

# Experiences with COVID-19 Stress Among Hispanic/Latino Farmworkers



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## HIGHLIGHTS

- The majority of Hispanic/Latino agricultural workers surveyed reported experiencing stress about becoming infected with and contracting COVID-19.
- A small proportion of Hispanic/Latino agricultural workers surveyed reported experiencing instances of COVID-19 traumatic stress.
- Hispanic/Latino farmworkers reported stress surrounding their ability to financially provide for their families as a result of the COVID-19 pandemic.

**ABSTRACT.** *Hispanics/Latinos, particularly those that identify as foreign-born, are overrepresented in the agricultural sector in the U.S. Over the course of the COVID-19 pandemic, this subpopulation of farmworkers was recognized as an invaluable group of essential workers unable to implement COVID-19 protections. Previously validated COVID-19 stress scale measures were identified, adapted, and translated to collect COVID-19 stress data from Hispanic/Latino agricultural workers in two heavily agricultural counties in northeastern North Carolina. Participants were recruited using purposive convenience sampling. Data collection took place from June to November of 2021. The majority of Hispanic/Latino agricultural workers surveyed reported experiencing worries about catching COVID-19 (92.00%) and being infected with the virus (95.95%). A small proportion of the surveyed population indicated experiencing COVID-19 traumatic stress. More than half of participants were concerned about the impacts COVID-19 would have on their ability to see (53.42%) and provide for their families (58.33%). Farmworkers bore relatively heavy stress burdens associated with the COVID-19 pandemic. Because this group is a vulnerable population at risk for adverse health outcomes, reports numerous barriers to healthcare access, and faces health and safety challenges related to acculturative stress, understanding their experiences with COVID-19 is essential for the*



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159

*development of protective and preventative efforts to improve outcomes among Hispanic/Latino farmworkers.*

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Farmworkers have long been recognized as a vulnerable population in the U.S., reporting low levels of educational attainment, low incomes, and limited access to health care services (Arcury et al., 2013; Hansen and Donohoe, 2003; Stoecklin-Marois et al., 2013). These workers, who often report feeling little to no control over their work environments, represented a particularly vulnerable group of essential workers over the course of the COVID-19 pandemic (Arcury et al., 2015; Quandt et al., 2020). Farmworkers in the U.S. were unable to implement recommended COVID-19 preventative and protective behaviors employed throughout the country, like sheltering in place or working from home (Quandt et al., 2020). These workers were required to continue living in crowded employer-provided housing, utilize transportation methods where social distancing was impossible, and complete work tasks in close proximity to one another, all while having limited access to clean water and sanitation supplies both in their employer provided housing and at work sites (Quandt et al., 2021).

Foreign-born Hispanics/Latinos, who are overrepresented in the agricultural sector, are a unique population of workers whose social and demographic characteristics further complicate their risk for poor health outcomes, including COVID-19 infection (Handal et al., 2020). Acculturative stressors like limited English language proficiency, experiences with discrimination, and undocumented status have been recognized as major factors exacerbating foreign-born Hispanics/Latinos risk for adverse COVID-19 outcomes (Arcury et al., 2015; Handal et al., 2020; Quandt et al., 2020). Demanding and stressful working conditions in which workers have little decision-making power, working conditions not compliant with basic infection-prevention measures, power differentials that leave workers feeling unable to approach employers about health and safety measures (e.g., personal protective equipment, accommodations to reduce COVID-19 risk), and poor living conditions have been identified as factors specific to farmworker populations potentially increasing their risk of COVID-19 infection. Furthermore, early efforts made to combat the negative economic impacts of COVID-19 systematically excluded foreign-born and undocumented farmworkers, despite recognizing these same overrepresented populations as essential workers. Farmworkers who were unauthorized or undocumented were ineligible for COVID-19 specific aid and relief, despite their increased economic and social vulnerability, further escalating their risk for adverse health outcomes and COVID-19 infection (Quandt et al., 2020).

Given the vulnerability of farmworker populations, their role as essential workers, and their heightened risk for COVID-19 infection, it is of crucial importance to further what is presently understood about the ways in which the pandemic has impacted farmworker communities in the U.S. Developing a more comprehensive understanding of the effects of the pandemic on Hispanic/Latino farmworker communities, in particular, is vital for the formulation of comprehensive health and safety interventions, workplace policies and protections, and health and safety guidelines.

The present study sought to answer the research question: “How have U.S. farmworkers been impacted by the COVID-19 pandemic?”. The objectives of the study were to (1) characterize farmworkers’ experiences with stress over the course of the pandemic and

(2) identify cultural and acculturative factors potentially impacting Hispanic/Latino farmworkers COVID-19 stress experiences. Research hypotheses for this study were that (1) Hispanic/Latino farmworkers surveyed would report elevated levels of stress related to COVID-19 danger and contamination fears and that (2) farmworkers would express concerns over their ability to financially provide for their families as a result of the COVID-19 pandemic.

## Methods

Northeastern North Carolina consists of a 16-county region. Agricultural production within this region is comprised of various crops, including soybeans, cotton, peanuts, corn, and tobacco, among others. The 2017 Census of Agriculture estimated the total number of hired farm laborers in North Carolina at over 60,000, almost 30,000 of whom were migrant/seasonal workers (United States Department of Agriculture and National Agricultural Statistics Service, 2019). Many agricultural regions face challenges to population health similar to those observed in Eastern North Carolina, including low population density, which typically translates to fewer healthcare services and diminished accessibility to healthcare resources, physical barriers to healthcare, limited knowledge on health problems and indicators of severe conditions, and difficulties in providing medical attention and preventative care to agricultural workers. These factors, along with the large population of farmworkers, and the importance of the state's agricultural yield to the country, in conjunction with the increased media coverage examining adverse COVID-19 health outcomes among NC farmworkers over the course of the pandemic, made the state the ideal place to conduct the proposed study.

This study recruited participants self-identifying as farmworkers from Pasquotank and Camden counties in North Carolina. For the purposes of the present study, farmworkers were defined as individuals employed in the agricultural sector actively performing labor tasks related to the cultivation and harvesting of crops or other agricultural yields. These counties were chosen for participant recruitment because of their large agricultural populations, notable regional health disparities, and accessibility. Camden County is home to 81 farms covering 59,239 acres (United States Department of Agriculture National Agricultural Statistics Service, and North Carolina Department of Agriculture and Consumer Services, 2019). Pasquotank County is home to 126 farms covering 72,174 acres of land (USDA-NASS and NCDACS, 2019).

Understanding the vulnerability and sensitivity of the population of interest to be recruited, the methodology employed in the study consisted of culturally appropriate participant recruitment and data collection strategies, non-experimental methodologies, and a cross-sectional survey. Sampling methods for the proposed study consisted of purposive convenience sampling. Participants were recruited using convenience methodologies and consisted of groups of farmworkers accessible to the research team through collaborative community partnerships specific to the region of interest. Community partners included well-respected community leaders who self-identified as members of the farmworker communities within the region of interest, as well as community health centers with focused migrant and seasonal farmworker health programs and services. Participant eligibility criteria required participants to (1) be presently employed in the agricultural sector in Pasquotank or Camden County, (2) be over the age of 18 at the time of participation, and (3) be able to provide written or verbal informed consent to participate in the study. The

study was determined to be exempt from IRB review, according to federal regulations, by Old Dominion University's Institutional Review Board (IRB).

Bilingual members of the research team facilitated data collection interview sessions at work sites during workers' lunch hour and after hours at local eateries and shops frequented by farmworkers. During the data collection interview sessions, a trained member of the research team collected consent, demographic, and COVID-19 data using an adapted questionnaire tool. The questionnaire collected data on a limited number of demographic characteristics. Demographic questionnaire items inquired about participants' age, race, ethnicity, gender, marital status, highest level of education, number of years employed as an agricultural worker in the United States, current crop/agricultural yield worked with (fruit, vegetable, livestock, dairy, etc.), English language proficiency, foreign-born status, and home country, if foreign-born. Demographic, occupational health, and occupational history questionnaire items were adapted from a validated English/Spanish occupational health and safety questionnaire, utilized in a previous study among Eastern NC farm workers (Akpınar-Elci et al., 2016). The questionnaire also included a limited number of items surrounding COVID-19 infection status (i.e., ever exposed to COVID-19, ever had a positive COVID-19 test, ever suspected having COVID-19).

The COVID-19 data collection instrument was adapted from the COVID-19 Stress Scales (CSS). The CSS was one of the only existing measures that worked to assess COVID-19 associated mental health issues comprehensively at the time this study was developed and took place (Chandu et al., 2020). The CSS consists of 36 items measured on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely) (Taylor et al., 2020). Items on the questionnaire inquire about COVID danger and contamination fears, fears about economic consequences, xenophobia, compulsive checking and reassurance seeking, or traumatic stress symptoms experienced over the seven-day period preceding questionnaire completion.

To formulate the finalized survey tool, CSS items were carefully evaluated for relevancy to the population of interest. For the purposes of the present study, the CSS measures adapted and included in the finalized tool consisted of those concerned with danger (n=6), contamination (n=5), and traumatic stress (n=6) experienced over the year preceding questionnaire completion. The present study purposely chose to omit questions concerned with xenophobia, economic consequences, compulsive checking, and reassurance seeking. This decision was made because the CSS questionnaire items measuring each of these constructs failed to account for cultural sensitivities and population-specific characteristics. For example, the phrasing of CSS items covering xenophobia may have been perceived as insensitive by those study participants identifying as foreign-born or undocumented, while those covering economic consequences inquired over experiences of economic distress that would not have been relatable for Hispanic/Latino farmworker populations. After screening questionnaire items for relevancy and cultural sensitivity, they were compiled into a finalized survey tool and translated to ensure linguistic appropriateness.

The translation of the adapted instrument consisted of (1) drafting and finalizing an English language questionnaire, (2) the translating of the finalized English language questionnaire into Spanish by a member of the study team, (3) subsequent back-translation by both a native Spanish speaker and a fluent Spanish speaker, (4) a consolidation of back-translations by the research team, (5) a review of the consolidated translated questionnaire by a native Spanish speaking community partner familiar with the target population, (6) finalization of the translated questionnaire, and (7) the delivery of test questionnaires to a

sample of five members of the population of interest to assess finalized questionnaire clarity and time needed to administer and complete the questionnaire. It is important to note that study team members involved in the processes of translation, back translation, and questionnaire consolidation employed to finalize the Spanish-language instrument were native speakers or fluent in Spanish from differing regions. Team members involved in the translation process spoke Spanish regionally specific to Mexico, Puerto Rico, Costa Rica, and Venezuela. The diversity in the translation team allowed for the identification and elimination of terminology with regionally different meanings that would have potentially confused study participants. The methods for translation employed in the present study were developed based on methodologies applied throughout existing research on translation processes and recommendations for community-engaged research (Manchaiah et al., 2020; Marinez-Lora et al., 2016; UCLA Clinical and Translational Science Institute, 2017).

Data collection took place from June to November of 2021. Statistical analyses were conducted using SPSS version 28. Data collection and analyses utilized descriptive statistics procedures appropriate for the exploration of primary data. The demographic information collected was assessed using frequencies and percentages to summarize the characteristics of the sample population and provide an overview of participant experiences with COVID-19 stress over the year preceding participation in the study.

## Results

A total of 75 participants were recruited for the present study. The mean age of study participants was 41.32 (SD = 11.32) years. The youngest and oldest participant ages recorded were 18 and 63. The majority of surveyed participants identified as female (75.00%). The majority of the study sample was identified as single (unmarried) (68.92%). Levels of educational attainment were low among the population. One-third (33.33%) of the population reported educational attainment of high school completion or higher. One-fourth (24.00%) of the population reported receiving no formal schooling at all. The majority of respondents identified as foreign-born (90.41%).

Among foreign-born participants, Mexico was the most commonly reported country of birth (79.41%). A smaller proportion of respondents reported Guatemala (8.82%), Honduras (7.35%), Venezuela (1.47%), or an unspecified country (2.94%) as their country of birth. The majority of participants identified as Hispanic/Latino (90.54%) and reported Spanish as their first language (89.33%). Limited English language proficiency was common among participants, with 91.67% reporting limited ability to understand English and 91.67% reporting limited ability to speak English. A detailed statistical overview of the study population demographic characteristics can be found in table 1.

The average number of years worked as an agricultural worker among the study population was 10.36 (SD = 8.84) (table 2). Most participants (92.96%) self-identified as general agricultural workers (crop pickers, crop harvesters, etc.). A smaller proportion identified as machine operators (2.82%), crew leaders (2.82%), or held more than one labor position (1.41%). Types of agricultural yields reaped/worked with included fruit (45.83%), vegetables (54.17%), cattle (5.56%), aquatic (47.22%), and others not specified (1.39%). Most farmworkers reported working 20 to 40 hours weekly (89.06%).

A large proportion of the population reported a known exposure to COVID-19 at some point over the year preceding participation in the study (90.54%) (table 2). More than one-fourth of the population suspected having had COVID-19 in the year preceding

**Table 1. Study Population Demographic Characteristics.**

Variable	N	Mean (SD)
Total Population	75	100.00
Age	75	41.32 (11.32)
Demographics	N	%
Gender	72	
Male	18	25.00
Female	54	75.00
Marital Status	74	
Single	51	68.92
Married	22	29.73
Divorced	1	1.35
Educational Attainment	75	
No formal education	18	24.00
Less than high school	32	42.67
High school graduate	21	28.00
College graduate	3	4.00
Professional-level education	1	1.33
Born Outside of U.S.	73	
No	7	9.59
Yes	66	90.41
Cultural Characteristics		
Country of Birth	68	
Mexico	54	79.41
Guatemala	6	8.82
Honduras	5	7.35
Venezuela	1	1.47
Other	2	2.94
Ethnicity	74	
Black, Not Hispanic/Latino	4	5.41
White, Not Hispanic/Latino	3	4.05
Hispanic/Latino	67	90.54
Language	75	
First Language English	8	10.67
First Language Spanish	67	89.33
English Language Proficiency	72	
Speak English Well	6	8.33
Do Not Speak English Well	66	91.67
Understand English Well	6	8.33
Do Not Understand English Well	66	91.67

participation in the study (29.73%). A slightly smaller proportion of participants reported having had a positive COVID-19 test at some point during the year preceding participation in the study (21.62%). More than half of participants reported having a COVID-19 vaccine (63.89%). Of those who were unvaccinated at the time of study participation, 84.00% reported an intention to get a COVID-19 vaccine.

When it came to self-reported danger fears, 92.00% of the population reported some degree of worry about contracting COVID-19, 94.67% reported worrying that basic hygiene would not protect them from contracting COVID-19, 88.00% reported worrying that the healthcare system would not be able to protect them from COVID-19, 93.33% reported worrying about being unable to protect their family from the COVID-19 virus, 91.89% reported some level of concern about the healthcare system being unable to protect loved

**Table 2. Study Population Farm Work Characteristics and COVID-19 Experiences.**

Variable	N	Mean (SD)
Total Population	75	100.00
Number of years worked as an agricultural worker	69	10.36 (8.84)
<b>Work Characteristics</b>	<b>N</b>	<b>%</b>
Job title	71	100.00
General Agricultural worker	67	92.96
Machine Operator	3	2.82
Crew Leader	2	2.82
More than one job title held	1	1.41
Agricultural yield worked with	72	
Fruit	33	45.83
Vegetables	39	54.17
Cattle	4	5.56
Aquatic yields	34	47.22
Other	1	1.39
Weekly Hours Worked	64	100.00
20 to 40 hours	57	89.06
More than 40 hours	7	10.94
<b>COVID-19 Experiences</b>		
Known exposure to COVID-19 in the past 12 months	74	100.00
Yes	67	90.54
No	7	9.46
Suspected COVID-19 in the past 12 months	74	100.00
Yes	22	29.73
No	52	70.27
Positive COVID-19 test in the past 12 months	74	100.00
Yes	16	21.62
No	58	78.38
At least one COVID-19 vaccine dose	72	100.00
Yes	46	63.89
No	26	36.11
Intend to get vaccinated (among those not yet vaccinated)	25	100.00
Yes	21	84.00
No	4	16.00

ones from COVID-19, and 94.52% worried that social distancing would not be able to protect them from contracting the COVID-19 virus. Degrees of concern varied for each of the danger fears (0= “not at all”, 1= “slightly”, 2= “moderately”, 3= “very”, 4= “extremely”). Across all danger fears, worries about being unable to protect family yielded the highest percentage of increased contamination fears (degree of concern  $\geq 2$ ), with 37.33% of participants reporting being moderately concerned, 22.67% reporting being very concerned, and 8.00% reporting being extremely concerned. A detailed summary of participant self-reported COVID-19 stress by questionnaire item can be found in table 3.

When it came to contamination fears, 95.95% of participants reported some degree of worry about being infected with COVID-19 by the people around them, 94.52% reported some degree of worry about contracting COVID-19 from touching things in public spaces, 97.26% were worried about contracting the virus from someone coughing or sneezing around them, 91.78% were worried about contracting the virus from handling money or using a debit machine, and 93.15% were worried about taking cash in transactions. Across all contamination fears, worries about contracting the virus from people around them and

**Table 3. Summary of Participants' COVID-19 Stress by Item and Worry Level (% [n]).**

Questionnaire Item	Not at all	Slightly	Moderately	Very	Extremely	Ever Worried <sup>[a]</sup>
D1. I was worried about catching the virus.	8.00 (6)	70.67 (53)	17.33 (13)	1.33 (1)	2.67 (2)	92.00 (69)
D2. I was worried that basic hygiene (e.g., handwashing) would not be enough to keep me safe from the virus.	5.33 (4)	52.00 (39)	37.33 (28)	4.00 (3)	1.33 (1)	94.67 (71)
D3. I was worried that the healthcare system would be unable to keep me safe from the virus.	12.00 (9)	36.00 (27)	34.67 (26)	16.00 (12)	1.33 (1)	88.00 (66)
D4. I was worried that I wouldn't be able to keep my family safe from the virus.	6.67 (5)	25.33 (19)	37.33 (28)	22.67 (17)	8.00 (6)	93.33 (70)
D5. I was worried that the healthcare system wouldn't be able to protect my loved ones.	8.11 (6)	32.43 (24)	37.84 (28)	16.22 (12)	5.41 (4)	91.89 (68)
D6. I was worried that social distancing would not be enough to keep me safe from the virus.	5.48 (4)	28.77 (21)	36.99 (27)	17.81 (13)	10.96 (8)	94.52 (68)
C1. I was worried that people around me would infect me with the virus.	4.05 (3)	39.19 (29)	31.08 (23)	22.97 (17)	2.70 (2)	95.95 (71)
C2. I was worried that if I touched something in a public space (e.g., handrail, door handle), I would catch the virus.	5.48 (4)	35.62 (26)	46.58 (34)	8.22 (6)	4.11 (3)	94.52 (69)
C3. I was worried that if someone coughed or sneezed near me, I would catch the virus.	2.74 (2)	23.29 (17)	32.88 (24)	24.66 (18)	16.44 (12)	97.26 (71)
C4. I was worried that I might catch the virus from handling money or using a debit machine.	8.22 (6)	53.42 (39)	28.77 (21)	9.59 (7)	0.00 (0)	91.78 (67)
C5. I was worried about taking cash in transactions.	6.85 (5)	56.16 (41)	28.77 (21)	8.22 (6)	0.00 (0)	93.15 (68)
T1. I had trouble sleeping because I was worried about the virus.	72.60 (53)	26.03 (19)	1.37 (1)	0.00 (0)	0.00 (0)	27.39 (20)
T2. I had bad dreams about the virus.	98.57 (69)	1.43 (1)	0.00 (0)	0.00 (0)	0.00 (0)	1.43 (1)
T3. I thought about the virus when I didn't mean to.	73.61 (53)	25.00 (18)	0.00 (0)	0.00 (0)	1.39 (1)	26.39 (19)
T4. Disturbing mental images about the virus popped into my mind against my will.	95.89 (70)	2.74 (2)	1.37 (1)	0.00 (0)	0.00 (0)	4.11 (3)
T5. I had trouble concentrating because I kept thinking about the virus.	95.89 (70)	4.11 (3)	0.00 (0)	0.00 (0)	0.00 (0)	4.11 (3)
T6. Reminders about the virus caused me to have physical reactions, such as sweating or a pounding heart.	97.26 (71)	1.37 (1)	0.00 (0)	1.37 (1)	0.00 (0)	2.74 (2)

<sup>[a]</sup> The ever-worried variable represents the total population (% (n)) of participants reporting experiencing any degree (slight to extreme) of self-reported stress per questionnaire item.

worries about contracting the virus from people coughing or sneezing around them yielded the highest percentage of increased contamination fears.

Measures of COVID-19 traumatic stress were reported more infrequently by study participants, with 27.39% reporting some level of difficulty sleeping attributable to worries about COVID-19, 1.43% reporting having nightmares about the virus, 26.39% reporting experiencing intrusive thoughts about the virus, 4.11% reporting having experienced struggling with intrusive, disturbing mental images concerned with COVID-19, 4.11% reporting trouble concentrating because of thinking about the virus, and 2.74% reporting having had physical reactions, such as sweating or pounding heart, because of reminders about the virus.

Respondents reported differing experiences of COVID-19-associated occupational and familial stress. Approximately one-third of participants (35.62%) reported worrying that their workplace would begin laying off workers as a result of the COVID-19 pandemic, 40.28% worried about losing their job if they contracted COVID-19, and 38.89% were worried that they would lose their job if they needed to take time off to recover from COVID-19. More than half of farmworkers also reported worrying that they would be unable to provide for their family (58.33%) or see friends and family (53.42%) because of COVID-19.

## Discussion

The present study sought to characterize Hispanic/Latino farmworkers with COVID-19 associated stress in a predominantly agricultural region in northeastern North Carolina. In accordance with study hypotheses, this study found that Hispanic/Latino farmworkers struggled with worries about COVID-19 danger and contamination and reported instances of traumatic stress related to COVID-19. Unsurprisingly, study participants reported increased levels of concern (degree of concern  $\geq 2$  using Likert scale) related to COVID-19 danger and COVID-19 contamination, specifically. These findings suggest that workers experienced a significant amount of stress stemming from concerns related to contracting the virus and the threat posed by the virus to individual health, as well as the health of loved ones.

While COVID-19 traumatic stress experiences were infrequently reported among study participants, the self-reporting of these experiences was a significant finding of the present study. Trouble sleeping and intrusive thoughts about the virus were the most frequently reported traumatic stress experiences. Trouble sleeping was an important self-reported outcome, as poor sleep quality, coupled with hot work environments, which are unavoidable in outdoor occupational settings, has been shown to increase workers' risk for adverse occupational safety outcomes (Sandberg et al., 2016). These experiences were important findings not only because of their relationship to occupational health but also because these factors are more transparently related to mental health outcomes. In Hispanic/Latino populations, mental health issues and conditions are negatively stigmatized (Moyce et al., 2022; Washburn et al., 2021). As such, participants' willingness to divulge experiencing traumatic stress related to COVID-19 was a significant strength of the present study.

### **Cultural Factors, Acculturative Stress, and COVID-19**

Studies have suggested that the COVID-19 pandemic resulted in increased fear and anxiety among Hispanic families. Data from a national survey conducted in the U.S. found that two-thirds of Hispanic adults considered COVID-19 a major threat to the health of the

U.S. population, while less than half of the general public reported this same concern (Calo et al., 2020). This same survey found that 39% of Hispanic adults considered COVID-19 a major threat to their personal health and safety, compared to 27% of other American adults. The high levels of COVID-19 fear and anxiety among Hispanic populations in the U.S. are not presently well understood but have been hypothesized to be associated with increased risk of COVID-19 exposure and infection, as Hispanics are more likely to be employed in essential service sectors, have decreased access to healthcare services, and have language barriers impacting their access to COVID-19 health information (Calo et al., 2020; Podewils et al., 2020).

This study found that approximately half of farmworkers surveyed were worried about their ability to provide for and see their families because of COVID-19. The prevalence of these concerns was unsurprising given the importance of familial and social ties in Hispanic/Latino culture (Kilanowski, 2014). *Familismo*, defined in existing research and literature as the emphasis placed on maintaining close relationships and strong ties with immediate and extended family members, is a distinctive cultural characteristic observed among Latino populations (Ayon et al., 2010; Rojas et al., 2021). The emphasis on maintaining familial ties and the obligation to take care of one another observed in Latino culture, attributable to the shared cultural belief and practice of *familismo*, likely influenced workers' experiences with and perceptions of COVID-19. While the social connectedness observed within Hispanic populations has been identified as a protective factor against chronic health conditions and adverse mental health outcomes in previous research, in the case of COVID-19, close networks were associated with an increased risk of exposure and infection (Podewils et al., 2020). Future studies should work to further explore the relationship between *familismo* and COVID-19 stress.

Farmworkers who identify as foreign-born have been disproportionately affected by COVID-19 and have struggled with increased mental health issues and stress as a result of the loss of family members because of COVID-19, loss of income over the course of the pandemic, lost and reduced work because of the pandemic, and a lack of COVID-19 personal protective equipment (California Institute for Rural Studies, 2020; Keeney et al., 2022). In accordance with existing research, the present study found that farmworkers struggled with increased levels of stress related to COVID-19. Future studies should work to further explore the associations between the acculturative stressors reported specifically by foreign-born Hispanic/Latino farmworkers and COVID-19 to better understand the impact of these factors on COVID-19 outcomes.

### **Strengths**

To the knowledge of the authors, the present study is among the first to utilize a validated COVID-19 stress measure for adaptation, translation, and delivery to a population of farmworkers in the U.S. As such, the findings reported in this study are novel and serve to provide unique insight on a limitedly researched topic. Because this study sought to characterize past and presently ongoing experiences related to COVID-19 as the pandemic persisted in 2021, recruited farmworkers were willing to participate in the study and provide details on recent experiences with COVID-19. Participants were very open to discussing their experiences. Very few participants elected to withhold responses to questionnaire items. Workers were very communicative about personal obstacles and challenges they faced as a result of COVID-19.

This study was able to recruit 75 farmworkers from two agricultural counties in North Carolina for participation. Populations of farmworkers are notoriously difficult to access (Kilanowski, 2014; Stoecklin-Marois et al., 2011). Research concerning these populations must overcome cultural, linguistic, and political barriers in order to recruit study participants safely and respectfully (Kilanowski, 2014). COVID-19 increased barriers to access and resulted in additional obstacles in working with the population of interest. Despite both anticipated and unanticipated challenges in accessing the population, a respectable number of farmworker participants were recruited.

An additional strength of the present study was the recruitment of a particularly vulnerable group of farmworkers. Most study participants identified as foreign-born, reported limited levels of educational attainment and English language proficiency. These factors are heavily associated with higher levels of acculturative stress. The increased prevalence of these factors among the population recruited for participation allowed a unique opportunity to explore COVID-19 stress in a group of farmworkers recognized to be at higher vulnerability for adverse health outcomes compared to US-born farmworkers who report lower levels of acculturative stress comparatively.

### **Limitations**

The present study is not without limitations. The study population consisted primarily of female farmworkers. While this made the study population a unique sample of farmworkers, males are overrepresented in the agricultural sector. As such, studies on general farmworker populations tend to recruit more male participants than what was observed in the present study. The over recruitment of female participants was not intentional but rather likely a result of having an all-female data collection team. Additionally, the community partnerships established and utilized to recruit study participants consisted of primarily female community leaders. These partnerships, while invaluable, may have impacted participant recruitment and influenced the willingness of male farmworkers to participate.

Because study recruitment and data collection took place over the second year of the COVID-19 pandemic in the U.S., COVID-19 related challenges arose. There were necessary pauses in data collection to protect the study team and population of interest from COVID-19 exposure. Over the data collection period, several farms in the region where data collection was taking place experienced COVID-19 outbreaks. The necessary pauses in data collection may have resulted in the unintentional exclusion of eligible participants. In the present sample, approximately half of the farmworkers surveyed reported working with aquatic agricultural yields. This finding was likely due to the increased accessibility of these workers year-round. Farmworkers working with vegetable and fruit crops travel in and out of the regions under study as growing seasons begin and end, making them more difficult to identify and access. The original data collection and recruitment plan accounted for migrant and seasonal farm work; however, revisions to data collection strategies had to be made on an ongoing basis.

Although the sample size collected for the present study was respectable given the known obstacles in accessing and recruiting Hispanic/Latino farmworker populations, the small sample limits the statistical power of study results. A larger, more heterogeneous, population sample would improve statistical power and allow for more complex analyses examining differences in COVID-19 experiences based on major demographic and cultural characteristics like foreign-born status and English language proficiency. An additional constraint resulting from the limited sample size recruited for the present study was the

inability to conduct an exploratory analysis to statistically assess and report on the psychometric quality of the adapted instrument.

## Conclusion

Hispanic/Latino farmworkers reported experiencing COVID-19 stress associated with perceived danger and contamination fears, as well as instances of traumatic stress. Hispanic/Latino farmworker participants in the present study also indicated significant stress related to fears of job loss, economic impacts, and an inability to connect with their social support networks. These findings, while expected, are important in furthering the understanding of how the pandemic impacted farmworker populations. Based on the results of the present study, it can be concluded that this group of farmworkers bore relatively heavy stress burdens associated with the COVID-19 pandemic. Because Hispanic/Latino farmworkers are a vulnerable population already at risk for adverse health outcomes, report numerous barriers to healthcare access, face significant health and safety challenges related to various acculturative stressors, and were excluded from many of the COVID-19 protection and relief efforts, they experienced significant mental health burden and financial strain. The findings of the present study suggest a need to further explore and work to alleviate adverse mental health, economic, and social impacts attributable to the COVID-19 pandemic among Hispanic/Latino farmworker populations. Understanding their adverse experiences over the course of the COVID-19 pandemic, policies working to actively formulate and implement feasible workplace protection standards to combat the spread of infectious diseases, further exploration of mental health and social outcomes attributable to the pandemic, and improved economic support initiatives for Hispanic/Latino farmworkers adversely impacted by the COVID-19 pandemic are recommended to improve and maintain farmworkers' overall health.

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