2016 Election and Transition to the Trump–Pence Administration

Outcome	*2015 %*[a]	*2018 %*[a]	*Net change, % points (95% CI)*[b]	*Relative % change from 2015*[c]
Frequent mental distress				
Transgender or gender nonconforming	12.6	28.5	+14.8 (10.0 to 19.6)***	+117.5
Cisgender and bisexual or other	17.4	23.3	+4.8 (1.6 to 7.9)**	+27.6
Cisgender and lesbian or gay	12.9	15.6	+1.5 (−0.3 to 3.4)	+11.6
Cisgender and heterosexual	10.4	11.5	Reference	Reference

[a]$n = 268{,}851$. Predicted percentage determined from predictive margins of logistic regression between the outcome and interaction term between SOGI status and year (both also included as main effects), with control for age, ethnicity/race, education level, employment status, relationship status, health care coverage status, and number of chronic medical conditions. Models also included state fixed effects. Standard errors are clustered by state.
[b]DID estimates calculated as net percentage point change between groups from 2015 to 2018.
[c]Percentage increase in frequent mental distress relative to the 2015 baseline.
**$p < 0.01$; ***$p < 0.001$.

Table 4. Potential Moderators of Frequent Mental Distress Among Sexual or Gender Minority and Cisgender and Heterosexual Respondents Associated with the 2016 Election and Transition to the Trump–Pence Administration

Outcome	*2015 %*[a]	*2018 %*[a]	*Difference % points*	*DID estimate % points (95% CI)*[b]	*DDD estimate % points (95% CI)*[c]
Frequent mental distress					
Sexual or gender minority with depression history	31.4	40.3	+8.9***	+6.3 (2.4 to 10.2)**	+5.3 (0.5 to 10.0)*
Sexual or gender minority without depression history	7.8	10.4	+2.6**	Reference	Reference
Cisgender and heterosexual with depression history	29.9	31.8	+1.9	+1.0 (−1.0 to 0.6)	Reference
Cisgender and heterosexual without depression history	5.5	6.4	+0.9***	Reference	Reference
Frequent mental distress					
Sexual or gender minority females	16.2	24.5	+8.3***	+5.9 (1.4 to 10.3)*	+6.0 (1.2 to 10.8)*
Sexual or gender minority males	11.7	12.8	+1.1**	Reference	Reference
Cisgender and heterosexual females	14.4	16.9	+2.5	−0.2 (−1.0 to 0.6)	Reference
Cisgender and heterosexual males	8.9	10.2	+1.3***	Reference	Reference
Frequent mental distress					
Sexual or gender minority in low SEI states	15.2	22.5	+7.3***	+2.2 (−1.9 to 6.3)	+1.0 (−2.8 to 4.8)
Sexual or gender minority in high SEI states	15.7	20.7	+5.1***	Reference	Reference
Cisgender and heterosexual in low SEI states	10.2	12.0	+1.7***	+1.2 (0.09 to 2.4)*	Reference
Cisgender and heterosexual in high SEI states	10.7	11.2	+0.5	Reference	Reference

[a]Predicted percentage determined from predictive margins of logistic regression between the outcome and three-way interaction term between SOGI status, year, and moderator, as well as all two-way interactions, with control for age, race/ethnicity, education level, employment status, relationship status, health care coverage status, and number of chronic medical conditions. Models also included state fixed effects (except for the analysis of SEI). Standard errors are clustered by state.

[b]DID estimates calculated as net percentage point change between groups from 2015 to 2018.

[c]DDD estimates calculated as the difference in the DID estimates.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

DDD, difference-in-difference-in-differences; SEI, State Equality Index.

indicating that the observed mean difference is not explained by chance (Supplementary Fig. S2). We also tested alternate pre- and postwindows, finding no significant change in mental distress in the 2014 versus 2016, 2016 versus 2018, and 2017 versus 2019 comparisons (Supplementary Table S9).

Discussion

The minority stress model proposes that structural, interpersonal, and personal stressors specific to the SGM experience negatively impact psychological health, leading to observed health disparities in comparison with the general population.[26] Prior studies indicate that structural discrimination can lead to long-term health sequelae.[27–29] Same-sex marriage prohibitions in the 2004 and 2005 elections correlated with increases in the prevalence of mood disorders, alcohol use disorder, and generalized anxiety disorder immediately after both elections.[27] Following the 2006 election, lesbian, gay, and bisexual survey respondents living in states with same-sex exclusions reported higher levels of psychological stress due to fear and increased exposure to negative media.[28] A prior study of BRFSS data from 2014 to 2016 found an association between legal denial of services to same-sex couples and a 46% relative increase in the proportion of sexual minority adults reporting frequent mental distress compared with the heterosexual population.[30] By contrast, protective legislation has been connected to more recent health care utilization and reduced rates of self-directed violence and alcohol use.[29,31]

The intensity with which a presidential administration focused on disbanding SGM protections immediately upon installation is unprecedented.[32] The current study found a 32.5% relative increase in the proportion of SGM adults reporting frequent mental distress (compared with the cisgender and heterosexual population) that was associated with the 2016 election and transition to the Trump–Pence administration. The 14-day criterion established by the BRFSS for frequent mental distress mirrors the cutoff employed clinically to diagnose depression and anxiety disorders.[33] Increases in rates of physical distress, limited activity, or fair/poor health did not reach the level of significance, emphasizing the initial psychological impact of this exposure. Lagged consequences on physical health and functioning are anticipated in accordance with the minority stress model. Frequent mental distress has been correlated with increased lifetime risk of chronic medical conditions, risk behaviors, and impaired functioning.[34–37] The apparent lack of a protective effect of existing state-level antidiscrimination policies in the current study may be the result of comparing states with a relatively narrow range of equality index or simply the overwhelming intensity of the exposure.

Subgroup analysis suggests that SGM subgroups experienced the negative effects of the tested exposure to different degrees. Although gay and lesbian respondents reported increases in mental distress, the difference in comparison with the cisgender and heterosexual respondents did not achieve significance. Gender minority and bisexual respondents, however, were profoundly impacted. Explanations for this observation are likely multifold. Prior studies indicate that gender

minority and bisexual individuals often experience greater vulnerability to poor mental and health outcomes.[38–40] Existing disparities may then sensitize these subgroups to the effects of acute or compounded stress. The overwhelming majority of anti-LGBT legislation proposed during the time period examined specifically targeted the rights of gender minority individuals, ranging from health care to military service to bathroom laws. The effect on subgroups may then be dose dependent, with the increases in mental distress proportionate to the extent to which the individual perceives impact. For some states, proposed changes in the language of federal protections were superseded by existing state protections. Alternatively, not all changes may impact the individual's immediate or future needs, such as adoption protections or the ability to serve in the military. The scrutiny on gay and lesbian as well as gender minority rights may have exacerbated feelings of bisexual invisibility/erasure.[41] Caution is urged in overinterpretation of the subgroup results given the constraints of the current study. Gender minority and sexual orientation subgroups are highly heterogeneous.

Strengths and limitations

The strengths of the study include the robust DID approach, large sample size, and use of multiple, validated, quality-of-life outcome measures. By employing population-level data not directly related to the election, the study avoided the high selection and response bias that hinders the interpretation and generalizability of community-based studies. The study has several notable limitations. The DID approach assumes that the control population does not receive the exposure. The mental health of the cisgender and heterosexual population may have also been affected by the 2016 election and transition to the new administration. The direction of this bias is theoretically indeterminate, although the most likely direction is conservative (toward zero), which would be the case if more cisgender and heterosexual individuals were adversely affected by the transition than were positively affected. Increased mental distress in the cisgender and heterosexual population would thus yield an underestimation of the negative effect of the exposure on the SGM population.

Although the selected states represent a broad range of geographical and political divisions, the study may not generalize to the entire country. The robustness of the main result to leave-one-out validation, however, demonstrates that the observed results were not biased by any individual state or its inhabitants. The pre- and postperiods were selected to isolate the election and transition period to the new administration. However, this event did not occur in isolation. The Supreme Court ruled in favor of *Obergefell v. Hodges* in June 2015, federally legalizing same-sex marriage.[42] We found no significant increase or decrease in frequent mental distress in SGM respondents compared with their cisgender and heterosexual peers between 2014 and 2016 that might be associated with this ruling. Furthermore, use of 2014 as an alternative preyear did not substantially change the observed increase in mental distress associated with the 2016 election/changeover. These results suggest a negligible confounding effect of the *Obergefell v. Hodges* ruling, somewhat expected as state-level measures supporting same-sex marriage existed in 36 states (including most states in the current analysis) at the time of the ruling.

The Trump–Pence administration persisted with anti-LGBT rhetoric and reversals of protections throughout its tenure. As the BRFSS is administered throughout a given year, the 2018 SGM respondents may have been negatively affected by ongoing anti-LGBT efforts as well as lagged effects from the election changeover. However, a truncated exposure window of 2016 only (comparing 2015 vs. 2017) still found a significant increase in frequent mental distress in the SGM population compared with the control population. No statistically significant increases were observed between the two groups using 2016 versus 2018 or 2017 versus 2019 as pre- and postperiods. These results suggest that the most profound negative impact occurred during the election–changeover window, even if later actions by the administration likely also contributed to distress. Further work is needed to (more precisely) dissect the mechanisms underlying the increase in distress, whether related to anticipatory fear or lived experience of increased stigma or discrimination (e.g., loss of employment or housing).

Finally, misclassification of natal sex is a known limitation of BRFSS data collection. Before 2016, the BRFSS permitted interviewers to use vocal timbre as a proxy for natal sex rather than asking the respondent directly. Approximately 27.8% of noncisgender respondents were estimated to have been misclassified in the 2014 BRFSS.[23] Natal sex moderated the effect of the exposure in SGM respondents; the influence of misclassification bias on the degree of moderation cannot be determined, but is expected to be minimal. In relation to the final model employed to produce the adjusted DID estimates, employment may be considered an endogenous covariate. Sensitivity analysis, however, found that no one covariate significantly altered the results.

Conclusions

A clear association exists between the 2016 election and the changeover to a decisively anti-LGBT administration and the worsening mental health of SGM adults, although a completely causal relationship cannot be fully established. Gender minority adults were the most profoundly affected and represent a subpopulation that is in dire need of increased engagement and support to guard against exacerbation of existing health disparities. The current study provides data-driven support for advocacy efforts toward the implementation of unequivocal antidiscrimination protections on the basis of SOGI across all domains of daily living, immutable to sudden political realignment.

Authors' Contributions

A.G. and J.M. conceived the study. S.L.E. assisted with study design and supervised all analyses. All statistical analyses were completed by A.G. and H.X. A.G. led the article writing. All coauthors were involved with review and interpretation of results. All coauthors reviewed and approved the current article.

Disclaimer

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Mental Health.

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Supplementary Material

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References

1. Gold J: 'Post-election stress disorder' strikes on both sides. Cable News Network, 2017. Available at https://www.cnn.com/2017/02/20/health/post-election-stress-partner/index.html Accessed August 1, 2020.
2. DeJonckheere M, Fisher A, Chang T: How has the presidential election affected young Americans? Child Adolesc Psychiatry Ment Health 2018;12:8.
3. Roche MJ, Jacobson NC: Elections have consequences for student mental health: An accidental daily diary study. Psychol Rep 2019;122:451–464.
4. McCarthy KS, Saks JV: Postelection stress: Symptoms, relationships, and counseling service utilization in clients before and after the 2016 U.S. national election. J Couns Psychol 2019;66:726–735.
5. Hagan MJ, Sladek MR, Luecken LJ, Doane LD: Event-related clinical distress in college students: Responses to the 2016 U.S. presidential election. J Am Coll Health 2020;68:21–25.
6. Pitcho-Prelorentzos S, Kaniasty K, Hamama-Raz Y, et al.: Factors associated with post-election psychological distress: The case of the 2016 U.S. presidential election. Psychiatry Res 2018;266:1–4.
7. Majumder MS, Nguyen CM, Sacco L, et al.: Risk factors associated with election-related stress and anxiety before and after the 2016 US presidential election. PsyArXiv Preprints. 2017. Available at https://doi.org/10.31234/osf.io/u4hns Accessed August 1, 2020.
8. Hoyt LT, Zeiders KH, Chaku N, et al.: Young adults' psychological and physiological reactions to the 2016 US presidential election. Psychoneuroendocrinology 2018;92:162–169.
9. Tashjian SM, Galván A: The role of mesolimbic circuitry in buffering election-related distress. J Neurosci 2018;38:2887–2898.
10. Skopec L, Long SK: Lesbian, gay, and bisexual adults making gains in health insurance and access to care. Health Aff (Millwood) 2015;34:1769–1773.
11. Padula WV, Baker K: Coverage for gender-affirming care: Making health insurance work for transgender Americans. LGBT Health 2017;4:244–247.
12. Gonzales G, McKay T: What an emerging Trump administration means for lesbian, gay, bisexual, and transgender health. Health Equity 2017;1:83–86.
13. Veldhuis CB, Drabble L, Riggle EDB, et al.: ''We won't go back into the closet now without one hell of a fight'': Effects of the 2016 presidential election on sexual minority women's and gender minorities' stigma-related concerns. Sex Res Social Policy 2018;15:12–24.
14. O'Hara ME: Trump administration removes LGBTQ content from federal websites. NBC News, 2017. Available at https://www.nbcnews.com/feature/nbc-out/trump-administration-removes-lgbtq-content-federal-websites-n711416 Accessed August 1, 2020.
15. Moreau J: Trump in transnational perspective: Insights from global LGBT politics. Politics Gend 2018;14:619–648.
16. Rosenbaum S: The Affordable Care Act and civil rights: The challenge of section 1557 of the Affordable Care Act. Milbank Q 2016;94:464–467.
17. Baker KE: The future of transgender coverage. N Engl J Med 2017;376:1801–1804.
18. Human Rights Campaign Foundation: State Equality Index. 2019. Available at https://www.hrc.org/campaigns/state-equality-index Accessed August 1, 2020.
19. Gates GJ: Life evaluations of LGBT Americans decline after election. Gallup News, 2016. Available at https://news.gallup.com/poll/199439/lgbt-status-party-wed-mid.aspx Accessed August 1, 2020.
20. Garrison SM, Doane MJ, Elliott M: Gay and lesbian experiences of discrimination, health, and well-being: Surrounding the presidential election. Soc Psychol Personal Sci 2018;9:131–142.
21. Gonzalez KA, Ramirez JL, Galupo MP: Increase in GLBTQ minority stress following the 2016 US presidential election. J GLBT Fam Stud 2018;14:130–151.
22. Centers for Disease Control and Prevention: The BRFSS Data User Guide. 2013. Available at https://www.cdc.gov/brfss/data_documentation/index.htm Accessed August 1, 2020.
23. Riley NC, Blosnich JR, Bear TM, Reisner SL: Vocal timbre and the classification of respondent sex in US phone-based surveys. Am J Public Health 2017;107:1290–1294.
24. Dwyer-Lindgren L, Mackenbach JP, van Lenthe FJ, Mokdad AH: Self-reported general health, physical distress, mental distress, and activity limitation by US county, 1995–2012. Popul Health Metr 2017;15:16.
25. Dimick JB, Ryan AM: Methods for evaluating changes in health care policy: The difference-in-differences approach. JAMA 2014;312:2401–2402.
26. Meyer IH: Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. Psychol Bull 2003;129:674–697.
27. Hatzenbuehler ML, McLaughlin KA, Keyes KM, Hasin DS: The impact of institutional discrimination on psychiatric disorders in lesbian, gay, and bisexual populations: A prospective study. Am J Public Health 2010;100:452–459.
28. Rostosky SS, Riggle ED, Horne SG, et al.: Lesbian, gay, and bisexual individuals' psychological reactions to amendments denying access to civil marriage. Am J Orthopsychiatry 2010;80:302–310.

29. Raifman J, Moscoe E, Austin SB, McConnell M: Difference-in-differences analysis of the association between state same-sex marriage policies and adolescent suicide attempts. JAMA Pediatr 2017;171:350–356.
30. Raifman J, Moscoe E, Austin SB, et al.: Association of state laws permitting denial of services to same-sex couples with mental distress in sexual minority adults: A difference-in-difference-in-differences analysis. JAMA Psychiatry 2018; 75:671–677.
31. Du Bois SN, Yoder W, Guy AA, et al.: Examining associations between state-level transgender policies and transgender health. Transgend Health 2018;3:220–224.
32. United States Commission on Civil Rights: Are rights really a reality: Evaluating federal civil rights enforcement. 2019. Available at https://www.usccr.gov/pubs/2019/11-21-Are-Rights-a-Reality.pdf Accessed August 1, 2020.
33. Bruning J, Arif AA, Rohrer JE: Medical cost and frequent mental distress among the non-elderly US adult population. J Public Health (Oxf) 2014;36:134–139.
34. Okoro CA, Strine TW, Balluz LS, et al.: Serious psychological distress among adults with and without disabilities. Int J Public Health 2009;54 Suppl 1:52–60.
35. Li C, Ford ES, Zhao G, et al.: Association between diagnosed diabetes and serious psychological distress among US adults: The Behavioral Risk Factor Surveillance System, 2007. Int J Public Health 2009;54 Suppl 1:43–51.
36. Okoro CA, Stoodt G, Rohrer JE, et al.: Physical activity patterns among US adults with and without serious psychological distress. Public Health Rep 2014;129:30–38.
37. Charara R, El Bcheraoui C, Kravitz H, et al.: Mental distress and functional health in the United States. Prev Med 2016; 89:292–300.
38. Crissman HP, Stroumsa D, Kobernik EK, Berger MB: Gender and frequent mental distress: Comparing transgender and non-transgender individuals' self-rated mental health. J Womens Health (Larchmt) 2019;28:143–151.
39. Meyer IH, Brown TNT, Herman JL, et al.: Demographic characteristics and health status of transgender adults in select US regions: Behavioral Risk Factor Surveillance System, 2014. Am J Public Health 2017;107:582–589.
40. Katz-Wise SL, Mereish EH, Woulfe J: Associations of bisexual-specific minority stress and health among cisgender and transgender adults with bisexual orientation. J Sex Res 2017;54:899–910.
41. Ross LE, Salway T, Tarasoff LA, et al.: Prevalence of depression and anxiety among bisexual people compared to gay, lesbian, and heterosexual individuals: A systematic review and meta-analysis. J Sex Res 2018;55:435–456.
42. Supreme Court of the United States: *Obergefell et al. v. Hodges*, Director, Ohio Department of Health, et al. 576 U.S. (2015). Available at https://www.supremecourt.gov/opinions/14pdf/14–556_3204.pdf Accessed August 1, 2020.

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