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The Effects of COVID-19 Victimization Distress and Racial Bias on Mental Health Among AIAN, Asian, Black, and Latinx Young Adults

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Objective: U.S. young adult racial minorities have been disproportionately impacted by the coronavirus disease (COVID-19) pandemic in rates of infection and morbidity. Prepandemic racial discrimination has been associated with depression and general anxiety. However, the effect of coronavirus-specific forms of discrimination on mental health has not been examined. This study assessed the effect of social determinants of mental health and COVID-19-specific victimization and racial bias beliefs on depression and anxiety among young adults of color in the U.S. ***Method:*** A national online survey of 399 American Indian/Alaskan Natives, Asian, Black, and Latinx adults (18–25 years) included demographic variables, COVID-19-health risks, and standardized measures of depression, anxiety, coronavirus-related victimization distress and perceptions of coronavirus-related racial bias across a range of contexts. ***Results:*** Employment, financial and prescription insecurity, COVID-19-health risks, coronavirus-victimization distress and coronavirus racial bias beliefs were positively correlated with depression and anxiety. Scores on the Coronavirus Racial Bias Scale were significantly higher among Asian and Black respondents. Structural equation modeling controlling for race/ethnicity and demographic variables indicated coronavirus racial bias mediated the effect of coronavirus victimization distress on both mental health indices. ***Conclusion:*** Results suggest the COVID-19 pandemic has created new pathways to mental health disparities among young adults of color by reversing formerly protective factors such as employment, and by exacerbating structural and societal inequities linked to race. Findings highlight the necessity of creating mental health services tailored to the specific needs of racial minorities during the current and future health crises.

Public Significance Statement
COVID-19 has had a devasting effect on the physical health of racial minorities in the U.S., yet little is known about how pandemic-related racial discrimination has affected their mental health. Using newly validated scales, a national survey found distress caused by COVID-19-related victimization experiences and perceived increases in nationwide racial bias increased symptoms of anxiety and depression over and above the impact of preexisting health risks, employment and financial insecurity among American Indian/Alaskan Natives, Asian, Black, and Latinx young adults. The study underscores how the pandemic has created new pathways to mental health disparities among young adults of color by exacerbating societal inequities linked to race.

Keywords: coronavirus, racial bias, mental health

The coronavirus disease (COVID-19) pandemic has amplified existing racial health disparities in the U.S. American Indian/Alaskan Natives (AIAN), Asian, Black, and Latinx young and older adults are at disproportionally higher risk for COVID-19 infection and mortality (Centers for Disease Control and Prevention [CDC], 2020a; Sze et al., 2020). These disparities are rooted in long-standing racial inequities in medical and behavioral health treatment utilization, access to culturally relevant health services, treatment satisfaction and trust, and service outcomes (Ben et al., 2017; Chen et al., 2019; Manuel, 2018; Melillo, 2020). During the COVID-19 pandemic, depression and anxiety among AIAN, Asian, Black, and Latinx people have also increased (Baldwin et al., 2020; Chen et al., 2019; McKnight-Eily et al., 2021). Prepandemic prevalence rates of major depression and generalized anxiety among these groups have often been reported to be similar to or lower than non-Hispanic Whites. These findings have been attributed to the fact that racial

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minorities in the U.S. seek mental health clinical care at rates well below their need, face discrimination during diagnosis and treatment, suffer from misdiagnosis and clinician bias, and within their communities mental health may be shrouded by silence and shame (Baldwin et al., 2020; Harkness et al., 2020; Mental Heath America, 2021; Novacek et al., 2020; Vilsaint et al., 2019). Further, although prior research has repeatedly reported on the protective effect of employment on mental health (McGee & Thompson, 2015; Paul & Moser, 2009), during the pandemic, employed individuals, especially those whose work involves in-person contact, are experiencing higher levels of depression and anxiety (McKnight-Eily et al., 2021; Mehdi et al., 2020). In 2020, people under the age of 30 accounted for more than 20% of COVID-19 cases, with young Black, Latinx young adults at greater risk than their counterparts; due in part to their disproportionate employment in health care, food, and essential services (Leidman et al., 2021). Although the proportion of Asian young adults infected and hospitalized were lower than these other groups, they faced increased cultural stigma and hate crime victimization leading to an increase in seeking mental health treatment (Lukpat, 2021).

Racial Discrimination and Mental Health

AIAN, Asian, Black, and Latinx populations in the U.S. experience unique stressors related to their marginalized social identity that adversely contribute to depression and anxiety, including explicit racial discrimination and microaggressions (Chin et al., 2020; Forrest–Bank & Cuellar, 2018; Lui, 2020). Intergenerational trauma created by enslavement of individuals of African descent and subsequent Jim Crow laws, colonialization of Indigenous people and violation of sacred lands, and labor-based exploitation and harsh immigration laws affecting Latinx and East Asian peoples have been shown to effect both physical and mental health among socially marginalized racial groups (Barlow, 2018; Chu et al., 2020; Cobb et al., 2019; Farisi et al., 2019; Sandoiu, 2020). Racial discrimination has long been documented as a psychosocial stressor associated with poor mental health outcomes including anxiety, depression, and decreased self-esteem (Hart et al., 2021; Sosoo et al., 2020; Yip, 2015). Racial discrimination affects mental health in many forms including frequent microaggressions creating sustained levels of stress and stress hormones, lack of access to mental health care, racism in mental health services marked by misdiagnosis, and race-based barriers to employment and housing (American Psychiatric Association, 2017; Gara et al., 2019; Trent et al., 2019; Williams, 2018). There is growing evidence that racism has increased during the current pandemic (Addo, 2020; Dhanani & Franz, 2021; Ruiz et al., 2020). According to the American Psychological Association's *Stress in American* annual report (American Psychological Association [APA], 2020), during the pandemic between 41% and 48% of AIAN, Asian, Black, and Latinx Americans reported discrimination as a significant source of stress in their life.

To date, the effect of COVID-19-specific victimization and racial bias on mental health among U.S. racially and ethnically minoritized individuals has not been examined among young adults. However, research on victimization distress in response to contagious diseases such as human immunodeficiency virus (HIV), influenza A subtype H1N1, and the 2003 severe acute respiratory syndrome (SARS) has found that both nationally and globally contagious disease discrimination is associated with long-term negative mental health outcomes including depression and anxiety (Crockett et al., 2019; Goodwin et al., 2009; Siu, 2008; Williams & Gonzalez–Medina, 2011). For young adult U.S. racially and ethnically minoritized individuals living through the COVID-19 pandemic, the extent to which personal experiences with coronavirus-related victimization are directly related to poor mental health outcomes may be influenced by perceptions regarding coronavirus-related racial bias across the country, and consequently, the extent to which they attribute coronavirus victimization as racially based (Mouzon et al., 2017; Potter et al., 2019).

The Biopsychosocial Theory and Social Determinants of Mental Health

The biopsychosocial theory of racism (Clark et al., 1999) provides a theoretical framework for understanding how racially motivated victimization and bias experienced within the context of health and economic racial inequities are critical social determinants of mental health among racial minorities during the COVID-19 pandemic. The principal assumption of this model is that the complex interplay of perceptions of life events as racist and disparities in preexisting health conditions, access to health care, financial security, and other sociodemographic factors increase stress and hinder adaptive coping among marginalized racial groups (Clark et al., 1999; Hisler & Brenner, 2019). Although rates differ among racial groups, compared with non-Hispanic Whites, AIAN, Asian, Black, and Latinx persons in the U.S. have higher rates of CDC-identified medical conditions associated with risk of severe illness from COVID-19, including obesity, diabetes, asthma, cardiovascular disease, and HIV (Bancks et al., 2017; Beavis et al., 2017; Cho et al., 2014; Flegal et al., 2016; Gold & Wright, 2005; Gordon et al., 2019). Moreover, during the pandemic racially and ethnically marginalized adults in the U.S. were more likely to be employed in the health-care work force or as frontline workers in industries such as food services, pharmacies, personal care and public transportation increasing their risk of COVID-19 exposure (Bureau of Labor Statistics, 2018; Gordon et al., 2019; Rho et al., 2020; Wang et al., 2020). Applied to the mental health of young adults, the theory suggests that personal experiences with COVID-related victimization and increases in pandemic-related racial bias will contribute to increases in anxiety and depression among racial minority adults. The theory further suggests that COVID-19 victimization and racial bias will exacerbate mental health stressors associated with preexisting health and economic disparities, work-related increases in exposure to COVID-19 infection, loss of a loved one to the virus, reduced access to prescriptions, and pandemic-related fears of unemployment and food insecurity (APA, 2020; Arenas et al., 2019; Donnelly & Farina, 2021; Mayo Clinic, 2020; McCurley et al., 2019; Nagata et al., 2019; Oh et al., 2019; Schachter et al., 2018), especially in lower income and racially segregated communities (CDC, 2020b).

The Present Study

Although the devastating impact of COVID-19 on the physical health of racial minorities in the U.S. has been well established, there is a paucity of research on how preexisting health and current economic and social factors are affecting the mental health of these populations (Galanis & Hanieh, 2021). Increased exposure to the

virus among racial young adults employed as essential workers and upsurges in racially based hate crimes and the COVID-19-specific tide of politically fomented related hate and violence against Asian Americans (Buchholz, 2021; Weiss, 2021) underscores the urgency of studying the effects of coronavirus-specific forms of discrimination and societal racial bias on the mental health of AIAN, Asian, Black, and Latinx young adults in the U.S.

The primary aim of the present study was to examine the relationship between coronavirus victimization distress and perceptions of COVID-19 related increases in racial bias and the mental health of AIAN, Asian, Black, and Latinx young adults during the first phase of the COVID-19 pandemic. The following hypotheses were tested: (1) Essential worker status, lower household income, financial and prescription insecurity, and number of COVID-19 health risks will be associated with higher levels of depression and anxiety; (2) higher levels of coronavirus victimization distress and perceptions of coronavirus racial bias across health care, social media and other settings will be associated with higher levels of depression and anxiety; (3) perceptions of coronavirus racial bias will mediate the association between coronavirus victimization distress and depression and anxiety among young adults of color when other variables are held constant.

Method

Participants and Recruitment

Data were collected during April 2020 as part of a larger internet-based national survey on the biological, psychological, and social impact of the coronavirus pandemic among young adults from diverse racial groups. Eligible participants self-identified as AIAN, Asian, Black, or Latinx; were between 18 and 25 years of age; self-reported they did not have/had the coronavirus; lived in the U.S. for more than 1 year; and could read English at an eighth-grade level.

Recruitment was conducted by Qualtrics XM, an aggregator of survey panel websites that can recruit individuals who have signed up to take paid surveys across multiple sites. The Qualtrics Research Suite allows for the Likert-type questions, display and skip logic used for the present study and has encryption and other privacy safeguards which separate participant email addresses from survey responses to provide additional privacy protections. Qualtrics XM posted advertisements on panel websites and sent emails to young adults who had signed up to take surveys across various survey panel websites and offered compensation worth $16.50 converted into the survey panels' point systems and received within 7 days of completion. The emails and posts briefly described the study and provided a link to a screener on a different Qualtrics site. The screener included questions on participants' age, race/ethnicity, assigned sex at birth, gender, sexual orientation, the U.S. state and zip code in which they lived, length of time living in the U.S., geographic region, living situation, employment and student status, and English-reading proficiency.

The target goal was to recruit 100 participants from each of the four racial groups, oversampling individuals living in rural areas. A Qualtrics system feature excluded participants who did not meet eligibility criteria and prevented them from reentering the screener. Manual data validation protocols were established to exclude fraudulent or repeat participants (e.g., consistency between age and date of birth; inconsistency between reported city in which the survey was taken and zip code). A speed check also excluded participants who responded in less than half the time of the median survey response. Approximately 57,000 people were contacted and a total of 223 AIAN, 198 Asian, 418 Black, and 195 Latinx participants completed the screener, with 535 meeting eligibility requirements. Of those 450 (84.11%) completed the survey and passed the speed check. An additional 51 respondents were eliminated because they reported having/had the coronavirus and seven were eliminated for missing data on the Coronavirus Racial Bias Scale (CRBS), resulting in a final sample of 399. Primary racial identity was reported as follows: AIAN (N = 86, representing 20 tribal memberships); Asian (N = 94; 54% East Asian, 46% South East Asian); Black (N = 128; 79% African American, 21% Caribbean, African, or Other); Latinx (N = 91; 47% Mexican, 18% Puerto Rican, 25% Central American, South American, or Other). The majority of the sample identified as cisgender females or males, heterosexual, were full or part-time employed (including 30.32% essential workers); and approximately half were students (see Table 1).

Following the screener, eligible individuals were sent to an informed consent page. Participants who selected "I agree" at the bottom of the page were redirected to the survey which consisted of 204 items (average completion time 14.02 min; SD = 33.84). Participants were able to quit the survey at any time by closing the survey window, these data were not included in analysis. At the end of the survey, online resources on health information and coronavirus prevention were provided. Qualtrics uses unique identification numbers for each participant so that identifiable information and survey data are not stored; therefore, participants identity and contact information were unknown to the investigators. The study was approved by the Fordham University Institutional Review Board.

Measures

Demographic Information

Demographic information collected included age, sex assigned at birth, gender, race, and ethnicity, sexual orientation, employment (full or part-time; "essential worker" status), student status and education, region, household income, financial and prescription insecurity, and CDC COVID-19-health risks (see Tables 1 and 2).

Coronavirus Victimization Distress Scale

The Coronavirus Victimization Distress Scale (CVDS) is a five-item scale adapted from the Daily Heterosexist Experiences Questionnaire (Balsam et al., 2013), lesbian, gay, bisexual, transsexual (LGBT) People of Color Microaggressions Scale (Balsam et al., 2011), and Adolescent Discrimination Distress Index (Fisher et al., 2000). The items assess distress in response to different instances of victimization, for example, "because someone thought I was infected with the Coronavirus" (see Table 3). Responses ranged from 1 = *It never happened*, 2 = *It happened but did not upset me*; 3 = *It happened and upset me a little*; 4 = *It happened and upset me moderately*; 5 = *It happened and upset me quite a bit*. Cronbach's α for this sample were computed following psychometric validation (see Data Analysis Plan and Results section).

Table 1

Frequency, Percentages, and Chi-Square Tests on Group Differences for Sociodemographic Characteristics, COVID-19 Health Risks, and Mental Health Screening Criteria

Demographic variable	AIAN $N = 86$ n (%)	Asian $N = 94$ n (%)	Black $N = 128$ n (%)	Latinx $N = 91$ n (%)	Total $N = 399$ n (%)	Chi square
Gender						$\chi^2_6 = 2.61$
Cisgender male	23 (26.74)	21 (22.34)	31 (14.21)	17 (18.68)	92 (23.06)	
Cisgender female	46 (53.49)	55 (58.51)	67 (52.34)	53 (58.24)	221 (55.39)	
Gender minority	17 (19.77)	18 (19.15)	30 (23.44)	21 (23.08)	86 (21.55)	
Sexual orientation						$\chi^2_6 = .85$
Heterosexual	59 (68.6)	66 (70.21)	91 (71.09)	61 (67.03)	277 (69.42)	
Sexual minority	25 (29.07)	26 (21.66)	33 (25.78)	27 (29.67)	111 (27.82)	
Missing	2 (2.33)	2 (2.13)	4 (3.13)	3 (3.3)	11 (2.76)	
Geographical regions						$\chi^2_9 = 53.34^{**}$
Urban	25 (29.07)	29 (30.85)	35 (27.34)	30 (32.97)	119 (29.82)	
Suburban	35 (40.7)	58 (61.7)	43 (33.59)	42 (46.15)	178 (44.61)	
Exurban	9 (10.47)	5 (5.32)	4 (3.13)	9 (9.89)	27 (6.77)	
Rural	17 (19.77)	2 (2.12)	46 (35.94)	10 (10.99)	75 (18.8)	
Education level						$\chi^2_{12} = 27.97^{**}$
Some high school or less	9 (10.47)	4 (4.26)	11 (8.59)	14 (15.38)	38 (9.52)	
High school graduate	29 (33.72)	24 (25.53)	59 (46.09)	23 (25.27)	135 (33.83)	
Some college	34 (27.91)	53 (56.38)	41 (21.09)	37 (23.08)	165 (41.35)	
Graduate degree	12 (13.95)	11 (11.7)	15 (11.72)	17 (18.68)	55 (13.78)	
Missing	2 (2.33)	2 (2.13)	2 (1.56)	0 (0)	6 (1.5)	
Student	45 (52.33)	73 (77.66)	73 (57.03)	56 (61.54)	247 (61.90)	$\chi^2_3 = 14.54^{**}$
Employment status						$\chi^2_6 = 21.13^{**}$
Unemployed	34 (39.53)	44 (46.8)	55 (42.97)	32 (35.16)	165 (41.35)	
Essential worker	31 (36.05)	12 (9.91)	44 (34.38)	34 (37.36)	121 (30.32)	
Nonessential worker	21 (24.42)	38 (40.42)	29 (22.67)	25 (27.47)	113 (28.32)	
Household annual income						$\chi^2_6 = 21.14^{**}$
Less than $30,999	42 (48.84)	27 (28.72)	58 (45.31)	39 (42.86)	166 (41.60)	
$31,000–$79,999	25 (29.07)	29 (30.85)	38 (29.69)	31 (34.07)	123 (30.83)	
More than $80,000	9 (10.47)	25 (26.6)	11 (8.59)	8 (8.79)	53 (13.28)	
Missing	10 (11.63)	13 (13.83)	21 (16.41)	13 (14.29)	57 (14.29)	
Financial insecurity						$\chi^2_6 = 21.00^{**}$
Can't make ends meet	23 (26.74)	13 (13.83)	46 (35.94)	22 (24.18)	104 (26.07)	
Have just enough	40 (46.51)	62 (66.96)	49 (38.28)	51 (56.04)	202 (50.63)	
Comfortable	23 (26.74)	19 (20.21)	33 (25.78)	18 (19.78)	93 (23.31)	
Prescription insecurity						$\chi^2_{12} = 10.90$
No, lack of insurance	9 (10.47)	8 (8.51)	19 (14.84)	16 (17.58)	52 (13.03)	
No, unable to reach a doctor to get prescription	10 (11.63)	13 (13.83)	25 (19.53)	14 (15.38)	62 (15.54)	
No, unable to get to pharmacy	7 (8.14)	4 (4.26)	8 (6.25)	4 (4.4)	23 (5.76)	
Yes, filled prescription	20 (23.26)	27 (28.73)	26 (20.31)	24 (26.37)	97 (24.31)	
No prescription needs	40 (46.51)	42 (44.68)	50 (39.06)	33 (36.26)	165 (41.35)	
COVID-19 health risks[a]						
Asthma/chronic lung disease	24 (27.91)	9 (9.57)	21 (16.41)	23 (25.27)	77 (19.3)	$\chi^2_3 = 12.57^{**}$
Heart condition	12 (13.95)	4 (4.26)	16 (12.5)	9 (9.89)	41 (10.28)	$\chi^2_3 = .5.65$
Human Immunodeficiency Virus (HIV)	4 (4.65)	3 (3.19)	7 (5.47)	6 (6.59)	20 (5.01)	$\chi^2_3 = .1.12$
Rheumatoid arthritis	8 (9.3)	2 (2.13)	10 (7.81)	8 (8.79)	28 (7.02)	$\chi^2_3 = .4.69$
Other immune diseases	11 (12.79)	5 (5.32)	8 (6.25)	9 (9.89)	33 (8.27)	$\chi^2_3 = 4.40$
Cancer treatment	7 (8.14)	4 (4.26)	6 (4.69)	5 (5.49)	22 (5.51)	$\chi^2_3 = 1.59$
Diabetes	9 (10.47)	3 (3.19)	11 (8.59)	8 (8.79)	31 (7.77)	$\chi^2_3 = 3.87$
Obesity	14 (16.28)	5 (5.32)	17 (13.28)	14 (15.38)	50 (12.53)	$\chi^2_3 = .6.30$
PHQ-9 ≥ moderate depression	53 (61.6%)	52 (55.3%)	81 (63.28)	58 (63.70)	244 (61.20)	$\chi^2_3 = 1.85$
GAD-7 ≥ moderate anxiety	43 (50.00)	33 (35.10)	63 (49.21)	51 (56.00)	190 (47.6)	$\chi^2_3 = 8.82^{*}$

Note. COVID-19 = coronavirus disease; AIAN = American Indian/Alaskan Natives; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = 7-item Generalized Anxiety Disorder Screener.

[a] Mean number of COVID-19 health risks, standard deviations, and range for each group are provided in Table 2.

$^{*}p < .05$. $^{**}p < .01$.

Coronavirus Racial Bias Scale

The CRBS is a nine-item scale developed to assess participants' beliefs on whether the pandemic is negatively affecting societal attitudes toward one's race/ethnicity, for example, "I believe the country has become more dangerous for people in my racial group because of fear of the Coronavirus" (see Table 3). Participants responded on a 4-point Likert-type scale (1 = *Strongly disagree*,

Table 2

Means, Standard Deviations, Ranges and Racial Group Comparisons for Age, COVID-19 Health Risks, Coronavirus Victimization Distress, Coronavirus Racial Bias, Depression, and Anxiety

Variable	AIAN (N = 86) M (SD)	Asian (N = 94) M (SD)	Black (N = 128) M (SD)	Latinx (N = 91) M (SD)	Total (N = 399) M (SD)	F(3, 395)
Age (range 18–25)	21.30 (2.41)	20.64 (2.17)	20.71 (2.15)	20.58 (1.99)	20.79 (2.19)	2.07
Number of COVID-19 health risks[a] (range 0–8)	1.03 (1.85)	.37 (1.13)	.75 (1.34)	.90 (1.43)	.76 (1.45)	3.59*
Coronavirus Victimization Distress Scale[b] (CVDS; range 1–5)	1.60 (.98)	1.41 (.84)	1.67 (.96)	1.65 (.90)	1.64 (.94)	1.66
Revised Coronavirus Racial Bias Scale (R-CRBS; range 1–4)	1.97 (.74)	2.55 (.73)	2.35 (.74)	2.26 (.67)	2.30 (.74)	9.81***
Patient Health Questionnaire-9 (PHQ-9; range 0–3)	1.36 (.83)	1.20 (.77)	1.28 (.81)	1.31 (.76)	1.29 (.79)	1.43
Generalized Anxiety Disorder Screener (GAD-7; range 0–3)	1.47 (.84)	1.10 (.81)	1.31 (.87)	1.47 (.79)	1.33 (.84)	3.12**

Note. COVID-19 = coronavirus disease; AIAN = American Indian/Alaskan Natives.
[a] Range for Black = 0–7; Latinx = 0–6. [b] Range for Latinx on the CVDS = 1–3.6.
* $p < .05$. ** $p < .01$. *** $p < .001$.

4 = *Strongly agree*). Cronbach's α for this sample were computed following psychometric validation (see Data Analysis Plan and Results section).

Racial Discrimination and Racism-Related Vigilance

Two previously validated scales relevant to experiences and perceptions of racial discrimination were included to evaluate the validity of the CVDS and CRBS. The six-item Racial/Ethnic Discrimination Index (Wang & Yip, 2020; Kendall's coefficient of concordance = .99) scored on a 3-point scale (0 = *did not happen/ was not a problem today*; 1 = *somewhat of a problem today*; 2 = *very much a problem today*) includes questions about daily experiences of racial/ethnic discrimination (e.g., unfairly treated, feeling unsafe). The six-item Racism-Related Vigilance Scale, scored on a 6-point Likert scale (1 = *Almost every day*, 6 = *Never*) was used to assess "anticipatory strategies/psychological predispositions used to negotiate everyday perceptions of inter-ethnic group racism" (Clark et al., 2006, p. 564).

Patient Health Questionnaire

The Patient Health Questionnaire-9 (PHQ-9) assesses the frequency of past month experiences with depressive symptoms (Kroenke et al., 2001). Sample items include "Trouble falling asleep, staying asleep, or sleeping too much" and "Feeling down, depressed or hopeless." Items are scored on a 4-point scale: 0 = *Not at all* to 3 = *Nearly every day*. Prior Cronbach's α for this scale ranged from .79 to .91 across AIAN, Asian, Black, and Latinx adults (Easton et al., 2019; Huang et al., 2006). For this sample, Cronbach's α indicated good interitem reliability (total sample = .89; range across racial groups = .89–.91).

General Anxiety Disorder Screener

The 7-item Generalized Anxiety Disorder Screener (GAD-7; Spitzer et al., 2006) assesses anxiety symptoms during the past month, for example, "Being so restless that it is hard to sit still" and "Feeling afraid as if something awful might happen." Items are scored on a 4-point scale: 0 = *Not at all*, 3 = *Nearly every day*. In prior studies, Cronbach's α for GAD-7 ranged from .79 to .91 across adults identifying as AIAN, Asian, Black, and Latinx (Dear et al., 2011; Löwe et al., 2008; Parkerson et al., 2015; Saunders, 2016; Wurster et al., 2020). For this sample, Cronbach's α indicated good interitem reliability (total sample = .90; range across racial groups = .86–.93).

Data Analysis Plan

Descriptive statistics were calculated for demographic variables and mental health indices followed by analysis of variance (ANOVA) and Chi-square tests to assess racial differences. To determine the independence and structure of the CVDS and CRBS, confirmatory factor analyses (CFA) with diagonally weighted least squares (DWLS) approach using the R-4.0.1 and *lavaan* package with "ordered" inside of *lavaan* (R Core Team, 2020; Rosseel, 2012) were conducted followed by Cronbach α to assess resulting scale reliability. Correlational analyses and ANOVAs then examined associations among demographic variables, the CVDS, CRBS and mental health indices. Structural equation modeling (SEM) with maximum likelihood estimation assessed the hypothesis that coronavirus racial bias mediates the effect of coronavirus victimization distress on depression and anxiety. An alternative model testing whether coronavirus victimization distress mediates the relationship between the mental health measures was also conducted. Goodness-of-fit indices included the comparative fit index (CFI), Tucker–Lewis Index (TLI), and the root-mean-square error of approximation (RMSEA). A fit of >.90 or .95 for the CFI and TLI and <.06 for RMSEA was considered adequate fit (Hu & Bentler, 1999). To test the indirect effects for statistical significance, the bias-corrected bootstrapping approach was adopted as it is robust against the violation of normal distribution assumptions for both the sampling distribution and indirect effect (MacKinnon et al., 2004); 1,000 resamples were drawn to estimate the standard errors of the indirect effects and their 95% confidence intervals.

Table 3
Factor Loadings for Coronavirus Victimization Distress Scale (CVDS) and Coronavirus Racial Bias Scale (CRBS) Based on CFA Model 1

Items	CVDS items	CRBS items
I have been teased or bullied because someone thought I was infected with the coronavirus	**.810**	.096
I have been physically threatened, hit or beaten up because someone thought I was infected with the coronavirus	**.868**	.099
I have been treated rudely or unfairly because someone thought I was infected with the coronavirus	**.853**	.114
I have been verbally taunted or called bad names in public because someone thought I was infected with the coronavirus	**.836**	.134
I have been cyberbullied because someone thought I was infected with the coronavirus	**.854**	.124
Due to the coronavirus I have been cyberbullied because of my race/ethnicity	.587	.473[a]
Since the coronavirus I have seen a lot more cyberbullying of people of my race/ethnicity	.236	**.729**
Negative social media posts against people of my race/ethnicity have increased because of the coronavirus	.156	**.775**
I worry about people thinking I have the coronavirus simply because of my race/ethnicity	.143	**.777**
People of my race/ethnicity are more likely to get the coronavirus	−.023	**.662**
Most social and mass media reports about the coronavirus create bias against people of my racial/ethnic group	.102	**.769**
People of my race/ethnicity will not receive coronavirus health care as good the care received by other groups	.172	**.570**
I believe the country has become more dangerous for people in my racial/ethnic group because of fear of the coronavirus	.029	**.738**
People of my race/ethnicity are more likely to lose their job because of the coronavirus	.344	**.546**

Note. Extraction method: Principal component. Rotation method: Varimax with Kaiser normalization. CFA = confirmatory factor analyses. Bolded values indicates the factor/scale on which the specific item loads.
[a] This item was removed from final scale based on analysis of confirmatory factor analysis.

Results

Descriptive Data

Demographic data, percentages, and Chi-square tests of significance across each racial group and total sample are provided in Table 1. The majority of respondents (N = 276; 69%) lived with their parents, a spouse, or romantic/sexual partner. Almost half the sample reported an annual household income below or just above the poverty line ($30,680; Department of Health and Human Services [HHS], 2020). Slightly more than a quarter indicated they felt financially insecure ("Can't make ends meet") and 34% reported difficulty filling prescriptions during the past month. Asian respondents compared to the other racial groups were less likely to be an essential worker and to report financial insecurity, were more likely to be a student, and reported higher household income and education; Black respondents were more likely than other groups to live in rural areas. Thirty-five percent reported at least one COVID-19 health risk (range = 0–8). Higher percentages of Black and Latinx young adults reported asthma or chronic lung disease. ANOVA followed by Tukey honestly significant difference (HSD) tests indicated AIAN reported the highest and Asians reported the lowest number of health risks (see Table 2). There were no racial age differences.

Relationships Among Demographic Variables and Mental Health Indices

Approximately 60% of respondents met screening criteria for moderate depression as assessed by the PHQ-9 ($\geq$ = 10; Kroenke et al., 2001); and close to 50% of respondents met GAD-7 screening criteria for moderate levels of anxiety ($\geq$ = 10; Spitzer et al., 2006). Although there were no racial differences for depression, Asian respondents reported significantly lower levels of anxiety than other groups (see Tables 1 and 2).

Correlations among variables are provided in Table 4. Consistent with Hypothesis 1, financial (r = .21, p < .001 for depression; r = .15, p = .004 for anxiety) and prescription insecurity (r = .22 for depression, r = .17 for anxiety, p < .001) and number of COVID-19 health risks (r = .24 for depression, r = .23 for anxiety, p < .001) were significantly associated with depression and anxiety measures. Significant mental health differences emerged based on employment status, $F(2, 396) = 3.93$, $p < .001$ and $F(2, 396) = 4.71$, $p < .001$ for depression and anxiety. Tukey's post hoc comparison indicates that both essential and nonessential workers had significantly higher scores on the mental health indices compared to unemployed respondents, but did not differ from one another. Since post hoc comparison tests found no significant differences in mental health indices between essential and nonessential workers, a combined employed/unemployed variable was adopted, which was significantly correlated with depression (r = .14, p = .007) and anxiety (r = .14, p = .005). Sexual minority participants reported higher levels of depression and anxiety than their heterosexual counterparts, $F(1, 386) = 28.60$, $p < .001$ and $F(1, 386) = 17.68$, $p < .001$, respectively. Significant differences in depression levels, $F(2, 396) = 3.68$, $p = .026$, were found across gender identities, with post hoc comparison indicating that gender minority respondents reported significantly higher levels of depression than cisgender males, but not cisgender females. There was no effect of gender on anxiety or any significant effects of age or household income on mental health indices.

Psychometric Validation of the Coronavirus Victimization Distress Scale and Coronavirus Racial Bias Scale

Prior to conducting correlational and SEM analyses, three confirmatory factor analyses were conducted to determine the independence and factor structure of the CVDS and CRBS. Model 1 (see Figure 1) included all items on both scales (CFI = .96, TLI = .95, RMSEA = .079). Modification indices (MI = 120.15) indicated a strong correlated error between Item 7 on the CRBS ("Due to the Coronavirus I have been cyberbullied because of my race/ethnicity") and the CVDS (MacCallum, 1986; Rosseel, 2012; Satorra, 1989); therefore, this item was removed from further analyses (see Table 4). Model 2 (see Figure 2) yielded a relatively good fit between the

Table 4

Correlation Matrix for Coronavirus Victimization Distress (CVDS), Coronavirus Racial Bias (CRBS), Depression, Anxiety, and Covariates (N = 399)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. CVDS	—	.33***	.28***	.24***	.22***	−.18***	.06	.43***	.34***	.01	.11*
2. CRBS		—	.26***	.21***	.05	−.08	.02	.16**	.10*	−.09	.07
3. Depression (PHQ-9)			—	.80***	.14**	−.05	.21***	.22***	.24***	−.06	.25***
4. Anxiety (GAD-7)				—	.14**	−.02	.15**	.17***	.23***	−.06	.21***
5. Employment					—	−.08	.06	.21***	.19***	.20***	−.011
6. Household income						—	−.09	.20***	−.11*	−.11*	−.05
7. Financial insecurity							—	.12*	−.11*	.04	.08
8. Prescription insecurity								—	.19***	.05	.08
9. COVID-19 health risks									—	.01	.05
10. Age										—	−.08
11. Sexual orientation[a]											—

Note. Categorically scored race/ethnicity and gender were not included in the table. CVDS = Coronavirus Victimization Distress; CRBS = Coronavirus Racial Bias; PHQ-9 = Patient Health Questionnaire-9; GAD-7 = 7-item Generalized Anxiety Disorder Screener; COVID-19 = coronavirus disease.
[a] $N = 388$ due to missing data.
* $p < .05$. ** $p < .01$. *** $p < .001$.

five-item CVDS and eight-item CRBS (CFI = .98, TLI = .97, RMSEA = .051). Cronbach's α for the total sample for the CVDS was .91 (range = .90–.93) and .87 (range = .84–.87) for the eight-item CRBS. The two scales were positively correlated ($r = .37$, $p < .001$). In addition, significant correlations between the CVDS and eight-item CRBS and the Racial Ethnic Discrimination Index (REDI) and Racism-Related Vigilance Scale provided evidence of construct validity for both scales: The CVDS was significantly associated with REDI and Racism-Related Vigilance Scale, $r = .29$ and .63, $p < .001$, respectively, and the CRBS was significantly associated with the REDI and Racism-Related Vigilance Scale, $r = .34$ and .29, $p < .001$, respectively. To yield higher reliability and communalities for the SEM (Little et al., 2002), Model 3 (see Figure 3) was developed, with all five-items on CVDS and four parcels constructed from the eight-item CRBS (created by randomly pairing two items together and calculating the mean). This model yielded the best fit to the data, CFI and TLI = .99, RMSEA = .037 (Hu & Bentler, 1999).

Racial and Demographic Differences on the CVDS and CRBS

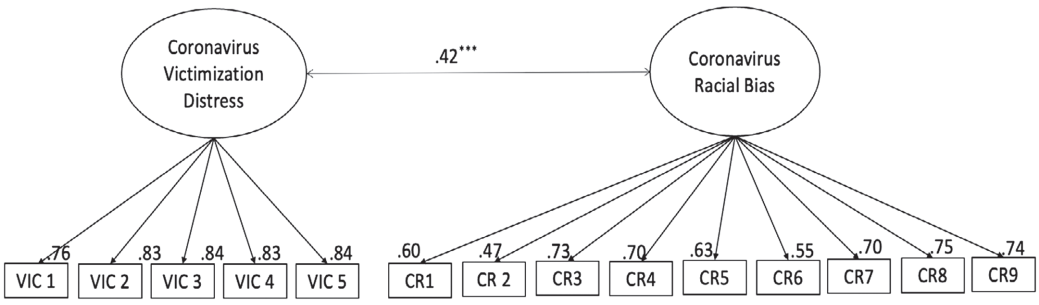
Mean scores and significant tests on the CVDS and CRBS among the four racial groups are provided in Table 2. An ANOVA followed by Tukey's post hoc comparison tests indicated Asian and Black participants had significantly higher scores on the CRBS than AIAN and Latinx respondents, but no significant racial differences emerged for the CVDS. Employed workers scored significantly higher on the CVDS than unemployed participants, $F(1, 397) = 19.24$, $p < .001$; although employment was not significant for scores on the CRBS. Participants who had difficulty filling prescriptions compared to those reporting no prescription problems scored higher on both the CVDS, $F(1, 397) = 87.47$, $p < .001$, and CRBS, $F(1, 397) = 9.94$, $p < .001$. Significant CVDS differences were found across gender identities, $F(2, 396) = 7.26$, $p = .001$, and post hoc comparison indicated that gender minority persons reported higher scores on the CVDS than cisgender females and males. Pearson's correlation tests indicated significant positive correlations between the number of COVID-19 health risks and scores on the CVDS and CRBS (see Table 4). There were no differences on CVDS and CRBS based on age, sexual orientation, financial security, or annual household income.

Tests of the Mediation Hypothesis

Consistent with Hypothesis 2, scores on the CVDS and CRBS were significantly and positively associated with the depression and

Figure 1

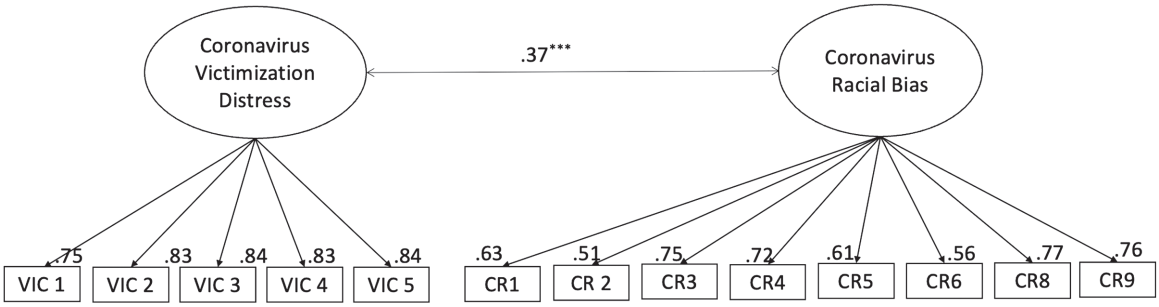
Model 1 for the Confirmatory Factor Analyses (CFA) Including All Items in Coronavirus Victimization Distress and Coronavirus Racial Bias Scales



*** $p < .001$.

Figure 2

Model 2 for the Confirmatory Factor Analyses (CFA) Excluded Item 7 in Coronavirus Racial Bias Scale



*** $p < .001$.

anxiety measures (see Table 4). SEM was conducted to test the third hypothesis that coronavirus racial bias mediates the effect of coronavirus victimization distress on depression and anxiety. Age, sexual orientation, financial security, COVID-19 health risks, prescription insecurity, and employment status (employed vs. unemployed) were included as covariates due to significant associations with the study variables. Based on the higher levels of anxiety reported by Asian respondents, racial differences on anxiety were assessed using three dummy variables with Asian as the reference group. Missing data ($N = 11$) on sexual orientation were handled by listwise deletion (Rosseel, 2012).

The primary analysis, which tested coronavirus racial bias as mediating the effect of coronavirus victimization distress on depression and anxiety, is presented in Figure 4. The direct effects were not fixed at 0. The model yielded adequate fit on all three fit indices including the RMSEA (.042), 90% CI [.031, .053], CFI (.95), and TCL (.92) and found coronavirus victimization distress had significant indirect effects on depression and anxiety, $\beta = .075$, $p = .003$, 95% CI [.019, .089], $\beta = .059$, $p = .002$, 95% CI [.012, .082], respectively, while direct effects were nonsignificant. Consistent with Hypothesis 3, the analysis indicated coronavirus racial bias beliefs fully accounted for the influence of coronavirus victimization distress on both mental health indices.

Test of Alternative Hypothesis

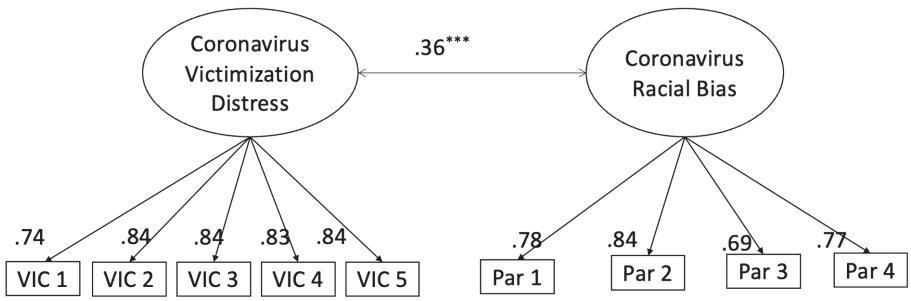
A second SEM analysis tested whether coronavirus victimization distress mediated the effect of coronavirus racial bias on depression and anxiety. We found a poor fit based on values of CFI (.86), TLI (.82) and RMSEA (.072) and the standardized direct and indirect effects were unsignificant.

Discussion

AIAN, Asian, Black, and Latinx people in the U.S. have been disproportionately impacted by the COVID-19 pandemic in rates of infection and morbidity. Explanations for these disparities include overrepresentation as essential workers and long-standing inequities in financial security and access to health services associated with racial discrimination. Prior to the pandemic, racial discrimination has been associated with poor mental health. A biopsychosocial approach calls for research that examines the complex relationship among prior health and economic disparities, pandemic-related victimization and racial bias and mental health. Our data demonstrate that in addition to employment and health risks, victimization experiences and increases in systemic racial biases specifically associated with the COVID-19 pandemic are related to higher levels of depression and anxiety among racial minority young adults across geographic regions of the U.S.

Figure 3

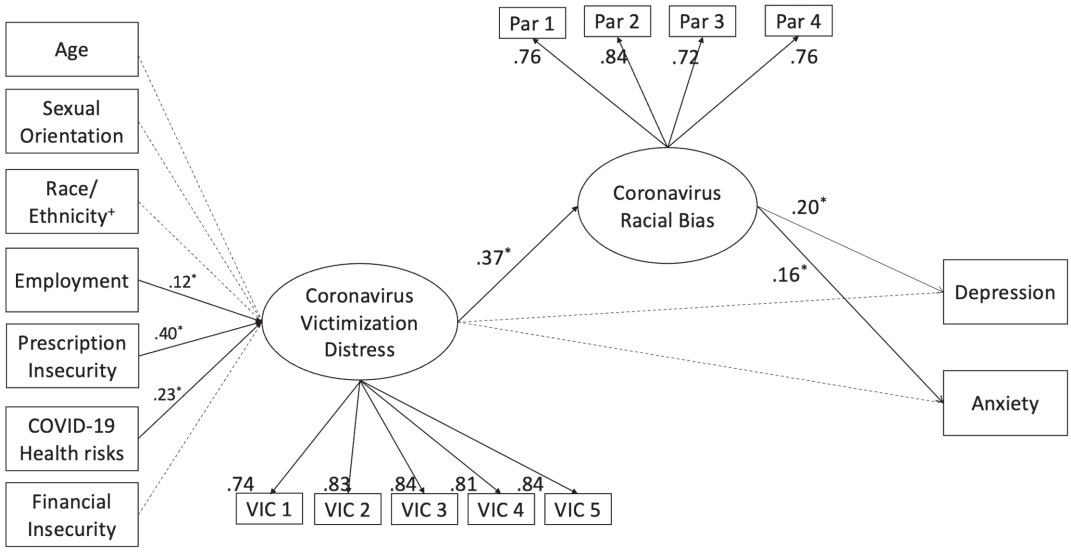
Model 3 for the Confirmatory Factor Analyses (CFA) With Parceled Coronavirus Racial Bias Scale



*** $p < .001$.

Figure 4

Standardized Results for Main Structural Equation Model With Bootstrapping Approach Testing the Mediating Effect of Coronavirus Racial Bias on the Association Between Coronavirus Victimization Distress and Depression and Anxiety



Note. Asterisk indicate results were statistically significant based on 95% confidence interval.

A critical finding of the present study is that the COVID-19 pandemic represents a unique situation in which employed young racial/minority adults face greater risk for depression and anxiety (McKnight–Eily et al., 2021; Mehdi et al., 2020). Our data suggest this is not only due to the infection risks associated with work outside the home during the pandemic, but also due to increased engagement in cross-race interactions that increased exposure to victimization and racial bias, based in part on social perceptions that racial minorities were more likely to be infected with the virus (Goldman et al., 2021). Our results expand on prior research by documenting the association among higher levels of preexisting health risks, financial insecurity, and internalizing disorders among young racial minority adults during the pandemic (Baldwin et al., 2020; Chen et al., 2019; Longmire-Avital & Robinson, 2018; McKnight-Eily et al., 2021). We also add to this literature in demonstrating that prescription insecurity is contributing to mental health risk among these young adults beginning at the first large-scale wave of the virus in 2020. Prior studies have found employment to be a protective factor against mental health problems (McGee & Thompson, 2015; Paul & Moser, 2009). These finding highlight the importance of understanding how pathways to mental health for racial minorities in the U.S. are influenced by interpersonal factors including preexisting COVID-19 health risks and direct exposure to coronavirus discrimination, and societal factors including increases in national racial prejudices associated with the virus and systemic inequities in occupational opportunities and access to health care.

Coronavirus Victimization Distress, Coronavirus Racial Bias, and Mental Health

The level of coronavirus victimization distress and percentage of participants reporting other risk factors did not differ across different racial groups, with one exception; Asian and Black respondents reported higher levels of coronavirus racial bias than AIAN and Latinx. This finding may be explained by political rhetoric and media reports at the time of data collection in April 2020. During the first few months of the pandemic, anti-Asian sentiment was fueled by scapegoating the "China virus." At the same time, the U.S. was in the early throes of a renewed racial justice movement and had witnessed disproportional COVID-19 infections and morbidity among Black Americans; with outbreaks among Latinx persons and on tribal lands largely ignored by the federal government, mainstream media, and online tracking (El Chaar et al., 2020; Natividad, 2020; Owen et al., 2020; Xu et al., 2021). Asian respondents were in general of higher household income, were less likely to be employed as essential workers or to report financial or prescription insecurity; social determinants traditionally associated with positive mental health. However, although they demonstrated lower levels of anxiety, Asian participants did not differ from other racial groups on depressive symptomology. These findings suggest racism has a pernicious effect on mental health irrespective of other historically documented protective factors (McGee & Thompson, 2015; Paul & Moser, 2009).

Results of the SEM analysis further underscore the impact of racism during the pandemic on mental health. When demographic variables were controlled, the effect of coronavirus victimization distress on mental health was fully mediated by perceptions of COVID-19-related increases in racial bias across the U.S. These findings may be explained, in part, by prior work, indicating the negative effect on mental health when members of marginalized groups attribute negative social experiences to racial discrimination (Schmitt et al., 2014). However, the CRBS included items on perceptions of coronavirus-related racist social and mass media posts and racial discrimination in COVID-19 health-care settings

that went beyond personal experiences related to bullying and other forms of victimization. Thus, CRBS responses within the context of national statistics documenting increases in racial discrimination during the pandemic indicate such beliefs were grounded in the reality of COVID-19-related racial strife (Addo, 2020; Dhanani & Franz, 2021; Ruiz et al., 2020).

Of note, 28% and 22% of participants in our study identified as sexual or gender minorities, respectively. Sexual and gender minority participants reported higher levels of depression and gender minorities also reported higher levels of coronavirus victimization. As both persons of color and members of sexual and gender minority groups, the current COVID-19 crisis likely exacerbated mental health stressors associated with medical mistrust, provider bias, and lack of insurance (Harkness et al., 2020; Ruprecht et al., 2021). These findings are consistent with recent work in diversity science reflecting the complex experiences of individuals who hold more than one marginalized identity simultaneously and the consequences of multiple forms of discrimination on mental health across interlocking oppressive systems, for example, racism, heterosexism, and transphobia (APA, 2017; Bowleg, 2008; Fattoracci et al., 2021; Watson–Singleton et al., 2021).

Limitations and Future Directions

To our knowledge, this is the first study to examine the relationship to mental health of victimization distress and racial bias directly related to the coronavirus among AIAN, Asian, Black, and Latinx young adults. However, due to the cross-sectional nature of the survey, we are unable to interpret the results as definitive of causation. It will be important for future studies to examine the longitudinal impact of coronavirus victimization distress and associated racial bias beliefs on mental health among young adults within these populations. Although the study's data collection and recruitment methods yielded a geographically diverse national sample of racial minority young adults; this methodology does not allow for absolute certainty that inclusion criteria were met and also limited participation to registered respondents with Internet or mobile phone access. Finally, our data also suggest that for some populations, minority stress associated with sexual and gender minority status may have a greater influence on coronavirus-related victimization. It will be fruitful to examine how the intersectionality of race/ethnicity and sexual and gender minority status further exacerbates the effect of coronavirus-related victimization and racial bias on the mental health of young adults of color.

Conclusions

The mental health of racial minorities in the U.S. has been associated with long-standing experiences of racial and ethnic discrimination and systemic bias. This study highlights how the current COVID-19 pandemic has added to these mental health burdens through increases in coronavirus victimization and racial bias experienced by AIAN, Asian, Black, and Latinx young adults. These findings also demonstrate how an infectious disease crisis can reverse the usual protective effects of employment on mental health, when working racial minorities are more likely to be employed in settings that increase their exposure to infection and subsequent social bias. In addition, this study underscores the deleterious effects on mental health of preexisting coronavirus health risks and associated prescription insecurity and the continuing vulnerabilities associated with financial insecurity and sexual minority status. In addition to ongoing efforts to increase general cultural competencies in mental health services, these findings highlight the urgency of mental health treatments tailored to the specific needs of racial minorities during the current and future health crises.

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