

Female black, indigenous, and students of color demonstrate greater resilience than other students during a global pandemic

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Abstract

Background: The impact of the COVID-19 pandemic on higher education institutions was particularly severe for those serving low-income students and/or students of color (BIPOC). Due to systemic inequities and intersectionality, the pandemic likely had a different impact on students depending on their identity. **Purpose:** This longitudinal study measured the stress of college students at a Hispanic-serving institution during the first year of the COVID-19 pandemic to understand how their racial/ethnic and gender identities shaped their experience. **Research Design:** A survey, including a refined and validated Perceived Stress Scale, was used to measure participants' stress, academic concerns, and pandemic concerns. **Study Sample:** Undergraduate students enrolled at Lehman College: n=849 in April 2020, n=701 in October 2020, and n = 686 in April 2021. **Data Analysis:** Descriptive statistics and ANVOA were used to analyze the data, group participants, and compare stress and concerns across groups. **Results:** Results indicate that female-identifying BIPOC students exhibited greater resilience than other students (by race/ethnicity and gender). **Conclusion:** These findings support prior research highlighting the resilience of BIPOC undergraduate students.

Keywords

COVID-19, intersectionality, racism, higher education

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Introduction

The impact of the COVID-19 pandemic on higher education institutions was sudden, swift, and severe. Faculty and students, some of whom

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had never used technology in the classroom before, were suddenly forced to teach and learn remotely (Maloney and Kim, 2020). The steep learning curve was complicated further for students and faculty in New York City, which was the epicenter of the pandemic from March to May 2020, in the United States (Thompson, 2020). Neighborhoods hit hardest included communities of color, those with the highest rates of poverty, and with high proportions of persons with underlying conditions. As home to some of the poorest neighborhoods of color suffering most from relevant co-morbidities (e.g., asthma), Bronx residents suffered more than any other borough: the age-adjusted incidence, hospitalization rate, and death rate were highest in the Bronx (Thompson, 2020). During this time, morale was low and stress was high: institutional racism, cramped multi-generational housing, and other social determinants of health were already accepted as factors contributing to the Bronx's status as the least healthy county in New York State and thought to contribute to the pandemic's early devastation in the borough (De Freytas-Tamura et al., 2020).

Lehman College is the only 4-year public institution of higher education in the Bronx and has been consistently ranked among the top five colleges for social mobility (CUNY–Lehman College Overall Rankings | US News Best Colleges, n.d.). At the onset of the pandemic (in the 2019–2020 academic year), nearly 7709 undergraduate and 985 graduate students enrolled at Lehman College were residing in the Bronx (Lehman College Institutional Research: Interactive Fact Book, n.d.). Of Lehman's undergraduate student population, 93.5% identify as Black, Indigenous, or a person of color (BIPOC), with the greatest proportion identifying as Hispanic (51.4%) and non-Hispanic Black (32.1%). As a result, the Lehman College student population were greatly affected, potentially more than any other students in the country at the pandemic's onset.

Recent research confirms that throughout the pandemic, college students experienced high rates of stress and anxiety. At the onset of the

pandemic (March–May 2020), students' high stress and anxiety was related to fear for their own health and the health of their loved ones, difficulty concentrating, sleep disruptions, decreased social interactions (due to physical distancing) and increased concerns about academic performance (Son et al., 2020). Many students also reported a negative perception of virtual learning during sheltering-in-place (Abbasi et al., 2020), which may be compounded for low-income students who have limited internet and/or technology accessibility (Gillis and Krull, 2020; Gonzalez-Ramirez et al., 2021). By the winter 2020, students were reportedly more sedentary, still anxious, and depressed (Huckins et al., 2020). Students struggled to find quiet spaces, worried about finances, and struggled to connect with peers and faculty (Gonzalez-Ramirez et al., 2021). While the opportunity for a COVID-19 vaccination might have contributed to a reduction in student stress, some research indicates that young adults (i.e., most of the US college student population) were among the most hesitant groups to receive the vaccine (Hamel et al., 2021).

Of particular concern is the effect of the pandemic on mental health may have been worse for women than men. A longitudinal study of the general population in China at the onset and 4 weeks into the pandemic (at the peak) indicated that being female was associated with a higher psychological impact of COVID-19 (Wang et al., 2020). Other research assessing mental health in the general population in the United Kingdom also indicated that being female—and also of a younger (adult) age—was associated with worsening mental health (Pierce et al., 2020). These data are particularly concerning because Black and Hispanic women enroll in college less frequently than white women (COE - College Enrollment Rates, n.d.). Given the evidence that pre-existing educational inequities were exacerbated and amplified during the pandemic (Shin and Hickey, 2021), women of color may be at a higher risk of attrition or suffering from greater psychological stress than other student populations.

Longitudinal research about the impact of the pandemic on college students' stress and academic concerns is extremely limited. Cross-sectional research from the early pandemic indicates that college students who are low-income, of color, female, non-binary, not heterosexual, or who are caregivers experienced more depression and anxiety than their non-impooverished, white, male, cis-gender, heterosexual, non-caregiving peers (Chirikov et al., 2020). The degree to which students' stress was related to concerns about the COVID-19 pandemic or their academics, however, remains unknown. Longitudinal research is needed to better understand college students' mental health and experiences during the pandemic, particularly for vulnerable, historically marginalized students, and is critical to improving educational equity in the pandemic's aftermath.

Mental state during a public health crisis may be explored using theoretical constructs described by Psychological Capital Theory (PsyCap), which indicates that a positive mental state (in which an individual feels hope, efficacy, resilience, and optimism) is correlated with a positive outlook, satisfaction, success, and wellbeing (Youssef-Morgan and Luthans, 2015). Qualitative research conducted at the onset of the COVID-19 pandemic indicates that students may demonstrate optimism and resilience (Burt and Eubank, 2021) but due to a small sample size and a retrospective study design, these constructs have not been fully explored nor explored longitudinally during the pandemic. The Perceived Stress Scale (PSS-12) was refined and validated to explore helplessness (the opposite of hope) and efficacy during the COVID-19 pandemic and may be used to explore PsyCap constructs over time. The purpose of this longitudinal study was to measure the stress of college students at a Hispanic-serving institution during the first year of the COVID-19 pandemic (using the PSS-12) to understand how their racial/ethnic and gender identities shaped their experience.

Methods

This longitudinal study measuring perceived stress and other concerns during the first year of the COVID pandemic was conducted from April 2020 to April 2021 at a 4-year Hispanic-Serving Institution in the Bronx, NY.

Study design and participants

Initial recruitment and data collection procedures for the baseline data collection, including the validation of a refined perceived stress scale (PSS-12), are described in the validation study (Eubank et al., 2021). For the current study, data was collected using the same survey at two additional time points: October 2020 (6 months after sheltering-in-place began) and April 2021 (1 year after the pandemic forced shutdowns). There were questions added to the survey in April 2021 about nutrition, physical activity, and vaccine hesitancy. The vaccine hesitancy questions were those validated by the Center for Disease Control, and increased participant burden substantially. As a result, participation was incentivized through raffling 5-\$50 Amazon gift cards to participants in April 2021. The current article reports only on student PSS-12 scores and pandemic and academic concerns at each time point. This study was reviewed and approved by the Lehman College Institutional Review Board (protocol #2020-0269).

Data analyses

Counts and percentages for categorical variables and n , mean, and standard deviation for continuous variables were used to summarize demographic and other characteristics at each of the 3 timepoints. Mean differences in continuous variables between participant types (white men, white women, BIPOC men, BIPOC women) were analyzed at each timepoint using an ANOVA model where the reference category was white men. For binary variables, differences in percentages between participant types were analyzed similarly at each timepoint using a

logistic regression model with participant type in the model.

Results

There were 849 students who participated in the survey at baseline, 701 in October 2020, and 686 in April 2021. At each time point, participants were mostly female (51.6–69.4%), 16–24 years old (33.8–41.6%), and Latinx (29.6–36.9%). All participant demographic information is available in [Table 1](#).

Using the PSS-12, a refined stress scale validated specifically for the COVID pandemic, stress among Lehman College students started high and decreased over the first year of the pandemic ([Table 2](#)). At the onset of the pandemic, the average stress according to the PSS-12 was 29.12 (9.64 SD), which decreased to 26.47 (6.94 SD) in October 2020 and fell further to 21.10 (7.08 SD) by April 2021. Overall, stress reduced by about 28% over the course of the first year of the COVID-19 pandemic. The PSS-12 helplessness subscale followed a similar trend, with decreasing helplessness during the first year of the pandemic: average helplessness was 22.60 (8.13 SD) in April 2020, 20.58 (8.0 SD) in October 2020, and 14.94 (7.63 SD) in April 2021. Interestingly, self-efficacy followed a different trend. Average self-efficacy (which was reverse coded) was 5.52 (2.59 SD) in April 2020, which increased to 9.17 (2.52 SD) in October 2020, before decreasing slightly to 8.84 (2.38 SD) in April 2021.

Gender and racial/ethnic differences

Given the interest of the pandemic experiences of persons based on race/ethnicity and gender, demographic differences between participant types (white men, white women, BIPOC men, BIPOC women) were assessed. There were no significant differences in age, income (most participants reported a household income of less than \$20,000 annually), education level, (most students were either high school graduates or held an associate degree), disability status,

enrollment status (i.e., full or part time students), receiving government assistance (most to all students reported receiving government assistance), having dependents, or classification as an “essential employee” who worked in person while sheltering in place. One difference was observed in which groups reported having lost work due to COVID: BIPOC men (BIPOC-M), were less likely to report losing work to COVID than white men (WM) ($p < 0.05$).

At the onset of the pandemic, in April 2020, there were no differences in stress based on race/ethnicity and gender. WM, white women (WW), BIPOC-M, and BIPOC women (BIPOC-W). BIPOC-W reported the highest baseline stress according to the PSS-12 of all groups in April 2020, which decreased over the first year of the COVID-19 pandemic. BIPOC-M and WW followed a similar trend of decreasing stress. WM, however, experienced a temporary decrease in stress during the first 6 months of the pandemic which increased by April 2021. Significant differences were observed between WM and other groups. In October 2020, the stress of WM was relatively low while stress in BIPOC-W was significantly higher ($p < 0.05$), and even higher than WW and BIPOC-M. In April 2021, all women were significantly less stressed than WM ($p < 0.001$ for BIPOC-W and WW) as were BIPOC-M (less stressed than WM) ($p < 0.05$).

Of the two subscales, helplessness was driving the observed differences in stress; that is, the same stress patterns (including statistical significance, but not to the same level) were observed on the helplessness subscale. In essence, the helplessness of all participant subgroups (WM, WW, BIPOC-M, and BIPOC-W) was high at baseline and, other than WM, decreased over time (p -values for each group are in [Table 2](#)). WM felt the most helpless at baseline, which decreased after 6 months and increased to a near-baseline level after 1 year.

Different patterns were observed for the self-efficacy subscale, with non-significant results. Decreases in self-efficacy were observed in WM, WW, and BIPOC-M throughout the first

Table I. Demographic information of student participants in a campus-wide survey of stress during the first year of the COVID pandemic at a 4-year public institution in the Bronx, NY.

	Baseline April 2020 n (%)	Oct 2020 n (%)	April 2021 n (%)
Total sample size	849	701	686
Gender			
Male	129 (15.2)	93 (13.3)	85 (12.4)
Female	589 (69.4)	362 (51.6)	377 (55)
Non-binary	2 (0.2)	6 (0.9)	9 (1.3)
No response	129 (15.2)	240 (34.2)	215 (31.3)
Age			
16–24	353 (41.6)	237 (33.8)	281 (41.0)
25–34	192 (22.6)	121 (17.3)	112 (16.3)
35–44	108 (12.7)	56 (8.0)	52 (7.6)
45–54	40 (4.7)	35 (5.0)	15 (2.2)
55–64	17 (2.0)	11 (1.6)	4 (0.58)
65–73	4 (0.47)	1 (0.14)	3 (0.44)
No response	135 (15.9)	240 (34.2)	219 (31.9)
Race			
African/African American	140 (16.5)	84 (12)	92 (13.4)
Afro-Caribbean or Afro-Latinx	107 (12.6)	80 (11.4)	67 (9.8)
Central or South American Latinx	71 (8.4)	47 (6.7)	44 (6.4)
North American or Caribbean Latinx	135 (15.9)	77 (11)	77 (11.2)
Native American/Alaskan Native	1 (0.1)	1 (0.1)	1 (0.1)
Middle Eastern	8 (0.9)	6 (0.9)	11 (1.6)
Indian/Other nation in Indian subcontinent	14 (1.6)	10 (1.4)	31 (4.5)
Pacific Islander	4 (0.5)	7 (1.0)	7 (1.0)
East Asian	8 (0.9)	13 (1.9)	17 (2.5)
White	55 (6.5)	40 (5.7)	56 (8.2)
Two or more	65 (7.7)	35 (5.0)	68 (9.9)
No response	241 (28.4)	301 (42.9)	215 (31.3)
POC			
No	134 (15.8)	91 (13)	127 (18.5)
Yes	470 (55.4)	294 (41.9)	342 (49.9)
No response	245 (28.9)	316 (45.1)	217 (31.6)
Income			
0-\$20k	309 (36.4)	128 (18.3)	175 (25.5)
20–40k	99 (11.7)	124 (17.7)	151 (22.0)
40–60	53 (6.2)	61 (8.7)	70 (10.2)
60–80	20 (2.4)	28 (4.0)	35 (5.1)
80–100	14 (1.6)	14 (2.0)	11 (1.6)

(continued)

Table 1. (continued)

	Baseline	April 2020 n (%)	Oct 2020 n (%)	April 2021 n (%)
100–150	9 (1.1)		13 (1.9)	19 (2.8)
150+	4 (0.5)		7 (1.0)	3 (0.4)
No response	341 (40.2)		326 (46.5)	222 (32.4)
Academic Degree				
Less than high school diploma	1 (0.1)		0 (0.0)	0 (0.0)
High school diploma	280 (33)		203 (29)	229 (33.4)
Technical/Vocational	11 (1.3)		7 (1)	4 (0.6)
Associates	328 (38.6)		196 (28)	159 (23.2)
Bachelors	68 (8.0)		38 (5.4)	75 (10.9)
Masters	9 (1.1)		5 (0.7)	3 (0.4)
Professional or other terminal	4 (0.5)		2 (0.3)	1 (0.1)
No response	148 (17.4)		250 (35.7)	215 (31.3)
Disability				
No	533 (62.8)		317 (45.2)	373 (54.4)
Yes	126 (14.8)		86 (12.3)	98 (14.3)
Missing	190 (22.4)		298 (42.5)	215 (31.3)
Enrollment status				
Part time	198 (23.3)		109 (15.5)	110 (16.0)
Full time	512 (60.3)		341 (48.6)	364 (53.1)
No response	139 (16.4)		251 (35.8)	212 (30.9)

year of the pandemic. That is, in general, participants reported feeling less self-efficacy as the pandemic went on. In contrast, BIPOC-W reported feeling the least self-efficacious in October 2020, which improved by April 2021.

Some differences were observed between subgroups in analyses of participants' concerns related to the pandemic and academics (Table 3). Five pandemic-related items measured concern to obtain food, earn enough income, get enough physical activity, pay for necessities, and obtain household items. Differences were observed only on the last item, at the last time point: in April 2021, WW ($p < 0.01$), BIPOC-W ($p < 0.05$), and BIPOC-M ($p < 0.05$) were significantly more concerned than WM about "obtaining household items (e.g., toilet paper)."

Academic concern items included: ability to complete coursework, earn a high grade, earn as high a grade as if the pandemic didn't happen, and balance personal responsibilities with coursework. Differences between subgroups were observed on some items in October 2020 and in April 2021. In October 2020, WW were significantly more concerned than WM about being able to complete coursework ($p < 0.05$), earn as high a grade as if the pandemic never happened ($p < 0.01$), and be able to manage personal responsibilities with schoolwork ($p < 0.05$). By April 2021, fewer differences were observed: WW's only remaining concern (which was significantly different from WM) was about managing personal responsibilities with schoolwork ($p < 0.05$).

Table 2. ANOVA interaction analysis of perceived stress score (using the PSS-12) by participant type among college students at a 4-year public institution in the Bronx, NY.

Total sample		April 2020 mean (SD)	October 2020 mean (SD)	April 2021 mean (SD)
PSS Total Score		29.12 (9.64)	26.47 (6.94)	21.10 (7.08)
PSS		22.60 (8.13)	20.58 (8.08)	14.94 (7.63)
Helplessness				
PSS Self-Efficacy ^a		5.52 (2.59)	9.17 (2.52)	8.84 (2.38)
	Participant Types	April 2020 mean (SD)	October 2020 mean (SD)	April 2021 mean (SD)
PSS Total Score	white male	29.49 (12.22)	23.93 (7.76)	27.03 (8.75)
	white female	27.41 (9.99)	23.77 (7.07)	20.92 (5.71)***
	BIPOC male	27.28 (10.82)	25.69 (7.35)	22.45 (7.55)*
	BIPOC female	29.96 (9.12)	27.62 (6.71)*	20.44 (6.82)***
PSS	white male	22.93 (10.41)	17.29 (9.45)	21.46 (10.28)
Helplessness	white female	21.36 (8.65)	16.85 (7.75)	14.87 (6.51)***
	BIPOC male	20.60 (8.86)	19.92 (8.12)	16.90 (8.05)*
	BIPOC female	23.33 (7.74)	21.99 (7.81)**	14.23 (7.14)***
PSS Self-Efficacy ^a	white male	6.11 (3.0)	8.30 (2.37)	9.40 (3.63)
	white female	5.88 (2.76)	8.22 (2.32)	8.96 (2.05)
	BIPOC male	5.33 (2.70)	9.21 (2.28)	9.46 (2.65)
	BIPOC female	5.36 (2.45)	9.44 (2.59)*	8.77 (2.29)

Note: p values indicate significance at that time point, compared to white men.

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

^aThis item was reverse coded so that a high score equals lower self-efficacy (and more stress).

Discussion

This study is the only known study to capture the experiences and stress of students during the first year of COVID-19 pandemic. At the time of baseline data collection, New York City (and the Bronx, specifically) was the epicenter of the pandemic and most of the country was under orders to shelter-in-place (De Freytas-Tamura et al., 2020), which was an especially unique and sensitive time to collect stress-related data among predominantly low-income students of color. The results of this study shed light on how students experienced the pandemic differently, based solely on gender and race. PsyCap Theory was used as the theoretical lens for this study to connect constructs measured by the PSS-12 (helplessness and efficacy) with other constructs related to success resulting from a positive mental state (resilience and optimism). This study was also conducted through the lens of systemic oppression and an assumption that

public health crises affect persons differently based on marginalization. Since there are known differences in education, income, and access to healthcare that falls along gender and/or racial lines due to historical injustices and bias, this study describes the unique impact on different student profiles.

Expectedly, total stress (measured by PSS-12) among all participants was relatively high at the onset of the pandemic. For WW, BIPOC-M, and BIPOC-W, decreased linearly throughout the first year of the pandemic. Exploring stress through the PSS-12's two subscales measuring helplessness (perceived ability to do something in a bad situation) and self-efficacy (belief in one's own skills to do something) illuminate important findings about participants' experience. While total stress decreased, BIPOC participants and WW felt less helplessness throughout the first year. Interestingly however, while total stress decreased from October 2020 to April 2021,

Table 3. Concerns about the pandemic and completing coursework during the pandemic among college students at a 4-year public institution in the Bronx, NY.

Pandemic concerns	Person type	April 2020 mean (SD)	October 2020 mean (SD)	April 2021 mean (SD)	
If I will be able to get enough food for myself my family	white male	3.1 (1.3)	2.64 (1.31)	2.23 (1.21)	
	white female	3.17 (1.31)	2.36 (1.36)	2.67 (1.26)	
	BIPOC male	3.07 (1.28)	2.5 (1.38)	2.77 (1.31)	
	BIPOC female	3.03 (1.26)	2.81 (1.28)	2.52 (1.12)	
	If I will be able to earn enough income to support myself and my family	white male	3.07 (1.46)	3.41 (1.37)	2.69 (1.35)
		white female	3.33 (1.31)	2.98 (1.39)	3.11 (1.21)
BIPOC male		3.2 (1.42)	3.07 (1.47)	3.03 (1.21)	
BIPOC female		3.45 (1.37)	3.39 (1.34)	3.11 (1.29)	
If I will be able get physical activity		white male	3.23 (1.25)	3.5 (1.26)	2.88 (1.45)
		white female	3.29 (1.19)	2.98 (1.20)	3.26 (0.98)
	BIPOC male	3.42 (1.31)	3.24 (1.32)	3.12 (1.26)	
	BIPOC female	3.21 (1.26)	3.08 (1.30)	3.24 (1.19)	
	If I will be able to pay for basic necessities (e.g., rent internet or phone service)	white male	3.1 (1.42)	3.25 (1.40)	2.58 (1.39)
		white female	3.32 (1.39)	2.82 (1.47)	3.15 (1.33)
BIPOC male		3.33 (1.36)	2.89 (1.55)	3.14 (1.32)	
BIPOC female		3.49 (1.35)	3.33 (1.40)	3.1 (1.3)	
If I will be able to obtain household items (e.g., toilet paper)		white male	3.47 (1.11)	3.0 (1.11)	2.38 (1.17)
		white female	3.47 (1.21)	2.74 (1.28)	3.15 (1.26)**
	BIPOC male	3.24 (1.28)	2.67 (1.32)	3.02 (1.26)*	
	BIPOC female	3.51 (1.21)	3.22 (1.31)	2.98 (1.20)*	
	Academic Concerns	Person Type	April 2020 mean (SD)	October 2020 mean (SD)	April 2021 mean (SD)

(continued)

Table 3. (continued)

Pandemic concerns	Person type	April 2020 mean (SD)	October 2020 mean (SD)	April 2021 mean (SD)
I will be able to complete my coursework	white male	3.03 (1.43)	3.14 (1.46)	3.81 (1.33)
	white female	3.33 (1.26)	3.72 (1.24)*	3.59 (1.04)
	BIPOC male	2.92 (1.34)	3.28 (1.08)	3.43 (1.08)
	BIPOC female	2.87 (1.17)	3.04 (1.26)	3.47 (1.21)
I will be able to earn a high grade in one or more courses	white male	2.72 (1.49)	3 (1.51)	3.77 (1.53)
	white female	3.1 (1.33)	3.47 (1.30)	3.43 (1.14)
	BIPOC male	3.0 (1.31)	3.22 (1.11)	3.44 (1.15)
	BIPOC female	2.57 (1.23)	2.86 (1.32)	3.35 (1.23)
I will be able to earn as high a grade as I would have if the COVID pandemic never happened	white male	2.8 (1.69)	2.52 (1.50)	3.35 (1.65)
	white female	2.91 (1.46)	3.43 (1.37)**	2.91 (1.22)
	BIPOC male	2.61 (1.47)	2.91 (1.23)	3.4 (1.34)
	BIPOC female	2.35 (1.42)	2.76 (1.45)	3.02 (1.38)
I will be able to manage my personal responsibilities with my schoolwork	white male	3.0 (1.51)	2.66 (1.20)	3.58 (1.55)
	white female	3.07 (1.26)	3.35 (1.23)*	3.15 (1.04)
	BIPOC male	2.71 (1.36)	3.11 (1.10)	3.4 (1.14)
	BIPOC female	2.58 (1.21)	2.71 (1.30)	3.06 (1.26)*

p values indicate significance at that time point, compared to white men.

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

BIOPC-M, BIPOC-W, and WW reported feeling less self-efficacy (e.g., confidence in their capacity to meet their goals). WM, on the other hand, experienced a temporary decrease in total stress, which rose again at 1 year, by April 2021. They reported decreasing self-efficacy throughout the first year, and helplessness, which was high in April 2020 and started to wane in October, rose again by April 2021.

Participants were feeling the most self-efficacious at baseline implying that they felt confident they could do what they needed to succeed. At the onset of the pandemic during the spring semester while most of the US was sheltering-in-place, data indicates there may have been a sense of “unrealistic optimism” about the consequences of the pandemic or improper risk perceptions (Bottemanne et al., 2020), which may have contributed to

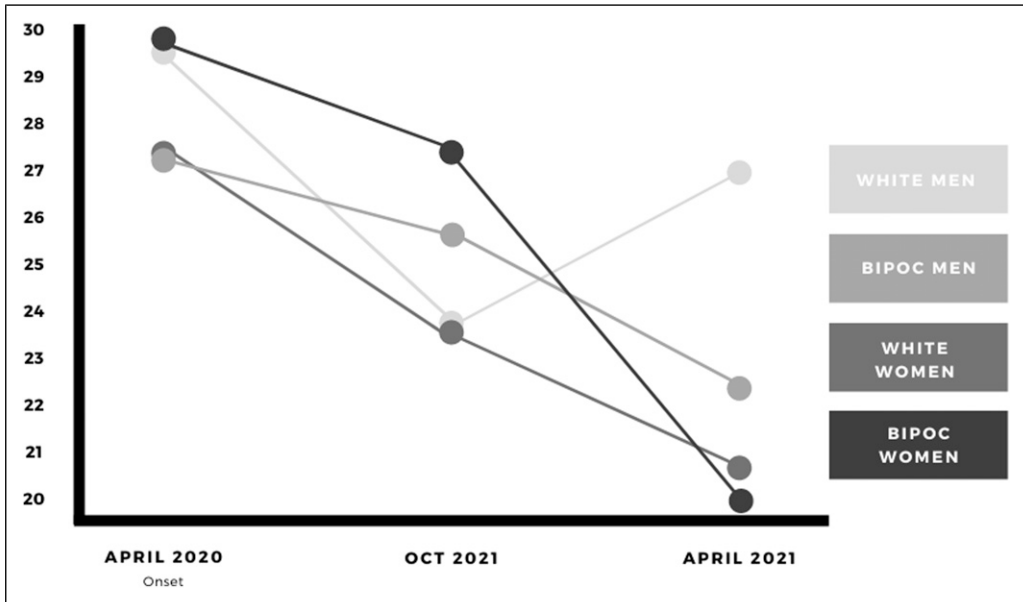


Figure 1. Trends in stress during the first year of the COVID-19 Pandemic using the PSS-12 among college students at a 4-year public institution in the Bronx, NY.

participants' relatively high sense of self-efficacy, compared to 6 months into the pandemic. By October 2020, it was clear that participants were reporting markedly different feelings of self-efficacy, which continued to trend in a worse direction in April 2021 for all groups except BIPOC-W. BIPOC-W was the only group for which self-efficacy improved between October 2020 and April 2021.

Taken together, these results indicate that in general, participants' initial feelings of helplessness during the onset of the pandemic improved within the first year. However, initial disillusionment may have contributed to a false sense of optimism, which dropped precipitously and remained low by the end of the first year. In sum, by April 2021, participants' felt less stressed, and perhaps like the pandemic was improving, but they still did not feel that they had the capacity to exert control to meet their own needs. However, participants' experiences varied significantly by race and gender, which is

described below in each participant profile type and observed in [Figure 1](#).

White men

The experience of white men (WM) during the pandemic was different than all other racial/gender participant types. Despite all participant types experiencing similar stress levels at the onset, WM had the highest total PSS-12 score in April 2020, which was driven by high levels of helplessness. One year later, WM reported continuing to experience greater levels of helplessness compared to everyone else. Interestingly, by April 2021, WM reported the lowest scores on pandemic concern items of all participant types but scored higher than others on all academic concerns. Perhaps reflecting WM's concerns about academics, their overall PSS-12 score was significantly higher than all other groups and was comparable to the high stress levels observed at the onset of the pandemic.

Black, Indigenous, and people of color men

Black, Indigenous, and people of color men (BIPOC-M) reported the lowest stress relative to other participant types at the onset of the pandemic, but it was not significantly different from WM. BIPOC-M experienced a slow but steady decline in stress during the pandemic. By April 2021, BIPOC-M were significantly less stressed than WM but still scored higher than BIPOC and white women.

White women

White women (WW) were the most concerned about academics at the onset of the pandemic, indicated by the highest absolute score on all academic concerns at baseline and in October 2020, only three of which were significantly different than WM. However, by April 2021, WW had a low PSS-12 score in April 2021, experienced the most self-efficacy, and low helplessness in April 2021.

Black, Indigenous, and people of color women

Black, Indigenous, and people of color women (BIPOC-W) had highest absolute stress score at baseline and the lowest stress score in April 2021. At the end of the first year of the pandemic, BIPOC-W were feeling the least helpless and the most self-efficacious, demonstrating tremendous resilience. This is especially notable given that BIPOC-W reported the highest baseline pandemic concerns (on most items) and some of their concerns remained in April 2021, which seems to not have impacted their total stress. BIPOC-W were not very concerned about academics (in terms of absolute numbers) at baseline compared to all other groups. They were able to keep those concerns at bay, as BIPOC-W continued to have low scores on academic concern items throughout the first year of the pandemic.

These findings are especially noteworthy given the disproportionate burden of intersectionality (racism, sexism, and other forms of bias) that has created additional social and familial responsibility for BIPOC-W. BIPOC-W are critical contributors of economic support for their families, often acting as sole earners or breadwinners (more frequently than WW), are more likely to be single parents than WW, and were more likely to work in industries affected by the COVID pandemic (Frye, 2020). Further complicating these conditions are historic inequities and systemic racism that contribute to BIPOC-W having accumulated less wealth and earning lower incomes, so disruptions to employment during the pandemic were disproportionately experienced by BIPOC-W. The reduction in stress observed in April 2021 might be related to the mass distribution of vaccines and/or the re-opening of K-12 schools, which may have resulted in optimism that the pandemic was improving.

Intersectionality also impacts BIPOC-W in educational settings and in academic institutions as well. BIPOC-W are underrepresented in academia, with few BIPOC-W faculty role models in an institutional landscape of white male dominance (Gause, 2021). Microaggressions, limited access to mentorship, overt stereotyping, and covert bias are a few of the ways that white male privilege in academia is manifested (Banks and Dohy, 2019; Burt et al., 2021; Gause, 2021; Johnson-Ahorlu, 2012). Black female leaders in academia are vocal about the marginalization they experienced as students and even more so as leaders (Gause, 2021). BIPOC-W undergraduates, especially Latina and Black students, demonstrate resilience in their everyday lives, under usual conditions, to navigate and succeed in the inequitable academic environment (Liou et al., 2021; West, 2018). These circumstances make it especially difficult for BIPOC-W to succeed and the crisis of a global pandemic exacerbates the challenges. Yet, at Lehman College nutrition undergraduate students demonstrated optimism and resilience despite being essential, front line health care workers at the

time that NYC was the pandemic epicenter (Burt and Eubank, 2021). The results of this study confirm students' resilience and demonstrate that BIPOC-W were able to retain and operationalize resilience to lower their own stress (and likely improve mental health and ultimate success).

Resilience, optimism, efficacy, and hope are key constructs described in PsyCap Theory and were used as the foundational basis of the current study and resilience was found to be highest among BIPOC-W but the reasons as to why are unknown (from this study). There may be reasons why resilience is higher among BIPOC-W, many of which are related to racism and systemic oppression. Institutional and systemic bias creates social disadvantage whereby marginalized persons face more adversity than their dominant group peers to realize the same goals. As a result, persons who have one or more marginalized identities experience chronic hardship which may (a) produce more stress (Williams (2019) and (b) also promote resilience (Anderson, 2019). Though there is a correlation between experiencing discrimination and poorer mental health (Williams, 2019), there is also evidence that facing adversity begets resilience for marginalized persons (Anderson, 2019). A recent systematic review confirmed these seemingly conflicting results, indicating a lack of understanding about the relationship between resilience and oppression (Cabrera Martinez et al., 2022) and the results of this study contribute to the much needed, growing body of literature.

Limitations

There is a substantially high proportion of missing data, as evidenced in Table 1. After careful consideration about participant burden during the worst of the NYC pandemic, the questions on the survey were all optional, allowing participants to answer only those they felt prepared to answer. This method was chosen to privilege that some information is better than no information.

Due to low participation from people who identify as non-binary, transgender, and/or genderqueer and within individual racial/ethnic groups, this study was underpowered to compare the nuances of students' experiences. As a result, participant profiles are based on very broad demographic categories.

Conclusion

The COVID-19 pandemic has had a disproportionate impact on people with marginalized identities, including those who are of lower socioeconomic status or who identify as persons of color. College students at institutions known for social mobility and serving their local communities (e.g., low-income neighborhoods of color), like Lehman College, struggled in unique and important ways during the onset of the pandemic when New York City was the epicenter and Bronx residents were suffering at high rates. Stress in the Bronx was high in the early pandemic; public housing for low-income residents became known as the "Death Towers" and some of the tens of thousands of bodies across New York City were stored on over 200 refrigerated trucks, parked on streets, loaded, and stored in plain sight (De Freytas-Tamura et al., 2020; Cherelus and Ochs, 2020). The Perceived Stress Scale (PSS-12) was adapted and validated to explore helplessness and self-efficacy during the COVID-19 pandemic and operationalized in this study at three time points over the first year of the pandemic to understand students' stress and how they were adapting.

The results of this study indicate that overall, participants' PSS-12 scores decreased over the first year of the pandemic. The scores white women, BIPOC men, and BIPOC women trended downward over the first year while the scores of white men initially decreased but rose again at 1 year. Though the reasons for this are unknown, these findings may be related to vaccine hesitancy, as young adults were among more hesitant groups. BIPOC women demonstrated the most resilience, having the highest scores at baseline and the lowest scores at 1 year.

PsyCap Theory, which describes how resilience, hope (the opposite of helplessness, efficacy, and optimism contribute toward a positive mental state that is correlated with success, is useful to understand the potential impact of these findings. Persons who experience marginalization because of systemic oppression face adversity daily and overcoming these may beget and promote greater resilience, and ultimately, success.

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