



# Preliminary Examination of the Confluence of Mental Health and Discrimination on Functional Impairment across Racial and Ethnic Groups within the United States

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**Abstract**

**Objective:** Mental health disparities in the US. Among racial and ethnic minorities are a serious public health issue associated with substantial ethical, economic and health costs. Racial/ethnic minorities exhibit more severe mental disorder symptomatology; however, very little research exists on how this impacts functional outcomes and quality of life. Research addressing the impact of discrimination on symptomatology and functional outcomes, especially across specific racial/ethnic subgroups, is lacking. The current study aims to address the relationship between mental disorder symptomatology and functional impairment across racial/ethnic groups, as well as the moderation of discrimination on this association.

**Methods:** Data from the Collaborative Psychiatric Epidemiological Surveys (CPES) among Vietnamese, Filipino, Chinese, Mexican, Puerto Rican, Cuban, Afro-Caribbean, and African American individuals (N = 3,887) were used.

**Results:** The relationship between mental disorder symptomatology and functional impairment was found to vary across racial/ethnic groups and functional domains. Across all domains, symptomatology was more strongly associated with impairment at low levels of discrimination for Chinese, Afro-Caribbean, and Mexican groups. The association between symptomatology and domains of impairment was stronger at high levels of discrimination for Vietnamese, Cuban, and Puerto Rican groups. Finally, across domains, discrimination was inconsistently associated with symptomatology and impairment for African Americans and Filipinos.

**Conclusion:** Findings suggest nuanced disparities in mental health continue to exist across racial/ethnic subgroups and additional work is needed to elucidate and address this public health problem using multifaceted outcomes such as functional impairment.

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**Keywords:** Black; Latinx; Asian american; Mental health; Discrimination; Functional impairment.

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## Introduction

Health disparities in the United States, particularly among racial and ethnic minorities, may be the “most serious and shameful health care issue of our time.” Health disparities are understood as “differences that exist among specific population groups in the United States in the attainment of full health potential that can be measured by differences in incidence, prevalence, mortality, burden of disease, and other adverse health conditions” [1]. Health disparities exemplify and perpetuate long-standing historical inequities based on race and ethnicity [2]. While eliminating racial/ethnic health disparities was prioritized in the 2001 U.S. Surgeon General’s report, [3] little progress has been made in the years since [4]. In particular, much more work is needed to ameliorate mental health disparities among racial/ethnic minorities [5]. Compared with Whites, many racial/ethnic minorities in the U.S. continue to have less access to mental health services, are less likely to receive care, are more likely to receive poor quality care [6]. Work to address and alleviate disparities in mental health among racial/ethnic minorities in the US. is greatly needed to improve health outcomes, and to eliminate long-standing social injustices [2]. As such, the current study investigated mental health and discrimination as predictors of functional impairment across racial/ethnic groups to better elucidate the nature and consequences of mental health disparities in the US.

### Mental health across racial/ethnic groups

Substantial research has documented differential and mixed outcomes in mental health among racial/ethnic minorities in the US. For example, some findings suggest that Latinx, Asian American, and Black individuals may have fewer mental disorders than Whites, but also have a greater number of subclinical symptoms [5,7]. On the other hand, other research suggests that Blacks and Latinx individuals may have higher rates of symptomatology than Asian Americans [8]. Studies examining rates of specific mental disorders across racial/ethnic groups indicate similarly mixed findings for depression, anxiety, [9] and alcohol and substance use disorders [10].

### Mental health and functional impairment

Currently, a majority of intervention literature addressing mental health outcomes and disparities define efficacy of treatment in terms of mental health symptoms, neglecting functional outcomes [11]. However, chronic mental health conditions can vary widely in effects on daily functioning and may not be fully explained by symptomatology [11]. Indeed, one study found that mental disorder symptomatology only explained a small-to-modest proportion of variance in quality of life among patients with significant mental disorder-related disability [12]. This suggests that efforts to solely reduce mental disorder symptomatology are inadequate given the multifaceted nature and consequences of mental health problems [13].

Despite the well-established importance of utilizing multidimensional approaches to assess mental health problems, research on functional impairment outcomes in the literature is greatly lacking [14]. The World Health Organization conceptualizes functional impairment as limitation in activities and behaviors as well as restriction on participation in life and society [15,16]. As mental health outcomes are of concern due to their associated functional impact affecting individuals, families, and societies, [14] improvement in functional impairment is of clinical importance and must be considered in conjunction with

symptomatology [17,18].

Functional impairment can affect numerous life domains including social impairment, [19] occupational impairment [20] and physical impairment [21]. The impact of mental disorders on various domains of functional impairment has not been widely examined. In particular, while social, occupational, and physical impairment have been addressed in the existing literature, [14] other domains of impairment, including cognitive (i.e., understanding and communicating), self-care (hygiene, dressing, eating), and role impairment (work, school, other responsibilities) have been largely neglected [22]. Thus, work addressing correlates of functional impairment across different domains of disability are also greatly needed to explore and establish multidimensional conceptualizations of mental health.

Furthermore, very little research exists on the link between mental disorder symptomatology and functional impairment among racial/ethnic minorities. However, the little extant research suggests that mental disorder symptomatology may differentially affect individuals across racial/ethnic groups, leading to varying degrees and perhaps different types of functional impairment [23,24]. For example, depression is related to the highest levels of functional impairment among Blacks as compared with other racial/ethnic groups [24]. Similarly, another study addressing the functional effects of disordered eating on Blacks, Latinx, Asian Americans, and Whites found that Blacks with an eating disorder reported significantly greater levels of functional impairment compared with Whites [23]. Of note, however, substantial intragroup variability in health and culture-related factors exist within commonly examined racial/ethnic groups (e.g., Black, Latinx, Asian American). Thus, it is important to examine more nuanced groups for a better examination of health and health-related disparities within specific populations.

### Discrimination as a predictor of functional impairment

Discrimination is an important factor when considering disparate health outcomes among racial/ethnic minorities in the US. Perceived discrimination is conceptualized as a perceived “behavioral manifestation of a negative attitude, judgment, or unfair treatment towards members of a [minority] group” [25]. Race and ethnicity-related discrimination is pervasive in the U.S. [26] yet experiences vary across ethnic minority groups. For example, one study found that, among Latinx, Asian Americans, and Blacks in the US., Latinx endorsed the highest rates of discrimination [27]. Others have found that Blacks report the highest level of race/ethnicity-related microaggressions, followed by Latinx and Asian Americans, respectively [28]. As such, more work, especially within more nuanced racial/ethnic groups, is needed to examine how different individuals in the US. experience race/ethnicity-related discrimination.

Existing research on discrimination and health outcomes suggests that discrimination increases morbidity [29] and is also associated with poorer mental health outcomes [26]. Discrimination and mental health outcomes may be linked through a number of different mechanisms. First, discrimination may elicit stress, which may in turn lead to negative emotional states, eliciting poor mental health. Second, coping responses to perceived discrimination can lead to maladaptive behaviors to manage stress. Finally, psychological and behavioral responses to stressors like discrimination can lead to structural and functional changes in physiological systems, including neuroendocrine, autonomic, and immune systems [30]. The link between discrimination and poor mental health has been well-established

among Blacks [31], Latinx, and Asian Americans [32,33].

However, to our knowledge, no research exists on the impact of discrimination on functional impairment. However, given that poor mental health is associated with functional impairment, [16] it is possible that discrimination, a predictor of poor mental health, [26] is also related increased functional impairment as a result of mental health problems [25]. Considering these associations, discrimination may also moderate and amplify the relationship between mental health symptoms and functional impairment. All in all, additional research is needed to explore the relationships between mental health symptomatology, functional impairment, and discrimination across racial/ethnic groups to reduce disparities in mental health outcomes in the US. Research addressing how mental health symptomatology leads to functional impairment across racial/ethnic groups is valuable to begin to explain and understand the implications of this discrepancy.

### The current study

The current study sought to assess the relationship between mental disorder symptomatology and functional impairment across Vietnamese, Filipino, Chinese, Mexican, Puerto Rican, Cuban, Afro-Caribbean, and African American individuals. Functional impairment was explored as a multifaceted outcome variable comprising five domains of impairment (i.e., social, cognitive, role, mobility, self-care). Discrimination was conceptualized as a moderating environmental factor. The effect of discrimination on the relationship between mental disorder symptomatology and functional impairment (across five distinct domains) was assessed across racial/ethnic groups. This work will provide much-needed information on why and how ethnic disparities in mental health continue to persist in the US. Given the lack of previous work in this area, this work pulls from a national epidemiological dataset to elucidate population-level patterns across mental disorder symptomatology, discrimination, and functional impairment to guide basic science and clinical science research.

Given the existing literature addressing mental health disparities among racial/ethnic minorities, it was hypothesized that mental disorder symptomatology would vary across racial/ethnic groups. Further, it was hypothesized that levels of discrimination would vary across racial/ethnic groups. As the previous literature has been inconsistent [23,27,28] and has not addressed racial/ethnic subgroups, no specific hypotheses were developed on which groups would report the most symptomatology or discrimination. It was hypothesized that both mental disorder symptomatology and discrimination would be associated with all domains of functional impairment. Given that little to no research currently exists comparing how mental disorder symptomatology and discrimination are associated with various types of functional impairment, these analyses were exploratory in nature. It was hypothesized that discrimination would strengthen the relation between mental disorder symptomatology and functional impairment across all groups and domains of impairment.

### Method

#### Participants

The Collaborative Psychiatric Epidemiological Surveys (CPES), funded by the National Institutes of Mental Health (NIMH), is the only national dataset currently in existence examining the mental health of racial/ethnic minorities. The CPES combines

data from three nationally representative surveys: the National Latino and Asian American Study (NLAAS), the National Survey of American Life (NSAL), and the National Comorbidity Survey Replication (NCS-R; [34]). The current study used two of the three CPES datasets: the NLAAS and the NSAL. The NSAL includes 3,570 African-Americans, 1,006 non-Hispanic Whites, and 1,623 Afro-Caribbean Blacks, for a total sample of 6,199 adults over the age of 18 years residing in the U.S. African-Americans included Black adults who did not identify Caribbean ancestry. Afro-Caribbean Blacks were limited to Black individuals who identified Caribbean ancestry [34]. The NLAAS survey population includes 4,649 Latinx (n = 2,554) and Asian American (n = 2,095) adults over the age of 18. Latinx were categorized into four groups of interest: Mexican (n = 868), Puerto Rican (n = 495), Cuban (n = 577), and all other Latinx (n = 614). Asian Americans were categorized into four groups of interest: Chinese (n = 600), Filipino (n = 508), Vietnamese (n = 520), and all other Asians (n = 467) [34].

### Procedures

All data was collected via in-person interviews. Trained Survey Research Center (SRC) interviewers contacted each sample housing unit and asked adult household informants to supply the age, gender, race, and ethnic ancestry status of each household member. This demographic data was recorded on a household roster, and the interviewer identified the subset of household members eligible to be selected a participant. Four-stage national area probability sampling was used and all respondents were interviewed using a modified version of the WHO-CIDI [34].

### Measures

Demographic and covariate variables. Gender, insurance status, years in the US., age, and education were included as covariates considering their relations with mental health outcomes [35-39]. Years of education was used as a proxy to assess socioeconomic status and was categorized into four groups and coded: 1 = "0-11 years", 2 = "12 years," 3 = "13-15 years," and 4 = "greater than or equal to 16 years." Gender was coded 0 = "male" and 1 = "female." Age was measured as a continuous variable ranging from 18 to 65 years. Insurance status consisted of a composite of 8 items assessing whether participants had insurance coverage through a purchased plan, the military, an employer, Medicare, Medicare supplemental, government assistance, state insurance, or other insurance and was coded 0 = "no insurance" and 1 = "yes has insurance." Number of years living in the US. was used as a proxy for acculturation as is common in epidemiological work [40-41] and was categorized into five groups: 0 = "born in the U.S.," 1 = "less than 5 years," 2 = "5-10 years," 3 = "11-20 years," and 4 = "greater than 20 years." The income to needs ratio was calculated using total family income and the corresponding poverty threshold.

### Race/ethnicity

Self-identified race/ethnicity were collected for all respondents as part of the screening process for interviews. For the NLAAS survey, participants were grouped into eight categories: Vietnamese, Filipino, Chinese, all other Asian, Mexican, Puerto Rican, Cuban, and all other Hispanic/Latinx. For the NSAL survey, participants were grouped into three categories: Afro-Caribbean, African American, and non-Hispanic White. Non-Hispanic White individuals were not included in the analyses due to power limitations.

Mental disorder symptomatology. Mental disorder symptomatology was assessed using an expanded version of the World Health Organization Composite International Diagnostic Interview [42]. In the CPES, this measure was used as a screener and was given to all participants in the sample. To examine any presence of symptomatology, thirty-six items binary from the screener were selected to assess endorsement of symptomatology for any past-year anxiety (panic disorder, agoraphobia without panic, specific phobia, social phobia, generalized anxiety disorder, posttraumatic stress disorder, and separation anxiety disorder), mood (bipolar I and II disorders, major depressive disorder, and dysthymia), or substance use disorder (alcohol, nicotine, and other substance abuse and dependence). Participants could respond “yes” or “no” to all items (e.g., “did you have an episode of being worried, lasting at least one month or longer, in the past 12 months?”). Symptoms were scored dichotomously (yes = 1, no = 0) and were summed to create a total score ranging from 0 to 36 with greater scores indicative of more mental disorder symptomatology.

Functional impairment. Functional impairment was assessed using the World Health Organization Disability Assessment Schedule II (WHO-DAS-II)[22]. This assessment consists of 36 items and six subscales examining various domains of impairment: Social impairment, role impairment, time out of role, mobility impairment, cognitive impairment, and self-care impairment. Role impairment was excluded from analyses as this subscale was not administered to NLAAS participants. Each domain was scored and converted to count score from 0 (no impairment) to 100 (full impairment).

### Discrimination

Discrimination was assessed using nine items assessing frequency of lifetime discrimination experiences (e.g., “In your day-to-day life, how often have you been treated with less courtesy than other people?”). Respondents indicated frequency of discrimination experiences on a six-point scale ranging from 1, “never,” to 6 “almost every day.” Items were summed to create a discrimination score. Scores computed this way have been found to be reliable in previous work with the same sample [43] and across racial/ethnic groups in the current study (Cronbach’s alpha ranged from 0.73 to 0.84 across groups). Participants were administered a separate question assessing perceived reason for discriminating experiences (e.g., ancestry, gender, race, height/weight, skin color).

### Data analysis

#### Preliminary analyses

All analyses were conducted in SPSS 25. The total combined sample was 10,731 individuals. Individuals with data missing on any of the variables of interest ( $N = 455$ ) were excluded with listwise deletion for a total sample of 10,276 individuals. The sample was then filtered using the item assessing reason for perceived discriminating experiences where individuals reporting ancestry/ethnicity, race, and skin color were selected for the analyses. Individuals who reported other reasons for discrimination (e.g., weight, gender) were excluded from the analyses for a resultant total sample of 3,887 individuals (see Table 1).

Preliminary analyses were conducted to evaluate age, years of education, number of years in the US., insurance status, and income ratio. Survey reliabilities, means, standard deviations, skew, and kurtosis were calculated and evaluated. Mental disorder symptomatology was log-transformed to meet standard cut-

offs for skew and kurtosis [44]. A one-way analysis of variance was conducted to determine if there were significant differences in mental disorder symptomatology and discrimination across racial/ethnic groups. The  $t$ -test for these analyses was two-tailed with the probability of rejecting the null hypothesis set at  $p < .05$ .

Primary analyses. Pearson product-moment  $r$  correlations were conducted to assess the relationship between mental disorder symptomatology and functional impairment across all racial/ethnic groups. Cohen’s standard was used to evaluate the correlation coefficient [45]. Post-hoc comparisons using the Fisher  $r$ -to- $z$  transformation with Bonferroni corrections were conducted to examine differences between correlation coefficients across groups.

Regression analyses were conducted to assess the moderating effect of discrimination on the relationships between mental disorder symptomatology and each functional impairment domain (social, role, cognitive, mobility, and self-care). Homoscedasticity was assessed and outlier diagnostics were performed using Cook’s  $D$ . The data were found to be homoscedastic and no outliers were excluded from analyses. All variables were assessed for linearity, normality, and independence. To evaluate for moderation, a hierarchical linear regression was conducted. The independent variables were mental disorder symptomatology, discrimination, and the interaction between mental disorder symptomatology and discrimination. Gender, age, insurance status, socioeconomic status, and acculturation were added to the regression equation as covariates. This moderation analysis was conducted separately across all eight racial/ethnic groups.

## Results

### Descriptive analyses

A one-way analysis of variance conducted to compare mental disorder symptomatology across racial/ethnic groups was significant,  $F(7, 3880) = 13.79, p < .001$ . Results indicated that mental disorder symptomatology differed significantly across groups ( $p < .001$ ). Post hoc comparisons using the Tukey HSD test indicated that mental disorder symptomatology among African Americans ( $M = 0.37, SD = 0.62$ ) was the highest compared to all other groups (i.e., Vietnamese ( $M = 0.09, SD = 0.45; p < .001$ ), Filipino ( $M = 0.15, SD = 0.45; p < .001$ ), Chinese ( $M = 0.13, SD = 0.40; p < .001$ ), Mexican ( $M = 0.24, SD = 0.49; p < .01$ ), and Afro-Caribbeans ( $M = 0.27, SD = 0.53; p < .001$ )). Afro-Caribbeans reported greater mental disorder symptomatology than Vietnamese ( $p < .05$ ) and Chinese individuals ( $p < .001$ ). Finally, the Puerto Rican group ( $M = 0.38, SD = 0.66$ ) reported significantly greater symptomatology than the Vietnamese ( $p < .05$ ), Filipino ( $p < .01$ ) and Chinese groups ( $p < .001$ ).

A one-way analysis of variance conducted to compare discrimination across racial/ethnic groups was also significant,  $F(7, 3880) = 42.29, p < .001$ . Post hoc comparisons using the Tukey HSD test indicated that discrimination among African Americans ( $M = 23.14, SD = 7.54$ ) was significantly greater than all other groups except Afro-Caribbeans (i.e., Vietnamese ( $M = 17.70, SD = 6.35; p < .001$ ), Filipino ( $M = 20.03, SD = 6.17; p < .001$ ), Chinese ( $M = 18.21, SD = 4.82; p < .001$ ), Cuban ( $M = 16.32, SD = 5.21; p < .001$ ), Puerto Rican ( $M = 19.46, SD = 7.51; p < .001$ ), and Mexican ( $M = 20.00, SD = 7.54; p < .001$ )). Afro-Caribbeans also reported greater discrimination than Vietnamese ( $p < .001$ ), Filipino ( $p < .001$ ), Chinese ( $p < .001$ ), Cuban ( $p < .001$ ), Puerto Rican ( $p < .001$ ), and Mexican ( $p < .001$ ) groups. Cubans reported less discrimination than Filipinos ( $p < .001$ ),

Puerto Ricans ( $p < .01$ ), and Mexicans ( $p < .001$ ).

### Primary analyses

Bivariate correlations were conducted to examine the relationship between mental disorder symptomatology and functional impairment across each racial/ethnic group. The correlations were significant ( $p < .01$ ) among the Filipino ( $r = 0.45$ ), Chinese ( $r = 0.33$ ), Cuban ( $r = 0.89$ ), Puerto Rican ( $r = 0.27$ ), Mexican ( $r = 0.37$ ), Afro-Caribbean ( $r = 0.36$ ), and African American ( $r = 0.42$ ) groups, indicating that functional impairment increases with mental disorder symptomatology. The correlation in the Vietnamese group was not significant. Post-hoc comparisons using the Fisher  $r$ -to- $z$  transformation with Bonferroni corrections indicated that the correlation between mental disorder symptomatology and functional impairment was significantly stronger in the Cuban group compared to all other groups ( $z = 8.25$ – $9.93$ ,  $p < .001$ ). The correlation was stronger in the Filipino group compared to the Puerto Rican group ( $z = 2.13$ ,  $p < .05$ ).

### Functional impairment by domain across racial/ethnic groups

Controlling for covariates (i.e., gender, insurance, years in the US., age, and education), hierarchical regression analyses were conducted to evaluate the differential effects of mental health symptomatology, discrimination, and the two-way interaction between mental disorder symptomatology and discrimination on five domains of functional impairment: social, role, mobility, cognitive, and self-care. All analyses were conducted across racial/ethnic groups.

#### Social impairment

The regression accounted for the greatest proportion of total variance in social impairment within the Cuban group ( $R^2 = 0.77$ ) followed by the Filipino group (see Table 2). Overall, the effect sizes for the regression equation ranged from small to large ( $f^2 = 0.02$  –  $3.35$ ). Mental disorder symptomatology was positively associated with social impairment across all groups except the Vietnamese group, with the strongest effects found in the Cuban group. Discrimination was a significant predictor of social impairment within the African American group. The interaction term was a significant predictor of social impairment within the Chinese, Cuban, and Afro-Caribbean groups. Among the Chinese and Afro-Caribbean groups, symptomatology was more strongly related to social impairment at lower levels of discrimination. However, the opposite was true in the Cuban group, where the association between symptomatology and impairment was when individuals reported high levels of discrimination.

#### Role impairment

The regression accounted for the greatest proportion of total variance in role impairment within the Cuban group ( $R^2 = 0.63$ ), followed by the Filipino group (see Table 3). Overall, the effect sizes for the regression equation ranged from small to large ( $f^2 = 0.03$  –  $1.70$ ) [46]. Mental disorder symptomatology was positively associated with role impairment across racial/ethnic groups with the exception of the Vietnamese group, with the strongest effects found in the African American group. Discrimination was a positive predictor of role impairment within the Puerto Rican, Mexican, Afro-Caribbean, and African American groups, with increased discrimination associated with greater role impairment. The interaction term was a significant predictor of role impairment within the Vietnamese, Puerto Rican,

Mexican, and Afro-Caribbean groups. Within the Mexican and Afro-Caribbean groups, symptomatology was associated with greater role impairment at low levels of discrimination. However, within the Vietnamese and Puerto Rican groups, the association between symptomatology and role impairment was stronger at high levels of discrimination.

#### Mobility Impairment

The regression accounted for the greatest proportion of total variance in mobility impairment in the Cuban group ( $R^2 = 0.47$ ), followed by the African American group (see Table 4). Overall, the effect sizes for the regression equation ranged from small to large ( $f^2 = 0.02$  -  $0.89$ ) [46]. Excluding the Vietnamese group, mental disorder symptomatology was positively associated with mobility impairment across all racial/ethnic groups, with the strongest effects found in the Cuban group. Discrimination was not associated with mobility impairment in any of the racial/ethnic groups. The interaction term was significant in the Filipino, Afro-Caribbean, and African American groups. Within the Filipino, African American, and Vietnamese groups, the association between symptomatology and mobility impairment was stronger at high levels of discrimination. However, among Afro-Caribbeans, the association was stronger at low levels of discrimination.

#### Cognitive

The regression accounted for the greatest proportion of total variance in cognitive impairment in the Cuban group ( $R^2 = 0.75$ ), followed by the Chinese group (see Table 5). Overall, the effect sizes for the regression equation ranged from medium to large ( $f^2 = 0.06$  -  $0.300$ ; Cohen) [46]. Mental disorder symptomatology was associated with cognitive impairment across all groups with the exception of the Mexican group. The strongest effects were found in the Cuban group. Discrimination was a significant positive predictor of cognitive impairment within the Mexican group, suggesting that increased discrimination is associated with increased cognitive impairment. The interaction term was a significant negative predictor of cognitive impairment within all the racial/ethnic groups. Among the Chinese, Mexican, and Afro-Caribbean groups, the association between symptomatology and cognitive impairment was stronger among those reporting low discrimination. However, among Puerto Rican, African American, and Filipino groups, the association was stronger among those reporting high discrimination.

#### Self-care

The regression accounted for the greatest proportion of total variance in the Latinx group ( $R^2 = 0.30$ ), followed by the Filipino group (see Table 6). Overall, the effect sizes for the regression equation ranged from small to large ( $f^2 = 0.01$  -  $0.43$ ) [46]. Mental disorder symptomatology was a significant positive predictor of self-care impairment across all racial/ethnic groups except the Vietnamese and Mexican groups. The strongest effects were found in the Cuban group. Discrimination did not significantly predict self-care impairment within any of the racial/ethnic groups. The interaction between discrimination and mental disorder symptomatology was a significant predictor of self-care impairment within the Filipino, Afro-Caribbean, and African American groups. Among the Filipino group, the association between symptomatology and self-care impairment was greater among those reporting high discrimination. However, among Afro-Caribbean's and African Americans, the association was greater among those reporting low discrimination.

**Table 1:** Descriptives and covariates by race/ethnicity.

	Vietnamese n = 134	Filipino n = 221	Chinese n = 221	Cuban n = 123	Puerto Rican n = 205	Mexican n = 321	Afro- Carib- bean n = 784	African American n = 1878
Gender								
Male	77	113	121	69	94	162	345	717
Female	57	108	101	54	111	159	439	1161
Years education								
0-11	30	17	24	31	61	159	124	434
12	24	34	27	32	65	87	225	694
13-15	38	78	51	23	52	50	226	460
16+	42	92	120	37	27	25	209	290
Years U.S.								
< 5 years	12	25	35	19	3	35	58	11
5-10 years	26	18	35	20	8	43	80	7
11-20 years	46	48	58	13	27	67	176	0
20+ years	44	75	53	58	54	53	221	0
U.S. Born	6	55	40	13	113	122	245	1843
Has insurance	113	202	189	93	178	182	784	1878
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Income Ratio	4.66 (4.86)	6.93 (4.93)	6.64 (5.45)	4.63 (4.40)	3.78 (3.89)	2.87 (3.09)	3.46 (2.77)	2.59 (2.33)
Symptomatology	0.19 (0.73)	0.40 (1.70)	0.31 (1.21)	0.72 (2.25)	1.00 (2.28)	0.51 (1.47)	0.61 (1.67)	0.90 (2.13)
Discrimination	17.70 (6.35)	20.03 (6.17)	18.21 (4.82)	16.32 (5.21)	19.46 (7.51)	20.00 (7.54)	22.52 (7.47)	23.14 (7.54)
Impairment	4.91 (21.98)	7.96 (27.89)	6.20 (23.14)	18.75 (61.80)	17.19 (45.72)	9.89 (29.19)	12.30 (36.41)	25.92 (51.74)
Age	39.08 (13.22)	41.36 (14.52)	39.18 (12.93)	45.01 (14.83)	39.30 (14.42)	34.89 (12.18)	39.51 (14.19)	41.21 (14.66)

Dummy coded variables were education: 1: 0-11 years; 2: 12 years; 3: 13-15 years; 4: 16+ years; Years in the US: 1: < 5 years; 2: 5-10 years; 3: 11-20 years; 4: > 20 years; 5: US born; Has insurance: 1: yes; 0: no.

**Table 2:** Results of hierarchical regression analyses evaluating the association of mental disorder symptomatology, perceived discrimination, the two-way interaction term, and covariates with social impairment across racial/ethnic groups.

		$\beta$	<i>t</i>	Adj. $R^2$	$f^2$	<i>F</i>	<i>df</i>
Vietnamese	Model 1			0.00	0.06	0.38	12, 121
	Symptomatology	-0.02	-0.16				
	Discrimination	-0.03	-0.32				
Filipino	Model 2			0.00	0.08	0.35	13, 120
	Symptomatology x Discrimination	0.04	0.09				
	Model 1			0.19	0.23	5.24***	12, 208
Filipino	Symptomatology	0.40	6.05***				
	Discrimination	0.09	1.39				
	Model 2			0.19	0.23	5.03***	13, 207
Chinese	Symptomatology x Discrimination	0.34	1.48				
	Model 1			0.12	0.14	3.46***	12, 209
	Symptomatology	0.37	5.73***				
Chinese	Discrimination	0.04	0.59				

	Model 2			0.17	0.20	4.41***	13, 208
	Symptomatology x Discrimination	1.40	3.65***				
Cuban	Model 1			0.69	2.23	23.64***	12, 110
	Symptomatology	0.88	15.92***				
	Discrimination	-0.11	-2.07*				
	Model 2			0.77	3.35	33.02***	13, 109
	Symptomatology x Discrimination	-1.14	-6.43***				
Puerto Rican	Model 1			0.04	0.04	1.68	12, 192
	Symptomatology	0.23	3.10**				
	Discrimination	0.05	0.70				
	Model 2			0.04	0.04	1.61	13, 191
	Symptomatology x Discrimination	-0.16	-0.91				
Mexican	Model 1			0.03	0.03	1.70	12, 308
	Symptomatology	0.14	2.46*				
	Discrimination	0.00	-0.00				
	Model 2			0.02	0.02	1.62	13, 307
	Symptomatology x Discrimination	-0.16	-0.78				
Afro-Caribbean	Model 1			0.09	0.10	8.42***	11, 772
	Symptomatology	0.29	8.25***				
	Discrimination	0.03	0.94				
	Model 2			0.11	0.12	9.39***	12, 771
	Symptomatology x Discrimination	0.40	4.24***				
African American	Model 1			0.15	0.18	38.78***	9, 1868
	Symptomatology	0.38	17.26***				
	Discrimination	0.05	2.33*				
	Model 2			0.15	0.18	35.04***	10, 1867
	Symptomatology x Discrimination	0.08	1.15				

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

**Table 3:** Results of hierarchical regression analyses evaluating the association of mental disorder symptomatology, perceived discrimination, the two-way interaction term, and covariates with role impairment across racial/ethnic groups.

		$\beta$	$t$	Adj. $R^2$	$f^2$	$F$	$df$
Vietnamese	Model 1			0.08	0.08	1.96*	12, 121
	Symptomatology	0.12	1.37				
	Discrimination	-0.08	-0.86				
	Model 2			0.15	0.18	2.867**	13, 120
	Symptomatology x Discrimination	-1.38	-3.41**				
Filipino	Model 1			0.22	0.28	6.24***	12, 208
	Symptomatology	0.47	7.40***				
	Discrimination	0.10	1.60				
	Model 2			0.22	0.28	5.77***	13, 207
	Symptomatology x Discrimination	-0.12	-0.55				

Chinese	Model 1			0.03	0.03	1.60	12, 209
	Symptomatology	0.22	3.19**				
	Discrimination	0.01	0.09				
	Model 2			0.03	0.03	1.56	13, 208
	Symptomatology x Discrimination	0.42	1.03				
Cuban	Model 1			0.64	1.78	18.71***	12, 110
	Symptomatology	0.80	13.27***				
	Discrimination	-0.04	-0.63				
	Model 2			0.63	1.70	17.15***	13, 109
	Symptomatology x Discrimination	-0.08	-0.36				
Puerto Rican	Model 1			0.09	0.09	2.62**	12, 192
	Symptomatology	0.26	3.61***				
	Discrimination	0.17	2.28*				
	Model 2			0.11	0.12	2.95**	13, 191
	Symptomatology x Discrimination	-0.41	-2.47*				
Mexican	Model 1			0.16	0.19	6.19***	12, 308
	Symptomatology	0.26	4.89***				
	Discrimination	0.21	3.67***				
	Model 2			0.17	0.20	6.10***	13, 307
	Symptomatology x Discrimination	0.38	2.04*				
Afro-Caribbean	Model 1			0.10	0.11	8.62***	11, 772
	Symptomatology	0.26	7.49***				
	Discrimination	0.08	2.17*				
	Model 2			0.11	0.12	8.72***	12, 771
	Symptomatology x Discrimination	0.28	2.97**				
African American	Model 1			0.15	0.18	36.80***	9, 1868
	Symptomatology	0.32	14.67***				
	Discrimination	0.07	3.14**				
	Model 2			0.15	0.18	33.10***	10, 1867
	Symptomatology x Discrimination	0.0	0.04				

\* p < .05; \*\* p < .01; \*\*\* p < .001

**Table 4:** Results of hierarchical regression analyses evaluating the association of mental disorder symptomatology, perceived discrimination, the two-way interaction term, and covariates with mobility impairment across racial/ethnic groups.

		$\beta$	<i>t</i>	Adj. $R^2$	$f^2$	<i>F</i>	<i>df</i>
Vietnamese	Model 1			0.00	0.04	.57	12, 121
	Symptomatology	-0.01	-0.13				
	Discrimination	0.06	0.65				
	Model 2			0.00	0.02	.77	13, 120
	Symptomatology x Discrimination	-0.79	-1.78				
Filipino	Model 1			0.04	0.04	1.68	12, 208
	Symptomatology	0.28	3.99***				
	Discrimination	0.01	0.19				



	Model 2			0.06	0.06	2.10*	13, 207
	Symptomatology x Discrimination	-0.63	-2.55*				
Chinese	Model 1			0.03	0.06	1.51	12, 209
	Symptomatology	0.23	3.38**				
	Discrimination	0.02	0.24				
	Model 2			0.03	0.03	1.52	13, 208
	Symptomatology x Discrimination	0.52	1.26				
Cuban	Model 1			0.47	0.89	10.06***	12, 110
	Symptomatology	0.71	9.78***				
	Discrimination	-0.07	-0.97				
	Model 2			0.47	0.89	9.24***	13, 109
	Symptomatology x Discrimination	0.14	0.50				
Puerto Rican	Model 1			0.04	0.04	1.69	12, 192
	Symptomatology	0.16	2.09*				
	Discrimination	0.06	0.84				
	Model 2			0.04	0.04	1.67	13, 191
	Symptomatology x Discrimination	-0.21	-1.20				
Mexican	Model 1			0.09	0.10	3.59***	12, 308
	Symptomatology	0.25	4.44***				
	Discrimination	0.06	1.09				
	Model 2			0.09	0.10	3.36***	13, 307
	Symptomatology x Discrimination	0.16	0.79				
Afro-Caribbean	Model 1			0.09	0.10	7.98***	11, 772
	Symptomatology	0.29	8.15***				
	Discrimination	0.05	1.31				
	Model 2			0.11	0.12	9.11***	12, 771
	Symptomatology x Discrimination	0.42	4.41***				
African American	Model 1			0.13	0.15	31.64***	9, 1868
	Symptomatology	0.30	13.18***				
	Discrimination	0.04	1.62				
	Model 2			0.13	0.15	28.94***	10, 1867
	Symptomatology x Discrimination	-0.14	-2.04*				

\* p < .05; \*\* p < .01; \*\*\* p < .001

**Table 5:** Results of hierarchical regression analyses evaluating the association of mental disorder symptomatology, perceived discrimination, the two-way interaction term, and covariates with cognitive impairment across racial/ethnic groups.

		$\beta$	$t$	Adj. $R^2$	$f^2$	$F$	$df$
Vietnamese	Model 1			0.02	0.02	1.26	12, 121
	Symptomatology	0.29	3.13**				
	Discrimination	-0.09	-.94				
	Model 2			0.20	0.25	3.52***	13, 120
	Symptomatology x Discrimination	-2.06	-5.23***				

Filipino	Model 1			0.13	0.15	3.67***	12, 208
	Symptomatology	0.38	5.60***				
	Discrimination	-0.05	-.69				
	Model 2			0.17	0.20	4.55***	13, 207
	Symptomatology x Discrimination	-0.82	-3.55***				
Chinese	Model 1			0.11	0.12	3.22***	12, 209
	Symptomatology	0.36	5.47***				
	Discrimination	0.08	1.15				
	Model 2			0.30	0.43	8.33***	13, 208
	Symptomatology x Discrimination	2.69	7.67***				
Cuban	Model 1			0.74	2.85	30.62***	12, 110
	Symptomatology	0.90	17.85***				
	Discrimination	-0.03	-.71				
	Model 2			0.75	3.00	29.06***	13, 109
	Symptomatology x Discrimination	-0.33	-1.77				
Puerto Rican	Model 1			0.07	0.07	2.36**	12, 192
	Symptomatology	0.36	4.98***				
	Discrimination	-0.05	-.72				
	Model 2			0.13	0.15	3.35***	13, 191
	Symptomatology x Discrimination	-0.60	-3.66***				
Mexican	Model 1			0.04	0.04	2.22*	12, 308
	Symptomatology	0.07	1.25				
	Discrimination	0.24	4.01***				
	Model 2			0.06	0.06	2.68**	13, 307
	Symptomatology x Discrimination	0.55	2.73**				
Afro-Caribbean	Model 1			0.17	0.20	15.18***	11, 772
	Symptomatology	0.39	11.52***				
	Discrimination	0.06	1.83				
	Model 2			0.21	0.27	18.67***	12, 771
	Symptomatology x Discrimination	0.61	6.86***				
African American	Model 1			0.15	0.18	36.78***	9, 1868
	Symptomatology	0.36	16.40***				
	Discrimination	0.04	1.58				
	Model 2			0.15	0.18	34.50***	10, 1867
	Symptomatology x Discrimination	-0.23	-3.47**				

\* p < .05; \*\* p < .01; \*\*\* p < .001

**Table 6:** Results of hierarchical regression analyses evaluating the association of mental disorder symptomatology, perceived discrimination, the two-way interaction term, and covariates with self-care impairment across racial/ethnic groups.

		$\beta$	$t$	Adj. $R^2$	$f^2$	$F$	$df$
Vietnamese	Model 1			0.04	0.04	1.45	12, 121
	Symptomatology	-0.05	-0.54				
	Discrimination	0.00	0.02				

	Model 2			0.03	0.03	1.34	13, 120
	Symptomatology x Discrimination	-0.12	-0.28				
Filipino	Model 1			0.10	0.11	3.05**	12, 208
	Symptomatology	0.35	5.15***				
	Discrimination	-0.05	-0.78				
	Model 2			0.14	0.16	3.75***	13, 207
	Symptomatology x Discrimination	-0.76	-3.24**				
Chinese	Model 1			0.02	0.02	1.28	12, 209
	Symptomatology	0.18	2.69**				
	Discrimination	-0.01	-0.18				
	Model 2			0.01	0.01	1.19	13, 208
	Symptomatology x Discrimination	-0.21	-0.49				
Cuban	Model 1			0.29	0.41	5.08***	12, 110
	Symptomatology	0.58	6.90***				
	Discrimination	-0.04	-0.52				
	Model 2			0.30	0.43	5.07***	13, 109
	Symptomatology x Discrimination	0.59	1.89				
Puerto Rican	Model 1			0.01	0.01	1.16	12, 192
	Symptomatology	0.12	0.16				
	Discrimination	0.01	1.17				
	Model 2			0.01	0.01	1.13	13, 191
	Symptomatology x Discrimination	-0.15	-0.88				
Mexican	Model 1			0.09	0.19	3.76***	12, 308
	Symptomatology	0.28	5.09***				
	Discrimination	0.03	0.46				
	Model 2			0.09	0.10	3.49***	13, 307
	Symptomatology x Discrimination	0.11	0.59				
Afro-Caribbean	Model 1			0.05	0.05	4.44***	11, 772
	Symptomatology	0.21	5.88***				
	Discrimination	0.02	0.45				
	Model 2			0.07	0.08	6.06***	12, 771
	Symptomatology x Discrimination	0.46	4.75***				
African American	Model 1			0.05	0.05	11.87***	9, 1868
	Symptomatology	0.21	9.05***				
	Discrimination	0.02	0.79				
	Model 2			0.05	0.05	11.18***	10, 1867
	Symptomatology x Discrimination	0.15	2.16*				

\* p < .05; \*\* p < .01; \*\*\* p < .001

## Discussion

The current study investigated the association of mental disorder symptomatology, discrimination, and functional impairment across racial/ethnic groups within a national epidemiological dataset. Overall, results were found to be generally consistent with previous work demonstrating differential rates

of mental disorder symptomatology, discrimination, and functional impairment across racial/ethnic groups. The hypothesized association between mental disorder symptomatology increasing functional impairment across domains was supported in the current study. Additionally, the relationship between mental

disorder symptomatology and functional impairment was found to vary across racial/ethnic groups and functional domains.

As hypothesized and consistent with the existing literature, mental disorder symptomatology was found to vary across racial/ethnic groups. Puerto Ricans, followed by African Americans, reported the highest rates of mental disorder symptomatology. These findings parallel previous work with the CPES indicating that Latinx and Black individuals may endorse higher rates of mental disorder symptomatology than do Asian Americans [8]. In fact, Vietnamese, Filipino, and Chinese individuals were found to report the lowest rates of mental disorder symptomatology, which aligns with previous research similarly identifying low rates of mood, substance use, [10] anxious, [47] and psychotic symptoms [8] in these groups.

While Vietnamese, Filipino, and Chinese individuals may endorse lower levels of mental disorder symptomatology compared with other groups, it is also possible that mental disorder symptomatology differs in its manifestation across racial/ethnic groups. More specifically, mental disorders have been shown to be associated with more somatic complaints among Asian Americans compared with other racial/ethnic groups [48]. In the current study, somatic symptoms were not assessed, potentially contributing to an underestimation of mental disorder symptomatology among Asian Americans in the sample.

While symptomatology and functional impairment were correlated in all the racial/ethnic groups, this association was substantially stronger among Cubans. Interestingly, this was not the case across all Latinx groups, with Puerto Ricans and Mexicans did not reporting significantly greater associations than other groups. These findings speak to substantial intragroup variability among Latinx individuals, highlighting the need for more nuanced and specific work to understand patterns of health and disparities in this area. Interestingly, symptomatology was not associated with impairment in the Vietnamese group. This may be attributed to attenuated variability due to the low levels of symptomatology and impairment in this group. Alternatively, this finding may highlight the presence of cultural or social protective factors among Vietnamese individuals that may reduce impairment.

In the current study, rates of discrimination were found to vary by race/ethnicity, as illustrated in previous research. Notably, discrimination was also found to be differentially associated with impairment across functional domains as well as across racial/ethnic groups. In general, discrimination was most often found to be associated with role impairment (i.e., in Puerto Rican, Mexican, Afro-Caribbean, and African American groups). Discrimination was also linked with social impairment among African Americans, and cognitive impairment among Mexicans. The association between discrimination and role impairment was unsurprising, given the effects of racial/ethnic bias on employment, education, and social interaction. More work is needed to ascertain how discrimination may impact cognitive impairment. It is possible that discrimination or expectation of stigma elicit cognitive burden [49] or rumination, [50] however, it is unclear why this may be isolated to the Mexican group, specifically.

Discrimination was found to differentially affect the relationship between mental disorder symptomatology and functional impairment, with mixed findings across both racial/ethnic groups and domains. Across all domains, symptomatology was more strongly associated with impairment at low levels

of discrimination for Chinese, Afro-Caribbean, and Mexican groups. The association between symptomatology and domains of impairment was stronger at high levels of discrimination for Vietnamese, Cuban, and Puerto Rican groups. Finally, across domains, discrimination was inconsistently associated with symptomatology and impairment for African Americans and Filipinos. Discrimination has consistently been highlighted as a predictor of poor mental health outcomes, [16] suggesting that it may also contribute to functional impairment, especially among racial/ethnic minorities who frequently experience high levels of discrimination [26]. As hypothesized, discrimination increased the relation between symptomatology and impairment, but only within some groups. As such, more work is needed to elucidate why Vietnamese, Cuban, and Puerto Rican individuals are uniquely impacted by discrimination.

One explanation for the strengthened association between symptomatology and impairment at low levels of discrimination can be illustrated with social identity theory, which suggests that experiences of discrimination attack an individual's group membership and self-concept, which can lead to a sense of exclusion from the majority group or dominant culture. [51] Social rejection from a majority group may in turn lead individuals to seek a sense of acceptance and belonging within their in-group communities [51]. Increased community ties and social support networks (i.e., familism values in Latinx culture) have been linked with greater mental health outcomes and resiliency [52]. While social identity theory may provide some explanation for the mixed findings, it does not adequately elucidate these differential effects. More work is needed to assess culture-specific variables such as social support familism within racial/ethnic groups to form a more detailed and informative explanation of these group differences.

There are a several notable limitations in the current study. First, while addressing mental disorder symptomatology as a multifaceted construct (i.e., including depressive, anxious, and substance use symptomatology) leads to increased generalizability and application to diverse clinical populations, previous work has largely targeted singular domains of symptomatology. Thus, it is difficult to establish direct comparisons across studies in addressing the role of symptomatology on functional outcomes, especially given the existing mixed findings in the literature [10]. Similarly, while the results of the current study expand upon the extant body of literature, the small effects found suggest that many other factors in addition to mental disorder symptomatology and discrimination impact functional impairment outcomes across racial/ethnic groups. These findings speak to the need for additional work evaluating alternative mechanisms and correlates of impairment. Furthermore, cultural conceptions of mental health problems have been shown to elicit stigma among some racial/ethnic groups and may lead to underreporting of mental disorder symptomatology [53]. Finally, while years in the U.S was examined as a covariate and proxy for acculturation, future research should assess adherence and assimilation to the dominant U.S. culture to more accurately elucidate the impact of acculturation on mental health outcomes.

There are a number of important takeaways in the current study. First, symptomatology was not found to universally predict impairment across all racial/ethnic groups and functional domains. This finding speaks to the need for additional research on predictors of mental health outcomes, such as social support, community, and other resiliency factors. Additional exami-

nation of cultural factors may assist in elucidating differential outcomes and highlight important protective factors against impairment. The value of multifaceted conceptualizations of functional impairment are highlighted in this work, illustrating the need for more nuanced investigation of impairment and correlates in future work. Finally, more work is needed to examine differential health outcomes among racial/ethnic subgroups. Findings from the current study illustrate the continued existence of differential outcomes in mental health across racial/ethnic groups and underscore the need for additional work to address developmental mechanisms, prevention, and impact of health disparities on quality of life across diverse populations.

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