

# Health and Emotional Well-Being of Urban University Students in the Era of COVID-19

Molly Lancaster and Erasto Arango

Division of Health Science, California State University, Dominguez Hills

The COVID-19 pandemic has prompted social distancing measures and forced transition to virtual learning for university students. Examining the impact of these disruptions on health-related quality of life (HRQoL) and psychological distress can contribute to the design of interventions and psychological services aimed at mitigating the long-term effects for vulnerable populations. A cross-sectional study was conducted with 225 predominantly Hispanic urban university students in Southern California. An online survey gathered sociodemographic variables and psychosocial factors (HRQoL [RAND-36], psychological well-being Psychological General Well Being Index [PGWBI-22], and perceived stress). Employment and sleep, as well as current use, and future interest in various mind–body and psychological services were also examined. Compared with national averages, participants scored statistically significantly higher on HRQoL subscales of Physical Functioning, Physical Role Functioning, Pain, and General Health. Participants scored statistically significantly lower on subscales of Emotional Role Functioning, Energy/Fatigue, Emotional Well-Being, Social Functioning, and Health Status. The majority of participants indicated a loss of employment (49.3%), increases in perceived stress, and sleep disturbances during COVID-19. Overall, students reported severe psychological distress based on the Psychological General Well-Being Index, and a fraction (12.8%) indicated they were currently using psychological counseling services. The majority of participants were interested or very interested in mind–body interventions (i.e., yoga, meditation). Recent data show that the COVID-19 pandemic and social distancing policies negatively affect specifically students of color. We discuss how stress and social distancing may impact immune functioning, health, and social support. In the long term, COVID-19 underscores the need for culturally competent mental health care targeting Hispanic populations who may be uniquely and disproportionately affected.

*Keywords:* social distancing, COVID-19, health-related quality of life, psychological distress, mind–body interventions

In December 2019, the identification of a new pathogen, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was brought to the attention of the World Health Organization (WHO, 2020). Early reports indicated that the novel coronavirus (COVID-19) disease is more contagious but perhaps less severe than previous SARS viruses (Epidemiology Working Group for NCIP Epidemic Response and Chinese Center for Disease Control and Prevention, 2020). In March 2020, the first cases of COVID-19 were reported in the United States, and the outbreak was declared a global pandemic (Centers for Disease Control and Prevention, 2020). Within 6 months, COVID-19 had infected over 15 million people worldwide (Johns Hopkins School of Medicine, 2020). The COVID-19 pandemic is a global public health crisis and is still unfolding.

A stressful event, such as the emergence of a pandemic, can interrupt an individual's social, relational, and environmental climate (Voitsidis et al., 2020). Such disruptions may be akin to those of a traumatic event. An infectious disease outbreak can potentially contribute to physical, emotional, and psychological distress or harm and represents an immediate threat to one's safety and security (Huremović, 2019). The long-term effects of the COVID-19 pandemic, as a global trauma, are expected to be far reaching. Given the high transmission rates, everyone is assumed to be susceptible to COVID-19. However, certain risk factors may lead to more severe forms of distress and traumatic experience in vulnerable populations.

In particular, psychosocial disruptions can interrupt daily routines and lead to increased stress (Lock et al., 2012; Voitsidis et al., 2020). Stress can lead to increases in mental health problems, but vulnerable populations facing financial difficulties may be at increased risk of pandemic-related trauma and subsequent anxiety and depression symptoms (Leon, 2004; North & Pfefferbaum, 2013). Reported psychosocial problems impacted by the public health emergency, COVID-19, include loss of employment, loss of social support, and fear of health-related problems (Groarke et

Molly Lancaster  <https://orcid.org/0000-0002-8880-1747>

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Correspondence concerning this article should be addressed to Molly Lancaster, Division of Health Science, California State University, Dominguez Hills, 1000 East Victoria Street, Carson, CA 90747, United States. Email: [mlancaster@csudh.edu](mailto:mlancaster@csudh.edu)

al., 2020; Montenovo et al., 2020; Pfefferbaum & North, 2020). The degree of stress and adversity individuals experience because of COVID-19 depends on the stability of economic, social, and health factors. For those in vulnerable situations such as living or working in total institutions, such as schools, these disruptions may be especially traumatic.

Health-related quality of life (HRQoL) is a measure of well-being that focuses on individuals' perceived health and functioning (Centers for Disease Control and Prevention, 2018). HRQoL is often used as a measurement for public health surveillance and can help track population-level policy changes and interventions. HRQoL is considered a valid measure of the unmet needs of a population and is widely applicable for tracking patterns and trends in health (Centers for Disease Control and Prevention, 2018). Little is known about the relationship between HRQoL and COVID-19. The pandemic's impact, including disruptions to work and school, including social distancing and work/learn from home policies, may pose unique challenges for well-being and threats to HRQoL. The effects of a global pandemic may be particularly damaging to the physical, emotional, and psychological well-being of urban university students and people of color (Rudenstine et al., 2020).

People of color have been disproportionately affected by COVID-19. Preliminary mortality rates are 30 deaths per 100,000 for Whites, 34 deaths per 100,000 for Hispanics, and 70 deaths per 100,000 for Blacks (American Public Media Research Lab, 2020). The age-adjusted mortality rates for COVID-19 show that Blacks are 3.8 times as high and Hispanics are 2.5 times as high when compared with Whites (American Public Media Research Lab, 2020). Existing and widespread health disparities before COVID-19 have become exacerbated by the pandemic (Fortuna et al., 2020). Mental health disparities are also likely to be exacerbated as we face this global trauma.

Nonpharmaceutical approaches to slowing the spread of COVID-19 include the use of social distancing and isolation measures. Social distancing approaches are not new to pandemic management and have been around since the phrase was first coined during the 1918 Influenza Pandemic (Glass et al., 2006). Social distancing measures include staying home when sick (isolating), or in general, avoiding mass gatherings, and keeping a safe physical distance from others. There are inherent benefits and risks associated with social and physical distancing strategies, and those in isolation may be at higher risk of mental health problems.

As early as March 11th, 2020, schools began to close to slow the spread of COVID-19. Many issued an ominous warning "closed until further notice." Poor school connections and social connections are associated with an increased risk of depression, smoking, and the use of marijuana later in life (Bond et al., 2007). For many students, a school may offer a source of meaning and deep social connection. The uncertainty for students, concerning if they will return to a major source of meaning in their lives, remains precarious months later. Overall, this is considered a massive social experiment, and although school closures may help flatten the curve of COVID-19, there may be long-term effects on the social and emotional well-being of those asked to stay home.

Prolonged ongoing stressors are associated with long-term mental illness outcomes. Kessler et al. (2008) found that those affected by Hurricane Katrina showed long-term stressors were linked to a

longer duration of PTSD (posttraumatic stress disorder). In addition, marginalized populations impacted by Hurricane Katrina experienced significant disparities in mental and physical health (Joseph et al., 2014; Mortensen et al., 2009). Beyond the immediate impact of the traumatic natural disaster, additional long-term stressors include financial uncertainty and fear (like paying the mortgage, worrying about relatives). Similarly, the stress associated with COVID-19 was found to be associated with the incidence and severity of mental illness (Czeisler et al., 2020). This association varied by age, race, employment, and urban environment showing those in younger age-groups, Hispanic ethnicity, unemployed, and urban settings to be at higher risk of adverse mental health symptoms. Vulnerable populations exposed to chronic COVID-related stressors may experience disproportionate and persistent mental illness far beyond the direct trauma.

Increases in mental health problems may be directly related to the physical proximity of individuals to the trauma. Following the terrorist attacks on the World Trade Center on September 11th, 2001, one study found the prevalence of depression and PTSD could be traced to where the towers fell (Galea et al., 2002), with higher incidences in closer proximity to ground zero. Frontline workers exposed to hazardous conditions increased their chances of developing psychological disorders due to trauma. Given the COVID-19 pandemic, trauma is global and national; we will likely see widespread and prolonged increases in emotional and mental illness prevalence and severity.

The long-term and widespread psychological effects of the still-unfolding pandemic are difficult to estimate as the duration of the trauma persists. Specifically, individuals living under mandatory social distancing measures, as seen with COVID-19, regardless of carrier status, are likely to experience fear, anxiety, and heightened risk perceptions (Johal, 2009). When these conditions continue for extended periods, the psychosocial impact is likely to be far-reaching and sustaining. This may lead to a higher incidence and severity of depression, anxiety, substance use disorders, and PTSD.

One study conducted during the MERS (Middle Eastern respiratory syndrome) outbreak found that 40% of patients who were isolated and later developed MERS required psychiatric treatment (Kim et al., 2018). Those who were not placed in isolation, nor developed MERS, did not require psychiatric care. The psychological and emotional well-being of individuals placed under widespread social distancing may suffer at the expense of shielding them from potential infection of COVID-19. As the lockdowns persist, the duration of trauma also extends and far exceeds previous research conducted during shorter duration pandemics, where social isolation was carried out.

The effects of lockdowns may have secondary effects on other health outcomes beyond COVID infections. Life changes, stress, and limited access to health care services due to the pandemic could lead to high numbers of secondary deaths related to drug overdoses, suicides, and mental illness (Alexander et al., 2020; Druss, 2020; Dsouza et al., 2020; Mamun & Griffiths, 2020). The American Medical Association (AMA; 2020) has reported increases in opioid-related drug overdose deaths during the pandemic. One study examined half a million urine drug analysis tests before and after the lockdowns went into effect and found increases in all four drugs screened, including cocaine, heroin, methamphetamine, and fentanyl (Millennium Health Signals Report, 2020). Treating those with mental illness or substance use disorders may

be especially challenging during a pandemic (AMA, 2020; Liebrenz et al., 2020). Those most susceptible to secondary effects of isolation and social distancing include those facing extreme financial uncertainty, social instability, and those living in total institutions.

The benefits and risks of social distancing may not be equitably shared across populations. Vulnerable populations are those who depend partially or entirely on others or institutions to protect or advance their rights, interests, or well-being (Inouye et al., 2020). Some groups may be vulnerable as a result of social distancing including people or entire communities who need physical closeness; certain groups, like Hispanics, are more collectivistic, and sociocultural values reflect proximity and dependence on social ties for well-being (Spector, 2017). Additional vulnerability may exist for those providing essential services, those of low socioeconomic status, and those living in total institutions such as nursing homes, prisons, or college campuses. Total institutions could be considered the ground zero of the COVID-19 pandemic.

Social distancing measures may have eliminated entire sources of social support for certain populations. The perception of social support may moderate the severity of perceived stress. One study found that social support could act as a resilience factor in mental health, allowing individuals that have been exposed to a traumatic event the ability to cope (Lee, 2019). Another study found that Hispanic individuals with strong family integrity and traditional values, reflective of their collectivistic cultures, tend to report higher stress levels but fewer mental health symptoms than their American-born counterparts (Cervantes et al., 2013). Stress has been linked to increased susceptibility to diseases due to the downstream effects of the central nervous system activation on the immune system (Vitlic et al., 2014). Chronic stress combined with social distancing in people of color communities, especially Hispanics and Blacks, may be contributing to both disproportionate morbidity and mortality and mental health disparities related to COVID.

Another benefit of social support during a pandemic is the ability to share resources like food or costs if needed. Individuals who experience food insecurity reported less community belonging and higher stress rates, which may contribute to the risk of developing a mental illness (Martin et al., 2016). Black and Hispanic individuals are twice as likely to live in poverty than Whites (Gradín, 2012). Thus, people of color will likely experience the greatest burdens on emotional and psychological health due to COVID-19. Given the link between economic uncertainty and psychological distress, existing racial disparities in mental health will almost certainly be exacerbated.

Socioeconomic protections may exist for more affluent individuals, including the ability to work remotely. Before the pandemic, people of color exhibited a trend of health and wealth inequality that translated into a higher risk for COVID-19 (Hawkins, 2020). Those in higher earning percentiles generally could work from home. According to the U.S. Bureau of Labor Statistics (BLS; 2019), 16.2% of Hispanic workers and 19.7% of Black workers were able to work remotely from home compared with 37.0% of Asian workers and 29.9% of White workers. People of color working in industries requiring physical closeness may experience higher levels of economic stress and greater exposure to infection during COVID-19.

Workers in less stable jobs may experience more stress and lower HRQoL during COVID-19. Ray et al. (2017) reported that employment arrangements serve as a predictor of HRQoL, with stressed workers having more days of missed work due to poor mental and physical health. However, this sample was predominantly White. For urban university students working in different job sectors and who experience a change in employment, this could affect their perceived stress levels and, in turn, HRQoL. Pandemic-related disruptions including employment stress may affect urban university students financially, academically, and psychologically. Inequalities in working and economic conditions are exaggerated with the implementation of social distancing and may lead to increases in perceived stress and reduced HRQoL in people of color.

Suicide represents the second leading cause of death in all age-groups 15 to 34 years old in the United States, and rates continue to increase year over year (Hedegaard et al., 2020). For those with a mental health condition, less than 45% are receiving mental health care services (Han et al., 2015). In people of color, service utilization numbers can be far less. The most commonly cited reasons for not seeking care were the inability to afford mental health care treatment, distrust of the medical system, and stigma. The mental health of disadvantaged Americans is declining (Goldman et al., 2018). Racial disparities are well documented and exist across the board in terms of outpatient, inpatient, and medication forms of treatment for mental health problems.

Poverty, in particular, affects individuals' mental health status, and those living in poverty are nearly twice as likely to suffer from mental health problems (U.S. Department of Health and Human Services, Office of Minority Health [USDHHS], 2019). Non-Hispanic White populations receive mental health care at twice the rates of Hispanics. Pharmacological treatments for mental health problems in Hispanics were half the rate of those received in non-Hispanic White populations (USDHHS, 2019). The existing mental health disparities in Hispanic populations are likely to be exacerbated by the current pandemic. However, little research exists on the impact of COVID-19 on the mental and emotional well-being of persons of color.

The phenomenon commonly referred to as the Hispanic health paradox has baffled health disparities researchers for decades. Despite numerous barriers to accessing and utilizing health care, Hispanic immigrants typically have better health outcomes than their domestic-born counterparts (Ruiz et al., 2016). Protective factors in Hispanics' general well-being are social connections and communal coping (Mulvaney-Day et al., 2007). However, as Hispanics become more acculturated, they may lose some of these protective factors.

One study found that lower acculturation (first-generation status) was associated with higher perceived stress without mental health symptoms when compared with more acculturated, later generation groups (Cervantes et al., 2013). These researchers also found that traditional family values and family cohesion could buffer the negative effects of stress. Stigma and distrust of the medical system may prevent Hispanics from being screened for problems and may be associated with acculturation (Cabassa et al., 2006; Keyes et al., 2012). Thus, estimates of mental health problems in Hispanics are likely drastically underestimated and grossly misunderstood. Poverty, in particular, affects the mental health status of people of color, including those that are Hispanic (Williams,

2018). Overall, the literature offers mixed results regarding Hispanics' mental health outcomes (Ruiz et al., 2018; Taningco, 2007). Further research is needed to examine the mental and emotional resilience of people of color in the face of traumatic experiences.

To the authors' knowledge, few studies have examined health and emotional well-being in urban university students during COVID, who constitute a vulnerable and significant portion of the U.S. population. Students of color may be uniquely affected by COVID-19. In turn, there is likely a great need for responsive and culturally competent mental health interventions, but more research is needed to determine this population's specific needs.

Thus, this study aims to describe the impact of COVID-19 on health-related quality of life and psychosocial well-being among a diverse sample of urban university students in Southern California. We also wish to examine the current utilization of mental health services and current mind-body practices and explore students' interest in future services. Altogether, this study will help inform the development of psychological services and other health-promoting programs to address students of color's mental health considering the unfolding pandemic. This research also has the potential to elucidate the broader public health impact of COVID-19 and pandemic management on emotional well-being and mental health.

## Method

### Participants

A cross-sectional survey was conducted during the unfolding COVID-19 pandemic at an urban university (federally designated Minority and Hispanic Serving Institution) in Southern California. Survey data were collected from May 4th–18th, 2020, resulting in a convenience sample of 225 undergraduate student participants. Participants, age 18 years and older, were recruited by invitation from course instructors during the Spring 2020 semester. Participants who completed the survey were offered extra credit for participating and were also entered into a drawing for a gift card as an incentive. All data were collected using Google Forms (Rayhan et al., 2013) and entered electronically via a secure, password-protected, and deidentified database. The electronic survey included general demographics and measures of perceived stress, lifestyle factors, changes in employment, health-related quality of life, psychological well-being, and psychosocial mind-body activity inventory.

This research protocol was reviewed and approved by the university's institutional review board (IRB), and a waiver of informed consent was granted due to minimal risk. Any data containing personally identifiable information was removed prior to analysis.

### Measures

Key demographics measured included gender, ethnicity, age (in years), student status (full-time, part-time), major, and grade point average (GPA). COVID-19-related changes in employment were measured by the current level of employment (full time, part-time, unemployed, or other) and reported changes (increased hours, decreased hours, laid off, or other). Participants were also asked to

report how these changes had affected their ability to perform schoolwork as positive, negative, or mixed.

Lifestyle factors measured included past month alcohol use, retrospective prior to COVID alcohol use, and tobacco use history. Alcohol use response choices included light or social drinker only (very occasional alcohol use), moderate (up to 1 drink per day for women, 2 drinks per day for men), heavy (8+ drinks per week for women or 15+ drinks per week for men), or don't drink alcohol. The survey also collected height and weight, which were used to calculate body mass index (BMI). Finally, exercise quantity (times per week) and duration (minutes) were also assessed.

HRQoL was assessed using the RAND 36-Item Health Survey (v. 1.0), which is highly reliable and has been validated across a variety of settings and populations (Hays & Morales, 2001). The RAND-36 assesses health-related quality of life across eight distinct domains: Physical Functioning, Role Functioning (Physical), Role Functioning (Emotional), Energy/Fatigue, Emotional Well-being, Social Functioning, Pain, and General Health. The RAND-36 also includes a single item to measure a Change in Health in the last year. Seven of the domains focus on the past 4 weeks, whereas general health does not, and change in health focuses on past year change. This scale generates a singular sum score (0–100) for each of the eight distinct domains. The 36 items are identical to those used in the Medical Outcomes (MOC) Study (Ware and Sherbourne, 1992). The MOC study is a nationally representative and publicly available report of the HRQoL measures in a sample of 2,349 participants (Tarlov et al., 1989), which can be compared with discrete samples.

Our sample size of 225 urban university students allows us to detect reasonable effect sizes using a *t* test to compare population mean to a cohort mean with adequate power (>.80). Although the sample characteristics are different, the measures are the same. Thus, we found this a meaningful comparison to assess the HRQoL of a discrete sample of urban university students compared with a historically nationally representative sample.

Scoring of the RAND-36 was done following the prescribed guidelines of the publisher (Ware & Sherbourne, 1992) in a two-part process. First, we recoded each item's original Likert response to a linear 0 to 100 scale, with reverse coding of the indicated items per scoring guidelines. Second, items in the same scale were averaged together to create eight domain scores. Missing data are not taken into account when calculated domain scores, thus the domain scores are the average of all items the respondent answered.

Perceived Stress was measured using three questions. First, participants were asked to retrospectively report perceived stress on a 6-point Likert scale (1 = *no stress* and 6 = *extreme stress*) for two distinct time points: (a) within the past month (during the COVID pandemic) and (b) prior to COVID. Participants were also asked to rate their ability to handle stress on a six-point Likert scale (1 = *I can shake off stress* and 6 = *stress eats away at me*). A fourth variable, the product of past month perceived stress and ability to handle stress, was created for Total Stress which has higher test-retest reliability than the single items alone (Littman et al., 2006). This method of measuring perceived stress has been validated in the literature.

Sleep was measured by asking students to retrospectively self-report the number of hours both (a) prior to COVID and (b) within the past month. Using self-reported sleep measures has been validated in previous studies (Cespedes et al., 2016). To study sleep

disturbances, participants responded to a seven-item subscale Sleep Questionnaire. Measuring the types of sleep disturbances to identify insomnia has been validated in previous studies (Wong et al., 2017).

Psychological well-being was measured using the Psychological General Well-Being Index (PGWBI-22) that has been validated in general population samples (Grossi & Compare, 2014; Grossi et al., 2006). The PGWBI is composed of 22 standardized items to measure overall psychological well-being. One question was omitted in the present study because it asked about suicide ideation. The IRB requested the omission of the question because it could act as a trigger for participants and represented an unnecessary risk for survey data collection and corresponding waiver of written informed consent.

Next, the scores of all six PGWBI domains were cumulatively summed on a global index score for a max score of 110 points (105 points in our study). Previous studies have shown PGWBI has yielded high internal construct validity and reliability (Grossi et al., 2006). Higher scores on the global index indicate higher levels of psychological well-being. Present study data on global index scores were compared with the RAND Health Insurance Survey, which offers the U.S. standard of reference for the PGWBI (Grossi & Compare, 2014).

The psychosocial mind-body inventory was used to characterize (a) current use of psychological services (individual counseling and support groups), (b) current use of alternative and complementary mind-body activities, and (c) future interest in services. We assessed a wide range of mind-body activities including relaxation techniques, meditation/mindfulness, imagery/visualization, biofeedback, hypnosis, yoga, breathwork, sound baths/gong meditations, mindset training, reiki, massage therapy, tai chi, and acupuncture. A list of 15 different activities was presented and participants rated each item for current use ("Never," "Current Use," or "Ever use") and then rated the same 15 activities for future interest ("Interested," "Very Interested," or "Not Interested").

## Statistical Analysis

Statistical analysis was conducted using the IBM SPSS Statistics Version 26. Statistical testing included a paired sample *t* test for continuous variables and correlation tables, and linear regression analysis was conducted including analysis of variance. To compare HRQoL between our sample and the MOC study sample, an independent sample *t* test was conducted. Descriptive statistics were used to present results from the psychosocial mind-body inventory. To determine statistical significance, the threshold was set at  $p < .05$ .

## Results

The demographic characteristics of the sample are presented in Table 1. Participants were predominantly female (80.9%). The mean age was 25.17 years ( $SD = 7.61$ , range 18–59). The sample was predominantly Hispanic (64.9%) and Black (10.7%). The majority of participants (81%) were full-time students (12 or more credit hours per semester), and the mean grade point average was 3.13 out of 4.0 scale ( $SD$  GPA = .54, range 1.00–4.00).

The majority of participants (65.8%) reported a change in employment due to COVID-19, with 39% currently unemployed, 26% working full time, and 35% working part-time. The majority of participants reported a change in employment as either being laid

off or reduced hours (49.3%). A small portion of participants reported increased hours (16.4%) and one third of participants experienced no employment change. The majority of participants described the effect of employment changes as negative in relation to their ability to complete schoolwork (45.3%). Reported employment and changes in employment are presented in Table 2.

Participant alcohol consumption in the past month was  $M = .82$ ,  $SD = .75$ . Alcohol consumption prior to COVID-19 was  $M = .74$ ,  $SD = .65$ . Within-subject *t* test mean difference was .084,  $SD = .52$ , and was statistically significantly different,  $p = .016$ . The majority of respondents indicated they had never smoked tobacco (64.0%), with about a third saying they had ever smoked (31.1%). A minority of participants (4.0%) indicated they were current smokers and two participants (.9%) were trying to quit. The overall participants' BMI was  $M = 27.23$ ,  $SD = 6.12$ . Participants' exercise frequency per week was  $M = 2.50$ ,  $SD = 2.02$ , and the minutes of exercise was  $M = 38.25$ ,  $SD = 29.55$ .

Participant data compared with the MOC on the HRQoL (RAND-36) is presented in Table 3. An independent-samples *t* test was conducted to compare each subscale on the HRQoL measure for the urban university student participants with national averages of the MOC study. Participants scored statistically significantly different from the MOC on all eight subscales. All subscales are "adjusted" to a scale of 0–100 for ease of comparison between subscales.

Participants scored statistically significantly higher than national averages in the MOC study in Physical Functioning, Physical Role Functioning, Pain, and General Health. Participants scored statistically significantly lower than national averages in the MOC study in Emotional Role Functioning, Energy/Fatigue, Emotional Well-being, Social Functioning, and Health Change over the last year.

**Table 1**  
*Demographics of the Sample*

Characteristic	<i>n</i> (%) or <i>M</i> ( <i>SD</i> )	Range
<i>N</i>	225	
Female	182 (80.9%)	
Male	41 (18.1%)	
Nonbinary	2 (0.9%)	
Ethnicity		
Hispanic/Latinx	146 (64.9%)	
Black/African	24 (10.7%)	
Asian	19 (8.4%)	
Caucasian	10 (4.4%)	
Pacific Islander	3 (1.3%)	
Middle Eastern	2 (0.9%)	
More than one race	18 (7.8%)	
Other race	3 (1.2%)	
Age	25.17 (7.61)	18–59
Student status		
Full-time	183 (81.3%)	
Part-time (<12 credit hours)	32 (14.2%)	
Max time (>18 credit hours)	10 (4.4%)	
Major		
Health science	91 (40.4%)	
Psychology	21 (9.3%)	
Sociology	22 (9.8%)	
Other/undecided	91 (40.4%)	
GPA	3.13 (0.54)	1.00–4.00

*Note.* GPA = grade point average. Due to rounding error, some percentages may not sum to 100%.

**Table 2**  
*Employment Status and Changes of the Sample*

Characteristic	<i>n</i> (%) or <i>M</i> ( <i>SD</i> )
Current employment status	
Unemployed	85 (38.6%)
Part-time	77 (35.0%)
Full-time	58 (26.4%)
COVID-related change in employment	
Yes	148 (65.8%)
No	77 (34.2%)
Reported employment changes	
Laid off/reduced hours	111 (49.3%)
Increased hours	37 (16.4%)
No change	77 (34.2%)
Reported effect of employment changes on schoolwork	
Positive	54 (24.0%)
Negative	102 (45.3%)
Mixed	10 (4.4%)
No change	59 (26.2%)

Mean differences on all scales were statistically significant at  $p < .05$  or  $p < .001$  as indicated in Table 3.

On a scale of 1 (*no stress*) to 6 (*extreme stress*), past month perceived stress was  $M = 4.72$ ,  $SD = 1.13$ . Perceived stress prior to COVID-19 was  $M = 3.78$ ,  $SD = 1.38$ . The mean difference between past month stress and prior to COVID stress was .94,  $SD = 1.63$ . Using a within-sample  $t$  test, this difference was statistically significantly different ( $p < .001$ ). The results of the within-subject  $t$  test are presented in Table 4. On a scale of 1 (*I can shake off stress*) to 6 (*Stress eats away at me*), the reported ability to handle stress was  $M = 3.79$ ,  $SD = 1.35$ . The product scores for total stress was  $M = 17.89$ ,  $SD = 1.53$ .

Reported sleep in the past month was  $M = 6.71$  hr,  $SD = 1.65$ , and prior to COVID was  $M = 6.89$ ,  $SD = 1.42$ . This change in sleep was not statistically significantly different,  $t = 1.42$  ( $df = 217$ ),  $p = .158$ . The majority of participants reported having insomnia (57.7%) or going to bed later (81.4%). Participants also reported waking up earlier (31.8%), waking up later (45.0%) and going to bed earlier (8.6%), and having more than one sleep disturbance (96.9%) in the past month.

**Table 3**  
*Independent Sample  $t$  test Comparing Health-Related Quality of Life (RAND-36) in National Sample and Urban University Study Sample*

Scale (items)	National ( <i>n</i> = 2,471)		Urban university ( <i>n</i> = 225)		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Physical Functioning (10)	70.61	27.42	82.53	24.45	6.93	2,694	<.001
Role Functioning/Physical (4)	52.97	40.78	62.78	40.24	3.50	2,694	<.001
Role Functioning/Emotional (3)	65.78	40.71	37.33	41.77	9.80	2,694	<.001
Energy/Fatigue (4)	52.15	22.39	42.60	19.83	6.84	2,694	<.001
Emotional Well-Being	70.38	21.97	53.05	20.38	12.13	2,694	<.001
Social Functioning (2)	78.77	25.43	53.33	29.03	12.71	2,694	<.001
Pain (2)	70.77	25.46	76.38	23.85	3.36	2,694	<.001
General Health (5)	56.99	21.11	59.96	19.78	2.14	2,694	.032
Health Change (1)	59.14	23.12	54.78	25.60	2.46	2,694	.014

The psychological general well-being (PGWBI) global index score was adjusted to reflect 21 items to make comparisons with the 22-item scores in the U.S. standard of reference derived from the RAND Health Insurance Survey (Grossi & Compare, 2014). The global index scores were divided by their respective total scores possible (either 105 or 110) points to create a percent score. The percent scores were used for comparison. Mean global index scores were  $M = 54.71$ ,  $SD = 16.49$ , which translates to a 52.10% adjusted 21-item percent score. The U.S. population sample averages between 80 and 81, which translates to a 72.72% to 73.64% adjusted 22-item percent score.

According to the RAND Health Insurance Survey (Grossi & Compare, 2014), 71% of adults in the United States are placed in the category of “being positive,” with 73–110 points (equivalent to 66.36% to 100% adjusted 22-item percent score). Typically 15.5% of national samples show moderate psychological distress, with scores between 61 and 72 points (equivalent to 55.55% to 65.45% adjusted 22-item percent score). The remaining 13.5% of national samples are classified as exhibiting severe psychological distress, with scores between 0 and 60 points (equivalent to 54.55% or lower adjusted 22-item percent score). The current sample reflected an average 52.10% adjusted 21-item percent score, which corresponds with severe psychological distress according to the U.S. population standard of reference. In the present study, 15.1% were characterized as “being positive,” 20.0% “moderate psychological distress,” and 64.9% “severe psychological distress.”

Correlation analysis was conducted to compare Total Stress and HRQoL, and coefficients are presented in Table 5. Pearson correlation coefficients were presented for all normally distributed variables. Physical Functioning was slightly skewed; thus, the nonparametric Spearman correlation coefficient is presented for that domain. The smallest correlation was found between Total Stress and Physical Functioning ( $r = -.17$ ). The strongest correlations were found between Total Stress and Social Functioning ( $r = -.46$ ) and Emotional Well-Being ( $r = -.43$ ). All eight domains of the HRQoL scale were statistically significantly negatively correlated with Total Stress. A strong negative correlation was found between Total Stress and PGWBI ( $r = -.48$ ) and was statistically significant using a two-tailed test ( $p < .001$ ).

Finally, simple linear regression analysis was conducted to explore the relationship between each HRQoL domain based on

**Table 4**  
Within-Subject *t* Test Comparing Perceived Past Month Stress and Prior to COVID Stress

	Past month		Prior to COVID		Test statistic	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Paired sample <i>t</i> ( <i>df</i> =224)	4.72	1.13	3.78	1.38	8.65	<.001

Total Stress as the predictor variable. We also conducted a simple linear regression to compare the predictive value of Total Stress for PGWBI to make comparisons. The results of the regression analyses are presented in Table 6.

Of the eight domains of HRQoL, total stress was the least predictive of Role Limitation due to Physical Functioning,  $b = -.17$ ,  $t(223) = 12.57$ ,  $p < .01$ . A significant regression equation was found,  $F(1, 223) = 6.748$ ,  $p < .01$ , with an  $R^2$  of .029. Total stress was the best predictor for the Social Functioning domain of HRQoL,  $b = -.46$ ,  $t(223) = 20.20$ ,  $p < .001$ . A significant regression equation was found,  $F(1, 223) = 58.127$ ,  $p < .001$ , with an  $R^2$  of .207. Total Stress was a better predictor of psychological general well-being than any of the HRQoL domains,  $b = -.48$ ,  $t(223) = 31.79$ ,  $p < .001$ . A significant regression equation was found,  $F(1, 223) = 66.894$ ,  $p < .001$ , with an  $R^2$  of .231.

To investigate whether the relationship between Total Stress and HRQoL (or PGWBI) varied according to demographic and sociodemographic variables, a simple moderator analysis was performed using PROCESS (Hayes, 2017). This analysis was repeated for each regression analysis between total stress as the predictor and all eight domains of HRQoL, and then PGWBI, as the outcome variables. The moderator variables evaluated for the analysis were gender, ethnicity, and employment status. No statistically significant interactions were found.

Using the psychosocial mind-body inventory, 12.9% indicated they were currently using individual counseling or therapy services, 87.1% indicated they had never used individual counseling or therapy, and nearly 37% indicated they had no interest in such services. Only 7.6% indicated they were currently using support groups.

According to the U.S. National Health Interview Survey (NHIS) lifetime prevalence of meditation use in a general population sample was 5.2%, and reported users of meditation were more likely to be older, female, non-Hispanic, and college-educated (Cramer et al.,

2016). Previous research reported Hispanics were less likely to use meditation, yoga, or tai chi compared with Whites (odds ratios were .57, .50, and .55, respectively; Olano et al., 2015). The majority of current participants (55.1%) indicated they were currently practicing relaxation techniques, 32.4% reported currently practicing mindfulness/meditation, and 25.3% reported currently practicing breathwork. About one-quarter of current participants (24.4%) reported using imagery or visualization techniques and 19.1% indicated using yoga. Between 5 and 10% of participants reported using mindset training, sound baths, massage, or biofeedback, and less than 5% reported using reiki, tai chi, hypnosis, or acupuncture.

In contrast to psychological counseling, the majority of participants indicated they were interested or very interested in a wide range of mind-body interventions, including relaxation techniques (84.9%), massage therapy (76%), and mindfulness/meditation (73.7%). Interest in yoga (72.9%), breathwork (72.9%), mindset training (67.1%), individual counseling (63.1%), imagery/visualization (58.2%), sound baths/gong meditations (49.8%), reiki (50.2%), acupuncture (48%), support groups (47.1%), tai chi (42.7%), biofeedback (35.2%), and hypnosis (30.2%) was characterized as generally positive.

## Discussion

Previous research examining the effects of pandemics and other disasters has found a relationship between such traumatic events and mental health outcomes. At least one previous study has found a direct relationship between physical distancing and psychiatric illness. Urban university students who participated in this research study were in moderate to poor emotional and psychological health when the survey was conducted amid the COVID-19 pandemic.

**Table 5**  
Correlations for Total Stress and HRQoL Domains

Variable	Total stress	PF	RFP	RFE	EF	EWB	SF	Pain	GH	CH
Total stress	—	-.352**	-.171*	-.351**	-.356**	-.426**	-.455**	-.225**	-.280**	-.297**
PF		—	.419**	.131	.133*	.165*	.196**	.447**	.380**	.180**
RFP			—	.397**	.227**	.269**	.288**	.443**	.344**	.217**
RFE				—	.413**	.592**	.500**	.227**	.254**	.194**
EF					—	.671**	.484**	.298**	.332**	.268**
EWB						—	.622**	.344**	.402**	.201**
SF							—	.309**	.250**	.123
Pain								—	.407**	.285*
GH									—	.351**
CH										—

Note. HRQoL = health-related quality of life; PF = Physical Functioning; RFP = Role Functioning/Physical; RFE = Role Functioning/Emotional; EF = Energy/Fatigue; EWB = Emotional Well-Being; SF = Social Functioning; GH = General Health; CH = Change in Health (Past Year).

\* $p < .05$  level (two tailed). \*\* $p < .01$  level (two tailed).

**Table 6**

*Linear Regression Analyses for HRQoL Domain Scores and PGWBI With Total Stress Scores as Predictor Variable*

HRQoL domain scores	<i>B</i>	<i>F</i>	<i>R</i> <sup>2</sup>	Adj. <i>R</i> <sup>2</sup>	95% CI
Physical Functioning	−.30**	21.63**	0.09	0.08	[−1.17, −0.48]
Role Functioning/Physical	−.17*	6.75*	0.03	0.03	[−1.38, −0.19]
Role Functioning/Emotional	−.35**	31.25**	0.12	0.12	[−2.25, −1.08]
Energy/Fatigue	−.36**	32.38**	0.13	0.12	[−1.08, −0.52]
Emotional Well-Being	−.43**	49.30**	0.18	0.18	[−1.26, −0.71]
Social Functioning	−.46**	58.13**	0.21	0.20	[−1.88, −1.11]
Pain	−.23*	11.95*	0.05	0.05	[−0.96, −0.26]
General Health	−.28**	18.93**	0.08	0.07	[−0.91, −0.34]
Change in Health	−.30**	21.63**	0.09	0.08	[−1.23, −0.50]
PGWBI	−.48**	66.89**	0.23	0.23	[−1.12, −0.68]

*Note.* HRQoL = health-related quality of life; PGWBI = Psychological General Well-Being Index; Adj. = adjusted; CI = confidence interval.

\*  $p < .01$  level. \*\*  $p < .001$  level.

Overall indicators for HRQoL and psychological well-being show signs of psychological distress in this predominantly Hispanic urban university sample compared with national averages and indexes. There was considerable variability on the HRQoL domains, some showing higher than national averages (i.e., physical health) and others lower (i.e., social and emotional health). In relation to HRQoL, perceived stress and ability to cope with stress varied in relation to all domains examined. As Total Stress increased on the two-item product total stress score, psychological general well-being, and all domains of HRQoL decreased considerably.

Despite high BMI levels, measures of HRQoL domains of Physical Functioning and Physical Health were generally positive. Obesity is a major public health concern, and more research is needed to understand the interactions between trauma, psychological well-being, and Physical Health or Physical Functioning within urban university students of color. The use of BMI is a fairly crude measurement, and more research is needed to understand the role of physical fitness on overall health during a pandemic.

Interestingly, our sample scored high on Physical Health and Physical Functioning HRQoL domains compared with the general population, but significantly lower on Emotional Well-Being and Social Functioning. This is in contrast with previous research on the Hispanic health paradox, which typically shows greater social cohesion. However, acculturation may play a role and we did not measure this factor.

Social cohesion is positively related to better physical and psychological well-being of Hispanic and non-Hispanic individuals (Rios et al., 2012). Thus, lower acculturation may be linked to higher social cohesion. In light of the Hispanic health paradox, we hypothesize that foreign-born and first-generation Hispanic students may experience less mental distress than their US-born and second- or third-generation students during a pandemic. Future studies should collect data on acculturation as it relates to mental health challenges associated with pandemic related stress. Further research is needed to understand the unique resiliency factors associated with Hispanic culture and how this may contribute to unique health disparities including mental health outcomes during a pandemic.

High rates of unemployment may be contributing to high stress levels, loss of sleep, and psychological distress or financial trauma in our sample. The COVID-19 pandemic may have uniquely

impacted students of color psychologically and emotionally as they are forced out of physical classrooms and distanced from college campus communities. Transitioning into virtual learning environments presented additional challenges and stressors. A sense of community connection may be particularly important for our Hispanic students who thrive in collective spaces.

Collective oriented groups, such as Hispanic students, may be at greater risk for poor mental health outcomes and lower immunity protection. Many urban university students were asked to move out of the dorms in the middle of their academic semester, disrupting their living conditions. Longitudinal research is needed to better understand the long-term physical, mental, and emotional effects of the COVID-19 pandemic on vulnerable, total institution populations like university students.

Our sample reported slightly higher alcohol consumption during COVID; thus, there may be the potential for alcohol abuse as a coping mechanism for stress and trauma of the pandemic. Research has shown a general increase in substance use during the pandemic, and more research is needed on substance use patterns in Hispanics and other people of color groups during COVID-19. Patterns may differ from the White populations in culture specific ways.

Our sample was predominantly self-identified as female. Females typically report higher rates of mental health problems (including depression) in the general population (Kessler, 2003). Females also are more likely to utilize mental health services at higher rates than men and are more likely to seek care. However, the overall rates of utilization of mental health care are still lower in Hispanic populations than non-Hispanic populations regardless of gender (Cabassa et al., 2006). There may be different coping and resilience factors in female Hispanics compared with male Hispanics, and this could be influenced by levels of acculturation as well.

More research is needed to better understand how acculturation plays a role in coping and resilience to stress in Hispanic populations during a traumatic event, like the COVID-19 pandemic. This could offer greater insights into the unique protective factors and help elucidate new conceptual models of the Hispanic health paradox. Longitudinal, acculturation-focused studies of trauma and the unique effects (including resiliency) in Hispanic populations are needed.

The majority of participants indicated they had never used individual counseling or therapy before, and more than a third of participants reported no interest in such services. Acculturation may



also play a role in willingness to seek psychological treatments and stigma associated with mental illness, and more research is needed. These numbers reflect typically lower utilization of mental health services seen in people of color. In comparison, our participants reported higher use of and interest in alternative and complementary mind–body activities (mindfulness, relaxation, yoga, etc.) compared with psychological counseling or support groups. Self-reported rates of meditation use were considerably higher than national population prevalence rates despite differing from key demographics of the national study (Cramer et al., 2016). More research is needed to understand urban university students' motivation and reasons for using meditation. Alternative and complementary services focusing on meditation and relaxation, especially those offered in a group setting, may be particularly helpful to urban university students during the pandemic and throughout long-term recovery from the pandemic.

Improved interventions and psychological services will be needed in the coming academic school year and into the foreseeable future. Given the cultural differences in approaching mental health and low utilization rates of psychological services in people of color, more culturally competent approaches are needed that address their unique risk and protective factors. Culturally competent and relevant interventions are needed to meet the diverse needs of vulnerable populations who may not be interested in counseling or therapy services.

Continued social distancing measures will likely necessitate innovative and virtual delivery of interventions in effect through at least 2021 in urban areas. Those with underlying medical problems may need special considerations, as they will be less likely to return to face-to-face services for an extended period. These special considerations and augmented service needs will likely continue for many years to come based on previous recovery times from other disasters and traumatic events in history. Creative and accessible approaches to delivering health promotion and education to people of color populations during a pandemic are greatly needed.

The recovery from social distancing (i.e., pandemic management) may have long-term serious emotional, social, and psychological side effects. People of color populations are the most vulnerable to COVID-19 infection and will experience disproportionate burdens of financial, emotional, and psychological trauma. Hispanic individuals, living in collectivistic and physically close communities, may be especially vulnerable to both the infectious disease threat and secondary effects of the pandemic-related social distancing as threats to social cohesion.

Mind–body interventions may be a promising area to explore. Previous research reported Hispanics were less likely to use meditation and yoga compared with Whites (Olano et al., 2015). However, our findings suggest high rates of current meditation and yoga in a predominantly Hispanic urban university student sample. Vulnerable populations, including Hispanics and Blacks, are less likely to use mind–body interventions, but our findings contradict the previous research.

More research is needed on the access and utilization rates of mind–body services and methods to increase acceptability and feasibility of such interventions within people of color populations. Vulnerable populations with generally disproportionately high rates of disease and mental health problems may benefit from mind–body programs if designed in culturally competent approaches that incorporate traditional, collectivistic values. Policymakers and college administrators have a duty to create

opportunities for students of color to not only survive the pandemic but to thrive during this unprecedented time.

Limitations of the current study include the use of retrospective reporting of various measures of psychosocial well-being including stress, sleep, and alcohol use. There is also a substantial limitation in using a modified 21-item PGWBI rather than the full 22-item scale, which could have altered its reliability and validity. Our measurement of employment does not comply with BLS categories and does not fully capture the full range of potential employment patterns. This limitation may have impacted our ability to measure changes in employment during the pandemic. The measure used did not allow for accurate assessment of categories related to unemployed (looking vs. not looking for work), retired, homemaker, assists with family businesses, and self-employed categories as dictated by BLS standards (BLS, 2017). Future research should focus on this pandemic's unique effects on students of color who represent the future majority of our workforce. The economic and workforce implications of this pandemic on people of color should be further investigated.

Furthermore, cross-cultural use of measures of psychological outcomes and health may be limited in their ability to assess health and emotional well-being in people of color. As diversity in populations increases and people of color populations continue to grow, more research is needed into the validity of scales (i.e., RAND-36, PGWBI) and validation of new scales for assessing psychological health during a public health emergency in multiethnic samples. Although the results of this study are exploratory, these findings add to our evolving understanding of mental health and other secondary public health effects related to the COVID-19 pandemic. Future research should seek to replicate these findings in a larger, more representative sample for greater generalizability.

## References

- Alexander, G. C., Stoller, K. B., Haffajee, R. L., & Saloner, B. (2020). An epidemic in the midst of a pandemic: Opioid use disorder and COVID-19. *Annals of Internal Medicine*, 173(1), 57–58. <https://doi.org/10.7326/M20-1141>
- American Medical Association (AMA). (2020, July 20). *Reports of increases in opioid related overdose and other concerns during COVID pandemic* [Issue brief]. <https://www.ama-assn.org/system/files/2020-12/issue-brief-increases-in-opioid-related-overdose.pdf>
- American Public Media Research Lab. (2020). *COVID-19 deaths analyzed by race and ethnicity in the U.S.* <https://www.apmresearchlab.org/covid/deaths-by-race>
- Bond, L., Butler, H., Thomas, L., Carlin, J., Glover, S., Bowes, G., & Patton, G. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health, and academic outcomes. *Journal of Adolescent Health*, 40(4), 357. e9–357–e18. <https://doi.org/10.1016/j.jadohealth.2006.10.013>
- Cabassa, L. J., Zayas, L. H., & Hansen, M. C. (2006). Latino adults' access to mental health care: A review of epidemiological studies. *Administration and Policy in Mental Health and Mental Health Services Research*, 33(3), 316–330. <https://doi.org/10.1007/s10488-006-0040-8>
- Centers for Disease Control and Prevention. (2018). *Health-related quality of life*. <https://www.cdc.gov/hrqol/wellbeing.htm>
- Centers for Disease Control and Prevention. (2020, April 5). *Coronavirus disease 2019 (COVID-19) 2020 interim case definition*. <https://www.cdc.gov/nndss/conditions/coronavirus-disease-2019-covid-19/case-definition/2020/>

- Cervantes, R. C., Padilla, A. M., Napper, L. E., & Goldbach, J. T. (2013). Acculturation-related stress and mental health outcomes among three generations of Hispanic adolescents. *Hispanic Journal of Behavioral Sciences*, 35(4), 451–468. <https://doi.org/10.1177/0739986313500924>
- Cespedes, E. M., Hu, F. B., Redline, S., Rosner, B., Alcantara, C., Cai, J., Hall, M. H., Loreda, J. S., Mossavar-Rahmani, Y., Ramos, A. R., Reid, K. J., Shah, N. A., Sotres-Alvarez, D., Zee, P. C., Wang, R., & Patel, S. R. (2016). Comparison of self-reported sleep duration with actigraphy: Results from the Hispanic Community Health Study/Study of Latinos Sueño Ancillary Study. *American Journal of Epidemiology*, 183(6), 561–573. <https://doi.org/10.1093/aje/kwv251>
- Cramer, H., Hall, H., Leach, M., Frawley, J., Zhang, Y., Leung, B., Adams, J., & Lauche, R. (2016). Prevalence, patterns, and predictors of meditation use among U.S. adults: A nationally representative survey. *Scientific Reports*, 6(1), Article 36760. <https://doi.org/10.1038/srep36760>
- Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., Weaver, M. D., Robbins, R., Facer-Childs, E. R., Barger, L. K., Czeisler, C. A., Howard, M. E., & Rajaratnam, S. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. *Morbidity and Mortality Weekly Report*, 69(32), 1049–1057. <https://doi.org/10.15585/mmwr.mm6932a1>
- Druss, B. G. (2020). Addressing the COVID-19 pandemic in populations with serious mental illness. *JAMA Psychiatry*, 77(9), 891–892. <https://doi.org/10.1001/jamapsychiatry.2020.0894>
- Dsouza, D. D., Quadros, S., Hyderabadwala, Z. J., & Mamun, M. A. (2020). Aggregated COVID-19 suicide incidences in India: Fear of COVID-19 infection is the prominent causative factor. *Psychiatry Research Article*, 290, e 1131. <https://doi.org/10.1016/j.psychres.2020.113145>
- Epidemiology Working Group for NCIP Epidemic Response and Chinese Center for Disease Control and Prevention. (2020, February 10) The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. *Zhonghua Liu Xing Bing Xue Za Zhi*, 41(2), 145–151. <https://doi.org/10.3760/cma.j.issn.0254-6450.2020.02.00>
- Fortuna, L. R., Tolou-Shams, M., Robles-Ramamurthy, B., & Porche, M. V. (2020). Inequity and the disproportionate impact of COVID-19 on communities of color in the United States: The need for a trauma-informed social justice response. *Psychological Trauma: Theory, Research, Practice, and Policy*, 12(5), 443–445. <https://doi.org/10.1037/tra0000889>
- Galea, S., Ahern, J., Resnick, H., Kilpatrick, D., Bucuvalas, M., Gold, J., & Vlahov, D. (2002). Psychological sequelae of the September 11 terrorist attacks in New York City. *The New England Journal of Medicine*, 346(13), 982–987. <https://doi.org/10.1056/NEJMsa013404>
- Glass, R. J., Glass, L. M., Beyeler, W. E., & Min, H. J. (2006). Targeted social distancing designs for pandemic influenza. *Emerging Infectious Diseases*, 12(11), Article 1671–1681. <https://doi.org/10.3201/eid1211.060255>
- Goldman, N., Gleit, D. A., & Weinstein, M. (2018). Declining mental health among disadvantaged Americans. *Proceedings of the National Academy of Sciences of the United States of America*, 115(28), 7290–7295. <https://doi.org/10.1073/pnas.1722023115>
- Gradín, C. (2012). Poverty among minorities in the United States: Explaining the racial poverty gap for Blacks and Latinos. *Applied Economics*, 44(29), 3793–3804. <https://doi.org/10.1080/00036846.2011.581219>
- Groarke, J., Berry, E., Wisener, L., McKenna-Plumley, P., McGlinchey, E., & Armour, C., (2020, June 24). Loneliness in the U.K. during the COVID-19 pandemic: Cross-sectional results from The COVID-19 Psychological Wellbeing Study. *PLoS ONE*, 15(9), Article e0239698. <https://doi.org/10.1371/journal.pone.0239698>
- Grossi, E., & Compare, A. (2014). Psychological General Well-Being Index (PGWB). In A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research* (pp. 5152–5156). Springer. [https://doi.org/10.1007/978-94-007-0753-5\\_2309](https://doi.org/10.1007/978-94-007-0753-5_2309)
- Grossi, E., Groth, N., Mosconi, P., Cerutti, R., Pace, F., Compare, A., & Apolone, G. (2006). Development and validation of the short version of the Psychological General Well-Being Index (PGWB-S). *Health and Quality of Life Outcomes*, 4(1), Article 88. <https://doi.org/10.1186/1477-7525-4-88>
- Han, B., Hedden, S. L., Lipari, R., Copello, E. A. P., & Kroutil, L. A. (2015, September). *Receipt of Services for Behavioral Health Problems: Results from the 2014 National Survey on Drug Use and Health*. Substance Abuse and Mental Health Services Administration. [https://www.samhsa.gov/data/sites/default/files/NSDUH-DR-FRR3-2014/NSDUH-DR-FRR3-2014.htm](https://www.samhsa.gov/data/sites/default/files/NSDUH-DR-FRR3-2014/NSDUH-DR-FRR3-2014/NSDUH-DR-FRR3-2014.htm)
- Hawkins, D. (2020). Differential occupational risk for COVID-19 and other infection exposure according to race and ethnicity. *American Journal of Industrial Medicine*, 63(9), 817–820. <https://doi.org/10.1002/ajim.23145>
- Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press Publications.
- Hays, R. D., & Morales, L. S. (2001). The RAND-36 measure of health-related quality of life. *Annals of Medicine*, 33(5), 350–357. <https://doi.org/10.3109/07853890109002089>
- Hedegaard, H., Curtin, S. C., & Warner, M. (2020). *Increase in suicide mortality in the United States, 1999–2018 [Data brief 362]*. National Center for Health Statistics. <https://www.cdc.gov/nchs/products/data/briefs/db362.htm>
- Huremović, D. (2019). Mental health of quarantine and isolation. In D. Huremović (Ed.), *Psychiatry of pandemics* (pp. 95–118). Springer. [https://doi.org/10.1007/978-3-030-15346-5\\_9](https://doi.org/10.1007/978-3-030-15346-5_9)
- Inouye, S., Schuchat, A., Galea, S., Karlawish, J., & Nuzzo, J. (2020, April 01). *COVID-19 conversations: The science of social distancing, Pt. 2 [Webinar]*. American Public Health Association & National Academy of Medicine. <https://covid19conversations.org/webinars/science-of-social-distancing-2>
- Johal, S. S. (2009). Psychosocial impacts of quarantine during disease outbreaks and interventions that may help to relieve strain. *The New Zealand Medical Journal*, 122(1296), 47–52. <https://doi.org/10.1177/070674370404900612>
- Johns Hopkins School of Medicine. (2020). *COVID-19 map*. <https://coronavirus.jhu.edu/map.html>
- Joseph, N. T., Matthews, K. A., & Myers, H. F. (2014). Conceptualizing health consequences of Hurricane Katrina from the perspective of socioeconomic status decline. *Health Psychology*, 33(2), 139–146. <https://doi.org/10.1037/a0031661>
- Kessler, R. C. (2003). Epidemiology of women and depression. *Journal of Affective Disorders*, 74(1), 5–13. [https://doi.org/10.1016/S0165-0327\(02\)00426-3](https://doi.org/10.1016/S0165-0327(02)00426-3)
- Kessler, R. C., Galea, S., Gruber, M. J., Sampson, N. A., Ursano, R. J., & Wessely, S. (2008). Trends in mental illness and suicidality after Hurricane Katrina. *Molecular Psychiatry*, 13(4), 374–384. <https://doi.org/10.1038/sj.mp.4002119>
- Keys, K. M., Martins, S. S., Hatzenbuehler, M. L., Blanco, C., Bates, L. M., & Hasin, D. S. (2012). Mental health service utilization for psychiatric disorders among Latinos living in the United States: The role of ethnic subgroup, ethnic identity, and language/social preferences. *Social Psychiatry and Psychiatric Epidemiology*, 47(3), 383–394. <https://doi.org/10.1007/s00127-010-0323-y>
- Kim, H. C., Yoo, S. Y., Lee, B. H., Lee, S. H., & Shin, H. S. (2018). Psychiatric findings in suspected and confirmed Middle East respiratory syndrome patients quarantined in hospital: A retrospective chart analysis. *Psychiatry Investigation*, 15(4), 355–360. <https://doi.org/10.30773/pi.2017.10.25.1>

- Lee, J. S. (2019). Perceived social support functions as a resilience in buffering the impact of trauma exposure on PTSD symptoms via intrusive rumination and entrapment in firefighters. *PLoS ONE*, *14*(8), Article 0220454. <https://doi.org/10.1371/journal.pone.0220454>
- Leon, G. R. (2004). Overview of the psychosocial impact of disasters. *Pre-hospital and Disaster Medicine*, *19*(1), 4–9. <https://doi.org/10.1017/s1049023x00001424>
- Liebrez, M., Bhugra, D., Buadze, A., & Schleifer, R. (2020). Caring for persons in detention suffering with mental illness during the Covid-19 outbreak. *Forensic Science International: Mind and Law*, *1*, Article 100013. <https://doi.org/10.1016/j.fsml.2020.100013>
- Lock, S., Rubin, G. J., Murray, V., Rogers, M. B., Amlôt, R., & Williams, R. (2012). Secondary stressors and extreme events and disasters: A systematic review of primary research from 2010-2011. *PLoS Currents*. Advance online publication. <https://doi.org/10.1371/currents.dis.a9b76fed1b2dd5c5bfefc13c87a2f24f>
- Littman, A. J., White, E., Satia, J. A., Bowen, D. J., & Kristal, A. R. (2006). Reliability and validity of 2 single-item measures of psychosocial stress. *Epidemiology*, *17*(4), 398–403. <https://doi.org/10.1097/01.ede.0000219721.89552.51>
- Mamun, M. A., & Griffiths, M. D. (2020). First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies. *Asian Journal of Psychiatry*, *51*, Article 102073. <https://doi.org/10.1016/j.ajp.2020.102073>
- Martin, M. S., Maddocks, E., Chen, Y., Gilman, S. E., & Colman, I. (2016). Food insecurity and mental illness: Disproportionate impacts in the context of perceived stress and social isolation. *Public Health*, *132*, 86–91. <https://doi.org/10.1016/j.puhe.2015.11.014>
- Millennium Health Signals Report. (2020, July). *COVID-19 Special Edition: Vol. 2.1 Significant Changes in Drug Use During the Pandemic*. <https://www.millenniumhealth.com/news/signalsreportcovid/>
- Montenovo, L., Jiang, X., Rojas, F. L., Schmutte, I. M., Simon, K. I., Weinberg, B. A., & Wing, C. (2020). *Determinants of disparities in covid-19 job losses (Working Paper No. 27132)*. National Bureau of Economic Research. <https://doi.org/10.3386/w27132>
- Mortensen, K., Wilson, R., & Ho, V. (2009). Physical and mental health status of Hurricane Katrina evacuees in Houston in 2005 and 2006. *Journal of Health Care for the Poor and Underserved*, *20*(2), 524–538. <https://doi.org/10.1353/hpu.0.0130>
- Mulvaney-Day, N. E., Alegría, M., & Sribney, W. (2007). Social cohesion, social support, and health among Latinos in the United States. *Social Science and Medicine* (1982), *64*(2), 477–495. <https://doi.org/10.1016/j.socscimed.2006.08.030>
- North, C. S., & Pfefferbaum, B. (2013). Mental health response to community disasters: A systematic review. *Journal of the American Medical Association*, *310*(5), 507–518. <https://doi.org/10.1001/jama.2013.107799>
- Olan, H. A., Kachan, D., Tannenbaum, S. L., Mehta, A., Annane, D., & Lee, D. J. (2015). Engagement in mindfulness practices by U.S. adults: Sociodemographic barriers. *Journal of Alternative and Complementary Medicine*, *21*(2), 100–102. <https://doi.org/10.1089/acm.2014.0269>
- Pfefferbaum, B., & North, C. S., (2020, April 13). Mental health and the Covid-19 pandemic. *The New England Journal of Medicine*, *383*(6), 510–512. <https://doi.org/10.1056/NEJMp2008017>
- Rayhan, R. U., Zheng, Y., Uddin, E., Timbol, C., Adewuyi, O., & Baraniuk, J. N. (2013). Administer and collect medical questionnaires with Google documents: A simple, safe, and free system. *Applied Medical Informatics*, *33*(3), 12–21.
- Ray, T. K., Kenigsberg, T. A., & Pana-Cryan, R. (2017). Employment arrangement, job stress, and health-related quality of life. *Safety Science*, *100*(Part A), 46–56. <https://doi.org/10.1016/j.ssci.2017.05.003>
- Rios, R., Aiken, L. S., & Zautra, A. J. (2012). Neighborhood contexts and the mediating role of neighborhood social cohesion on health and psychological distress among Hispanic and non-Hispanic residents. *Annals of Behavioral Medicine*, *43*(1), 50–61. <https://doi.org/10.1007/s12160-011-9306-9>
- Rudenstine, S., McNeal, K., Schulder, T., Ettman, C. K., Hernandez, M., Gvozdieva, K., & Galea, S. (2020). Depression and anxiety during the COVID-19 pandemic in an urban, low-income public university sample. *Journal of Traumatic Stress*. Advance online publication. <https://doi.org/10.1002/jts.22600>
- Ruiz, J. M., Hamann, H. A., Mehl, M. R., & O'Connor, M. F. (2016). The Hispanic health paradox: From epidemiological phenomenon to contribution opportunities for psychological science. *Group Processes and Intergroup Relations*, *19*(4), 462–476. <https://doi.org/10.1177/1368430216638540>
- Ruiz, J. M., Sbarra, D., & Steffen, P. R. (2018). Hispanic ethnicity, stress psychophysiology and paradoxical health outcomes: A review with conceptual considerations and a call for research. *International Journal of Psychophysiology*, *131*, 24–29. <https://doi.org/10.1016/j.ijpsycho.2018.04.001>
- Spector, R. (2017). *Cultural diversity in health and illness* (9th ed.). Pearson Prentice Hall.
- Taningo, M. T. V. (2007, August). *Revisiting the Latino health paradox [Policy brief]*. The Tomás Rivera Policy Institute. <https://socialinnovation.usc.edu/trpi/archives/Latino%20Paradox%20Aug%202007%20PDF.pdf>
- Tarlov, A. R., Ware, J. E., Greenfield, S., Nelson, E. C., Perrin, E., & Zubkoff, M. (1989). The medical outcomes study: An application of methods for monitoring the results of medical care. *Journal of the American Medical Association*, *262*(7), 925–930. <https://doi.org/10.1001/jama.1989.03430070073033>
- U.S. Bureau of Labor Statistics (BLS). (2017, January 25). *How the government measures unemployment*. [https://www.bls.gov/CPS/cps\\_htgm.htm#unemployed](https://www.bls.gov/CPS/cps_htgm.htm#unemployed)
- U.S. Bureau of Labor Statistics (BLS). (2019, September 24). *Workers who could work at home, did work at home, and were paid for work at home, by selected characteristics, averages for the period 2017-2018 [Table 1]*. <https://www.bls.gov/news.release/flex2.t01.htm>
- U.S. Department of Health and Human Services, Office of Minority Health (USDHHS). (2019). *Mental and behavioral health - Hispanics*. <https://www.minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=69>
- Vitlic, A., Lord, J. M., & Phillips, A. C. (2014). Stress, ageing and their influence on functional, cellular and molecular aspects of the immune system. *Age (Dordrecht, Netherlands)*, *36*(3), 9631. <https://doi.org/10.1007/s11357-014-9631-6>
- Voitsidis, P., Gliatas, I., Bairachtari, V., Papadopoulou, K., Papageorgiou, G., Parlapani, E., Syngelakis, M., Holveva, V., & Diakogiannis, I. (2020). Insomnia during the COVID-19 pandemic in a Greek population. *Psychiatry Research*, *289*, Article 113076. <https://doi.org/10.1016/j.psychres.2020.113076>
- Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item Short-Form Health Survey (SF-36): I. Conceptual framework and item selection. *Medical Care*, *30*(6), 473–483. <https://doi.org/10.1097/00005650-199206000-00002>
- Williams, D. R. (2018). Stress and the mental health of populations of color: Advancing our understanding of race-related stressors. *Journal of Health and Social Behavior*, *59*(4), 466–485. <https://doi.org/10.1177/0022146518814251>
- Wong, M. L., Lau, K. N. T., Espie, C. A., Luik, A. I., Kyle, S. D., & Lau, E. Y. Y. (2017). Psychometric properties of the Sleep Condition Indicator and Insomnia Severity Index in the evaluation of insomnia disorder. *Sleep Medicine*, *33*, 76–81. <https://doi.org/10.1016/j.sleep.2016.05.019>
- World Health Organization. (2020, January 12). *Novel Coronavirus—China*. <https://www.who.int/csr/don/12-january-2020-novel-coronavirus-china/en/>

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