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Psychiatric impacts of the COVID-19 global pandemic on U.S. sexual and gender minority young adults

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ABSTRACT

The COVID-19 pandemic has caused unprecedented isolation and mental health effects; few studies have characterized this in sexual and gender (SGM) minority young people, a particularly vulnerable population. This cross-sectional study sought to analyze the mental health outcomes of SGM young people (18-30 years) during the early stages of the pandemic in the United States (April 13-June 18, 2020) and to explore how factors related to SGM identity impact mental health, such as lifetime discrimination, family support, and pre-existing mental health conditions. An online survey collected socio-demographic information and assessed for both mental health (depression (PHQ-8), anxiety (GAD-7), PTSD (PCL-C)) and COVID-19-related outcomes (COVID-19-related worries and COVID-19-related grief). Out of 981 participants, 320 (32.6%) identified as SGM. SGM had significantly higher levels of depression and PTSD symptoms as well as COVID-19-related worries and grief than non-SGM, even after controlling for family support, lifetime discrimination, and pre-existing mental health diagnoses. These findings suggest that not only has the COVID-19 pandemic disproportionately impacted SGM mental health, but that minority stress factors cannot fully explain this impact. Thus, clinicians and societal stakeholders (schools, employers, policymakers) must think beyond traditional minority stress factors (family support, discrimination) and pre-pandemic disparities to support this vulnerable population as the pandemic progresses.

1. Introduction

Since March 2020, the coronavirus disease 2019 (COVID-19) pandemic has disrupted the lives of people worldwide; universities sent their students home, non-essential businesses closed, and daily life came to a standstill. Such abrupt disconnection and isolation from family and friends has contributed to higher rates of depression, anxiety, PTSD, and loneliness in young adults during the COVID-19 pandemic (Fitzpatrick et al., 2020; Hyun et al., 2021; Liu et al., 2020a,b).

Some populations are more vulnerable to the COVID-19 pandemic and its social repercussions, notably racial and ethnic minority communities (Bibbins-Domingo, 2020; Laurencin and McClinton, 2020). However, few studies have investigated how sexual and gender minorities (SGM), defined as non-cisgender, non-heterosexual people, have been affected by the pandemic. SGM individuals may face disproportionate COVID-19-related mental health issues given their increased mental health risk in pre-pandemic conditions. For example, compared with non-SGM counterparts, SGM people are significantly more likely to report depression, anxiety, and substance use issues as well as decreased social and family support (Ryan et al., 2010; Baams et al., 2018). Thus far, studies have largely corroborated this prediction. In Hong Kong and India, SGM individuals reported increased depression and anxiety symptoms related to both COVID-19 and specific SGM-related stressors (Sharma and Subramanyam, 2020; Suen et al., 2020). Similarly, a global sample of men who have sex with men demonstrated elevated depression and anxiety symptoms related to COVID-19' impact on accessing HIV care (Santos et al., 2020). However, this may not be the case for all SGM individuals, as demonstrated by a study in Taiwan noting that SGM individuals felt less worried about the direct health effects of COVID-19 than non-SGM individuals (Ko et al., 2020).

SGM young adults (ages 18-30) warrant special attention in mental health research during the COVID-19 pandemic. In pre-pandemic

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conditions, 67% of SGM youth reported facing family rejection, 77% reported feeling depressed in the last week, and 95% reported trouble sleeping (Human Rights Campaign, 2018). Given that the pandemic has caused widespread social changes, such as school closures, layoffs, and quarantine orders (Conrad et al., 2021), negative mental health outcomes may be elevated among SGM young people as they become disconnected from social and mental health support at school, work, or in socialization (Liu et al., 2020c). In the early stages of the COVID-19 pandemic, Gonzales *et al.* and Fish *et al.* found that SGM young adults in the United States also struggled with returning to unsupportive homes, reporting adverse mental health outcomes because of the pandemic (Fish et al., 2020; Gonzales et al., 2020). These findings underscore the need to better characterize the unique and significant stressors confronting SGM young adults during the pandemic.

To our knowledge, no investigations in the United States have measured COVID-19-related worries (worries related to food, employment, and financial security) and COVID-19-related grief (concerns about missing out on significant life events or friendships) as mental health outcomes among SGM young adults during the pandemic. Yet, these measures are crucial to understanding how and which basic social needs can be tangibly and rapidly addressed with policymaking and social programs. Given the breadth of literature documenting mental health and social support disparities pre-pandemic, we predicted that SGM young adults may be particularly vulnerable to the effects of COVID-19-induced isolation, school and employment changes, and the health uncertainties inherent to a global pandemic. Thus, the main goals of this study are to 1) explore the relationships between SGM identity and psychiatric symptoms (depression, anxiety, and PTSD), COVID-19-related worries, and COVID-19-related grief during the pandemic, 2) analyze whether these relationships are explained by factors previously found to be related to SGM identity, such as lifetime discrimination, family support, pre-existing mental health conditions (diagnosed before the pandemic began), and 3) analyze whether these factors interact with SGM identity in explaining outcomes. Understanding the burden that SGM young adults experience during the pandemic is crucial to inform clinicians, university administrators, employers, and families how to best care for this vulnerable population as the pandemic continues.

2. Method

2.1. Study Population

To track young adult experiences in the U.S., we launched the COVID-19 Adult Resilience Experiences Study (CARES 2020), a longitudinal cohort study, on April 13, 2020, one month after the U.S. state of emergency declaration. Preliminary study data was obtained via the online survey during Wave 1 (N = 981) from April 13, 2020 to June 18, 2020. Recruitment occurred online via university newsletters, email listservs, social media, and word of mouth (e.g., listservs and Facebook and Instagram pages for churches, school organizations and clubs, college dorms, and community centers). Recruitment was initially focused on schools and organizations in the New England area before additional outreach targeted all areas of the U.S. (Midwest, South, and West). Those who lived or studied in the United States and were between the ages 18 to 30 were eligible to complete the survey, and informed consent was obtained for all participants. The online survey took approximately 30 minutes to complete and asked about participants' experiences during the beginning stages of the COVID-19 pandemic, including, but not limited to, physical and mental health outcomes, resilience, social support, and perceived COVID-19 health risk. Human verification and attention checks were implemented throughout the survey to ensure data integrity. Further, research staff conducted weekly quality assurance checks of the data to exclude any response irregularities indicative of bots. One in 10 participants were compensated with a $25 gift card. This study was approved by the Boston University Institutional Review Board.

2.2. Measures

2.2.1. Demographic information

The CARES 2020 survey collected demographic information, including age, race, and income using both multiple choice and free response. Additionally, we collected gender identity (male, female, transgender man, transgender woman, or other) and sexual orientation (gay, lesbian, bisexual, asexual, questioning, or other). For "other," participants could write-in their gender and sexual orientation identity. Participants who identified as heterosexual and cisgender (male or female) were included in the non-SGM group. All others identifying as non-cisgender or non-heterosexual were included in the SGM group.

We also controlled for the number of days between the survey administration and the declaration of a national emergency (March 15th, 2020) to account for time, a possible covariate given the dynamic nature of the pandemic. Lastly, participants were asked to indicate whether they had ever been diagnosed with any of the following nine clinical disorders prior to the pandemic: attention deficit hyperactivity disorder (ADHD); generalized anxiety disorder; depression; insomnia; obsessive compulsive disorder (OCD); panic disorder; post-traumatic stress disorder (PTSD); substance abuse or addiction (alcohol or other drugs); and other mental health condition. For each disorder, participants could select *"No"; "Suspected, but not diagnosed"; "Yes, diagnosed but not treated"*; or *"Yes, diagnosed and treated."* Participants who previously received a diagnosis before the COVID-19 pandemic began, regardless of treatment, were counted as having a pre-existing mental health diagnosis.

2.2.2. Risk and Protective Factors

This study assessed perceived social support with the 12-item Multidimensional Scale of Perceived Social Support (MSPSS) (Zimet et al., 1990). Participants rated their perceived emotional support from family, friends, and partners on a Likert scale ranging from 1 ("very strongly disagree") to 7 ("very strongly agree").

Lifetime discrimination was assessed using the 11-item Lifetime Discrimination Scale (Williams et al., 1997). Participants rated on a scale of 0-3 how many times they have faced unfair treatment at school, work, or when receiving financial or other services throughout their lifetime. Zero was None, 1 was 1-2 times, and 2 was 3-4 times, and 3 was 5 or more times.

Sum scores for both of these factors were used as continuous predictors, with higher scores meaning less social support and more lifetime discrimination, respectively.

Two 6-item scales, that have been used in previous published work, assessed the severity of COVID-19-related worries and COVID-19-related grief (Liu et al., 2020a; 2020b). The COVID-19-related worries scale measured concerns surrounding food stability, keeping in touch with loved ones in quarantine, maintaining financial stability, and accessing COVID-19 testing and treatment. The COVID-19-related grief scale, adapted from the Inventory of Complicated Grief (Prigerson et al., 1996), measured concerns surrounding missing out on significant life events and feelings of emptiness or bitterness because of loss of daily routine. Participants rated their concern about each item on a scale from 1 (COVID-19-related worries: "not worried at all"; COVID-19-related grief: "strongly disagree") to 5 (COVID-19-related worries: "very worried"; COVID-19-related grief: "strongly agree"). Scores represented the sum of the ratings from each question and were used as continuous variables. The range of possible scores for both scales is from 6 to 30. Cronbach's alpha for measured items indicated good reliability (COVID-19-related worries = .70, COVID-19-related grief = .79).

2.2.3. Mental Health Outcomes

An 8-item version of the Patient Health Questionnaire (PHQ-8) was used to assess symptoms of depression. The PHQ-8 asked participants to rate the frequency of depressive symptoms in the past two weeks from 0 ("not at all") to 3 ("nearly every day").

A 7-item version of the Generalized Anxiety Disorder Scale (GAD-7), a commonly utilized scale, was used to assess anxiety symptoms. Participants were asked to rate the frequency of anxiety symptoms in the past two weeks from 0 ("not at all") to 3 ("nearly every day").

A 17-item version of the PTSD Checklist—Civilian Version (PCL-C) was used to assess PTSD symptoms. Respondents indicated how much they were bothered by problems and experiences in response to stressful life events in the past month, with 1 as "not at all" and 5 as "extremely."

Each scale's sum score was used as continuous variables.

2.3. Statistical Analyses

Chi-Square analyses were used to indicate statistically significant differences in the proportions between SGM and non-SGM groups. We conducted multiple regression analyses to examine SGM status as a predictor for mental health and COVID-19-related outcomes, primary mental health outcomes (depression, anxiety, PTSD symptoms), and COVID-19-related worries and grief. We regressed these outcomes on sociodemographic characteristics (Block 1), pre-existing mental health diagnoses before COVID-19 began (Block 2), lifetime discrimination (Block 3), family support (Block 4), and SGM identity (Block 5). Sociodemographic characteristics incorporated into the analyses included age, race, whether or not they were a student, and days since the pandemic was declared a national emergency to account for time effects. We used SPSS 26.0 to perform these analyses.

3. Results

Table 1 depicts descriptive data on demographic characteristics as well as predictors and outcomes of our study population, broken down by SGM status. Our study cohort consisted of 60.8% White, 20.9% Asian, 4.8% Black, 5.8% Hispanic/Latinx, 6.3 % mixed race, and 1.5% "other" race participants. In addition to racial and ethnic diversity, the gender identity of our sample varied, with 83.2% identifying as cisgender women, 12.6% identifying as cisgender men, and 4.2% identifying as other gender identities. The mean age of our sample was 24 years and the majority (63.9%) were students and those who earned an income of <$25,000 a year (47.1%). Nearly half of our cohort (45.1%) reported having at least one previous mental health diagnosis. Finally, out of 981 respondents, 320 (32.6%) identified as SGM. Out of these 320 participants, 11.7% were lesbian, 10.2% gay, 43.2% bisexual, 8.6% asexual, 6.8% questioning, and 11.7% identified as having a "self-identified" SGM status.

Two-tailed independent samples t-test and chi-square analyses revealed significant differences between the SGM and non-SGM group in gender, race, income, and rates of previous mental health diagnoses ($p < 0.05$) (Table 1). Notably, SGM young adults scored higher in lifetime discrimination on average (M = 2.00 vs. M = 1.38, $p = .001$) and lower in family support (M = 4.77 vs. M = 5.24, $p < .001$). All of these factors, except for income, were included in the subsequent regression analyses. Income was omitted as a covariate as our largely student population, the majority of whom reported zero income or less than $25,000 a year, may not be reflective of true household wealth.

ANOVA analyses controlling for age, race, student status, days since the pandemic, pre-existing mental health conditions (diagnosed prior to the pandemic), lifetime discrimination, and family support demonstrate significantly elevated levels of depression ($F(1, 931) = 9.05$, $p = .003$), PTSD ($F(1, 931) = 6.17$, $p = .013$), COVID-19-related worries ($F(1, 931) = 16.15$, $p < .001$), and COVID-19-related grief ($F(1, 931) = 4.64$, $p = .032$) among SGM compared to non-SGM young adults (Table 2). There was no significant difference in anxiety symptoms between these two groups ($F(1, 931) = 2.39$, $p = .122$).

Table 3 provides results from multiple regression models for depression, anxiety, and PTSD symptoms, adjusting for five different blocks. We found that pre-existing mental health diagnoses, lifetime discrimination, and family support are statistically significant predictors

Table 1
Descriptive data from Wave I (April 13-June 18, 2020) of the Coronavirus disease 2019 Adult Resilience Experiences Study (N=981), proportions unless otherwise noted.

Factors	Total	Non-SGM (*N*= 624)	SGM (*N* = 320)	*t*-test or Chi Square
Age (years)	*M*=24.37 (*SD*=3.26)	M= 24.78 (*SD* = 3.19)	M= 23.59 (*SD* = 3.28)	$t(942) = 5.36$, $p < .001$***
Gender				
Men	119 (12.6%)	78 (12.5%)	41 (12.8%)	X^2 (2, *N* =981) = 82.19, $p < .001$***
Women	785 (83.2%)	546 (87.5%)	239 (74.7%)	
Other[1]	40 (4.2%)	—	40 (12.5%)	
Race				
White	574 (60.8%)	367 (58.8%)	207 (64.7%)	X^2 (5, *N* =981) = 20.43, $p = .001$**
Black	45 (4.8%)	23 (3.7%)	22 (6.9%)	
Hispanic or Latinx	55 (5.8%)	39 (6.3%)	16 (5.0%)	
Asian	197 (20.9%)	153 (24.5%)	44 (13.8%)	
Mixed	59 (6.3%)	34 (5.4%)	25 (7.8%)	
Other race	14 (1.5%)	8 (1.3%)	6 (1.9%)	
Income				
No Income	117 (12.4%)	72 (11.5%)	45 (14.1%)	X^2 (4, *N* =981) = 10.87, $p = .028$*
Under 25,000	445 (47.1%)	281 (45.0%)	164 (51.3%)	
25,000 - 49,000	226 (23.9%)	151 (24.2%)	75 (23.4%)	
50,000 -75,000	99 (10.5%)	77 (12.3%)	22 (6.9%)	
Above 75,000	56 (5.9%)	42 (6.7%)	14 (4.4%)	
U.S.-Born				
Yes	823 (87.2%)	554 (88.8%)	279 (87.2%)	X^2 (1, *N* =981) = 0.10, $p = .919$
No	121 (12.8%)	80 (11.2%)	41 (12.8%)	
Student				
Yes	603 (63.9%)	388 (62.2%)	215 (67.2%)	X^2 (1, *N* =981) = 2.30, $p = .129$
No	341 (36.1%)	236 (37.8%)	105 (32.8%)	
Received a mental health diagnosis				
No	518 (54.9%)	386 (61.9%)	132 (41.3%)	X^2 (1, *N* =981) = 36.28, $p < .001$***
Yes	426 (45.1%)	238 (38.1%)	188 (58.8%)	
Lifetime discrimination	M= 1.59(*SD* = 2.58)	M = 1.38 (*SD* = 2.20)	M = 2.00 (*SD* = 3.17)	$t(481.85) = -3.20$, $p = .001$**
Family support	M= 5.09 (*SD* = 1.39)	M = 5.24 (*SD* = 1.37)	M = 4.77 (*SD* = 1.35)	$t(942) = 5.05$, $p < .001$***
Days Since the Pandemic Began (March 13, 2020)	M = 44.17 (*SD* = 13.48)	M = 42.93 (*SD* = 13.11)	M = 45.59 (*SD* = 13.89)	$t(611.74) = -3.90$, $p < .001$***
SGM				
Lesbian	38 (11.7%)	–	–	
Gay	33 (10.2%)	–	–	
Bisexual	140 (43.2%)	–	–	
Asexual	28 (8.6%)	–	–	
Questioning	22 (6.8%)	–	–	
Self-Identify[2]	38 (11.7%)	–	–	

N = 981 †p<0.1, *p<.05, **p<.01, ***p<.001.

[1] *Gender minorities, including transgender man, transgender woman, non-binary, gender non-conforming, gender queer.*

[2] *All those who opted to write-in their sexual orientation, such as non-heterosexual, queer.*SGM = Sexual and Gender Minorities

Table 2
Univariate analysis of variance (ANOVA) comparing mental health and coronavirus disease 2019 related outcomes between sexual and gender minority and non-sexual and gender minority young people.

Factors	Non-SGM (*N*= 624*)*	SGM (*N* = 320)	F value, *p* value
Depression (PHQ-8)	M = 8.70 (*SE* = .202)	M = 9.79 (*SE* = .287)	F(1, 931) = 9.05, *p* = .003**
Anxiety (GAD-7)	M = 9.32 (*SE* = .206)	M = 9.89 (*SE* = .294)	F(1, 931) = 2.39, *p* = .122
PTSD (PLC-C)	M = 37.72 (*SE* = .496)	M = 39.92 (*SE* = .706)	F(1, 931) = 6.17, *p* = .013*
COVID-19-Related Worries	M = 15.28 (*SE* = .200*)*	M = 16.70 (*SE* = .285)	F(1, 931) = 16.15, *p* < .001***
COVID-19-Related Grief	M = 19.01 (*SE* = 0.174)	M = 19.68 (*SE* = .248)	F(1, 931) = 4.64, *p* = .032*

N = 981 †p<0.1, *p<.05, **p<.01, ***p<.001. *Adjusting for age, race, student status, days since pandemic, pre-existing mental health condition (diagnosed prior to the pandemic), lifetime discrimination, and family support.*
SGM = Sexual and Gender Minorities.
COVID = coronavirus disease 2019.

for all mental health outcomes at or below the $p = 0.05$ level. When SGM identity was incorporated into regression models, it was a statistically significant predictor for depression and PTSD symptoms, but not anxiety, after controlling for the above factors.

Regression results for COVID-19-related worries and grief are displayed on Table 4, with the same five blocks as the previous regression models in Table 3. While lifetime discrimination and family support were statistically significant predictors for COVID-19-related worries and grief, pre-existing mental health conditions were significant predictors only for COVID-19-related grief, and not for COVID-19-related worries when SGM status was incorporated. Similarly to the mental health outcomes, SGM identity was a statistically significant predictor for COVID-19-related worries (B =.130, $p < 0.001$*)* and grief (B=.068, $p < 0.05$*)* after incorporating pre-existing mental health conditions, lifetime discrimination, and family support.

4. Discussion

To our knowledge, this study is the first quantitative survey examining the major psychiatric challenges faced by SGM compared to non-SGM young adults during the initial period of the COVID-19 pandemic in the United States. We present several key findings.

First, consistent with previous literature in non-pandemic conditions, the SGM young adults in our sample had significantly higher baseline rates of previous mental health diagnoses (Semlyen et al., 2016), lower levels of family support (Ryan et al., 2010), and higher levels of lifetime discrimination compared to their non-SGM counterparts (Human Rights Campaign, 2018). As anticipated, SGM young adults are a population particularly vulnerable to the societal impacts of the pandemic.

Second, we found that SGM compared to non-SGM young adults reported significantly elevated mean levels of depression and PTSD symptoms, and COVID-19-related worries and grief. Our mental health findings are consistent with Suen *et al.*, Sharma and Subramanyam, and Santos *et al.*, who found elevated depressive and anxiety symptoms during the COVID-19 pandemic among LGB (lesbian, gender, bisexual) people in Hong Kong, India, and in a global sample (Santos et al., 2020; Sharma and Subramanyam, 2020; Suen et al., 2020). We note that our SGM sample's mean depression and anxiety scores approached the

Table 4
Multiple regression analyses predicting coronavirus disease 2019 related worries and coronavirus disease 2019 related grief, based on pre-existing mental health diagnoses (diagnosed prior to the pandemic), lifetime discrimination, family support, and sexual and gender minority status.

	COVID-19 worries			**COVID-19 grief**		
	B	R^2	ΔR^2	*B*	R^2	ΔR^2
Covariates						
Age	-.031***	.016	.016	-.187***	.104	.111
Days Since Pandemic	-.084*			.029		
Began	.105**			.121***		
Student Status	.013			-.132***		
Race	-.012			-.119***		
Asian	.013			-.040		
Black	-.017			-.050†		
Hispanic	.037			-.011		
Mixed						
Other						
Pre-existing mental health diagnosis	.133***	.032	.016	.111***	.130	.027
Lifetime Discrimination	.276***	.100	.068	.105***	.146	.016
Family Support	-.147***	.118	.018	-.147***	.165	.020
SGM Status	.130***	.132	.014	.068*	.169	.004

N = 981 †p<0.1, *p<.05, **p<.01, ***p<.001.
SGM = Sexual and Gender Minorities.

Table 3
Multiple regression analyses predicting depression, anxiety, and post-traumatic stress disorder (PTSD), based on pre-existing mental health diagnoses (diagnosed prior to the pandemic), lifetime discrimination, family support, and sexual and gender minority status.

	Depression (PHQ-8)			Anxiety (GAD-7)			PTSD (PCL-C)		
	B	R^2	ΔR^2	*B*	R^2	ΔR^2	*B*	R^2	ΔR^2
Covariates		.030	.030		.037	.037		.045	.045
Age	-.136***			-.126***			-.193***		
Days Since Pandemic Began	.040			.005			.063†		
Student Status	.035			.013			.007		
Race				-.155***			-.098**		
Asian	-.092**			-.066*			-.003		
Black	.011			–.032			-.019		
Hispanic	.026			.035			-.027		
Mixed	.008			.036			-.002		
Other	.024								
Pre-existing mental health diagnosis	.353***	.149	.119	.311***	.130	.093	.350***	.163	.118
Lifetime Discrimination	.173***	.175	.027	.150***	.149	.021	.193***	.195	.032
Family Support	-.261***	.234	.060	-.176***	.175	.028	-.272***	.260	.065
SGM Status	.091**	.241	.007	.048	.177	.002	.074*	.264	.006

N = 981 †p<0.1, *p<.05, **p<.01, ***p<.001.
PTSD = Post-Traumatic Stress Disorder.

clinical threshold (scores of greater than 10), and therefore represents the highest mental health symptoms measured out of the aforementioned SGM COVID-19 studies utilizing the same clinical scales (Sharma and Subramanyam, 2020; Suen et al., 2020). Our elevated COVID-19-related worries and grief may be a result of greater levels of rumination, which has been previously reported among SGM communities (Lewis et al., 2016; Sarno et al., 2020). As rumination has been described as fixating on problems and negative feelings, this may be analogous to fixating on worries and grief surrounding the pandemic.

Third, SGM identity predicted depression and PTSD symptoms and COVID-19 related worries and grief even after controlling for sociodemographic factors, pre-existing mental health conditions (diagnosed prior to the pandemic), family support, and lifetime discrimination. Controlling for these potential cofounders allowed us to identify the extent to which SGM identity alone accounted for our outcomes. Our findings suggest that baseline SGM mental health disparities, family support, and lifetime discrimination—which in previous literature have often been utilized to explain SGM mental health disparities—cannot fully explain why mental health outcomes were elevated among SGM young people during the pandemic (Russell and Fish, 2016). In particular, by controlling for mental health conditions diagnosed prior to the pandemic, our findings demonstrate that SGM identity is still significantly associated with current mental health symptoms even after controlling and accounting for the well-documented baseline disparities in mental health conditions among SGM communities in pre-pandemic times. Further, interactions between SGM and the above factors showed no significant effects on our measured outcomes. These findings contrast previous research on SGM young adult mental health. For example, Ryan *et al.* found that family rejection predicted increased depression among SGM young adults (2009). Critically, factors like family acceptance and strong social support have been protective against adverse mental health issues in young adults (Kibirk et al., 2019; Ryan et al., 2009; McConnell et al., 2015). In the case of COVID-19-related and mental health outcomes, our findings suggest a more complicated picture with SGM identity, which likely represent an interconnection of minority stress factors (e.g., lifetime experiences, stigma) that together affect how SGM young people are uniquely experiencing acute stressors during this pandemic (White Hughto et al., 2015; Phillips et al., 2020).

There are several hypotheses for why SGM young people may be experiencing the stressors of COVID-19 differently than non-SGM young adults outside of the above factors. Given their significantly higher levels of PTSD symptoms ($p<.001$), an unprecedented social isolation mandate can feel re-traumatizing for SGM young adults, who commonly have histories of victimization and rejection (Livingston et al., 2020). Furthermore, many young people have returned to their parents' homes during the pandemic. This may have prevented them from receiving routine support (e.g., therapy), even virtually, due to worries about privacy, "outness," and family rejection. This is particularly concerning given that the COVID-19 pandemic implies an entirely new set of social and emotional stressors not normally seen in day to day life (Fish et al., 2020). Lastly, given the demonstrated burden of COVID-19's on SGM young adults, they may not be able to give or receive the same caliber of support from their SGM peers as before the pandemic. Loss of connection to and participation in LGBTQ+ communities, which has been shown to be a stronger protective factor for SGM compared to non-SGM mental health, could explain the disparity in COVID-19-related worry and grief seen in SGM young people (Toomey et al., 2011; Mereish and Poteat, 2015; Poteat et al., 2016).

Future research around understanding the SGM identity in COVID-19 may need to develop more detailed survey questions and incorporate qualitative analyses. This will allow us to delve deeper (as well as beyond) the well-described constructs of family support, resilience, and discrimination in explaining the SGM experience.

4.1. Limitations

The present study has several limitations. First, as a cross-sectional cohort recruited through convenience sampling, our sample is majority white female students from similar socioeconomic backgrounds, concentrated in the northeast of the United States. Thus, one must use discretion when drawing cause-and-effect conclusions and generalizing to the U.S. young adult population. Second, our survey relies on self-report, which may be prone to bias and misinterpretation. Third, while our survey had various options for gender identity, we did not explicitly ask for sex assigned at birth, which may have been important in identifying gender minorities. Finally, our survey did not assess whether respondents relocated to their family members' homes, which could further clarify how family support affects mental health. Future analyses with qualitative interviews and longitudinal follow-up data will mitigate these limitations and better characterize the SGM experience during the pandemic.

4.2. Conclusions

SGM young people are a particularly vulnerable and often overlooked community affected by the pandemic, with less family support and more baseline mental health diagnoses and lifetime discrimination than their non-SGM peers. University administrators and employers must consider the unique impacts of closing work spaces and campus housing and potentially forcing SGM young adults to engage with unsupportive family members and act accordingly. This includes, but is not limited to, offering tangible resources regarding housing and employment security or health education and risk management regarding COVID-19. Clinically, because previous diagnoses do not entirely predict mental health symptoms during the pandemic, providers must tailor their treatment to consider how SGM patient's mental health may be uniquely affected by the pandemic's disruptions to society and daily life. Attention should be given to how SGM young people access mental health care while maintaining confidentiality and privacy, especially because their families may be unaware or unsupportive of their identities.

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CRediT authorship contribution statement

Kanika Kamal: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing. **Jason J. Li:** Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing. **Hyeouk Chris Hahm:** Conceptualization, Writing - review & editing, Supervision, Funding acquisition. **Cindy H. Liu:** Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing, Project administration, Supervision, Funding acquisition.

Declaration of Interests

None.

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