Household Financial Hardship Factors Are Strongly Associated with Poorer Latino Mental Health During COVID-19

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Abstract

Background Latinos have suffered disproportionate adversity during the COVID-19 pandemic. Many studies have focused on comparing Latinos to other groups, potentially masking critical concerns within population. This study identifies potential pathways to poor mental health among Latinos during the pandemic.

Methods Data from US Census Household Pulse Survey, covering April 23, 2020, to October 11, 2021, were analyzed. Ordinal logistic regression evaluated categorical frequencies of problems with anxiety, loss of interest, worry, and feeling down. Findings were stratified by gender, poverty status, metropolitan location, and work. Demographic, household, financial, and work covariates were mutually adjusted, and jackknife replications and population weights applied.

Results Adverse mental health was common, with higher frequencies of 2 or more adverse mental health symptoms for at least several days in the prior 2 weeks (59.1–76.3%, depending on stratified group). Food insufficiency was strongly associated with adverse mental health symptoms across all characteristics. Odds ratios of often not having enough to eat compared to enough of foods wanted being associated with adverse mental health ranged from 2.6 to 6.56 (depending on stratified group). Difficulty with expenses was also strongly associated with adverse mental health across characteristics, with odds ratios very difficult compared to not at all ranging from 2.7 to 7.7 (depending on stratified group).

Conclusion These observations suggest household financial hardship factors influence mental health regardless of other personal characteristics, and this could inform services for Latinos. Targeted programs to ensure food sufficiency and income may be necessary to improve mental health in US Latinos.

Keywords Latino health • Latino mental health • COVID-19 • Latino COVID-19

Introduction

Although there exists an emergent scholarship on Latino COVID-19 health outcomes and studies exploring the intersection of the virus and mental health, research probing the question of how the pandemic has affected Latino mental health remains sparse [1–3]. This issue is a critical avenue for inquiry, given that recent studies suggest that US adults as a whole who suffer mental health disorders are at escalated risk for COVID-19 infection, complications, and mortality [4–9]. An analysis of electronic health records from 61 million adult patients assessing the impact of a diagnosis within the past year of bipolar disorder, depression, attention-deficit/ hyperactivity disorder (ADHD), and schizophrenia found that a recent psychiatric disorder diagnosis significantly increased risk for COVID-19 infection [6]. Researchers have expressed concern that compromised mental health could increase risk of COVID infection and complications due to challenges in understanding health information, complying with public health mandates, psychosocial stressors such as inadequate shelter, and a high prevalence of comorbid conditions that exacerbate COVID symptoms [6]. In addition to concerns that poor mental health contributes to COVID infection and mortality, scientists have warned that pandemic-related social isolation, financial strain, barriers to treatment, and pre-existing psychiatric disorders could fuel deleterious mental health outcomes including high depression and suicide rates [9–11].
Prior studies using the U.S. Bureau of the Census’ Household Pulse Survey (HPS) survey data to evaluate mental health in the aggregate have identified concerning trends [5, 10, 11]. An analysis comparing HPS data from August 19, 2020, to February 1, 2021, found that the percentage of US adults reporting depression or anxiety symptoms in the past 7 days increased significantly, from 36.4 to 41.5% [10]. Another study using HPS data from March 17 to 29, 2021 (N = 77,104) found that 35% of adults surveyed experienced depression or anxiety [5]. One study (N = 988,349) comparing scores on psychometric scales from April 2020 to July 2020 found that younger people, women, racial/ethnic minorities, lower-income respondents, and those with less education suffered higher rates of depression and anxiety [11]. The same study found that individuals in states with higher COVID-19 diagnoses had larger increases in both depression and anxiety compared to those in the lowest quintile for diagnoses (p < 0.001) [11].

**Latino Mental Health**

Poor mental health among Latinos in the USA merits particular consideration given the disproportionate rates of COVID-19 infection, hospitalizations, and mortality among this population subgroup [12–14]. According to the most recently available statistics from the U.S. Centers for Disease Control (2022), Latinos are 1.5 times more likely to contract the disease than whites [13]. Latinos are also 2.2 times as likely to be hospitalized with COVID-19 than whites and are 1.8 times as likely to die from the disease than whites [13]. One recent epidemiological study comparing COVID mortality by county population density found that disproportionately, Latino counties (defined as ≥ 17.8% Latino) experienced higher rates of diagnoses with the disease at 90.9 per 100,000 compared to 82.0 per 100,000 in the remaining counties [14]. COVID diagnoses were associated with high densities of monolingual Spanish speakers as well as other social determinants of health such as overcrowded housing, inability to work from home, and occupations that afforded high rates of disease exposure such as work in meat-packing plants in the Midwest [14].

A study analyzing HPS data from June 24 to 30, 2020, found that the percentage of Latinos who had seriously considered suicide in the 30 days prior to the survey was statistically significantly higher compared to the population as a whole, with 18.6% of Latinos admitting contemplating killing themselves [15]. Latinos surveyed by the CDC reported higher rates of mental health issues compared to whites across the domains of depression (40.3%), suicidal thoughts/ideation (22.9%), and substance use increase or initiation (36.9%) [16]. One study early in the pandemic used data from the SOMOS COVID-19 Crisis National Latino Survey (n = 1200) collected between April 7 and 12, 2020, to explore mental health for Latinas [1]. It found that knowing an undocumented immigrant and/or someone suffering COVID-19 escalated the probability of having a mental health problem by 52% [1]. Given the CDC’s concerning findings linking age (18–29) to poor pandemic mental health outcomes, it is worth considering how COVID-19 may affect Latinos in particular [14]. As noted in one epidemiological study, approximately 59% of Latinos are aged less than 35 years compared with 46% of the remaining US population [14].

In addition to higher rates of COVID-related mortality and mental health adversity, recent studies suggest US Latinos have been disadvantaged by job losses due to COVID-related business closures, immigration status, and food insecurity [17, 18]. A scoping review of the literature analyzing 37 studies published in 2020 identified risk factors for Latino social determinants of health including work in jobs considered essential, overcrowded housing, limited English proficiency, residing in areas of dense Latino populations, and being unable to engage in social distancing [19]. Occupational status is particularly concerning for Latinos because of job loss due to workplace closures and quarantine, especially in the early months of the pandemic [19].

A bilingual, online study of 3,375 Latinos conducted by the Pew Research Center in March 2021 found that job and wage losses for households during the pandemic were as prevalent among American-born Latinos as they were for immigrants [20]. The same study found that 58% of immigrants who had neither citizenship nor permanent resident status suffered a lost job or wages since February 2020, compared to 45% of naturalized citizens. [20] Sixty-two percent of Latinos surveyed — a cohort that included American-born, naturalized citizens, legal permanent residents, and undocumented — said they had suffered at least one of seven potential hardships including trouble paying bills (35%); relying on food banks (31%); difficulty paying a mortgage or rent (25%); receiving government food assistance such as SNAP (23%); struggling to pay for health care (19%); receiving unemployment benefits (17%); or losing health insurance coverage (11%) [20]. Not surprisingly, immigration status affected those outcomes. As noted by Pew, 48% of Latino immigrants without legal permanent residency struggled to pay bills during the pandemic, a 13% higher rate than those who had a “green card” [20]. The same study found that 35% of US-born Latinos and 26% of naturalized citizens reported trouble paying their bills [20]. Prior to the pandemic, financial hardship, trauma during the journey to cross the Mexico/US border, vulnerability to exploitation, marginalization and isolation, and fear were found to contribute to poor mental health outcomes for undocumented immigrants, including Latinos [21–23].

These observations underscore the importance of identifying unmodifiable and modifiable factors associated with
poorer mental health in Latinos, so that actionable steps can be developed to mitigate impacts [24, 25]. We argue that pivotal factors including lack of access to resources such as housing, food, and safe and stable work may lead to or interact with other factors to contribute to poorer mental health outcomes, including anxiety and depression. The objective of this work was to examine Latinos, not compared to other ethnic groups, to identify factors associated with poorer mental health outcomes in this population group in order to inform public health policies and social service interventions that can be developed to meet their unique needs.

Methods

Data Source

The Household Pulse Survey is conducted by the U.S. Bureau of the Census in collaboration with other federal agencies to collect data on the social and economic effects of coronavirus on American households [26]. Data is collected online and the survey includes questions about childcare, education, employment, energy use, food security, health, housing, household spending, other financial information, transportation, and COVID-19 vaccination. The first phase of the survey began on April 23, 2020. Data for this analysis included participants surveyed from April 23, 2020, through October 2021, which covered phases 1, 2, 3, 3.1, and 3.2. All responses were self-reported. The collection of data for the Household Pulse Survey was approved by the Office of Management and Budget (approval number: 0607–1013). This analysis was conducted on the Household Pulse Survey Data publicly available, de-identified data, and secondary analysis is considered not human subjects research.

Study Sample

Individuals who affirmatively to the question “Are you of Hispanic, Latino, or Spanish origin?” were included in the analysis. There were 209,384 individuals included in the analysis stratified by poverty and gender; 96,969 individuals included in the sub-analysis of MSAs; and 50,755 individuals included in the analysis stratified by work status.

Outcome (Dependent) Variables

Participants were asked to rate their mental health in the prior 2 weeks for feeling anxious, feeling worried, having little interest, and feeling depressed as: not at all, several days, more than half the days, and nearly every day. A composite variable was created based on these responses for the number of symptoms reported for at least several days (several days, more than half the days, or nearly every day).

Predictor (Independent) Variables

Personal and situational characteristics (demographic, financial, household, and work-related variables) were considered as independent variables in the analysis. Demographic variables included age (in 10-year increments), race (White, Black, Asian, and other), education (less than high school, some high school, high school graduate or equivalent, some college, earned associates degree, earned bachelor’s degree, or earned graduate degree), and marital status (married, widowed, divorced, separated, or never married). Household variables included number of adults in the household, number of children in the household, and living quarters (mobile home, single-family detached, single-family attached, building with two apartments, building with three or four apartments, building with 5 or more apartments, or vehicle (boat, RV, van, etc.)). Financial variables included food sufficiency in the past 7 days (enough of kinds of food wanted; enough but not always kind wanted; sometimes not enough to eat; or often not enough to eat), difficulty with expenses (not at all, a little, somewhat difficult, very difficult, or not asked), and confidence paying mortgage or rent (not at all, slightly, moderately, highly, or payment deferred). Separate categories were created for missing values.

Stratification Variables

Gender and poverty may act as effect modifiers of relationships of mental health with personal and situational characteristics in Latinos because of cultural expectations or access to resources. Gender was classified by reported male gender (cis- and trans-gender male) or female (cis- and trans-gender female). Individuals were classified as above or at/below the federal poverty line based on household size and income (https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines). Income is reported in categories, and midpoint values were used to assign an income level to participants (500,000 was used for the upper category where no upper bound was reported). Classification into categories based on using the low value, midpoint, or upper value of categories was undertaken to assess bias. Percent agreement for all participants was 95% for low value verses midpoint value and 89% for midpoint value verses high value, indicating high agreement regardless of value of utilized.

Geographic location may act as an effect modifier of relationships of mental health with personal and situational characteristics through structural factors, such as policies or access to resources. A sub-analysis was conducted for participants that lived in the reported metropolitan statistical areas (MSAs): MSA 12,060: Altanta-Sandy Springs-Alpharetta, GA; MSA 14,460: Boston-Cambridge-Newton, MA-NH; MSA 16,980: Chicago-Naperville-Elgin, IL-IN-WI; MSA 19,100: Dallas-Fort Worth-Arlington, TX; MSA

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19,820: Detroit-Warren-Dearborn, MI; MSA 26,420: Houston-The Woodlands-Sugar Land, TX; MSA 31,080: Los Angeles-Long Beach-Anaheim, CA; MSA 33,100: Miami-Fort Lauderdale-Pompano Beach, FL; MSA 35,620: New York-Newark-Jersey City, NY-NJ-PA; MSA 37,980: Philadelphia-Camden-Wilmington, PA-NJ-DE; MSA 38,060: Phoenix-Mesa-Chandler, AZ; MSA 40,140: Riverside-San Bernardino-Ontario, CA; MSA 41,860: San Francisco-Oakland-Berkeley, CA; MSA 42,660: Seattle-Tacoma-Bellevue, WA; and MSA 47,900: Washington-Arlington-Alexandria, DC-VA-MD. An exploratory analysis was conducted to evaluate the associations of personal and situational characteristics with mental health stratified by MSAs.

The type of jobs people work may influence how they respond to stress. An exploratory analysis was conducted to evaluate the impact of work situation. In phase 3, the survey included a question about work in an essential setting (health care, school, first response, death care, correctional facility, food store, food manufacturing, agriculture, forestry, fishing, hunting, social services, postal service, or other essential not listed). Individuals were classified into three categories based on responses to the question about working in essential settings and work in the prior week: 1. no work in the prior week, 2. working in the prior week, and 3. work in a non-essential setting (did not indicate affirmatively to one of the essential settings asked), or work in the prior week and work in an essential setting (indicated affirmatively to one of the essential settings asked). Analyses of mental health in relation to personal and situational characteristics were evaluated through stratification by work setting. For analysis of work situation, other work predictors were not considered to avoid possible collinearity or overfitting.

**Statistical Analysis**

Individuals with missing data for mental health, gender, income, or ethnicity variables were excluded. Means with population-weighted standard errors and frequencies with population-weighted percentages were calculated as descriptive statistics. Ordinal logistic regression was used to evaluate categorical frequencies (not at all, several days, more than half of days, and nearly every day) of anxiety, loss of interest, worry, and feeling down over previous 2 weeks, stratified by gender and poverty status. Demographic, household, financial, and work covariates were mutually adjusted, and jackknife replications and population weights applied. Population weights were appropriate to the phases included in the analysis and accounted for exclusions made. Analyses were conducted using Stata (version 15.1, StataCorp, TX, USA). Copies of statistical code are available upon reasonable request to the authors. Heat maps were created using Microsoft Excel.

**Results**

**Population Characteristics**

There were 209,384 individuals included in the analysis stratified by poverty and gender; 96,969 individuals included in the sub-analysis of MSAs; and 50,755 individuals included in the analysis stratified by work status. Personal characteristics, stratified by gender and poverty and by work situation, are presented in Table 1. The overall average age ranged from 42 to 49 years across the stratifications. The majority of Latino participants identified themselves as White race. As to be expected, there was a mix of education and marital status across gender, poverty, and work situations, with more married individuals among those above the poverty line, and higher education among those working, among females, and among those above the poverty line. The average number of people in the household was higher for those below poverty. Individuals working and those above poverty were more frequently living in single-family homes. Also as expected, food insufficiency, having difficulty with expenses, and lower confidence in ability to pay rent or mortgage were higher among those below poverty and those not working.

**Predictors of Mental Health, Stratified by Poverty and Gender**

A majority of participants reported adverse mental health symptoms at several days or more across gender and poverty categories, and more than half the population reported having two or more symptoms at least several days in the prior 2 weeks (Table 2). Compared to males above poverty, other groups reported significantly higher frequencies of anxiety, worry, having little interest, and feeling depressed. The strongest magnitudes of association with higher frequencies of adverse mental health in the previous 2 weeks were observed for food insufficiency and difficulty with expenses, with similar magnitude of association observed across gender and poverty groups (Fig. 1; data in Supplemental Table 1).

**Predictors of Mental Health, Stratified by Work Situation**

Compared to those who were working in a self-reported non-essential setting, individuals with jobs in essential settings had mostly similar adverse mental health frequencies in the previous 2 weeks (Table 2). An exception was that there was a slightly lower frequency of worry. However, individuals who were not working compared to those working in a non-essential setting had higher frequencies of anxiety, worry, having
Table 1 Demographic, household, financial, and work characteristics of Latino participants in the US Census Household Pulse Survey included in this analysis

| Characteristics | Gender & poverty | Gender & poverty | Gender & poverty | Gender & poverty |
|----------------|------------------|------------------|------------------|------------------|
|                | Males, above poverty | Males, below poverty | Females, above poverty | Females, below poverty |
|                | N or mean | Wgt % or SE | N or mean | Wgt % or SE | N or mean | Wgt % or SE | N or mean | Wgt % or SE |
| Total          | 70,184 | 12,233 | 100,654 | 26,313 |
| Age in years   | 44.2 | 42.2 | 44.3 | 43.4 |
| Race           | 55,702 | 58547 | 81,287 | 17,954 |
| White          | 2992 | 823 | 4949 | 1898 |
| Black          | 2417 | 508 | 2683 | 707 |
| Asian          | 9073 | 2355 | 11,735 | 3954 |
| Other          | 1333 | 853 | 1268 | 1621 |
| Education      | 16,863 | 3311 | 24,539 | 7606 |
| Less than HS   | 7266 | 1187 | 12,439 | 1362 |
| Some HS        | 14,562 | 967 | 20,826 | 7166 |
| High school grad or equiv | 10,025 | 3123 | 13,395 | 7166 |
| Marital status | 43,948 | 4032 | 56,184 | 6917 |
| Married        | 1140 | 403 | 3690 | 1701 |
| Widowed        | 7667 | 2199 | 15,617 | 5946 |
| Divorced       | 1560 | 615 | 2880 | 2303 |
| Household composition | 15,521 | 4913 | 21,844 | 9284 |
| Number of people | 3.7 | 4.6 | 3.8 | 4.7 |
| Number of adults | 2.9 | 3.4 | 2.9 | 3.2 |
| Number of children < 18 years | 0.8 | 1.2 | 0.9 | 1.4 |
| Living quarters, building type | 401 | 146 | 600 | 305 |
| Missing        | 1242 | 594 | 1950 | 1363 |
| Mobile home    | 28,993 | 3088 | 41,270 | 6566 |
| Single-family, detached | 4016 | 749 | 5933 | 1549 |
| Single-family, attached to other houses | 1210 | 348 | 1624 | 782 |
| Building with 2 apartments | 5854 | 1602 | 8628 | 3437 |
| Building with 3 or 4 apartments | 2620 | 719 | 3422 | 1359 |
| Building with 5 apartments | 193 | 163 | 190 | 187 |
| Boat, RV, van, etc | 208 | 80 | 241 | 176 |
| Food sufficiency in the past 7 days | 44,797 | 4010 | 60,725 | 8514 |
| Missing        | 19,642 | 4539 | 31,229 | 10,362 |
| Enough of the kinds of food wanted | 19,642 | 4539 | 31,229 | 10,362 |
| Sometimes not enough to eat | 4552 | 2646 | 7199 | 5716 |
| Often not enough to eat | 985 | 958 | 1260 | 1545 |
Table 1 (continued)

| Characteristics | Gender & poverty | Work situation | Location |
|-----------------|------------------|----------------|----------|
|                 | Males, above poverty | Males, below poverty | Females, above poverty | Females, below poverty |
|                 | N or mean Wgt % or SE | N or mean Wgt % or SE | N or mean Wgt % or SE | N or mean Wgt % or SE |
| Difficulty with expenses | | | | |
| Missing | 76 0.2 | 23 0.2 | 94 0.1 | 51 0.3 |
| Not at all | 21,060 36.9 | 1150 14.9 | 26,966 34.1 | 1929 11.0 |
| A little | 10,779 26.9 | 1688 23.4 | 16,475 28.4 | 3689 24.9 |
| Somewhat difficult | 7646 21.2 | 1960 26.8 | 12,581 22.9 | 4499 29.9 |
| Confidence in ability to pay rent or mortgage next month | | | | |
| Very difficult | 4968 14.9 | 2588 34.6 | 7501 14.5 | 5380 34.0 |
| Missing | 14,246 18.3 | 2979 22.3 | 17,632 17.9 | 5008 19.3 |
| Not at all | 3823 8.2 | 1844 17.6 | 5289 6.7 | 4218 17.1 |
| Slightly | 6689 14.0 | 2260 20.8 | 10,682 14.1 | 5610 23.4 |
| Moderately | 11,531 19.3 | 2546 21.6 | 19,261 21.7 | 5800 21.4 |
| Highly | 32,989 38.8 | 2409 15.9 | 46,505 38.3 | 5344 17.6 |
| Payment deferred | 906 1.3 | 195 1.9 | 1285 1.3 | 333 1.2 |
| Recent household job loss | | | | |
| Missing | 81 0.1 | 22 0.2 | 108 0.1 | 77 0.4 |
| Yes | 28,874 49.0 | 7232 64.8 | 41,286 46.8 | 15,197 59.2 |
| No | 41,229 50.9 | 4979 35.1 | 59,260 53.1 | 11,039 40.4 |
| Employed in last 7 days | | | | |
| Missing | 112 0.2 | 38 0.2 | 159 0.2 | 72 0.4 |
| Yes | 47,290 64.8 | 4715 40.8 | 64,690 59.1 | 9975 37.3 |
| No | 22,782 35.0 | 7480 59.0 | 35,805 40.7 | 16,266 62.3 |
| Receiving unemployment pay | | | | |
| Missing | 29,131 37.1 | 3136 25.4 | 40,207 34.3 | 6829 24.8 |
| Yes, I use paid leave | 407 0.9 | 62 0.6 | 611 0.6 | 157 0.5 |
| Yes, I receive full pay | 734 1.0 | 106 0.8 | 1285 1.4 | 290 1.0 |
| Yes, I receive partial pay | 899 1.6 | 236 2.1 | 1343 1.4 | 562 1.8 |
| No, I receive no pay | 11,298 17.6 | 4042 31.1 | 17,637 19.7 | 8885 32.4 |
| Not phase 1, 2, or 3 | 27,715 41.9 | 4651 40.1 | 39,571 42.6 | 9590 39.5 |
| Employment sector | | | | |
| Missing | 23,237 35.8 | 7620 60.3 | 37,220 42.3 | 16,712 64.3 |
| Government | 7978 8.0 | 474 3.5 | 13,232 10.1 | 1280 4.7 |
| Private company | 29,085 43.3 | 2565 23.5 | 33,282 33.5 | 5277 19.5 |
| Non-profit organization | 3294 3.1 | 291 1.8 | 9620 7.1 | 900 3.1 |
| Self-employed | 5461 7.5 | 1038 8.1 | 5859 5.4 | 1690 6.6 |
| Working in a family business | 1129 2.3 | 245 2.8 | 1441 1.6 | 454 1.8 |

| Characteristics | Work in past 7 days, non-essential setting | Work in past 7 days, essential setting | No work in the past 7 days | Located in select metropolitan statistical areas |
|-----------------|------------------------------------------|---------------------------------------|----------------------------|-----------------------------------------------|
|                 | N or mean Wgt % or SE | N or mean Wgt % or SE | N or mean Wgt % or SE | N or mean Wgt % or SE |
| Total | 14,222 0.21 | 17,424 0.22 | 19,109 0.26 | 96,969 0.09 |
| Age in years | 42.3 | 41.7 | 49.4 | 43.77 |
| Race | | | | |
| White | 11,687 83.0 | 14,185 81.5 | 15,263 79.4 | 76,536 77.4 |
| Black | 638 4.6 | 745 4.6 | 907 4.8 | 5662 6.0 |
| Asian | 398 3.1 | 412 2.5 | 611 3.6 | 3136 3.4 |
| Other | 1499 9.4 | 2082 11.4 | 2328 12.2 | 11,535 13.2 |
Table 1 (continued)

| Characteristics                  | Work situation | Location |
|----------------------------------|----------------|----------|
|                                  | Work in past 7 days, non-essential setting | Located in select metropolitan statistical areas |
|                                  | Work in past 7 days, essential setting | N or mean | Wgt % or SE | N or mean | Wgt % or SE |
| Education                        |                | N or mean | Wgt % or SE |
| Less than HS                     | 202            | 4.9       |             |
| Some HS                          | 343            | 8.9       |             |
| High school grad or equiv        | 1798           | 28.9      |             |
| Some college                     | 3221           | 20.8      |             |
| Associate degree                 | 1488           | 9.6       |             |
| Bachelor degree                  | 3933           | 16.3      |             |
| Graduate degree                  | 3237           | 10.7      |             |
| Marital status                   |                |           |             |
| Missing                          | 54             | 0.5       |             |
| Married                          | 7889           | 53.5      |             |
| Widowed                          | 262            | 1.4       |             |
| Divorced                         | 2030           | 9.9       |             |
| Separated                        | 405            | 3.2       |             |
| Never married                    | 3582           | 31.6      |             |
| Household composition            |                |           |             |
| Number of people                 | 3.8            | 0.03      |             |
| Number of adults                 | 2.9            | 0.03      |             |
| Number of children < 18 years    | 0.9            | 0.02      |             |
| Living quarters, building type   |                |           |             |
| Missing                          | 131            | 1.3       |             |
| Mobile home                      | 411            | 4.7       |             |
| Single-family, detached          | 8889           | 60.4      |             |
| Single-family, attached to other houses | 1357     | 9.7       |             |
| Building with 2 apartments       | 389            | 3.2       |             |
| Building with 3 or 4 apartments   | 601            | 4.6       |             |
| Building with 5 apartments        | 2410           | 15.9      |             |
| Boat, RV, van, etc               | 34             | 0.3       |             |
| Missing                          | 26             | 0.4       |             |
| Food sufficiency in the past 7 days |          |           |             |
| Enough of the kinds of food wanted | 10,275 | 63.2      |             |
| Enough, but not always the kinds of food wanted | 2938 | 25.4      |             |
| Difficulty with expenses         |                |           |             |
| Missing                          | 815            | 8.6       |             |
| Not at all                       | 168            | 2.4       |             |
| A little                         | 7051           | 39.1      |             |
| Somewhat difficult               | 3611           | 28.5      |             |
| Very difficult                   | 2351           | 20.7      |             |
| Confident in ability to pay rent or mortgage next month | |           |             |
| Missing                          | 1200           | 11.6      |             |
| Not at all                       | 2551           | 17.5      |             |
| Slightly                         | 486            | 5.4       |             |
| Moderately                       | 1249           | 13.1      |             |
| Highly                           | 1964           | 17.4      |             |
| Payment deferred                 | 7858           | 45.8      |             |


little interest, and feeling depressed. The strongest magnitudes of association with higher frequencies of adverse mental health in the previous 2 weeks were observed for food insufficiency and difficulty with expenses, with similar magnitude of association observed across work location (Fig. 2; data in Supplemental Table 2).

Predictors of Mental Health, Stratified by Location

As there is no clear MSA for reference, statistical testing was not performed across MSAs, and frequencies of mental health by MSA are presented for descriptive purposes in Supplemental Table 3. As there were similar associations observed for anxiety, worry, having little interest, and feeling depressed in the other analyses stratified by gender and poverty and by work location, results are presented for a single mental health outcome for MSA stratification. Similar to other stratifications, the strongest magnitudes of association for feeling depressed in the previous 2 weeks were observed for food insufficiency and difficulty with expenses (Supplemental Fig. 1; data in Supplemental Table 4). Depending on MSA, there were differing directionality in associations observed for education, living quarters, any work in the past 7 days, and receiving unemployment pay. However, due to the relatively smaller frequencies in the MSA stratification, these differences should be interpreted with caution.

Discussion

Latinos are at higher risk for COVID-19 infection and mortality compared to whites, and to experience poor pandemic-related mental health at higher rates than whites [13, 15, 16]. In addition, they are vulnerable to economic adversity including food insecurity, unemployment, and problems paying bills — all factors that contribute to poor mental health outcomes [17–20]. The goal of this study was to close a gap in the COVID-related scholarship on Latino mental health by using HPS data to identify which economic and demographic factors inform poor pandemic mental outcomes in this population group. With more than half of Latinos surveyed from April 23, 2020, through October 2021 reporting two or more depression or anxiety symptoms for at least several days in the preceding 2 weeks, this analysis shows strong evidence of disadvantage with respect to mental health outcomes because of the COVID-19 pandemic. Even the group with lowest frequency of adverse mental health symptoms when stratified by gender and poverty — Latino males living above the federal poverty threshold — had high frequencies of depression symptoms, anxiety, worry, and diminished interest.

Our analysis showed that social location — difficulty with expenses and food insufficiency — had strong...
associations with anxiety, worry, depression, and having little interest, indicating escalated overall adversity with respect to mental health for Latinos during the pandemic. These findings are concerning given the fact that even before the pandemic, financial hardship, unemployment, and discrimination based on race/ethnicity had been identified in studies of Latino mental health to have a deleterious impact including development of psychiatric disorders such as depression [21–23]. As noted earlier in this analysis, research has shown that people with psychiatric disorders had poor COVID outcomes in comparison to those not struggling with mental health, which raises concerns that the combination of economic adversity and poor mental health could be contributing to Latino infection and mortality [4–7, 9].

Our findings echo those of a previous survey that showed an overall socio-economic disadvantage for US Latinos during the COVID-19 pandemic including problems paying bills, reliance on food banks, struggles to afford health care, and lost health insurance [20]. These findings call into question the adequacy of the nation’s social welfare system, which for decades has been characterized by more stringent limits on claims for benefits such as Transitional Assistance for Needy Families (cash assistance) and the Supplemental Nutrition Assistance Program (food stamps) including regulations prohibiting immigrants with legal status from receiving income supports until they prove 5 years residency [27–29]. Our findings indicate that respondents struggled to pay bills, as well as to cover expenses for housing. As noted in our findings, there were strong associations between poor mental health and food insecurity. The USA issued three rounds of stimulus checks from April 2020 to March 2021, but it is possible that these payments were insufficient to meet the needs of low-income Latino workers, or that many were ineligible to receive them [30]. Further research is needed to understand why so many Latino workers fell through the social safety net, including examining whether the lowest income earners were eligible for social insurance programs such as unemployment benefits and SNAP. Nativity was not included in the HPS data, so immigration status is not known. It is possible that immigration status was a barrier for some who needed benefits such as SNAP or unemployment.

Our study demonstrates that demographic factors are salient in informing differential mental health outcomes during the pandemic. Latinas in our study were found to be at greater risk for self-reported of depression and anxiety, even if they had an income that exceeded the poverty threshold. The higher risk for Latinas raises the question of whether the pandemic caused problems that women are typically expected to address, such as securing childcare and ensuring that children have adequate resources such as computers for online classes during extended quarantines. Women in the youngest age cohort had even higher rates of both depression and anxiety compared to men. These results show similarity to a recent CDC analysis referenced earlier showing that increases of depression and anxiety were highest among US adults ages 18–29 and who had less than a high school diploma [16]. It is possible that many in this youngest cohort of Latinas were less established in stable jobs or enduring spells of pandemic-related unemployment as they struggled with maintaining housing, paying bills, and caring for young children. Again, the mental health harms coupled with our findings indicating economic precarity raise the question of whether the USA has in place adequate social insurance programs to protect low-income people in times of escalated adversity.

Our analysis of MSA stratification was limited by relatively smaller frequencies and we have thus urged caution in their interpretation. It is worth noting, however, the self-reported depression symptoms were informed by food insufficiency and problems with keeping up with expenses.

Limitations

Our study was limited because the Pulse Survey Data does not disaggregate Latino groups according to their ethnic backgrounds or region/country of origins such as Mexican, Central American, and Puerto Rican [26]. Spanish language data was also not disaggregated.

Conclusion

Our analysis shows that regardless of personal characteristics such as work, gender, poverty, and location, food insecurity and financial duress are adversely related to mental health in this population. Thus, addressing issues of food insecurity and financial adversity may be key in consideration of improved social services for this population. Access to food and income supports could be pivotal in improving mental health outcomes for low-income Latinos. In addition, these results highlight important factors associated with mental health in Latinos, but even with the extensive data collection, there is a lack of information about characteristics such as immigration status and ethnic subgroups among Latinos (e.g., Mexicans and Puerto Ricans) that are important to consider. Future research should examine COVID-19 pandemic-related mental health outcomes for monolingual Spanish speakers as well as comparisons by immigration status that include citizenship, permanent residency (“green card”), and effects on households in mixed immigration status families. Future longitudinal studies...
Table 2  Frequency of adverse mental health symptoms in the prior 2 weeks in Latino participants of the US Census Household Pulse Survey, stratified by gender, poverty, and work location

| Frequency in previous 2 weeks | Gender and poverty |  |  |  |
|------------------------------|-------------------|---|---|---|
|                              | Males, above poverty | Males, below poverty | Females, above poverty | Females, below poverty |
|                              | N | Wgt % | p-value | N | Wgt % | p-value | N | Wgt % | p-value |
| Anxiety                      |  |  |  |  |  |  |  |  |  |
| Not at all                   | 28,364 | 39.54 | Ref | 3707 | 31.93 | < 0.001 | 27,183 | 26.62 | < 0.001 |
| Several days                 | 23,182 | 32.97 |  | 3808 | 31.23 |  | 37,902 | 38.07 |  |
| More than half the days      | 8457  | 12.37 |  | 1741 | 13.71 |  | 15,303 | 15.19 |  |
| Nearly every day             | 10,181 | 15.13 |  | 2977 | 23.13 |  | 20,266 | 20.12 |  |
| Worry                        | 33,945 | 45.42 | Ref | 4218 | 35.16 | < 0.001 | 35,882 | 37.39 | < 0.001 |
| Not at all                   | 21,826 | 32.11 |  | 3986 | 31.91 |  | 36,878 | 37.35 |  |
| More than half the days      | 7101  | 11.39 |  | 1662 | 12.76 |  | 13,431 | 13.6  |  |
| Nearly every day             | 7312  | 11.15 |  | 2367 | 19.04 |  | 14,463 | 15.25 |  |
| Having little interest       | 34,256 | 45.61 | Ref | 4359 | 36.98 | < 0.001 | 42,731 | 39.26 | < 0.001 |
| Not at all                   | 22,098 | 32.11 |  | 3968 | 31.91 |  | 34,661 | 35.34 |  |
| More than half the days      | 7683  | 12.21 |  | 1834 | 14.63 |  | 13,141 | 13.6  |  |
| Nearly every day             | 6147  | 10.07 |  | 2072 | 16.48 |  | 10,121 | 11.7  |  |
| Feeling depressed            | 36,323 | 48.96 | Ref | 4456 | 37.41 | < 0.001 | 44,243 | 41.5  | < 0.001 |
| Not at all                   | 21,568 | 31.44 |  | 3916 | 30.68 |  | 35,128 | 35.25 |  |
| More than half the days      | 6206  | 9.85  |  | 1628 | 12.98 |  | 11,102 | 11.42 |  |
| Nearly every day             | 6087  | 9.75  |  | 2233 | 18.92 |  | 10,181 | 11.82 |  |
| Number symptoms had at least several days | 22,203 | 29.64 | Ref | 2534 | 21.92 | < 0.001 | 20,928 | 23.39 | < 0.001 |
| 0 symptoms                   | 5597  | 39.23 |  | 7073 | 40.46 | 0.549 | 7475  | 37.22 | < 0.001 |
| 1 symptom                    | 4949  | 33.74 |  | 5782 | 32.26 |  | 5819  | 30.36 |  |
| 2 symptoms                   | 6147  | 10.07 |  | 2072 | 16.48 |  | 10,121 | 11.7  |  |
| 3 symptoms                   | 7722  | 11.76 |  | 1442 | 12.45 |  | 13,132 | 12.59 |  |
| 4 symptoms                   | 25,259 | 38.81 |  | 6146 | 48.73 |  | 44,512 | 47.3  |  |
| Work location                |  |  |  |  |  |  |  |  |  |
| Work in past 7 days, non-essential setting |  |  |  |  |  |  |  |  |  |
| Anxiety                      |  |  |  |  |  |  |  |  |  |
| Not at all                   | 5597  | 39.23 | Ref | 7073 | 40.46 | 0.549 | 7475  | 37.22 | < 0.001 |
| Several days                 | 4949  | 33.74 |  | 5782 | 32.26 |  | 5819  | 30.36 |  |
| More than half the days      | 6147  | 10.07 |  | 2072 | 16.48 |  | 10,121 | 11.7  |  |
| Nearly every day             | 7722  | 11.76 |  | 1442 | 12.45 |  | 13,132 | 12.59 |  |
| Worry                        |  |  |  |  |  |  |  |  |  |
| Not at all                   | 6710  | 45.51 | Ref | 8526 | 47.70 | 0.032 | 8421  | 40.92 | < 0.001 |
| Several days                 | 6147  | 10.07 |  | 2072 | 16.48 |  | 10,121 | 11.7  |  |
| More than half the days      | 7722  | 11.76 |  | 1442 | 12.45 |  | 13,132 | 12.59 |  |
| Nearly every day             | 25,259 | 38.81 |  | 6146 | 48.73 |  | 44,512 | 47.3  |  |
| Frequency in previous 2 weeks | Work location | Work in past 7 days, non-essential setting | Work in past 7 days, essential setting | No work in the past 7 days |
|-----------------------------|--------------|------------------------------------------|---------------------------------------|---------------------------|
|                             |              | $N$ | Wgt % | $p$-value | $N$ | Wgt % | $p$-value | $N$ | Wgt % | $p$-value |
| Having little interest      | Not at all   | 7255 | 48.72 | Ref       | 9288 | 49.91 | 0.688     | 8811 | 42.87 | <0.001    |
|                             | Several days | 4440 | 31.08 |           | 5051 | 29.10 |           | 5775 | 30.15 |           |
|                             | More than half the days | 1405 | 10.96 |           | 1665 | 11.20 |           | 2204 | 11.97 |           |
|                             | Nearly every day | 1122 | 9.24  |           | 1420 | 9.79  |           | 2319 | 15.01 |           |
| Feeling depressed           | Not at all   | 7425 | 50.01 | Ref       | 9386 | 50.80 | 0.534     | 9049 | 44.04 | <0.001    |
|                             | Several days | 4456 | 30.89 |           | 5135 | 30.18 |           | 5775 | 30.29 |           |
|                             | More than half the days | 1194 | 9.34  |           | 1485 | 9.67  |           | 1939 | 11.07 |           |
|                             | Nearly every day | 1147 | 9.76  |           | 1418 | 9.34  |           | 2346 | 14.60 |           |
| Number symptoms had at least several days | 0 symptoms | 4515 | 31.16 | Ref       | 5799 | 32.00 | 0.178     | 5834 | 28.03 | <0.001    |
|                             | 1 symptom    | 1299 | 7.88  |           | 1668 | 8.86  |           | 1577 | 7.81  |           |
|                             | 2 symptoms   | 1706 | 11.58 |           | 2019 | 11.09 |           | 1860 | 9.41  |           |
|                             | 3 symptoms   | 1618 | 12.02 |           | 2035 | 12.12 |           | 1969 | 10.69 |           |
|                             | 4 symptoms   | 5084 | 37.36 |           | 5903 | 35.93 |           | 7869 | 44.07 |           |
will also be an important contribution to identify the temporal sequence of associations between mental health and food insufficiency or financial difficulty. We do have sufficient data, however, to note that the outcomes we reported were arguably exacerbated the lack of a social safety net for those experiencing food insecurity and poverty. Addressing the mental health needs of this population may be partially attenuated through the provision of accessible mental health services. Our findings raise the need, however, for a broader, more vigorous approach to addressing poor mental health outcomes among Latinos in the wake of COVID-19 including a social safety net to protect people from food insecurity and inability to pay for such basic needs as housing.

Fig. 1 Heat map for associations of adverse mental health in relation to demographic, household, financial, and work characteristics for Latino participants of the US Census Household Pulse Survey, stratified by gender and poverty. Red color indicates values above 1 and blue color indicates values below 1, with darker shades indicating stronger magnitude odds ratios.

Fig. 2 Heat map for associations of adverse mental health in relation to demographic, household, and financial characteristics for Latino participants of the US Census Household Pulse Survey, stratified by work location. Red color indicates values above 1 and blue color indicates values below 1, with darker shades indicating stronger magnitude odds ratios.
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Author Contribution All authors contributed to the conception and design. Data acquisition and analysis was performed by CF. The first draft of the manuscript was written by CC. All authors read and approved the final manuscript.

Data Availability The Household Pulse Survey Data used in this analysis are publicly available from the US Census (https://www.census.gov/programs-surveys/household-pulse-survey/data.html).

Declarations

Ethics Approval The collection of data for the Household Pulse Survey was approved by the Office of Management and Budget (approval number: 0607–1013). This analysis was conducted on the Household Pulse Survey Data publicly available, de-identified data, and this analysis of the de-identified data is considered not human subjects research.

Competing Interests The authors declare no competing interests.

References

1. Gomez-Aguinaga B, Dominguez MS, Manzano S. Immigration and gender as social determinants of mental health during the COVID-19 outbreak: the case of US Latina/os. Int J Environ Res Public Health. 2021;18(11):6065. https://doi.org/10.3390/ijerph18116065.
2. Clay LA, Rogus S. Primary and secondary health impacts of COVID-19 among minority individuals in New York State. Int J Environ Res Public Health. 2021;18:683. https://doi.org/10.3390/ijerph18020683.
3. Clark E, Fredricks K, Woc-Colburn L, Bottazzi ME, Weatherhead J. Disproportionate impact of the COVID-19 pandemic on immigrant communities in the United States. PLoS Negl Trop Dis. 2020;14(7):e0008484. https://doi.org/10.1371/journal.pntd.0008484.
4. Nemani K, Li C, Olfson M, Blessing EM, Razavian N, Chen J, Petkova E, Goff DC. Association of psychiatric disorders with mortality among patients with COVID-19. JAMA Psychiatry. 2021;78:380–6. https://doi.org/10.1001/jamapsychiatry.2020.4442.
5. Nguyen KH, Chen S, Morris K, Chui K, Allen JD. Mental health symptoms and association with COVID-19 vaccination receipt and intention to vaccinate among adults, United States. Prev Med. 2022;154: https://doi.org/10.1016/j.pmed.2021.106905.
6. Wang Q, Xu R, Volkow ND. Increased risk of COVID-19 infection and mortality in people with mental disorders: analysis from electronic health records in the United States. World Psychiatry. 2021;20:124–30. https://doi.org/10.1002/wps.20806.
7. De Hert M, Mazerelle V, Stroobants M, De Picker L, Van Assche K, Detraux J. COVID-19–related mortality risk in people with severe mental illness: a systematic and critical review. Front Psychiatry. 2022;1:1–20.
8. Pfeifferbaum B, North CS. Mental health and the COVID-19 pandemic. N Engl J Med. 2020;383(6):510–2. https://doi.org/10.1056/NEJMep2008017.
9. Reger MA, Stanley IH, Joiner TE. Suicide mortality and coronavirus disease 2019—a perfect storm? JAMA Psychiat. 2020;77:1093–4. https://doi.org/10.1001/jamapsychiatry.2020.1060.
10. Vahdatian A, Blumberg SJ, Terlizzi EP, Schiller JS. Symptoms of anxiety or depressive disorder and use of mental health care among adults during the COVID-19 pandemic—United States, August 2020–February 2021. MMWR Morb Mortal Wkly Rep. 2021;70(13):490–4. https://doi.org/10.15585/mmwr.mm7013e2.
11. Cai C, Woolhandler S, Himmelstein DU, Gaffney A. Trends in anxiety and depression symptoms during the COVID-19 pandemic: results from the US Census Bureau’s Household Pulse Survey. J Gen Intern Med. 2021;36:1841–3. https://doi.org/10.1007/s11606-021-06759-9.
12. Sáenz R, Garcia MA. The disproportionate impact of COVID-19 on older Latino mortality: the rapidly diminishing Latino paradox. J Gerontol B Psychol Sci Soc Sci. 2021;76(3):e81–7. https://doi.org/10.1093/geronb/gbaa158.
13. Centers for Disease Control and Prevention. Risk for COVID-19 infection, hospitalization, and death by race/ethnicity. 2022. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/data-investigations-discovery/hospitalization-death-by-race-ethnicity.html. Accessed June 14, 2022.
14. Rodriguez-Diaz CE, Guilamo-Ramos V, Mena L, Hall E, Honermann B, Crowley JS, Baral S, Prado GJ, Marzan-Rodriguez M, Beyer C, Sullivan PS. Risk for COVID-19 infection and death among Latinos in the United States: examining heterogeneity in transmission dynamics. Ann Epidemiol. 2020;52:46–53. https://doi.org/10.1016/j.annepidem.2020.07.007.
15. Czeisler MÉ, Lane RI, Petsky E, Wiley JF, Christensen A, Njai R, Weaver MD, Robbins R, Facett-Childs ER, Barger LK, Czeisler CA. Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. MMWR Morb Mortal Wkly Rep. 2020;69:1049. https://doi.org/10.15585/ mmwr.mm6932a1.
16. McKnight-Eily LR, Okoro CA, Strine TW, Verlenden J, Hollis ND, Njai R, Mitchell EW, Board A, Puddy R, Thomas C. Racial and ethnic disparities in the prevalence of stress and worry, mental health conditions, and increased substance use among adults during the COVID-19 pandemic—United States, April and May 2020. MMWR Morb Mortal Wkly Rep. 2021;70:162.
17. Lauren BN, Silver ER, Faye AS, Rogers AM, Woo-Baidal JA, Ozanne EM, Hur C. Predictors of households at risk for food insecurity in the United States during the COVID-19 pandemic. Public Health Nutr. 2021;24:3929–36. https://doi.org/10.1017/S1368946921000353.
18. Rodriguez C, Crowder SL, Rodriguez M, Redwine L, Stern M. Food insecurity and the Hispanic population during the COVID-19 pandemic. Ecol Food Nutr. 2021;60:548–63. https://doi.org/10.1080/03670244.2021.11974014.
19. Salgado de Snyder VN, McDaniel M, Padilla AM, Parra-Medina D. Impact of COVID-19 on Latinos: a social determinants of health model and scoping review of the literature. Hisp J Behav Sci. 2021;43:174–203. https://doi.org/10.1177/0739986821000360.
20. Nee-Bustamente L, Krogstad JM, Lopez MH. For U.S. Latinos, COVID has taken a personal and financial toll. Pew Research Center. 2021. https://www.pewresearch.org/race-ethnicity/2021/07/15/for-u-s-latinos-covid-19-has-taken-a-personal-and-financial-toll/. Accessed 18 March 2022.
21. Cleaveland C, Frankenfeld C. “They kill people over nothing”: an exploratory study of Latina immigrant trauma. J Soc Serv Res. 2021;43:174–203. https://doi.org/10.1080/01488376.2019.1602100.
22. Garcini LM, Murray KE, Zhou A, Klonoff EA, Myers MG, Elder JP. Mental health of undocumented immigrant adults in the United States: a systematic review of methodology and findings. J Immigr Refug Stud. 2016;14:1–25. https://doi.org/10.1080/15562948.2014.998849.
23. Sullivan MM, Rehm R. Mental health of undocumented Mexican immigrants: a review of the literature. ANS Adv Nurs Sci. 2005;28:240–51. https://doi.org/10.1097/00012272-200507000-00006.

24. Blanco L, Cruz V, Frederick D, Herrera S. Financial stress among Latino adults in California during COVID-19. J Econ Race Policy. 2022;5(2):134–48. https://doi.org/10.1007/s41996-021-00087-0.

25. Bui CN, Peng C, Mutchler JE, Burr JA. Race and ethnic group disparities in emotional distress among older adults during the COVID-19 pandemic. Gerontologist. 2021;61:262–72. https://doi.org/10.1093/geront/gnaa217.

26. Enriquez D, Goldstein A. COVID-19’s socioeconomic impact on low-income benefit recipients: early evidence from tracking surveys. Socius. 2020;6:1–17. https://doi.org/10.1177/2378023120970794.

27. Reingold B, Smith AR. Welfare policymaking and intersections of race, ethnicity, and gender in U.S. state legislatures. Am J Pol Sci. 2012;56(1):131–47. https://doi.org/10.1111/j.1540-5907.2011.00569.x.

28. Abramowitz M. Welfare reform in the United States: gender, race and class matter. Crit Soc Policy. 2006;26(2):336–64.10. https://doi.org/10.1177/0261027706062589.

29. Mink G. Welfare’s end. Cornell University Press; 2018.

30. Internal Revenue Service. Economic impact payments. https://www.irs.gov/coronavirus/economic-impact-payments. Retrieved June 16, 2022.

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