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Psychiatry Research 303 (2021) 114084

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Perceived COVID-19-related anti-Asian discrimination predicts post traumatic stress disorder symptoms among Asian and Asian American young adults

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ARTICLE INFO

Keywords:
Covid-19
PTSD
Discrimination
Asians
Asian Americans
Young adults

ABSTRACT

Objective: This study investigates the prevalence of COVID-19-related discrimination and the extent to which COVID-19-related discrimination is associated with mental health symptoms among Asians and Asian American (A/AA) young adults during the first three months of the COVID-19 pandemic.
Methods: We used data from the COVID-19 Adult Resilience Experiences Study (CARES), a cross-sectional online survey conducted in the U.S. Out of 1,001 respondents, 211 A/AA young adults were analyzed for this study.
Results: Sixty-eight percent of A/AA young adults reported that they or their family have experienced COVID-19-related discrimination and approximately 15% of respondents reported verbal or physical assaults. After controlling for covariates including predisposing factors, lifetime discrimination, and pre-existing mental health diagnoses, COVID-19-related discrimination was significantly associated with an increased level of symptoms of posttraumatic stress disorder (PTSD), but not of anxiety or depression. Our study results suggest that COVID-19-related discrimination may contribute to PTSD symptoms among A/AA young adults.
Limitations: This was cross-sectional data which was collected through online and self-report rather than clinical evaluation.
Conclusion: This finding adds greater urgency to develop and implement policy- and individual-level interventions to reduce race-based discrimination among A/AA.

1. Introduction

The COVID-19 pandemic has led to a dramatic increase in anti-Asian racism and xenophobia worldwide. References to the coronavirus as the "Chinese virus" or "Kung Flu" by former U.S. President Trump and other government officials encouraged implicit bias against Asians and Asian Americans (A/AA), which have since fueled explicit anti-Asian sentiments (Reny and Barreto, 2020). Asians of all ethnicities have been subjected to slurs and jokes related to their race or ethnicity (Ruiz et al., 2020) and have been the target of profane verbal harassment, shunning, and spitting/coughing (Turton, 2020; Yan et al., 2020). Although overall hate crimes decreased by 7% nationwide, hate crimes targeting A/AA have risen by 150% in 2020 and 194% in the first quarter of 2021 (Levin and Grisham, 2021), totaling 344% since the pandemic. Between March 2020 and March 2021, the data tracking organization, Stop Asian American Pacific Islander (AAPI) Hate, recorded over 6600 Anti-Asian racist incidents nationwide.

The Pew Research Center reported that in the first three months of the COVID-19 pandemic, 58% of U.S. Asian adults perceived anti-Asian racial discrimination to be more frequent after the start of the pandemic (Ruiz et al., 2020). Among the Asian respondents in the Pew report, 39% indicated that non-Asians have acted more uncomfortable around them because of race, 31% state that they have been the subject of slurs or jokes, and 26% fear that someone may threaten or physically attack

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https://doi.org/10.1016/j.psychres.2021.114084
Received 14 April 2021; Received in revised form 14 June 2021; Accepted 26 June 2021
Available online 29 June 2021

them (Ruiz et al., 2020).

Anti-Asian rhetoric has not only led to discrimination but also racially motivated violence. As early as March 2020, the FBI predicted a rise in anti-Asian hate crimes due to the pandemic (Kim et al., 2021). In 2021, anti-Asian sentiments escalated from microaggressions to physical assaults, vandalism, and even murder. Most recently, six Asian American women were killed when a man went on a shooting rampage at three spas in Atlanta ("Atlanta shootings," 2021).

1.1. Lifetime discrimination, COVID-19-related discrimination, and mental health among Asian Americans

Stereotypes and scapegoating of A/AA as disease carriers are not new. Long perceived as "perpetual foreigners," A/AA are no strangers to both overt and covert forms of discrimination and racism. The Chinese Exclusion Act (Chen et al., 2020) was the first immigration law to exclude an entire ethnic group, and the internment of Japanese Americans and confiscation of their properties during World War II has been widely regarded as discriminatory and dehumanizing. Since the COVID-19 crisis began, A/AA have been subjected to surges in overt racism: dehumanizing racial slurs and jokes, references to the "Chinese virus," verbal harassment, shunning, spitting, workplace discrimination, and violence (Liu et al., 2020a; 2020b, 2020c, 2020d).

There are explanations for why racialized discrimination might increase mental health problems. According to Race-based Traumatic Stress Theory (Carter et al., 2017), experiences may be traumatic if one perceives a racially discriminatory experience as a threat to their physical or emotional well-being and is an incident that is sudden and out of their control. When dealing with racially traumatic experiences, commonly used coping strategies may be ineffective; dehumanizing experiences may increase internalized racism, in which individuals may accept stigmatized and negative messages about their own intrinsic worth (Jones, 2000). Therefore, individuals experiencing such events may suffer from psychological distress and mental health symptoms similar to those seen in posttraumatic responses, including sleep disturbance, poor psychological and physical health outcomes, increased pain and disability, and higher all-cause mortality (Hyun et al., 2021; Litam, 2020; Liu et al., 2020b).

There is significant evidence to suggest that lifetime discrimination is likely to exert negative effects on the mental health and well-being of A/AA (Chen et al., 2020; Lee and Ahn, 2011). Lifetime discrimination is described as chronic and institutionalized discriminatory experiences, such as those experienced at work, within healthcare services, or with police (Williams et al., 1997). This can contribute to lower self-worth, internalized stigma, and worsened health. In addition, lifetime discrimination is associated with increased risk of psychological distress, suicidal ideation, anxiety, and depression among A/AA populations (Lee and Ahn, 2011). However, the intensity and magnitude of discrimination specifically related to COVID-19 anti-Asian discrimination have the potential to worsen mental health problems beyond more chronic and indirect systemic lifetime discrimination, especially during the first three months of COVID-19 pandemic (Liu et al., 2020a; 2020b, 2020c, 2020d). Therefore, it is important to examine the roles of acute discrimination on mental health controlling for chronic and systemic discrimination. Although a tracking system has been established for documenting the experiences of anti-Asian discrimination in the U.S. during the COVID-19 pandemic, the research on COVID-19-related discrimination and its implications for Asian American mental health remains largely limited. In another study, perceived racism and racial discrimination among Chinese American parents and youth were associated with reported poor mental health during the COVID-19 pandemic (Cheah et al., 2020).

This present study documents the prevalence of COVID-19-related anti-Asian discrimination and examines the association between COVID-19-related discrimination and mental health symptoms. We purposely focus our attention on A/AA young adults given the high prevalence of mental health disorders and an alarming upward trend in mental health struggles during this developmental time period (Augsberger et al., 2018; Choi et al., 2020). We also assessed discrimination experiences that took place within the first few months of the U.S. pandemic. Considering anti-Asian racial incidents received significant national attention only recently in 2021, an analysis of the early months of the pandemic sheds light on the occurrence of discrimination and its negative potential mental health effects on the A/AA community as a baseline regarding the prevalence of anti-Asian discrimination and associated mental health outcomes.

We hypothesized that A/AA who reported experiences of COVID-19-related discrimination would report higher levels of depression, anxiety, and PTSD symptoms. We controlled for lifetime discrimination and pre-existing mental health diagnosis to ensure that COVID-19-related discrimination was separate from prior reports of discrimination as well as pre-existing mental health conditions, given that young adults with pre-existing mental health problems may be more susceptible to COVID-19-related anxiety and more vulnerable to psychological distress during the pandemic (Liu et al., 2020b).

2. Methods

2.1. Data

This study uses Wave I of the COVID-19 Adult Resilience Experiences Study (CARES) (Conrad et al., 2021; Hyun et al., 2021; Kamal et al., 2021; Liu et al., 2020a; 2020b, 2020c, 2020d), a longitudinal study examining the psychosocial experiences of individuals aged 18–30 years across four time-points from 2020 to 2021. The purpose of CARES is to assess a range of COVID-19-related experiences, including discrimination, perceived and experienced lifetime discrimination, psychiatric symptoms, and physical and mental health functioning. A total of 1002 young adults, aged 18–30 years, completed a 30-minute online survey from April 13 to June 11, 2020, representing the first wave of the study. Respondents were recruited through social media, email listservs, and word of mouth. All participants were either currently living in the U.S. or attended U.S.-based educational institutions. To ensure data quality, the online survey embedded various attention checks and human verification questions. One out of every 10 participants received a $25 gift card. This study was reviewed and approved by the Institutional Review Board. The current analysis includes study participants who self-identified as Asian or Asian American ($n = 211$). Participants who self-identified as a mixed race but did not identify as Asian ($n = 61$) were excluded from the analysis, because their experience related to COVID-19 could be different from those who self-identified as A/AA.

2.2. Measures

2.2.1. Explanatory variable

2.2.1.1. COVID-19-related discrimination. The key explanatory variable in the analysis was COVID-19-related discrimination. Respondents were asked if they had encountered any COVID-19-related discrimination using a 7-item measure newly developed for this study by the research team (Hahm et al., 2021). Items included: "Someone has actively avoided physical contact with me or my family because of my or my family member's race/ethnicity"; "Someone has made a comment about Chinese/Asian people being the source of the virus"; "Someone has made a comment about Chinese/Asian people being dirty"; "Someone has made a comment that they avoid eating Chinese/Asian food because they are worried about contracting COVID-19″; "Someone has made a comment about Chinese/Asian eating habits"; "I or my family member have been verbally assaulted because of my or my family member's race/ethnicity due to COVID-19″; and, "I or my family member have been physically assaulted because of my or my family member's race/ethnicity due to

COVID-19." Cronbach's α for these items was 0.71, indicating good reliability. The sum score was used for this analysis.

2.2.2. Outcome variables

Depression was assessed with an 8-item version of the Patient Health Questionnaire (PHQ-8, Kroenke et al., 2009) which asks about the frequency of depressive symptoms in the past two weeks on a scale of 0 ("not at all") to 3 ("nearly every day"). Sum scores of the PHQ-8 had a total possible range of 0 to 24 and were recorded dichotomously based on a cutoff score of 10 or higher (Liu et al., 2020b).

Anxiety was assessed with the widely used Generalized Anxiety Disorder Scale (GAD-7, Spitzer et al., 2006), which assesses the frequency of anxiety symptoms in the past two weeks on a scale of 0 to 3, with 0 being "not at all" and 3 being "nearly every day." Sum scores ranged from 0 to 21. Following the convention of prior studies (Plummer et al., 2016), responses were recorded dichotomously based on a cutoff score of 10 or higher to determine elevated anxiety.

The PTSD Checklist—Civilian Version (PCL-C), a validated 17-item measure was administered to assess PTSD symptoms (Weathers et al., 1993). Participants expressed how much they were bothered by stressful life events in the past month, with 1 as "not at all" and 5 as "extremely." Sum scores of the 17 items were calculated and recorded dichotomously with a cutoff score of 45 or greater, based on the psychometric properties for the measure and as suggested by the National Center for PTSD (Blanchard et al., 1996).

2.2.3. Covariates

Four sets of covariates associated with mental health outcomes in minority populations were included in the analysis to control for potential confounders: 1) predisposing factors, 2) socioeconomic status, 3) lifetime discrimination, and 4) pre-existing mental health diagnoses. In the descriptive analysis, we showed the percentage of students in the sample as the study focused on the young adult population. However, we excluded student status in the multivariate analysis because it was highly correlated with age and employment status.

2.2.3.2. Predisposing factors. Key demographic characteristics of the sample, including gender (female, male, and trans/non-binary), age, and U.S. nativity were included as covariates.

2.2.3.3. Socioeconomic status. Two questions were used as proxies for respondents' socioeconomic status, which served as covariates in the analysis: current employment status, and current housing situations. The current employment status options were "employed" (coded as 1) and "unemployed" (coded as 0). Respondents were asked to rate the stability of their current housing situation, with 1 being *"not at all stable"* to 5 being *"extremely stable."* We created a dichotomous variable, combining "stable," and "extremely stable," to be stable (coded as 1) and "not at all stable," "slightly stable," and "moderately stable" to be unstable (coded as 0).

2.2.3.4. Lifetime discrimination. Participants' lifetime discrimination was measured with 11 items in the questionnaire Major Experiences of Discrimination Scales (Williams et al., 1997). Respondents were asked the number of times they have been unfairly treated with regard to 11 discriminatory events at school or work, and in receiving financial and other services over the course of their lifetime on a scale of 0 to 3, with 0 as *None*, 1 as *1–2 times*, 2 as *3–4 times*, and 3 as *5 times or more*. The sum of the scores from the 11 items was used in the analysis, with a higher score corresponding to increased experiences of lifetime discrimination.

2.2.3.5. Pre-existing mental health diagnoses. Respondents were asked whether they had ever been diagnosed with generalized anxiety disorder, depression, or post-traumatic stress disorder (PTSD). For each disorder, respondents were asked to indicate *"Yes, diagnosed but not treated," "Yes, diagnosed and treated," "Suspected, but not diagnosed," or "No."* We developed a dichotomous variable for each disorder; if respondents indicated either "*Yes, diagnosed and treated*" or "*Yes, diagnosed and untreated,*" we coded them as 1, representing that they have a pre-existing diagnosis for each of the disorders. If they responded as "Suspected, but not diagnosed" or "No," they were coded as 0, indicating not having a pre-existing diagnosis for each of the disorders.

2.3. Analytical plan

We began by documenting the correlations between all the variables included in the analysis. A series of Ordinary Least Square (OLS) regression models were employed to examine how the COVID-19-related discrimination experience was associated with the mental health outcomes, controlling for covariates. Two sets of analyses were conducted. First, we examined the relationship between COVID-19-related discrimination and anxiety, PTSD, and depression, respectively, controlling for individual characteristics (gender, age, U.S.-born), socioeconomic status (housing stability, employment status), and lifetime discrimination. In the second set of the analyses, we controlled for individuals' pre-existing mental health diagnoses (depression, anxiety disorder, or PTSD) as well as covariates included in the first set of analysis, considering that individuals who had prior or currently diagnosed mental health symptoms could have been more likely to experience anxiety, PTSD, or depression under the pandemic, not related to COVID-19-related discrimination.

3. Findings

Table 1 summarizes the sample characteristics. Within the A/AA racial group, about 43% identified as East Asian, 9% South Asian, 8% Southeast Asian, and about 40% as Asian in general, which included those who did not report their specific ethnicities. Specifically, one person identified as Pacific Islander, and one person identified as multiracial and Asian, and these two individuals were included in the "Asian in general" category. The sample consisted of 78.7% women, 19.9% men, and 1.4% transgender or non-binary individuals. The majority of the sample was born in the U.S. (57.8%), and about 82% of the sample reported stable housing. About a quarter of the sample (25.6%) reported having received a prior mental health diagnosis, with 19.9% of the sample diagnosed with depression, 14.7% with Generalized Anxiety Disorder, and 19.9% with post-traumatic stress disorder (PTSD). In terms of current mental health status, 31.8% of the sample experienced probable clinical levels of either depression symptoms, 30.3% experienced anxiety symptoms, and 22.3% experienced PTSD symptoms at the time of the study.

Table 2 presents the prevalence of the respondents' COVID-19-related discrimination experiences. Nearly half of the respondents reported that someone had commented about Chinese/Asian people being the source of the virus (45.0%) or that someone had made a comment about Chinese/Asian eating habits (e.g., eating bat soup) (41.7%). About a third of the respondents reported that someone had commented that they avoid eating Chinese/Asian food due to fear of contracting COVID-19 (32.7%), and 27.5% reported that someone had actively avoided physical contact with them or their family members because of their race/ethnicity. Respondents also reported witnessing comments from others about Chinese/Asian people being dirty (23.2%), racially-based verbal assaults (12.8%) or physical assaults due to COVID-19 (2.4%).

Table 3 presents the mean differences in current anxiety, depression, and PTSD symptoms between individuals who endorsed at least one COVID-19-related discrimination incident and individuals who did not endorse any incident. The mean scores of current anxiety symptoms and PTSD symptoms were significantly higher for those who experienced at least one COVID-19-related discrimination incident than those who did not (8.2 vs. 6.6 for anxiety symptoms; 37.1 vs. 31.7 for PTSD symptoms; all $p<.05$). Those with COVID-19-related discrimination experiences

Table 1
Characteristics of samples ($N = 211$).

	N (%)	Mean (Ranges)
Ethnicity		
	East Asian	90 (42.7%)
	South Asian	19 (9.0%)
	Southeast Asian	17 (18.1%)
	Asian in general	85 (40.0%)
Age (years)		24.5 (18.6–30.6)
Gender		
	Women	166 (78.7%)
	Men	42 (19.9%)
	Transgender/Non-binary	3 (1.4%)
Born in the United States		
	Yes	122 (57.8%)
	No	89 (42.2%)
Currently a Student		
	Yes	126 (59.7%)
	No	85 (40.3%)
Housing Stability		
	Stable	172 (81.5%)
	Unstable	39 (18.5%)
Employment status		
	Currently employed	73 (34.6%)
	Currently unemployed	138 (65.4%)
Preexisting mental health diagnosis		
	Depression	42 (19.9%)
	Anxiety disorder	31 (14.7%)
	PTSD	42 (19.9%)
	Any mental health diagnosis	54 (25.6%)
Discrimination		
	COVID-19 discrimination	1.9 (0–7.0)
	Lifetime discrimination	1.7 (0–13.0)
Mental Health Outcomes		
Current Depression Symptoms (PHQ-8 $\geq$ 10)	67 (31.8%)	7.7 (0–24.0)
Current Anxiety Symptoms (GAD-7 $\geq$ 10)	64 (30.3%)	7.7 (0–21.0)
Current PTSD Symptoms (PCL-*C* $\geq$ 45)	47 (22.3%)	35.3 (17.0–85.0)

Table 2
Prevalence of COVID-19-Anti-Asian Discrimination by Asian American Respondents from the CARES Project ($n = 211$).

	Items	N (%)
Covert discrimination	Someone has made a comment about Chinese/Asian people being the source of the virus	95 (45.0%)
Covert discrimination	Someone has made a comment about Chinese/Asian eating habits (e.g., eating bat soup)	88 (41.7%)
Covert discrimination	Someone has made a comment that they avoid eating Chinese/Asian food because they are worried about contracting COVID-19.	69 (32.7%)
Covert discrimination	Someone has actively avoided physical contact with me or my family because of my or my family member's race/ethnicity.	58 (27.5%)
Covert discrimination	Someone has made a comment about Chinese/Asian people being dirty.	49 (23.2%)
Overt discrimination	I or my family member have been verbally assaulted because of my or my family member's race/ethnicity due to COVID-19.	27 (12.8%)
Overt discrimination	I or my family member have been physically assaulted because of my or my family member's race/ethnicity due to COVID-19.	5 (2.4%)
Total	Any experience of racial discrimination or racial harassment.	143 (67.8%)

had higher scores on the depression scale compared to those who did not endorse any COVID-19-related discrimination experiences.

The results of the OLS regression models that examined the relationships between COVID-19-related discrimination and three mental health outcome measures are shown in Table 4. Model 1 controlled for individuals' demographic and socioeconomic characteristics and lifetime discrimination. Increases in COVID-19-related discrimination were statistically significantly related to increases in anxiety symptoms ($B = 0.39$, $p<.05$) and PTSD symptoms ($B = 1.33$, $p<.05$). No statistically significant relationship was found between COVID-19-related discrimination and depression symptoms.

Model 2 controlled for individuals' pre-existing mental health diagnoses in addition to demographic characteristics, socioeconomic status, and lifetime discrimination experiences. Increases in COVID-19-related discrimination experiences were still significantly associated with increases in PTSD symptoms ($B = 1.10$, $p<.05$). The relationship between COVID-19-related discrimination and anxiety symptoms was no longer significant in Model 2.

Table 3
Unadjusted mean comparisons of COVID-19-anti-Asian discrimination by mental health outcomes.

	COVID-19 Discrimination Mean	No COVID-19 Discrimination Mean	t	p value
Current Depression Symptoms (PHQ-8)	8.06	6.85	−1.45	0.14
Current Anxiety Symptoms (GAD-7)	8.19	6.60	−2.05	0.041*
Current PTSD Symptoms (PCL-C)	37.05	31.70	−2.58	0.015*

*$p<.05$, **$p<.01$, ***$p<.001$.

4. Discussion

Three key findings emerged from this study. First, our findings validate the public perception that COVID-19-related anti-Asian discrimination has been widespread from the very beginning of the COVID-19 pandemic. Two-thirds of participants reported that they or their family members experienced at least one of the seven covert or overt discriminatory experiences presented in the survey. Covert racism such as others actively avoiding physical contact with them (27.5%) or making comments about Chinese/Asian people being dirty (23.2%) was more common than overt racism such as physical (2.4%) or verbal assaults (12.8%). It is important to understand the nature of the discrimination that took place during this time, as it coincided with particularly heightened anxieties about contracting the virus and being targeted by the media, scapegoating China and the Chinese as the source of virus, as well as pivotal shifts that took place as a result of the pandemic (lockdowns, transition to virtual work and school, etc.).

Second, almost one in three A/AA young adults reported having clinically elevated levels of depression (31.8%, mean=7.7), generalized anxiety (30%), and almost one in four reported having PTSD symptoms (22.3%). These rates of depression are substantially higher than mental health estimates among the general young adult population prior to the COVID-19 pandemic (McGee and Thompson, 2015), and the level of generalized anxiety symptoms reported by our respondents was substantially higher compared to Korean American adults (Koh, 2018) and other Asian American college students (Cadigan et al., 2019). Similarly, the PTSD symptoms among those who reported at least one experience of COVID-19-related discrimination were higher than those in other studies that measured Asian American college students (Pieterse et al., 2010).

Third, the results suggest that for A/AA participants, COVID-19-related discrimination may be more strongly associated with PTSD symptoms than symptoms of depression and generalized anxiety. The PTSD symptoms assessed included disturbing memories, thoughts, and

Table 4
Multiple Regression Coefficients (β ± Standard Error of β) Based on Construction of Regression Models for Anxiety, PTSD, and Depression symptoms.

	Current Depression symptoms		Current Anxiety Symptoms		Current PTSD Symptoms	
	Model 1 B (SE)	Model 2 β (SE)	Model 1 B (SE)	Model 2 β (SE)	Model 1 B (SE)	Model 2 β (SE)
Predisposing factors						
Gender						
Female	..	..	..	..	..	..
Male	−2.567**	−2.209*	−3.055***	−2.995***	−5.736*	−4.804*
	(0.931)	(0.895)	(0.863)	(0.851)	(2.284)	(2.181)
Trans/non-binary	9.630**	7.679*	6.971*	5.469	25.479***	20.392**
	(3.163)	(3.060)	(2.935)	(2.950)	(7.761)	(7.462)
Age	.068	.002**	.007	−0.045	.172	−0.002
	(0.128)	(0.124)	(0.119)	(0.119)	(0.315)	(0.302)
birth place	.446	.294	−0.092	−0.193	−1.676	−2.073
	(0.760)	(0.729)	(0.705)	(0.697)	(1.866)	(1.777)
Socio-economic status						
Employed	.0789	−0.083	−0.785	−0.667	−2.249	−2.671
	(0.826)	(0.792)	(0.766)	(0.757)	(2.027)	(1.930)
Stable Housing	−1.771	−1.802	−1.059	−1.100	−5.098*	−5.178*
	(1.003)	(0.960)	(0.931)	(0.918)	(2.461)	(2.341)
Perceived discrimination						
COVID-19 discrimination	.234	.145	.391*	.324	1.331*	1.097*
	(0.211)	(0.203)	(0.196)	(0.195)	(0.517)	(0.495)
Lifetime discrimination	.215	.105	.206	.147	0.409	.123
	(0.161)	(0.156)	(0.150)	(0.149)	(0.396)	(0.381)
Pre-existing DX[+]		4.165***		2.675**		10.861***
		(0.951)		(1.028)		(2.319)
Adjusted ΔR^2	.093***	.168***	.109***	.134***	.136***	.218***

*$p<.05$, **$p<.01$, ***$p<.001$.

[+] Pre-existing diagnosis: For depression symptoms model, pre-existing DX means pre-existing depressive disorder. For anxiety symptoms model, pre-existing DX indicates pre-existing anxiety disorder. For PTSD symptoms model, pre-existing DX indicates pre-existing PTSD diagnosis.

avoidance. The nature of COVID-19-related discrimination measured in our study may be consistent with PTSD symptoms related to greater vigilance and fear regarding encounters with others. The link between COVID-19-related discrimination and PTSD symptoms may be due to fears regarding safety, which would lead to greater vigilance—a common symptom of PTSD. COVID-19-related discrimination could also eventually lead to higher levels of depression and anxiety, as such discrimination poses stress that can lead to higher levels of these particular symptoms. Subsequently, they may also experience sadness or hopelessness when reflecting on these circumstances. Longitudinal data analysis is necessary to test this hypothesis.

Our study also demonstrated that the intensity and magnitude of COVID-19-related discrimination was significantly associated with increases in symptoms of PTSD even after controlling for lifetime discrimination, measured as more chronic and indirect systemic discrimination such as disparities in healthcare services, unfair treatment by law enforcement, and not being promoted or paid equally (Williams et al., 1997). This result highlights that COVID-19-related discrimination may have significantly exacerbated and was more of a proximal risk for PTSD relative to lifetime discrimination during the first three months of the pandemic.

Our findings linking COVID-19-related discrimination to PTSD symptoms were still statistically significant after controlling for pre-existing mental health conditions. Most studies that examined the relationship between discrimination and mental health symptoms did not control for other well-established mental health risk factors such as pre-existing mental health diagnoses (Everett et al., 2016; Sutter and Perrin, 2016), thus confounding the relationship between discrimination and mental health outcomes. As such, we conclude that the associations between COVID-19-related discrimination and PTSD symptoms exist regardless of one's mental health history.

Our study has several limitations. First, our cross-sectional design precludes making assumptions about causality or directionality of the association between COVID-19-related discrimination and PTSD. Individuals with PTSD symptoms may have been more likely to recall or emphasize discrimination experiences. Second, measures of symptoms of depression, anxiety, and PTSD were based solely on self-report rather than clinical evaluation. Third, there might be a different level of experiences with COVID-19-related discrimination and its association with mental health outcomes based on specific ethnicities of participants. However, because of small sample sizes of sub-categories by ethnicity within A/AA, we were unable to conduct subgroup analyses by ethnic group within A/AA. Fourth, we asked if the respondents themselves or their family members experienced COVID-19-related discrimination. Attempting to elicit the experiences of family members may introduce bias, misreporting, or underreporting. In addition, participants may have recall bias due to the recency effect (Greene, 1986). Specifically, recalling the most recent instances of lifetime discrimination might have been influenced by recent COVID-related discrimination. Similarly, reporting pre-existing mental health conditions might have been also influenced by the current mental health condition influenced by COVID-19 related distress and vice versa. Finally, there is also potential bias sourcing from unmeasured confounders such as stress related to COVID-19 infection of participants or their loved ones, and genetics, which are ubiquitous problems for most observational studies.

Despite these limitations, this study adds to the growing evidence base that COVID-19-related discrimination is a threat to public health given links to problematic levels of mental health symptoms. AA have long suffered from the "model minority myth," which falsely suggests that all Asian Americans are self-reliant, free from problems (including mental health problems), and successful in academic and economic aspects of life (Sue et al., 2007). This insidious myth has led policy makers to overlook the pressing mental health needs of AA, leading to an inequitable distribution of federal investments in addressing the health of AA communities (Đoàn et al., 2019). Subsequently, AA young adults have faced the widest disparities in prescribed medication and outpatient behavioral health treatment, with 80% of cases going untreated (Lipson et al., 2018; Moniz and Gorin, 2018). Despite the fact that AA struggle with mental health at similar rates as their White peers, they are three times less likely to seek treatment for these concerns than the general population (Lee et al., 2009). This may be explained by the stigma and shame attached to the diagnosis and treatment of mental

health problems. AA are also prone to systemic and structural barriers to care, including severe shortages of linguistically diverse providers and accessibility barriers to quality health care (Kim and Keefe, 2010; Liu and Tronick, 2012). The growing evidence shows that culturally grounded group psychotherapy programs such as Asian Women's Action for Resilience and Empowerment (AWARE) can be efficacious for treating Asian American women diagnosed with PTSD (Hahm et al., 2020a; 2020b, 2019; Rivera et al., 2019). Identification of mental health symptoms and dissemination and provision of culturally grounded PTSD treatment for vulnerable A/AA young adults are urgently needed.

On May 20, 2021, President Biden signed the COVID-19 Hate Crimes Act. This bipartisan law is the first step in acknowledging that putting an end to violence against A/AA is important at a national level. Future policy must address the consequences of systemic racism and xenophobia, and systemic and policy-level interventions should be designed to have a common perspective with shared values that promote a safer society and will eventually lead to a reduction in racial disparities in mental health. Coordinated efforts to prevent violence against A/AA by justice system agencies, educational institutions, police, and social service agencies are critical. School administrators and mental health clinicians should be encouraged to screen and treat A/AA for race-based trauma.

Although we did not see an effect of lifetime discrimination on mental health outcomes in Wave I of the CARES data, the longitudinal nature of this study will allow us to test whether lifetime discrimination may also exert a negative impact on mental health along with COVID-19-related discrimination in future studies. Similarly, we did not see a significant association between COVID-19-related discrimination and symptoms of depression or anxiety. As the pandemic lingers, it will be important to conduct longitudinal assessments regarding the impact of COVID-19-related discrimination and lifetime discrimination on mental health outcomes. Monitoring changes in mental health outcomes will be crucial.

We believe that these results suggest that intervening actively to reduce and prevent COVID-19-related anti-Asian discrimination is imperative. Developing a shared understanding that "discrimination is a serious threat to public health" is an urgent task. Actions to change the narratives and rhetoric regarding Asian stereotypes must be taken so that bias and prejudice against Asians can be dismantled, whether it be on social media or in person. Future research should endeavor to develop and test trauma-focused interventions that seek to empower A/AA through validation of their experiences, providing them with a sense of safety, and supporting them to learn how to respond to racist experiences in a manner that promotes resilience.

Acknowledgments

We would like to thank to Kirsten Fleming, Emily Zhang, Fifi Ga Tin Wong, and Rumin Shaik for their contribution for data collection and editing of the manuscript.

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