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Latent syndemic profiles among sexual and gender minority college students and psychological distress amid the COVID-19 pandemic

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Abstract

Sexual and gender minority (SGM) college students experience compounding psychological effects as a result of the COVID-19 pandemic. Using latent profile analysis of cross-sectional data from a sample of SGM students (n=565) we tested for a syndemic of victimization, internalized LGBTQ+ stigma, racism, racialized heterosexism/cisgenderism, family rejection, and isolation associated with psychological distress. We also tested if increases in these factors since the start of the COVID-19 pandemic were associated with greater psychological distress among syndemic profiles. We identified four profiles: "Lowest syndemic factors" (reference), "High isolation only," "High isolation and rejection only," and "High syndemic." The greatest distress was observed among the "High syndemic" profile (aPR=2.99, 95% CI 2.20, 4.06), followed by the "High isolation and rejection only" profile (aPR=2.11, 95% CI 1.61, 2.76), and the "High isolation only" profile (aPR=1.32, 95% CI 1.03, 1.70). Among the "High syndemic profile," increases in every factor since the start of the COVID-19 pandemic were associated with greater psychological distress. The strongest associations were seen among increased victimization (aPR=5.85, 95% CI 1.33, 25.71). Victimization, internalized LGBTQ+ stigma, racism, family rejection, and isolation form a syndemic among SGM students, which has magnified since the start of the COVID-19 pandemic.

Keywords

LGBTQ; youth; racism; homophobia; social support; isolation

Introduction

The COVID-19 pandemic has uniquely affected sexual and gender minority (SGM) youth due to pre-existing mental health disparities, including greater rates of depression, anxiety,

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traumatic stress, psychological distress, suicidal ideation, and behavior (Fish et al., 2020). SGM youth are also more vulnerable to physical and sexual victimization (Friedman et al., 2011; Johns et al., 2018) compared to heterosexual and/or cisgender persons. Existing research has documented negative mental health ramifications since the start of the COVID-19 pandemic on SGM people, including alcohol use, psychological distress, depression, anxiety, and PTSD (Kamal et al., 2021; Moore et al., 2021). Given the large proportion of young people currently enrolled in U.S. colleges (41%) (Espinosa, 2019) and the increased psychological vulnerabilities of SGM young people, it is important to investigate the mental health of SGM college students amid COVID-19 (Gonzales et al., 2020). Despite the greater vulnerability to psychological stressors, SGM college students have received limited public health attention amid COVID-19 (Phillips Ii et al., Devadas, et al., 2020).

Stigma and other sources of stress experienced by SGM college students are potential sources of significant psychological distress; which is consistent with minority stress theory (Meyer, 1995). Minority stress theory posits that minority groups experience identity-related stressors, such as internalized LGBTQ+ stigma and racism, which have adverse effects on health outcomes. SGM college students often face several unique stressors related to sexual identity that can affect their mental wellness; SGM students of color also experience racism as a unique stressor that can negatively impact psychological wellness. Psychological distress is a particularly important factor experienced by SGM college students, as it is a risk factor for depression, substance use, and suicidality, all of which are disparately high among LGBTQ+ youth and young adults compared to their cisgender and heterosexual peers (Card et al., 2018; Johns et al., 2018; Kahle, 2017; Mereish et al., 2018; Savin-Williams, 1994; Seelman & Walker, 2018). Specific to college campuses, there is substantial evidence that LGBTQ+ college students are marginalized in campus settings, including experiencing heterosexist environmental microaggressions (Amodeo, Esposito, Bacchini, 2020), peer victimization, (Moran, et al., 2018; Heiden-Rootes, et al., 2020), and both physical and sexual violence (Moran, et al., 2018; Heiden-Rootes, et al., 2020). These outcomes are strongly associated with adverse mental health outcomes, including depression, among college students (Moran, et al., 2018; Heiden-Rootes, et al., 2020; Amodeo, Esposito, Bacchini, 2020). SGM college students often face unique challenges related to victimization, family rejection, and social isolation in community contexts, as college is often a time when SGM young adults begin to form and accept their identity. These students are especially vulnerable to rejection from peers and family during this period. This can directly relate to stigma based on sexual or gender identity, and racism among LGBTQ+ students of color (Heiden-Rootes et al., 2020; Martin-Storey & August, 2016; Pachankis et al., 2018; Rimes et al., 2018; Sosoo et al., 2020). A qualitative study by Mance et. al (2020) highlighted the salience of race-related trauma and violence to mental health among Black adolescents . These psychosocial stressors are especially salient at intersections of racial and sexual minority status, as these populations often face greater mental health inequities than their white and heterosexual peers (Ricca et al., 2018). Additionally, the COVID-19 pandemic may have exacerbated many of these adverse experiences, including greater social isolation and more adverse psychological effects from continuing to share a living space

with unsupportive family members (Gato et al., 2021). Thus, these factors are especially salient to the mental wellness of SGM college students in the era of COVID-19.

Syndemic theory posits that social and structural risk factors may reinforce one another, cumulatively increasing risk of an adverse health outcome (Singer & Clair, 2003). This collection of mutually reinforcing factors is termed a syndemic. A key characteristic of a syndemic is that it consists of factors positively associated with one another and with a specific health outcome. Victimization, internalized LGBTQ+ stigma, racism, racialized heterosexism/cisgenderism, family rejection, and isolation may form a syndemic, as many of these factors have been demonstrated to be associated with each other, and all of them are associated with adverse mental health outcomes (Eres et al., 2020; Heiden-Rootes et al., 2020; Johns et al., 2018; Johnson et al., 2019; Mereish et al., 2018; Miltz et al., 2019; Smith et al., 2020; Sosoo et al., 2020). Therefore, they may form a syndemic associated with psychological distress. Built upon both syndemic and minority stress theories, the purpose of our study was twofold. First, to test for a syndemic of victimization, internalized LGBTQ+ stigma, racism, racialized heterosexism/cisgenderism (based on sexual identity and race/ethnicity), family rejection, and isolation associated with psychological distress among LGBTQ+ college students. Second, to determine if among syndemic profiles, increases in these factors since the start of the COVID-19 pandemic were associated with greater psychological distress. We hypothesized that latent profiles characterized by this syndemic will be associated with greater psychological distress compared to profiles not characterized by these factors. We also hypothesize that among profiles characterized by syndemic factors, increases in these factors since the start of the COVID-19 pandemic will also be associated with greater psychological distress.

Methods

Participants and Procedures:

We conducted an analysis of cross-sectional data collected from a sample of sexual and gender minority college students in the U.S. (n=565) to explore the mental health and pandemic and minority stress impacts of COVID-19 on SGM university students.. The majority of the sample was between the ages of 18 to 22, with a median age of 20 years old. Participants were recruited using an electronic recruitment flyer with a link to an online Qualtrics survey. The recruitment flyer was distributed via multiple social media platforms (i.e., Facebook, LinkedIn, and Twitter). We also recruited through email campaigning within our internal (i.e., within our University) and external professional networks. Upon clicking the survey link , participants immediately underwent a self-administered electronic informed consent process. Those that accepted to participate provided implied informed consent by clicking an arrow at the end of the informed consent process to proceed and begin the survey. Data was collected between May 27th and August 14th in 2020 via an online questionnaire. All measures were self-reported. Participants were incentivized with a raffle for a $50 Amazon gift card. The Institutional Review Board granted approval for the study.

Psychosocial Exposures:

The term "psychosocial exposures" encompasses social exposures with psychological impact. Here, this included 6 factors: *family rejection* was measured using 10- items (Cronbach's alpha = 0.81) from the Sexual Minority Adolescent Sexual Minority Stress Inventory (SMASI), e.g. My parents are sad that I am LGBTQ (Schrager et al., 2018) and 7-items (Cronbach's alpha = 0.84) from the Daily Heterosexist Experiences Questionnaire (DHEQ), e.g. Being rejected by my mother for being LGBTQ (Balsam et al., 2013) *social isolation* was measured using the 3-item (Cronbach's alpha = 0.74) loneliness scale (Hughes et al., 2004), *LGBTQ+ victimization* was measured using 4-items from the SMASI, e.g. Being punched, hit, kicked, or beaten because I am LGBTQ (Schrager et al., 2018) and 2-items from the LGBT Minority Stress Scale (LMSS), e.g. Being bullied by others because I am LGBTQ (Outland, 2016) (Cronbach's alpha = 0.79). *Internalized LGBTQ+ Stigma* was measured using 7-items (Cronbach's alpha = 0.85) from the LGBT Minority Stress Measure (LMSM), e.g. I feel that being LGBTQ is a personal flaw in me (Outland, 2016), *racism* was measured using 5-items (Cronbach's alpha = 0.79) from the LGBT People of Color Microaggressions Scale, (Balsam et al., 2011), while racialized heterosexism/cisgenderism (i.e., discrimination experienced at the intersection of racial/ethnic and sexual minority status) was measured using 5 items (Cronbach's alpha = 0.76) from the same scale.
For all analyses, we considered three approaches to racism and racialized heterosexism/ cisgenderism measures: For our primary analyses, these measures were only analyzed among students of color (any race/ethnicity other than Non-Hispanic/Latinx White), with measures for White students considered missing in the generation of latent profiles. Latent profile analysis can be conducted even in the presence of partial item missingness without biasing estimates, as it only results in slight penalties to certainty of class assignment (measured using entropy). In a sensitivity analysis, we imputed these as 0 for White students. For all scales, item responses reflected if the participant experienced that item within the past year (yes, no). All items within scales demonstrated acceptable internal consistency (Cronbach's alpha >.70), so these were combined into 6 summed indices. Each scale was standardized to a percentage (ranging from 0 to 100%), with 0% representing none of the items having occurred, and 100% representing all of the items having occurred, as this standardizes the scales so they are comparable to one another.

Change in Psychosocial Exposures since Covid-19:

In addition to measuring having experienced each item for psychosocial exposures, participants were also asked if each item had "happened to you more often since the start of the COVID-19 pandemic?" (yes, no). These items also demonstrated acceptable internal consistency (Cronbach's alpha >.70) within each of the 5 scales, so these were combined into 5 summed indices as well. These were then standardized to a percentage (ranging from 0 to 100%), with 0% representing none of the items having gotten worse since the start of the COVID-19 pandemic, and 100% representing all of the items having gotten worse.

Psychological Distress Outcome:

Psychological distress was measured using the previously validated Kessler-10 (K10) scale (Kessler et al., 2002), measured with the general question "Please read each statement and

answer how often you have felt this way during the last 30 days" (None of the time, A little of the time, Some of the time, Most of the time, All of the time). All items demonstrated acceptable internal consistency (Cronbach's alpha >.70), so this was measured as a summed index, also scaled in percentage (0% to 100%).

Covariates:

Sexual Identity was measured with the question "Which term best describes your current sexual orientation?" (Asexual, bisexual, gay/lesbian, same gender loving, pansexual, queer, questioning, heterosexual/straight). Due to few participants identifying as same gender loving, pansexual, questioning, or heterosexual/straight (<5%) these identities were not reported in analyses. Gender Identity was measured with the question "What is your gender identity?" (Non-binary, Cisgender woman, Cisgender man, trans woman, trans femme, trans man, trans masculine, genderqueer, two-spirit, gender fluid, agender). Due to few participants identifying as genderqueer, two-spirit, gender fluid, agender (<5%) these identities were not reported in analyses. Trans femme, and trans man identities were also rare in the sample (<3%), these were combined with trans woman and trans man respectively. Sex Assigned at Birth was measured with the question "What is your sex assigned at birth?" (Male, Female, Intersex), with no participants responding as Intersex. We used a 4-category measure for race/ethnicity (Asian, Black, Hispanic/Latinx, White), as other race/ethnicities (e.g., Native American, Biracial) were rare in the sample (<3%).

Missing Data:

Overall missingness for items was low (10% or less), with the majority of items having less than 1% missingness. We used intrascale stochastic imputation to impute missing items from other items within each aforementioned scale. This uses non-missing items within an internally consistent construct to impute values for missing items within the same construct, with the addition of a randomized residual to account for imputation uncertainty. The strong internal consistency within each scale (all >.70) and overall individual low missingness both supported this approach. Note that we did not impute values for racism or racialized heterosexism/cisgenderism for white participants. After imputation, our analytic dataset maintained all 565 participants.

Preparatory Analyses:

Prior to our latent variable analyses, correlations between indices of all syndemic factors and psychological distress were measured using Spearman's rank-sum correlation coefficients.

Latent Profile Analysis:

LPA was used to identify syndemic statuses based on the presence of the 6 psychosocial exposures of interest (family rejection, social isolation, LGBTQ+ victimization, internalized LGBTQ+ stigma, racism, racialized heterosexism/cisgenderism). This method allows for the identification of homogeneous subgroups within a heterogeneous population (Lanza et al., 2010). We did not use our outcome (psychological distress) when generating latent profiles. The number of profiles was selected based on the log-likelihood, Vu-Lo-Mendel-Rubin likelihood ratio test, Bayesian Information Criterion (BIC), and entropy. Entropy

is a measure of certainty of latent profiles, with greater values (closer to 1) indicating greater certainty of profile assignment. We also used minimum class size to identify "outlier profiles;" a profile consisting of less than 10 participants would be considered a potential outlier. Analyses incorporated probit-transformed residuals to reduce violations of local interdependence. LPA was conducted using Mplus 8.2. (Muthén, 2017).

Bivariate Analyses:

We tested if each psychosocial syndemic factor and psychological distress was associated with latent profiles using Kruskal-Wallis tests, and present means of each syndemic factor and psychological distress across latent profiles. We also tested associations between latent profiles and all covariates.

Regression Analyses:

Associations between latent profiles and the psychological distress outcome were measured using a cumulative log model. Both unadjusted models and models adjusted for gender identity, sex assigned at birth, race, ethnicity, and sexual identity were generated. These variables were selected based on demonstrating confounding (>10% change in estimates for our exposure). We generated cumulative prevalence ratios for associations between latent profiles and psychological distress. We also calculated cumulative prevalence ratios for associations between increases in psychological factors since the start of the COVID-19 pandemic and psychological distress among the profile identified as representing a syndemic. This restriction was to ensure that the measure of increases in psychosocial factors since COVID-19 was limited to the profile with frequent experiences of each of the psychosocial measures. There was no evidence of intercollinearity (all VIF<5). Bivariate and regression analyses were conducted in SAS 9.4 (SAS Institute Inc., 2014).

Results

Preliminary Analyses:

We identified positive associations among every single syndemic factor (family rejection, social isolation, physical victimization, internalized LGBTQ+ stigma, racism, racialized heterosexism/cisgenderism) (Table 1). All syndemic factors were also associated with greater psychological distress, with racism and isolation having the strongest associations with psychological distress, followed by family rejection.

Latent Profile Analyses:

Based on significant improvements in log-likelihood, relatively small information loss measured using the BIC, and sufficiently high entropy (>0.80), we proceeded with a four-profile model for all subsequent analyses (Table 2). A four-profile model also did not have any overly small profiles (smallest profile n=80). While we only used our syndemic factors in generating latent profiles, we also observed differences in psychological distress across these profiles (Figure 1). Profile 1 was identified as the "High syndemic" profile, as this profile had the highest levels of every single syndemic factor. Profile 2 was characterized by high levels of social isolation only ("Social isolation only"), while profile 3 was characterized by low rates of all syndemic factors and psychological distress ("Lowest

syndemic factors"). Profile 4 was characterized by high levels of both social isolation and family rejection ("Isolation and Rejection Only").

Sample Characteristics:

Approximately two-thirds of the sample identified as cisgender, with non-binary participants accounting for a fifth of the sample (Table 3). Only 15% of the sample identified as cisgender men, approximately 7% identified as transgender men/masculine, and 2% identified as transgender women/feminine. 80% of the sample was assigned female at birth. The most common sexual identities were bisexual (32%) and gay/lesbian (31%), followed by queer (16%). The sample was 61% White, 13% Asian, 13% Hispanic/Latinx, and 10% Black.

Bivariate Analyses:

We observed an approximate dose-response in psychological distress across these profiles as well (Table 3), with profiles characterized by more syndemic factors associated with greater psychological distress. The low syndemic factor profile had the lowest psychological distress, followed by the single factor profile, follow ed by the profile with two factors, and finally the high syndemic profile had the greatest psychological distress. We also observed a similar pattern in increases in syndemic factors since the start of the COVID-19 pandemic across profiles. The high syndemic profile had the largest increases in all syndemic factors and psychological distress since the start of the COVID-19 pandemic, with especially large increases in internalized LGBTQ+ stigma, isolation, and family rejection. Notably, in our sensitivity analyses for how to handle the racism measure among white students, there was no substantial difference in class assignment between the three approaches (less than a 6% change in class assignment). For this reason, we proceeded with only our primary approach to analyses for racism measures.

Regression Analyses:

In our models, all other profiles had significantly higher psychological distress than the referent "low syndemic profile" profile (Table 4), with no substantial changes after adjustment for covariates. The greatest differences from the reference were observed among the "high syndemic profile" (aPR=2.99, 95% CI 2.20, 4.06), followed by the "Isolation and Rejection" profile (aPR=2.11, 95% CI 1.61, 2.76), and finally the "Isolation only" profile (aPR=1.32, 95% CI 1.03, 1.70). Additionally, among the "high syndemic profile," increases in every factor since the start of the COVID-19 pandemic were associated with greater psychological distress both before and after adjustment, though this was not statistically significant for racism. This is in large part due to sample size limitations, as this specific measure was only analyzed within this profile among participants of color within this profile (n=34). The strongest associations were seen among increases in victimization (aPR=5.85, 95% CI 1.33, 25.71) and family rejection (aPR=4.39, 95% CI 1.45, 13.24) since the start of the COVID-19 pandemic.

Discussion

We identified a syndemic of experienced victimization, racism, racialized heterosexism/cisgenderism, internalized LGBTQ+ stigma, isolation, and family rejection associated with psychological distress among SGM college students. Additionally, among the profile characterized by the presence of all syndemic factors, students who had experienced worsening of these factors since the start of the COVID-19 pandemic had substantially greater psychological distress. This is consistent with the literature, in that associations between these factors and mental health are relatively well documented among SGM youth and young adults (Johns et al., 2018; Kahle, 2017; Mereish et al., 2018; Miltz et al., 2019). However, our identification of a syndemic formed by these factors and the association between worsening of these factors since COVID-19 and much greater psychological distress, are both novel findings. Few studies have demonstrated how syndemics of these factors have changed for students in the height of the COVID-19 pandemic, or their relevance to this population's mental health in this context (Fish et al., 2020).

While the syndemic profile was characterized overall by victimization, racism, racialized heterosexism/cisgenderism, internalized LGBTQ+ stigma, isolation, and family rejection, racism was only utilized for participants of color. In essence, the profile consists of two similar syndemics; one consisting of all the factors among SGM students of color, and one consisting of all of the aforementioned factors except racism for white SGM students. These are both syndemics consisting of several social factors with public health relevance. The clustering of these two groups is largely driven by the strong interassociations between racism and all of the other factors. There may be some individual-level variation in the structure of syndemics within syndemic profiles; despite this, the profile indicates there is enough consistent clustering to characterize this group as having substantially more psychosocial risk factors than any of the other profiles. This is also why sensitivity analyses that handled racism differently largely did not change profile assignment; no matter how racism was imputed there was still a predominance of psychosocial risk factors among this profile. In conjunction with the strong interassociations between these factors, this is sufficient to characterize the profile as a syndemic profile overall.

We used missing data for racism measures among white students to essentially examine racism as a syndemic factor among SGM students of color only. Conceptually, this means that we should interpret racism as part of a syndemic in comparison to students of color in other profiles. SGM students of color within the syndemic profile did experience substantially more racism than those in any other profile however, further supporting it as part of a syndemic among students of color. While we did not find significant associations between increases in racism since the start of COVID-19 and psychological distress, this was likely due to this being measured only among students of color in this profile (n=34), preventing reasonable statistical power. Despite this, the large estimates, with approximately twice the level of psychological distress among students who experienced greater racism since the start of COVID-19, warrants further study. We also identified notable associations between racism and every other syndemic factor among students of color (n=220) in the overall sample (n=565), demonstrating its relevance to the lived experiences of SGM students of color. Racism and racialized heterosexism/cisgenderism, as persistent stressors

in the lives of people of color, can often be a source of isolation, victimization, and overall rejection.

Our findings also highlight the value of latent profile analysis in identifying non-linear patterns of factors. While we found a syndemic profile characterized by all of the factors of interest, we also identified a profile characterized by isolation only, and a profile characterized by both isolation and family rejection. Both of these profiles also had significantly higher psychological distress compared to the reference non-syndemic profile. These patterns highlight the relevance of isolation as a core factor in psychological distress among SGM students. Given how much social isolation has increased as a result of COVID-19, this is a particularly salient finding.

Policy approaches to meeting the mental health needs of SGM students have had to address new challenges in the context of COVID-19 (Gato et al., 2021; Gonzales et al., 2020). Social distancing practices, while important for reducing likelihood of acquiring COVID-19, have created additional difficulties in meeting needs for social acceptance and connection (Moore et al., 2021). The impact of victimization and discriminatory experiences is often greater given the loss of social support during this time (Moore et al., 2021; Phillips et al., 2020). Many SGM students may be confined to unsupportive family environments (Gato et al., 2021) Policy efforts to address the mental health of SGM students need to consider these challenges. Outreach to SGM students in unsupportive home settings is especially important, as students often have little means of leaving these environments, especially during the pandemic (Fish et al., 2020).

Our study has important limitations to acknowledge. First, the study is limited to a relatively narrow cross-sectional sample of SGM college students, impacting generalizability of findings. Despite this, the focus on SGM college students is important, given that these populations face disparately elevated victimization, discrimination, and isolation resulting in significant mental health challenges and associated outcomes, including substance use and suicidality. Members of the syndemic profile represented a relatively small portion of our sample so analyses of changes in syndemic factors since the start of COVID-19 were limited. Despite the small sample size, we found remarkably strong associations, including nearly 6 times the level of psychological distress among those who experienced the greatest increases in victimization since the start of COVID-19. Finally, given the sensitive nature of many of the topics, including sexual identity, social desirability bias is likely to present some limitations. Despite these limitations, we were able to identify key syndemic profiles among SGM college students and provide evidence that these syndemic factors have exacerbated since the start of COVID-19.

Our findings have significant public health implications, highlighting the need for health equity efforts focused on LGBTQ+ students. The COVID-19 pandemic has substantially changed the context of the stressors faced by LGBTQ+ students; this is a critical consideration in developing policies to address psychosocial health disparities faced by this population. Both higher education institutions and mental health services for youth and young adults must consider that LGBTQ+ students are facing many of these challenges; our findings reinforce the importance of providing culturally competent mental health services

to these students. Similarly, culturally competent mental health services must consider intersectional experiences of these students, such as the compounding of socio-economic adversity, racism, racialized heterosexism/cisgenderism, and sexual minority stressors among LGBTQ+ students of color. Novel strategies to address isolation and family rejection are needed, given the context of social distancing and that LGBTQ+ students may be forced into living spaces with unsupportive families. Approaches to address racism, racialized heterosexism/cisgenderism, internalized LGBTQ+ stigma, and victimization must account for how these have changed with the pandemic (e.g., anti-Asian coronavirus-related racism). Overall, our study highlights important needs to be addressed in addressing LGTBQ+ health disparities among college students, a population where these disparities are particularly relevant.

Conclusion

We identified a syndemic of victimization, internalized LGBTQ+ stigma, racism, racialized heterosexism/cisgenderism, family rejection, and isolation associated with psychological distress among SGM college students and found that worsening of these syndemic factors since the start of the COVID-19 pandemic was associated with even greater psychological distress. Our findings highlight critical needs for SGM students that have been exacerbated since the start of the pandemic. In efforts to address the needs of students affected by the COVID-19 pandemic, these factors are critically important considerations towards larger goals of achieving health equity. Future research into intervention approaches toward reducing the impact of these factors and promoting effective coping among SGM students during the pandemic are needed. Research focused on the intersectional experiences of SGM students of color is especially recommended.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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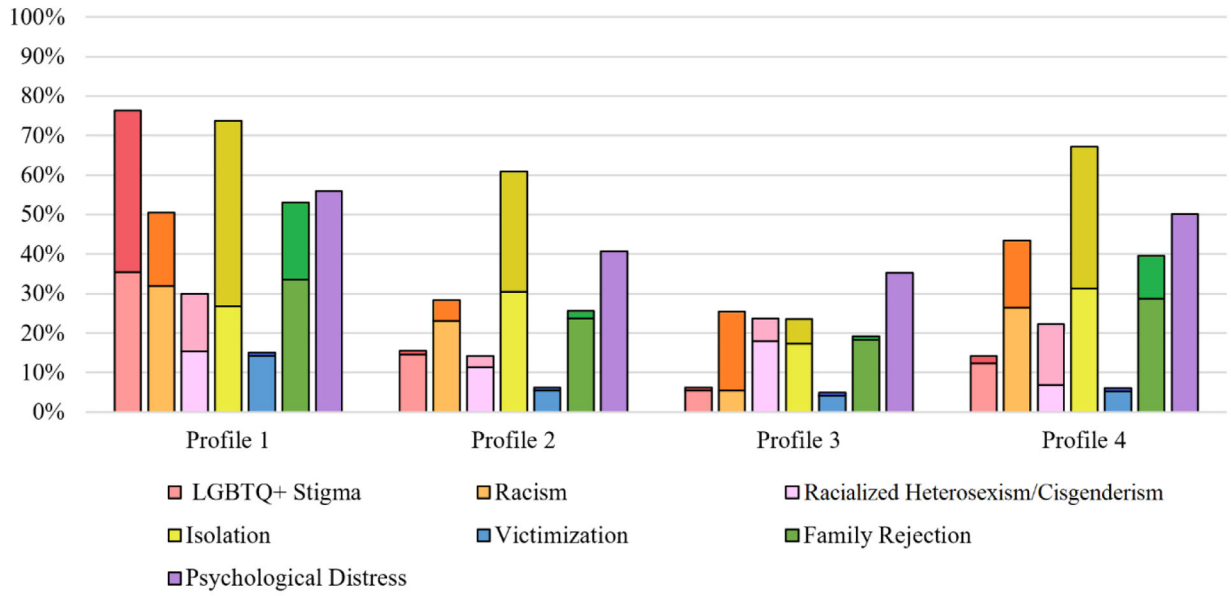

Figure 1.

Mean syndemic indicators, changes in indicators since COVID-19, and psychological distress across latent profiles (n=565).

[1]All mean measures were scaled in percentage (with 0% representing the lowest possible value, and 100% representing the highest possible value) to allow for standardization across measures.

[2]All measures were significantly associated with latent profiles ($p<.05$) using Kruskal-Wallis tests. Psychological distress was not used in generating latent profiles. All other measures shown were used in generating latent profiles.

[3]Upper half of bars for homophobia, racism, intersectional discrimination, isolation, victimization, and family rejection represent proportion increased since the start of the COVID-19 pandemic.

Table 1.

Spearman's rank-sum correlations between syndemic factors and psychological distress in the past year among sexual minorities (n=565).

	Internalized LGBTQ+ Stigma	**Racism[1]**	**Racialized Heterosexism/ Cisgenderism**	**Isolation**	**Victimization**	**Family Rejection**	**Psychological Distress**
Internalized LGBTQ+ Stigma		0.15 p=0.024	0.17 p=0.011	0.222 p<.001	0.217 p<.001	0.317 p<.001	0.176 <.001
Racism [1]			0.821 p<.001	0.199 p<.001	0.343 p<.001	0.514 p<.001	0.402 p<.001
Racialized Heterosexism/ Cisgenderism				0.130 p=0.045	0.254 p<.001	0.451 p<.001	0.201 p<.001
Isolation					0.119 p=0.005	0.140 p=0.008	0.347 p<.001
Victimization						0.209 p<.001	0.192 p<.001
Family Rejection							0.288 p<.001

[1]Racism and Racialized Heterosexism/Cisgenderism measures reported among participants of color only (n=220).

Table 2.

Comparisons of models with fixed numbers of latent profiles (n=565).

Number of classes	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Log-likelihood	9514.9	9421.3	9307.3	9275.6	9229.1	9210.0	9210.3	9111.3
Difference in Log-likelihood	-	**93.6**	**114.0**	31.7	46.5	19.1	−0.3	99.0
Bayesian Information Criterion	19245.3	19146.9	18874.5	18899.8	18851.1	18857.2	18902.2	18748.7
Entropy	0.956	0.906	0.848	0.826	0.822	0.812	0.723	0.731
Minimum Class Size	278	151	80	50	9	7	6	6

Significant results (p<.05) using the Vu-Lo-Mendell-Rubin adjusted likelihood ratio test bolded.

Table 3.

Increases in syndemic factors Since COVID-19, mean psychological distress, and sociodemographics across latent profiles of sexual minority students (n=565).

	Total (n=565)	Profile 1: Highest Syndemic Factors (n=80)	Profile 2: Isolation Only (n=288)	Profile 3: Lowest Syndemic Factors (n=102)	Profile 4: Isolation and Rejection (n=155)
Increases in Syndemic Factors Since COVID-19 (%)					
Internalized LGBTQ+ Stigma	0.13	**55.00**	**7.02**	**1.68**	**9.12**
Racism	0.14	**19.25**	**5.70**	**22.35**	**17.41**
Racialized Heterosexism/ Cisgenderism	0.09	**15.55**	**3.42**	**8.43**	**13.93**
Isolation	0.46	**63.54**	**45.61**	**26.47**	**48.92**
Victimization	0.02	**6.04**	**1.32**	**1.63**	**1.40**
Family Rejection	0.16	**32.94**	**9.29**	**5.48**	**24.17**
Psychological Distress (Mean)	0.45	**0.56**	**0.41**	**0.35**	**0.50**
Gender (%)					
Cisgender Woman	53.45	**43.75**	**69.30**	**37.25**	**45.81**
Cisgender Male	15.22	**22.50**	**15.79**	**19.61**	**7.74**
Non-Binary	21.95	**20.00**	**10.53**	**27.45**	**36.13**
Transgender Woman/Femme	2.12	2.50	0.88	3.92	2.58
Transgender Man/Masculine	7.26	**11.25**	**3.51**	**11.76**	**7.74**
Sex Assigned at Birth (%)					
Female	79.12	72.50	81.14	69.61	85.81
Male	20.88	27.50	18.86	30.39	14.19
Sexual Identity (%)					
Asexual	7.26	6.25	6.14	3.92	11.61
Bisexual	32.04	25.00	33.77	33.33	32.26
Gay/Lesbian	31.68	**46.25**	**31.14**	**32.35**	**24.52**
Pansexual	8.67	6.25	10.09	7.84	8.39
Queer	15.75	**8.75**	**15.35**	**15.69**	**20.00**
Race/Ethnicity (%)					
Asian	13.27	**12.50**	**12.28**	**20.59**	**10.32**
Black	9.73	**8.75**	**6.14**	**14.71**	**12.26**
Hispanic/Latinx	13.1	17.50	9.21	17.65	13.55
White	61.06	**57.50**	**68.86**	**45.10**	**61.94**

Statistically significant ($p<.05$) associations with latent profiles bolded.

Table 4.

Cumulative prevalence ratios for associations between latent profiles and psychological distress (n=565).

	Unadjusted	Adjusted*
Latent Profile		
1 (Highest Syndemic factors)	**2.75 (2.03, 3.71)**	**2.99 (2.20, 4.06)**
2 (Isolation only)	**1.32 (1.04, 1.68)**	**1.32 (1.03, 1.70)**
3 (Low Syndemic Factors)	Reference	Reference
4 (Isolation and Rejection)	**2.32 (1.79, 3.01)**	**2.11 (1.61, 2.76)**

*Adjusted for gender identity, sex assigned at birth, race, ethnicity, and sexual identity. Statistically significant ($p<.05$) estimates bolded.

Table 5.

Cumulative prevalence ratios for associations between increases in psychological factors since the start of the CoVID-19 pandemic and psychological distress among the highest syndemic profile (n=80).

	Unadjusted	**Adjusted***
Victimization since COVID-19	**3.33 (1.20, 9.22)**	**5.85 (1.33, 25.71)**
Racism since COVID-19	1.94 (0.71, 5.27)	1.91 (0.51, 7.07)
Racialized Heterosexism/Cisgenderism since COVID-19	1.55 (0.72, 3.32)	1.57 (0.59, 4.15)
Internalized LGBTQ+ Stigma since COVID-19	**3.04 (1.50, 6.16)**	**2.33 (1.05, 5.15)**
Isolation since COVID-19	**2.64 (1.20, 5.80)**	**2.77 (1.08, 7.11)**
Family Rejection since COVID-19	**3.11 (1.27, 7.64)**	**4.39 (1.45, 13.24)**

* Racism and Racialized Heterosexism/Cisgenderism estimates adjusted for sex assigned at birth, gender identity, and sexual identity. All other estimates adjusted for gender identity, sex assigned at birth, race/ethnicity, and sexual identity. Statistically significant ($p<.05$) estimates bolded.